HABITUS PROFILES AS INDICATORS OF BRUNEI STUDENTS’ DISPOSITIONS TOWARDS LEARNING IN ONLINE LEARNING SYSTEMS

A thesis submitted to the University of Manchester for the degree of Doctor of Philosophy in Education in the Faculty of Humanities

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Definition of terms

Abductive inferencing – A logical process of inferencing the simplest and likeliest explanation(s) of findings from the data based on observations, theories, and the literature (interchangeably used with abductive reasoning).

Adaptive Online Learning System (AOLS) – An emerging type of online learning system that uses algorithms and fuzzy logic to profile learners and adapt to their learning needs.

Andragogy – Self-directed learning where the learners strive for increasing autonomy in learning. This learning process is facilitated by the teachers.

Capital – Personal characteristics that an individual acquires or owns throughout his/her lifetime. Capitals can be in the forms of social status and involvement (social capital), financial asset and access to funds (economic capital), cultural values and religious beliefs (cultural capital), skills and intelligence (intellectual capital), and digital skills and technology ownership (techno-capital).

Conatus – Factors and variables that incline individuals to strive towards improving their identity through the alteration of their dispositions.

Disposition – An individual’s tendency to behave in a certain way, react toward certain stimuli and preferences for certain affordances, artefacts and approaches.

Doxa – Unquestioned and oftentimes unrealistic dogma prescribed by the system with specific expectations of its users.

Dynamicity – The condition of being dynamic.

Field – A site within which the individual and the system interact with each other, with the individual’s dispositions emerging as the modus operandi and the system’s expectations and features presented as opus operatum.

Habitus – A collection of interplaying and transposable dispositions that may be used to profile learners into discernible habitus types.
**Heutagogy** – Self-determined learning where the learners solve their own problems and find solutions to their own complex enquiries with the role of the teacher reduce to coaches who provide learning opportunities and contexts.

**Hypotheticity** – The state of statements being neither arbitrary nor having insufficient empirical verifiability. A hypothetical state.

**Hysteresis** – A mismatch between the learners’ dispositions and the expectations of the learning system.

**Learner theory** – A theory that has been used in educational research to investigate and profile learners. Examples include learning styles, multiple intelligences, learner habits, personality psychometrics, etc.

**Modus operandi** – The observable behaviour and actions of a learner as influenced by his/ her dispositions.

**Multimodal Online Learning System** – An online learning system that uses different modes of tools and format to deliver the same content and interaction.

**Opus operatum** – The features, affordances and artefacts of a learning system and their expectations of the learners.

**Practice** – A system within which the interactions of an individual’s capitals and habitus with the field transpire and become observable.

**Psychographic** – A type of Individual characteristic such as attitudes, dispositions, personalities, values, opinions, interests and lifestyles, but not demographic properties.

**Two-Cycle Coding** – A qualitative data coding method advocated by Saldana that uses different combinations of coding strategies to systematically form categories and themes as findings.
# List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AOLS</td>
<td>Adaptive Online Learning System</td>
</tr>
<tr>
<td>ALPIS</td>
<td>Automatic Learner’s Personality Identifier System</td>
</tr>
<tr>
<td>BTE</td>
<td>Brunei Technical Education</td>
</tr>
<tr>
<td>HCI</td>
<td>Human-Computer Interaction</td>
</tr>
<tr>
<td>HLMS</td>
<td>Heterogeneous Learning Management System</td>
</tr>
<tr>
<td>IWB</td>
<td>Interactive Whiteboard</td>
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<tr>
<td>KLSI</td>
<td>Kolb’s Learning Styles Inventory</td>
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<tr>
<td>LMS</td>
<td>Learning Management System</td>
</tr>
<tr>
<td>LUM</td>
<td>Lazy User Model</td>
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<tr>
<td>MBTI</td>
<td>Myers-Briggs Type Indicator</td>
</tr>
<tr>
<td>MOOC</td>
<td>Massive Open Online Course</td>
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<tr>
<td>MoE</td>
<td>Ministry of Education (Brunei)</td>
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<tr>
<td>MOLS</td>
<td>Multimodal Online Learning System</td>
</tr>
<tr>
<td>OLP</td>
<td>Online Learner Profiling</td>
</tr>
<tr>
<td>PCA</td>
<td>Principal Component Analysis</td>
</tr>
<tr>
<td>PLE</td>
<td>Personalised Learning Environment</td>
</tr>
<tr>
<td>SALSA</td>
<td>Search, Appraisal, Synthesise and Analyse</td>
</tr>
<tr>
<td>SAMR</td>
<td>Substitution, Augmentation, Modification and Redefinition</td>
</tr>
<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
</tr>
<tr>
<td>TALO</td>
<td>Teaching and Learning Online</td>
</tr>
<tr>
<td>TVET</td>
<td>Technical Vocational Education and Training</td>
</tr>
<tr>
<td>UTAUT</td>
<td>Unified Theory of Acceptance and Use of Technology</td>
</tr>
<tr>
<td>VAK</td>
<td>Visual, Auditory, Kinaesthetic</td>
</tr>
<tr>
<td>VARK</td>
<td>Visual, Auditory, Read/Write, Kinaesthetic</td>
</tr>
<tr>
<td>VLE</td>
<td>Virtual Learning Environment</td>
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List of previous work


Abstract

This PhD research investigates the significance of learners’ profiles on the implementation of online learning systems. Using Brunei Darussalam as its research context where online learning implementation is at its infancy and with 73.7% of its young population having been identified as ‘digital natives’, this research explores the diversity in the student population based on their dispositions and how these dispositions influence their learning effectiveness. A series of systematic literature reviews on preceding student-profiling practices and three pilot studies precursory to this research suggested that the learner population comprise of multidimensional and heterogeneous individuals whose dispositions interplay and dynamically change.

Utilising Pierre Bourdieu’s theory of practice as an all-encompassing theoretical framework, 407 learners from the Brunei technical vocational education student population were holistically profiled into different learner types. The research adapted a sequential transformative mixed-method design with its data collection methods comprising of a self-designed quantitative questionnaire called the Online Learner Profiling questionnaire and a sequential series of qualitative interviews. Data from the questionnaire was analysed using Exploratory Factor Analysis that identified 7 possible habitus types and several variant types based on a 6-factor model. Subsequently, data from the interviews was inductively and deductively analysed through a Two-Cycle Coding Method that established the differences between habitus types as well as similarities between members of the same type. Abductive inferencing generated detailed descriptions of the 7 main habitus types based on their dispositions and the probable online learning tools, approaches and affordances that can be incorporated in online learning systems to complement their dispositions.

The research discourse extends to a hypothetical projection that there are 64 possible habitus types. Collectively this theory has been given the name the Habitus Lattice Theory due to the habitus types interconnecting into a lattice. The profiling of students is anticipated to prepare educators and policy-makers in the implementation of online learning systems revolving around the issues of ‘hysteresis’ whereby online learning systems do not complement students’ dispositions; the relevance of ‘conatus’ whereby students dynamically move from one habitus type to another; and the reduction of ‘doxa’ which are predetermined and oftentimes conjectural perceptions of who the online students are. Ultimately, the utilisation of Bourdieu’s theory as a profiling mechanism provides a more holistic and possibly novel alternative to the many existing learning models and inventories that are used in understanding students’ learning preferences.

Keywords: Online learning, online learner profiling, Bourdieu’s theory, habitus, dispositions.
Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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He holds a BA in Education (TESL) from Universiti Brunei Darussalam and an MA in Educational Technology and TESOL from the University of Manchester, with his final dissertation on the topic of online learning implementation in Brunei Darussalam. This thesis is a continuation of his previous research, which - along with his other studies on digital and online technologies for education - serve as the foundations for his PhD research.
Chapter 1. Introduction to the research

1.1. Research background

The recent integration of internet technology into education has given rise to ‘online learning’, a learning approach that uses in its entirety the internet to deliver information and provide an online space for learning processes (Moore, Dickson-Deane and Galyen, 2011, p.130). Online learning has been growing rapidly and is fast becoming a viable alternative to on-campus learning. However, the journey towards implementing online learning, particularly on a large scale, is not always straightforward; as what has been encountered by my country Brunei Darussalam.

Brunei Darussalam (henceforth Brunei) is one of several countries that sensed the shift towards educational technology. In 1996, the Sultan of Brunei in a royal decree to the teachers of Brunei emphasised that “the advancement of information technology has made the teaching career more challenging than before. Teachers have to either keep pace with the challenging new information or face the risk of being left behind by their students” (Borneo Bulletin, 1996; cited in Kooi, 2001, p. 87). The official acknowledgment of the then fresh research on educational technology indicated Brunei’s timely intent of a large-scale education reform after a relatively unchanged education system since the country’s independence in 1984.

In 1999, Brunei shared its aspiration to embrace internet technology for education during a Commonwealth of Learning forum held in Brunei (Commonwealth of Learning, 1999a); a forum when two major online institutions - Open University UK and Open University Hong Kong - were invited to share their online learning experiences with the South-East Asian countries in attendance (Commonwealth of Learning, 1999b; 1999c). Gradually, open universities were established in Malaysia, the Philippines, Thailand, Vietnam, Indonesia and Cambodia (UNESCO, 2004). Currently, online learning in Asia is the second-highest self-paced online learning
market after North America with the highest growth rate of 50.2% for Myanmar, 43.7% for Thailand and 42.3% for Malaysia in 2014 (Adkins, 2014) and in 2015, Laos at 48.7% and Thailand at 46.2% being the highest growth rates in the world (Adkins, 2015).

1.2. Statement of the problem

However, until now, unlike that of its regional neighbours, the pursuit of implementing online learning in Brunei has been riddled with challenges. For Brunei, none of the 7 local post-secondary institutions and 3 universities offers any semblance of structured formal online learning, be it fully-fledged online systems or course-level blended learning delivery. It can be argued that Brunei, being a small country geographically, does not require online distance learning. However, Bayne and Ross (2016) suggested that the online learning that is practised today is more than an approach to defy spatial and temporal limitations. They believe that as a learning system it provides pedagogical approaches and learning mechanisms that may be more attuned to today’s learners and their dispositions for online activities.

In addition, there are other reasons for why online learning would benefit Brunei. Firstly, Brunei is a country geographically split into two parts. Wedged in between is the Malaysian state Sarawak, requiring Bruneian citizens to undergo not less than ten immigration and security checkpoints using travel documents to move between the separated districts. Tertiary institutions are only available in the West districts thus depriving Bruneian in the East district of higher education. Online learning may mitigate this hassle of travelling several hours through congestion and checkpoints.

Secondly, the country intends to invest on human capital, with 40,000 students to be trained for the energy industry alone by 2035 (International Business Publications, 2017, p. 94). With Brunei’s universities and post-secondary
institutions having an extremely limited capacity to cater for such a large-scale production within the given timescale, online learning’s ability to offer massive online courses may be a viable solution. Brunei’s Minister of Education, Pehin Abu Bakar Apong, in his acceptance speech during Open University Malaysia’s 15th convocation ceremony, shared that “in this modern age where countries face various challenges to improve the human resource capacity, long distance education or online gives the opportunity for individuals to pursue their studies without leaving their workplace for too long” (Kassim, A. A., 2013, para. 15). The Minister was referring to the 10,000 Bruneians who require re-training and upgrading but are currently unable to do so. This show of intent highlights the Ministry’s acknowledgment of online learning as the solution for mass education.

The paradox to the above however is that the national accrediting authority does not accredit online learning qualifications. Specifically, according to a report by the Brunei Darussalam National Accreditation Council (BDNAC), online qualifications from first degree and below are not accredited, while only a short list of qualifications in the non-professional disciplines for Master’s degree are accredited, provided that there are elements of on-campus interaction (Ministry of Education Brunei, 2014). Statement 1.4 in the BDNAC report however underlines the benefits of online learning for Brunei:

1.4. Despite the absence of any substantive plan to adopt this system of education delivery, Brunei Darussalam, nonetheless, acknowledges the benefits of ODL, particularly, in relation to: widening access in education; its flexibility and versatility in fulfilling constant re-training, ‘re-skilling’ and upgrading requirements in an ever changing society and market economy; and, including its perceived cost-effectiveness and lesser cost features. (Ministry of Education Brunei, 2014, p. 1)

The lack of any substantive plan is therefore a third problem. This research believes that, if Brunei decides to implement online learning, coinciding with its
introduction will be the accreditation of courses offered through this pathway. Not doing so will be an obvious contradiction to the efforts of the Ministry in mass educating Bruneians, because the Ministry is responsible for both the provision of the technology and accreditation of the learning.

Collectively, the fundamental problem faced by Brunei is the lack of online learning itself. Brunei’s attempts in integrating technology into education, online technology notwithstanding, have been met with challenges. Brown and Derus (2013) admitted that technology integration in Brunei “lacked a shared vision or goals [sic], internal coherence and alignment” and that “as systems and teacher/student demands become more complex, this lack of alignment and separate development became increasingly difficult to manage effectively” (p. 15, emphasis added). Derus, then the Director of ICT for the Ministry of Education, has underlined the complexity of learners’ demands and in turn the failings of the education system in allocating the right technology for these demands. This research is thus an exploration of learners’ demands, more specifically of their dispositions towards learning in online learning systems.

1.3. Research setting

Due to my first-hand access to and familiarity of the Brunei education system, I have chosen Brunei as my research context. I would like to emphasise however that the challenge of implementing an online learning system that is sustainable and relevant to every learner is not exclusive to Brunei alone. Nations, educational institutions and online educators occasionally face the dilemma of providing an online learning approach that will purposefully cater for its respective learners. Without a proper guideline in place, implementation can be a precarious affair. The United States for example, during its push for online education in the early 1990s closely abided to the Five Pillars of Quality Online Education, viz. 1) access, 2) cost effectiveness, 3) learning effectiveness, 4) faculty satisfaction, and 5) student satisfaction (Moore, 2002, p.2). To date, the United States now has more than 260
nationally accredited online higher institutions (Distance Education and Training Council, 2015).

The Five Pillars cover all the main aspects of education transformation and as such are applicable to various contexts, including Brunei. For Brunei, issues of (1) access, (2) cost effectiveness, and (4) faculty satisfaction are under the direct purview of the Ministry of Education. With the Ministry’s judiciously generous resources, these factors are rarely problematic when it comes to implementing new technology. Thus, I hypothesise here that the uncertainty that has plagued online learning implementation in Brunei resides in the yet unexplored relationship between (3) student satisfaction, and (5) learning effectiveness where learners’ dispositions are most influential. My theory is that only through investigating these learner dispositions will the Ministry of Education Brunei be more informed of what online learning systems are appropriate for Bruneian learners.

My research thus focuses not on the ‘institutional’ entity but rather the ‘student’ entity; not on the ‘interaction of the institution to the student’ but rather the ‘interaction of the student with the institution’; not the failure in providing technology but the failure in understanding which appropriate technology is suitable for the learners. Because of how previous local studies have focused more on the technology, my research consolidates the literature by focusing on the learners instead.

One widely accepted justification in Brunei for the provision of technology and the use of Internet tools is the perception that Bruneian learners are internet savvy. However, as I will establish in my subsequent literature review, this perception creates a misinformed understanding of how Bruneian learners actually engage with online technology. Considering all of the above, my research setting thus revolves around Bruneian learners.
1.4. Research thesis

My research is driven by the hypothesis that Brunei’s struggles with online learning implementation are related to students’ satisfaction and learning effectiveness, though what this is, is hitherto unknown. There is a yet unidentified disposition, or rather likely a group of dispositions that predisposes a learner to embrace or avoid online learning. These dispositions in turn influence their satisfaction as a learner and affect their learning either positively or negatively. I interpret these as their 1) dispositions towards learning, 2) dispositions towards technology, and 3) dispositions towards learning with internet technology.

There is a large body of literature on dispositions towards learning measured through a plethora of perspectives. Some measure dispositions towards learning such as ‘learning styles’, ‘study habits’, ‘personality’ psychometrics and ‘multiple intelligences’. Others measure dispositions towards technology such as the various technology acceptance models. Still others measure dispositions towards learning with technology such as ‘digital literacy’, ‘digital natives’, ‘online learning acceptance’ and ‘online learning readiness’. However, through my literature review on these various learner theories (see Chapter 2), I found that these learner theories have similar limitations, notably in holistically profiling the learners’ seemingly diverse, dynamic and interplaying dispositions.

On the many studies involving the use of learner theories as a profiling mechanism, Bloomer and Hodkinson (2000) stressed that, “despite an extensive literature on the subject of learning, very little has been written about the ways in which young people’s dispositions to learning transform over time” (p. 583). Working in the policy and management side of the education system of Brunei, I found this issue highlighted by Bloomer and Hodkinson to be true. There is a lack of acknowledgment that dispositions change. Many learner theories take a snapshot of the learner profile and present it as a perpetual state of self. In the case of Brunei, there is a tendency to introduce new digital technology without taking into consideration learners’ dispositions. Theories such as ‘learning styles’ and ‘digital
nativeness’ based on international contexts have been frequently referred to as justifications for projects and initiatives. Yet, there is a dearth in empirical evidence of how these theories are locally represented in the Brunei learner population.

The premise for my research enquiry is that Brunei has a misconstrued understanding of the dispositions that constitutes the Bruneian learners. This misconception extends further to syllogistically assuming that Brunei learners are ‘digital natives’; a homogeneous rather than diversified generation of youths who are immersed in and thus fluent in internet technology (Prensky, 2001). As such, past one-size-fits-all educational technology approaches with their narrow expectations of learners rendered learning ineffective, in that they fostered inequality and favoured the elitism of online learners (i.e. digital native) through unrealistic expectations and unquestioned dogma.

1.5. Research objective

The main objective of my research is to identify these learner dispositions. This in turn allows me to profile the learners based on their different dispositions towards online learning. To generate a holistic profile of the learners based on their dispositions, I adapted an overarching theoretical framework based on Pierre Bourdieu’s Social Theory of ‘capital’ as traits and ‘habitus’ as dispositions. A section in Chapter 2 (Literature Review) will be dedicated to the elucidations of Bourdieu’s theory and on how it fits with the impetus of the research and its methodology.

Additionally, the three research questions that guided this research will be discussed at the end of Chapter 2 (Literature Review), but for foresight and clarity I have included the research questions here. My research was designed to address the following research questions:

1. What are the different types of learner habitus?
2. How might a learner’s habitus influences how he/she performs in an online learning system?

3. What online learning systems are capable of catering for the different types of learner habitus?

The three questions above collaborate together to contribute to a more comprehensive understanding of learners’ dispositions towards learning in online learning systems. The first research question is a panoramic empirical enquiry to identifying significant and prevalent dispositions that could be used as indicators of similarities and differences between learners. These patterns of similarities and differences in turn constitute discernible learner profiles called habitus types. The second research question focuses on the most prevalent profiles and, through a series of reflective, hypothetical and heuristic approaches, interprets several subjective theories on how specific habitus types have specific dispositions towards learning in online learning systems. The integration of both empirical and interpretive knowledge from the two questions thus allows for a more guided deliberation on which particular online learning systems would hypothetically work on the target population. This final enquiry is addressed by the third research question. Collectively, the three questions outlines the pragmatic approach taken by my research in addressing the problems identified earlier.

1.6. Significance of this research

My investigation based on these three research questions led this research toward a few significant and possibly original contributions to approaching the challenges of online learning implementation. Within the Brunei context, this research will undoubtedly be the first of its kind in profiling learners according to their dispositions towards learning online. For Brunei, the generated empirical and interpreted knowledge will contribute to the local literature and that of the region. This research will also be the first initiative whereby technology procurement is
preceded by a localised needs analysis – as opposed to procurement based only on findings from international studies or from being persuaded by technological providers and their sales pitches.

Beyond the Brunei context, this research contributes to the growing pool of Bourdieu-inspired educational research. My use of Bourdieu’s theory to describe various aspects of the learning ecosystem may not be the first attempt in associating habitus with learners’ use of technology (Bennett and Maton, 2010, p. 326; Davies, 2015), but the interpreted theory that resulted from my research is certainly unique, albeit for this moment speculative.

1.7. Outline of the thesis

This thesis has 8 chapters. This current chapter (Chapter 1 Introduction) presents the background of my research, which pertains to online learning implementation in the context of Brunei and the value of profiling learners as indicators to their readiness towards learning in online learning systems. In this chapter I have also thus far presented the research problems, my hypothesis, research premise and research objective to serve as the fundamental drivers and rationale to my undertaking this research.

Chapter 2 (Literature Review) investigates through a series of systematic literature reviews the challenges of online learning implementation and the relationship between dispositions and learning effectiveness. These discussions involve the review of emerging online learning systems, followed by several deliberations of various learner theories. The highlight of this chapter is the eventual derivation of a theoretical framework for my research based on Bourdieu’s (1977) Theory of Practice.

Chapter 3 (Preliminary Research Strategy) reports on the preliminary processes prior to conducting my research, notably the thought processes and selection of
methods as guided by my beliefs as a researcher, which I present as my research paradigm. This chapter also reports on the preliminary studies involved in piloting early versions of the instruments used in the main research. This chapter bridges the theories discussed in the literature review with the research methodology presented in Chapter 4.

Chapter 4 (Methodology) describes and justifies the finalised versions of my data collection instruments and their methods of data analysis. These include my decision in adapting a Sequential Transformative Mixed Method approach and my rationales for using a self-designed quantitative questionnaire and a qualitative interview procedure. This chapter presents my reasons for selecting Exploratory Factor Analysis and Two Cycle Coding as my methods of analyses with inductive-deductive-abductive reasoning as my approach in integrating my data sets together. This chapter also describes the target population, the sampling, ethical considerations and other logistical processes including reporting on the administration of the data collection instruments.

A common practice in theses is the reporting of results in one chapter and the interpretations and discussions on the results in a subsequent chapter. However, due to the sequential and constantly transformative nature of this research where results and findings of certain stages of my research formatively informed consequent procedures, the results and findings of the quantitative and qualitative phases are presented in separate chapters to allow for the interpretation of each set of results.

Chapter 5 (Quantitative Results and Findings) presents the statistical processes and results generated from the Exploratory Factor Analysis, followed by the statistical interpretation of learners’ profiles based on the habitus construct. The focus of this chapter is the identification of latent variables (i.e. factors) based on questionnaire items that in turn formulate the possible types of habitus and the types that are prevalent in my target population. Interconnecting these habitus types together forms an illustrative lattice structure.
Chapter 6 (Qualitative Results and Findings) describes the coding procedures performed on the interview responses based on Saldana’s Two Cycle Coding method. This method involved several stages of coding strategies where each step refined interview responses into more discernible themes and categories that resemble the factors derived in the quantitative phase. The findings in this chapter involved comparing different habitus types.

Chapter 7 (Discussion) is a two-part discussion that firstly elucidates on the theory of habitus as a profiling mechanism, followed by addressing the three research questions.

Chapter 8 (Recommendations and Conclusion) recommends several ways forward after this research which include suggestions for further research and refinement of the instruments. The chapter concludes the thesis with a summary of the research, its findings and its contributions to the context of Brunei and the international literature.

In addition to the outline of the thesis above, I have also included a list of definitions and abbreviations in the preliminary pages (see pages 11-13) seeing that this research constantly refers to specific terminology, theories and procedures.
Chapter 2. Literature review

2.1. Introduction

As indicated in the previous chapter, the Bruneian learners and their dispositions towards online learning are central to my research. A search of the local literature revealed only two studies that made any reference to online learning in Brunei, one about e-libraries (Karim and Dih, 2009) and one about how learning styles affect the use of e-learning systems (Seyal and Rahman, 2015). The international literature however has an extensive body of concept papers and studies pertaining to online learning, online learners and their dispositions, and the learner theories that have been used by researchers and educators alike to define these learner dispositions. This chapter reviews the extensive body of literature on online learning through providing a brief history of online learning, which then extends to introducing the three integral components of online learning systems, notably 1) the learning tools, 2) the learners, and 3) the learning process.

In my literature review of online learning and its tools, I firstly highlight the roles of affordances, artefacts and human-computer interactions in various devices and platforms, and relate these elements to the idea of ‘systems’. My specific reviews on Adaptive Online Learning Systems, Multimodal Online Learning Systems and Personalised Learning Environments are based on the prospect of identifying learners and their differences in dispositions. In my literature review on the learners and their dispositions I begin with a systematic literature review of the concept of ‘digital natives’ with a discussion on why Bruneian learners and any given learner population are not a homogeneous group of ‘digital natives’. My discussion on online learners extends further into reviewing several learner theories that have been used to profile learners/ online learners. This series of systematic literature reviews scrutinises various learning styles, personality psychometrics, study habits models, technology based models and the growing body of literature on combining learner theories to create a more holistic profiling mechanism. Each body of literature has been reviewed based on the SALSA
framework (Booth, Sutton and Papaioannou, 2016). They are presented in dedicated sections where deliberations of their strengths and limitations reveal the appropriateness of these theories in profiling online learners.

The discussion from the two previous components contributes to my discourse of the interactions between the learning system and the learner; in other words the learning process. Maintaining the learner as the priority, I identified Pierre Bourdieu’s Theory of Practice as an appropriate theoretical framework to interpret this complex interaction. In addition, Bourdieu’s liberal, comprehensive and overarching concepts collectively became a more viable alternative in light of the limitations of existing learner theories. This chapter thus culminates into a discussion on Bourdieu’s theory and of how its key constructs contribute to other areas of this thesis.

2.2. An overview of online learning

Online learning is not mutually dependent to the development of the World Wide Web. In fact, online learning has existed since the 1960s, a few decades before the World Wide Web, albeit sporadically in small research circles. However, even with the advent of the World Wide Web in 1989 (Berners-Lee and Fischetti, 2000), online learning had its limitations due in part to the static and underdeveloped Hyper Text Transfer Protocol (HTTP) standards.

It was not until 1998 that technologists envisioned the transition from static web documents to interactive web features (Downes, 1998). This eventually became a reality with the upgrade of the World Wide Web into ‘Web 2.0’, a term coined by DiNucci (1999) and made popular by O’Reilly (O’Reilly and Battelle, 2004). Web 2.0 has a loose definition but is best defined as “the group of technologies which have become deeply associated with the term: wikis, podcasts, RSS feeds, etc., which facilitate a more socially connected Web where everyone is able to add and edit the information space” (Anderson, 2007, p. 5).
It is through these web technologies that online learning found its place. As stated by Ryberg and Dirckinck-Holmfeld (2010), “the emergence of so-called Web 2.0 technologies and practices (...) are hypothesized to better afford learners’ control of their own learning, while also facilitating more collaborative modes of learning and work” (p.170). Web 2.0 is also well received because “most Web2.0 are designed user-friendly [sic], neither the instructor nor students need preliminary training [and that] they can develop learning contents, lead online instruction or take part in online activities” (Cheng, 2012, p. 476).

Educators saw this increasing accessibility and ease for contemporary learning, information and interaction as an opportunity to improve learner satisfaction and learning effectiveness, to the extent where learning is made possible without physical attendance. A fresh perception of online learning is that it is neither a learning approach to replicate traditional onsite learning, nor a second best alternative when onsite learning is not practical; rather it stands on its own with its enhanced features and functions that provide a different if not better experience (Bayne and Ross, 2016, pp. 120-121).

However, the acceptance and success of any new internet technology implementation is not guaranteed, as suggested by Richardson (2010) who warned that on the introduction of wikis, blogs and podcasts in learning, “tens of thousands of teachers and students have begun using some of these tools, but the vast majority of educators still have little or no context for these shifts” (p.5, emphasis added). Drawing from the bolded elements above, there are generally 3 identifiable components to be considered when implementing online learning systems, notably 1) the learning tools, 2) the learner, and 3) the learning context.
2.3. Online learning tools

Online learning tools exist as web features in the form of affordances pertaining to tool design and functions (Norman, 1999); objectified tools in the form of technological artefacts (De Vries, 2005); and most recently Web Apps due to the omnipresence of interactive Web 2.0 websites and mobile application software c.2009 (Rossing et al., 2012). These representations of online learning tools are not absolutely analogous but do interact as components of a grander system such as the Learning Management Systems (LMS) that are commonly used by higher institutions (UCISA, 2012).

Kirschner (2002), who drew upon Gibson’s (1979) first definition of learning affordances, refers to this system as “the relationship between an object’s physical properties (artefacts) and the characteristics of an agent (user) that enables particular interactions between agent and object” (p.12). This understanding of artefacts and the human-computer interactions, referred to as affordances, being a system is further corroborated by De Vries (2005) who states that “most artefacts consist of more than one part [and] the idea that these artefacts have to work together to make the artefact as a whole fulfil its function, has led people to come up with the concept of systems” (p.25). De Vries (2005) further suggests that, “a system, roughly defined, is a set of parts that work together” (p.25, emphasis in original). Thus, an artefact (e.g. a smart-phone) with a collection of mobile apps catering for a myriad of learning affordances can be regarded as a mobile learning system.

Online learning is itself a higher construct system consisting of an elaborate combination of web artefacts, affordances and apps that allow interactive learning to take place, for “the greatest affordance of the Web for educational use is the profound and multifaceted increase in communication and interaction capability” (Anderson, 2004, p.42). It is due in large part to this plethora of available technological artefacts, tools, affordances and features in addition to constantly emerging internet technologies that online learning has been able to evolve into
several distinctive sub-types. For example, the advent of mobile technology led to the development of mobile learning or m-Learning (Ally, 2009, p.1) while the ephemeral popularity of virtual game-based worlds gave birth to v-Learning (Annetta, Folta and Klesath, 2010).

Another variant is the intelligent algorithm-dependent Adaptive Interactive Web-Based Educational System (Brusilovsky and Peylo, 2003) and its ‘artificial intelligence’-enhanced successor Adaptive Online Learning System (AOLS) more commonly found as commercially packaged systems like Smart Sparrow (Wong et al., 2015) and Wiley’s ORION system (McClaren, 2013). There is also the distinction between a Virtual Learning Environment (VLE) and a Personalised Learning Environment (PLE) whereby the former is a “designed information space” (Dillenbourg, Schneider and Synteta, 2002) such as the Blackboard Learning Management System, and the latter refers to a learner’s personalised collection of preferred internet tools such as a selected collection of social networking software (McLoughlin and Lee, 2010).

Free online courses have also flourished in the realms of Massive Open Online Course systems (Mackness, Mak and Williams, 2010, p.268). Existing brick-and-mortar institutions have begun providing online courses internally or via Massive Open Online Courses (MOOC) outlets. The MOOC provider Coursera for example, has a consortium of more than 70 world class universities including the University of Manchester, Yale University, Ecole Polytechnic, University of Tokyo and National University of Singapore all under one virtual institutional roof (www.coursera.org).

My review of online learning systems has identified Adaptive Online Learning Systems (AOLS), Multimodal Online Learning Systems (MOLS) and Personalised Learning Environments (PLE) as the three emergent online learning systems that have been documented as capable of handling diverse learner types through its method of adaptiveness, wide-ranging affordances, or personalisable features respectively.
2.3.1. Adaptive Online Learning Systems

In the traditional classroom, an observant teacher constantly assesses each learner’s satisfaction and learning effectiveness through formative input, performance scores and their learning behaviour. This approach is called differentiated instruction whereby it involves “a teacher attending to the learning needs of a particular student or small groups of students, rather than teaching a class as though all individuals in it were basically alike” (Tomlinson and Allan, 2000, p. 170). This formative cycle is repeated throughout the learner’s learning experience as a gradual mechanism to facilitate the improvement in learning effectiveness and to scaffold the learner in reaching his/her potential as per the Zone of Proximal Development (Vygotsky, 1980).

This cycle however requires the constant observation and response from the teacher in the classroom, which may not be easily replicated in a virtual learning space where learners’ engagement with the learning environment is independent of temporal and spatial constraints (Vonderwell and Boboc, 2013). There is also a possibility of larger class sizes in online environments as evident in MOOCs, and differentiation by the teacher may not be possible as the opportunity to formatively assess every learner is reduced.

An alternative to teacher-based differentiation is having an online learning system that adapts to the preferences and abilities of the learners. An adaptive online learning system is quicker in formatively assessing learners, and the repetitive matching of similar learner types with learning processes results in a profiling database that can be reused and referred for future learner cohorts. Ghorbani and Montazer (2015) has demonstrated through their Automatic Learners’ Personality Identifying System (ALPIS) prototype that adaptive systems are more systematic in their assessment of a learner’s current learning need. The experimental ALPIS technology uses an intricate fuzzy inference algorithm that formulates profiles based on learners’ patterns of engagement with the system.
The substitution of the teacher with digital technology however is not the easiest of tasks for the technologies that are comparable to teacher presence are either based on complex algorithms that require technical expertise (e.g. ALPIS), or the still developing field of artificial intelligence to replicate the expected humanistic sensitivity when teachers subjectively and holistically assess their learners needs. Bayne (2015) states that “where advanced computational methods are proposed from an instrumentalising, humanistic perspective which sees the technology as in service to social ‘need’, resistance to such methods also takes humanistic forms positing essentialism (the ‘human touch’, ‘desirable humanity’ and ‘human relationships’) as the main locus for resistance to cold technocratic imperative” (p. 460). Thus, one opposition to this online learning system is based on its devoid of empathy for a learner’s progress due to its lack of emotional intelligence.

These challenges however should not thwart the option of AOLS as according to Bayne and Ross (2016) the technology of intelligent systems is a new frontier in teaching that should be embraced (p. 125). An adaptive online learning system is expected to be an automated or self-regulating technology that tailors the learning based on its impression of the learner. This automation is to be considered in the design of an AOLS whereby “[the] gathered information about learners can help system designer to develop a matching, relating and inferring mechanism with digital resource of learning object repository, and then generate the content, context and information that learners need” (Lin and Kuo, 2005, p. 2). It is also anticipated that pre-programmed algorithms will be used to tailor learners’ learning experience in the absence of educator presence with the system being “a computer-based program applying a sophisticated pedagogical methods [sic] that lead the students to knowledge discovery and construction” (Gusev, Ristov and Armenski, 2013, p. 6).

Although intelligent e-learning environments have existed for more than 10 years (Cristea and Tuduce, 2004), the realisation of AOLS technology is very much in its infancy. In fact, it is still in development with around 6 currently existing platforms that attempt to become truly adaptive. These are Smart Sparrow, Acrobatiq,
Realizeit, Junction, Cogbooks and Knewto HE (Brown, 2015). Several universities including Arizona State University and the University of New South Wales Australia use Smart Sparrow. According to EdSurge (no date), “Smart Sparrow’s adaptive rules are based on factors such as learner confidence and self-assessment, time to complete learning exercises, performance on questions, learning style preference and mastery of prior learning objectives” (para. 2). This ability in adapting to learners’ profiles and preferences as exhibited by AOLS such as Smart Sparrow, justifies this form of technology as a viable online learning system for Brunei.

2.3.2. Multimodal Online Learning Systems (MOLS)

Multimodal Online Learning is underwhelmingly represented in literature with not more than 24 studies mentioning the online approach (Gadanidis, 2007; Mahfouz and Ihmeideh, 2009; Hampel and Stickler, 2012; and several others) and only one dedicated to the investigation of its technology (Sun, 2015). The multimodality of an online learning system is represented through several forms. Firstly, multimodality can refer to content. There is the multimodality of how content is delivered and in what format it is being offered. Studies on multimodal online notes included the use of different multimedia, in particular verbal and non-verbal forms (Moreno and Mayer, 2007), and the multiple formats of learning via text, video, audio, images and interactive elements (Sankey, Birch and Gardiner, 2010).

Secondly, multimodality can refer to the learning technology. This exists in the form of the various technologies that are used to interact with learners and teachers. Studies include the use of different narrative approaches in gamified learning environments (Dickey, 2006), the use of several communicative features such as chat rooms, forums, audio and video conferencing to interact (Hampel and Hauck, 2006), the combining of audio, text and graphics (Hampel, 2006), webcasting and online text-chat (King and Fricker, 2007), and the likely discipline-specific use of gestures, speech, facial expressions and graphical inputs (Bunt and Romary, 2002).
Thirdly, there is the multimodality in instruction and pedagogy. Several studies include having alternative instructions to reach a shared outcome or end objective (Whittington, 2010), and the human-computer interaction based on multimodal instructions delivered by a robot (Wolf and Bugmann, 2006). This form of multimodality is the least researched, and it may be due in large part to reliance in algorithms or artificial intelligence to deliver tailored instructions; an area that is more associated with Adaptive Online Learning Systems.

The purpose of the Multimodal Online Learning System (MOLS) is to provide an array of alternatives that can be selected by learners. Drawing from Hampel’s (2002) work on multimodality, Mahfouz and Ihmeideh (2009) conceptualise that, “in multimodal learning environments, learners exert more control over the learning situation, and the multimodal synchronous interactions allow learners to combine text chat, audio chat and even graphics, thus working collectively at a distance in a multimodal and multidimensional learning environment” (p. 210). This approach is in contrast to the implicit system-selected instruction of AOLS, because in MOLS the learners explicitly select their own preferred learning pathway(s) instead.

By offering alternative affordances, a few may match the learners’ dispositions. A tele-collaboration online learning project called ‘Tridem’ incorporated a self-designed synchronous audiographic conferencing software called Lyceum, which utilised oral, written, and graphic user output combined with the use of external blog platforms (Hauck and Lewis, 2007). Through the multimodal online learning environment, the researchers found that all four modals of outputting responses were used by the learners to different extents, with the most used being external blogs (pp. 255-257). The system allowed learners to choose their preferred modal of learning in order to reach the same outcome.
As the multimodal system relies more on chance than algorithms, Moreno and Mayer (2007) emphasise the importance of a facilitator to guide learners in this vast intricate system. They state that:

This interactive learning environment imposes high cognitive demands for both, teachers and students. On one hand, students need to engage in multiple interactions by dialoguing, searching, and manipulating. On the other hand, teachers need to engage in customized dialoguing by prompting students when they are not making progress, responding to their answers to simulation questions, analyzing students’ entries to journals, and evaluating students who use presentation software to communicate their understanding. (Moreno and Mayer, 2007, p. 323)

Admittedly, Moreno and Mayer’s work is 10 years in the past, and advancements in technology particularly in Web2.0 and social network have exponentially improved since then. However, their fundamental suggestion still holds true in that the multimodal online learning system is still prescribed by the educators and policy-makers, and to function in this expansive virtual environment may likely require facilitation from educators. It doesn’t have the intelligence and fuzzy inferencing that AOLS has, although both systems can perhaps be integrated together.

2.3.3. Personalised Learning Environments

Personalised Learning Environments is a relatively new concept that was first mentioned in 2006 in conferences on learning technologies. Van Harmelen (2006) defines a Personalised Learning Environment as “a single user’s e-Learning system that provides access to a variety of learning resources, and that may provide access to learners and teachers who use other PLEs and/or VLEs” (p. 815). The main difference between this system and the AOLS and MOLS is that the affordances, artefacts and tools involved are selected and structured together by the learner to create his/her own system.
Attwell (2007) describes Personalised Learning Environment as a system that “comprised of all the different tools we use in our everyday life for learning [and that] many of these tools will be based on social software” (p. 4). The use of social software is prevalent in learners for social and entertainment purposes, which is why the idea of Personalised Learning Environments has been an attractive proposition. Costello and Shaw (2014) shared several examples on what social software can offer learners through PLE, viz. “face to face interaction using Skype; Twitter, to share and communicate questions with other students on the course or globally; YouTube and SlideShare.net for Self-Regulated Learning (SRL), Facebook, to communicate discussion and engage within collaborative development challenges” (p. 6). The benefits of each type of social software on learning have been comprehensively investigated in recent literature; Twitter (Grosseck and Holotescu, 2008); YouTube (Duffy, 2008); Facebook (Madge et al., 2009) among many others.

However, not all studies advocate the suitability of social software for learning. The study on Facebook for example, concluded that certain learning activities such as communicating with peers is acceptable through Facebook, but formal learning activities such as consultations and actual teaching are not (Madge et al., 2009). Hence, one main concern of using PLEs and why despite it being an attractive option it is rarely prescribed over VLEs is because of its association with the use of social software. According to Martindale and Dowdy (2010), the PLE approach “has gone through at least one hype cycle, is not yet fully understood, and is potentially disruptive with unfulfilled potential” (p. 179). Social software has been claimed to be disruptive for learning such as its tendency to encourage interruption or procrastination. Nevertheless, a study by Conole et al. (2008) argue that our perception of disruption has changed and that learners are able to integrate these disruptive technologies into their learning without much disruption, so much so that learners professed of learning more effectively compared to using prescribed VLEs which was disliked by 9 out of 10 learners (Conole et al., 2008). Thus, PLE has
a strong advantage over VLE based systems as it seamlessly complements learners’ lifestyles.

The enumeration of the various types of online learning systems, and specifically of AOLS, MOLS and PLEs, is certainly not exhaustive. As internet technologies develop and evolve, so too will online learning and its many learning systems. One challenge of online learning implementation is thus in identifying which tools or systematic collections of tools are applicable to the target learners and their dispositions. Concurrent to the literature focusing on online learning technologies, there is a prevalent trend in social science research that puts focus on the online learner – most notably on learner traits such as learning styles, study habits, personalities and other dispositions.

At this juncture, my literature review shifts its focus towards the learner element, because they are the main stakeholders of learning and the end-users of the online learning systems described above. Rather than dedicating my investigation exclusively on finding the most appropriate online learning systems for Bruneian learners, my research prioritises on finding out if learners’ dispositions match these systems. The next part of my review is a series of reviews on how learners have been profiled in the literature.

2.4. Online learners and who they are/ they are not

With the rapid development of the internet and online learning, several attempts were made in the 90s to profile learners who appeared to be increasingly adept in their use of internet technology. One such attempt is the digital native concept. Digital natives were defined first by Marc Prensky as “a generation born after the 1980s surrounded by and immersed in digital technologies such as computers, video games, cell phones and other toys and tools of the digital age” (2001, p.1). It is one-half of his bifurcated ‘Digital Native-Digital Immigrant’ theory where the digital immigrant is the direct opposite of the aforesaid definition. Digital natives
are supposedly proficient in the interfaces and concepts of navigating through the internet realm.

The digital native concept has been embraced by many in the region, Brunei notwithstanding, as a seemingly logical phenomenon that justifies the implementation of internet technology in education. In 2007, Professor Lee Sing Kong of the National Institute of Education Singapore in his keynote address to the Brunei education community advised that, “our profile of students has changed, schools today are admitting ‘digital natives’ and as digital natives they demand different approaches to learning to stay engaged” (Aripin, 2008).

The term digital native soon became a buzzword among policy-makers as it fits the ground level observations of how the learner population use online technology. Moreover, Brunei is ranked 2nd in the world for iPad internet penetration (Pingdom, 2012), 1st in Facebook usage in Asia with 62.3% as well as the 2nd highest in Asia for Internet penetration with 78%, one below education powerhouse South Korea with 82% (Internet World Stats, 2012). A worldwide study by the International Telecommunications Union (2013a) revealed that 73.7% of the Bruneian youth population is digitally native, ranking Brunei as 13th out of 180 countries in its World Digital Natives ranking.

During the completion of this thesis, this information still holds true. Othman (2017) reported that, “Brunei Darussalam has the third highest social media penetration in the world with 370,000 users, or 86 per cent of the total population, according to the new Digital in 2017 Global Overview report from We Are Social and Hootsuite” (para. 10). He also reported on Brunei’s social media penetration via mobile as 6th in the world (Othman, 2017). These statistics have resulted in a self-professed conclusion that Bruneian youths are without doubt digital natives.

It is indeed daunting for a country such as Brunei to eventually face the prospect of dealing with a new generation of learners who have new attitudes and aptitudes (Oblinger, 2003), rely heavily on technology (Lloyd and Devine, 2009); are more
open, liberal (Rettie, 2002; Leung, 2003) and confident with the Internet (Leung, 2003) and are overall better multitaskers (Uğraş and Gülseçen, 2013). Reverting to moral panic, the most straightforward solution provided by Brunei policy-makers is unfortunately to implement the most advanced and in vogue learning technology available; systems that ended up not reciprocal to certain learners and their dispositions.

Much of the decision making process in Brunei with regards to education technology was informed by the acceptance that Bruneian learners, due to their use of internet technologies and the statistics above, are digital natives. However, Ryberg and Dirckinck-Holmfeld (2010) cautioned that, “we should be careful in assuming that young people will automatically develop advanced learning capabilities and critical, academic skills through their informal use of technology, use that is most often motivated by social and entertainment purposes” (p.171). Establishing if our new generation of learners are really digital natives is thus a litmus test to exploring if possessing online technologies and internet skills indeed influences dispositions towards learning online.

For all the championing of digital natives in the literature, particularly in the media and policy papers, one element has been crucially absent from the start in the argument for digital natives, which is the empirical evidence for digital natives (Bennett, Maton and Kervin, 2008, p. 778). Profiling learners as digital natives has been a widespread oversight as “the idea of the digital native captured the imagination of teachers, parents, journalists, commentators and academics” (Bennett, 2012, p.213); but one that is substantiated by “anecdotes, conjecture and speculation” (Bennett, 2012, p.213).

Several studies have been performed to debunk the concept of the digital native. Of these studies, eight were performed on university students (Kennedy et al., 2007; Kennedy et al., 2008; Jones and Cross, 2009; Elwood and MacLean, 2009; Thinyane, 2010; Brown and Czerniewicz, 2010; Jones et al., 2010; Thompson, 2013), two studies on middle and high school students (Li and Ranieri, 2010;
Sánchez et al., 2011), and one study had its youngest sampling frame as 20 years old and above (Ramdhani and Wiradhany, 2013). These studies corroborate the assertions made by Bennett et al. (2008) that there is scant evidence in support of digital natives, and that recent research has challenged this perception of learners being homogenous in their technical expertise (p. 782) and having a distinctive learning style (p. 780). Only one study on digital natives included a younger sample in a range of 12-30 year olds, which among its findings concluded that “when it comes to the generational differences for the Internet activities analysed ... it is shown that very few Internet activities can be ascribed to the Net Generation’” (Zimic, 2009, p.142). These studies provided empirical evidence that invalidates the ‘digital natives’ concept.

However, interestingly the same study by Zimic (2009) also contemplated that his youngest sample (12-16 year olds) would have likely scored higher on the test for Internet skills if they were measured based on the internet activities that they were more accustomed to, because their high scores in self-efficacy tests suggested that they are the most internet savvy across all age ranges (p.141-142). This forethought is noteworthy, for the few empirical studies that do provide evidence of digital natives concerned samples of 10-11 year olds (Lloyd and Devine, 2009), 8-19 year olds (Eynon, 2010) and 13-16 year olds (Teo, 2013). In other words, studies debunking ‘digital natives’ had samples that consisted of older learners, while studies that provide evidence of ‘digital natives’ had considerably younger samples. When these two sets of seemingly conflicting evidence are aligned together, an assumption that can be made is that the younger the sample, the higher the chances of encountering digital natives, as illustrated in Figure 1 below.
To declare that a generation of digital natives exists, from the basis of this evidence alone, is indeed premature. However, perhaps what is premature is Prensky’s theory after all. Prensky forecasted right but targeted the wrong generation, as did the oppositions of his theory in countering his claims. Regardless of the conflicting evidence, the prevalence of the concept in grey literature has convinced many stakeholders. Learners as technology users have been misconstrued as a homogenous group of tech savvy individuals who are able to adapt seamlessly to the increasingly digitised world. Unfortunately, many decisions have been made based on this conjecture, when what is required instead is a comprehensive profiling of the learner population so that we are well informed of their dispositions towards learning online.

Prensky (2011) himself has refined his standpoint on digital natives. In his update on the theory, he refers to the digital natives term as a metaphor, a broad generalising mechanism that liberally profiles learners into a nominal taxonomy. Arguably useful as a vocabulary, this term has no clear increments of measure. The International Telecommunications Union (2013a) in their effort to rank the digital native populations of various countries presented percentage values, but in truth these values were formulated from estimations based on various population-based factors such as a country’s level of technology use. No actual diagnostic tests were
conducted on individuals to discern their order of digital nativeness; just numbers mathematically formulated together.

Without a defined scale of nativeness and what each increment of nativeness represents, the term has little contextual value in learner profiling. A data collection instrument called the Digital Native Assessment Scale (DNAS) (Teo, 2013) has attempted to define these increment measures but the items are more indicative of nativeness being a process than a state of self; or ‘digital nativation’ as opposed to ‘digital natives’. Digital nativation is however not simply a pre-programmed or ‘rewired’ (Prensky and Berry, 2001) process of maturing into nativeness. Prensky’s reinvention of the theory to digital wisdom reflects this idea of a continuous attribute (wisdom) rather than a nominal attribute (nativity); of an abstract metaphor on nativation whereby the more wisdom one acquires, the more ‘native’ the individual becomes (Prensky, 2011).

At last, the digital native theory, or rather digital wisdom theory, reflects the diversity and dynamicity of learners whose digital capacity is influenced by the digital world and its many practice (i.e. learning, socialising, entertainment purposes). In other words, the digital native remains the end-point of the trajectory towards complete digital fluency and that it is digital wisdom that shifts learners across the nativity continuum, constantly moving back and forth based on the ever-changing digital world and its technologies.

Drawing from the studies that alluded to younger learners having a more developed digital capacity than older learners (Sanchez et al., 2011; Zimic, 2009), it can be surmised that this nativation process is not dependent on the amount of time being immersed in the digital world. Rather, it is related to the types of digital technologies that each cohort of learners is immersed into and the wisdom to interact with them. Nevertheless, as with digital natives there yet exists empirical evidence on a learner’s digital wisdom.
2.5. Rationales for online learner profiling

The view that a given student population is homogeneous is a dangerous fallacy as not only is it a gross generalisation, but it also idealises the elitist form of online learners that as the previous section concluded as non-existent; at least not in the near future. The notion of 'digital natives' is therefore a flimsy rationale upon which to implement online learning, when evidence shows that learners are yet to reach the homogeneity that it affirms. Learners are simply heterogeneous in their dispositions towards learning, towards online technologies, and towards learning online.

Hence, the relationship between learners’ dispositions and learning effectiveness becomes an intricate equation that needs addressing, and several studies have done so, albeit many times through profiling learners based on selected fragments of their character. Learner profiling is a tacit concept in educational research, where models and theories of how learners are profiled often becoming the conceptual framework that rationalises observations and phenomena. A report by the Government of Alberta conceptualises learner profiling as follows:

A learner profile describes the ways in which a student learns best. A comprehensive learner profile includes information on student interests, learning preferences and styles, and differences related to gender, culture and personality. It might also include information on student learning strengths, needs and types of supports that have been successful in the past. **A learner profile needs to be dynamic, as individual learners are constantly growing and changing.** (Government of Alberta Education, 2010, p.24; emphasis added)

Learner profiling is a fundamental mechanism in the pursuit of understanding the online learner. Research projects on online learning have underlined the importance of profiling learners prior to introducing them into online learning environments, for purposes including but not limited to the personalisation of
learning processes (Dolog et al., 2004) or curriculum (Knauf et al., 2009), the grouping of learners into manageable distinct groups (Muehlenbrock, 2006; Christodoulopoulos and Papanikolaou, 2007), and in the data mining of a learner population to inform the design of online learning systems (Tzouveli, Mylonas and Kolia, 2008; Özpolat and Akar, 2009; Mustafa and Sharif, 2011).

Learners in Brunei however have never experienced online learning systems. Therefore, in my attempt to profiling them, I took into consideration a broad range of learner dispositions, including their dispositions toward digital technologies. A review of the literature showed no distinction between digital and online format, with online technologies being analogous to digital technologies. Nevertheless, the prevalent trends in profiling online learners also revealed the adaptation of existing learner theories that were not constructed in deliberation of online learning. Based on my review of these learner theories, learners have been profiled according to their 1) demographic characteristics (e.g. age, gender, ethnicity, social status), their 2) psychographic characteristics (e.g. learning styles, study habits, personality), or 3) a combination of both demographic and psychographic characteristics.

2.5.1. Profiling learners based on their demographic traits

Demographic profiling is a common profiling approach used in various fields ranging from population studies to market research. In educational research it is used to great effect in addressing issues of inequality and access to education. For clarity, it is best to define demographic profiling to differentiate it from psychographic profiling. According to Kaur (2013), “each student’s life is composed and stimulated by different features whether it is a low income family, family traditions, their parent’s education, community involvement, or race [and that] they cannot be manipulated” (p. 37). This suggests that demographic variables are mainly nominal and ordinal variables that either do not change, or do not experience a quick series of changes. Several common demographic variables used
In profiling include “age, gender, occupation, marital status, and income” (Kaur, 2013, p. 37).

In educational research, demographic variables have been used to profile various learner populations, including online learners. In online learning studies, age was found to either contribute significantly to learning success (Wojciechowski and Palmer, 2005; Colorado and Eberle, 2010; Wladis, Conway and Hachey, 2016) or to have no effect at all (Willging and Johnson, 2004; Li and Lee, 2016). Similar inconsistencies can be seen in other demographic markers such as gender or prior academic performance. Xu and Jaggers (2013) found that there are several studies confirming that there is no difference in online learning success between men and women, and there are also several studies confirming that women are more successful than men when learning online (p.2). Then again, Wladis, Conway and Hachey (2015) found that women actually did significantly worse online. Wladis et al. (2016) also followed a different line of query to conclude that females are more likely to enrol in online learning (p. 98).

Xu and Jaggers (2013) also found that prior academic performance did not matter when learners were equipped with high academic qualifications, but when learners have low academic qualifications they tend to be more varied in terms of their online learning success (p. 4). Hachey et al. (2012) however found no significant difference in online learning outcomes based on prior academic attainments. Then again, such studies on online learners introduce bias in that online learners according to Wladis et al. (2016) “tend to have higher academic preparation and higher G.P.A.s” (p.4). There is a lot of discrepancy and possible bias when profiling online learners based on demographic properties alone. In fact, learners who are likely to enrol in online learning themselves are suggested to already come from specific demographic groups (Wladis et al., 2016, pp. 98-99), thus introducing bias.

It is apparent that there has been a range of conflicting results coming from purely demographic based research. Demographic profiling is suited for research in the fields of education demographics, where the changing trend of a population’s
demography can be studied to identify the direction towards which the education system is headed. However, in terms of profiling online learners and their online learning success the studies mentioned earlier have shown that there are glaring inconsistencies in findings. This has been the pattern with demographic profiling and education research. Findings have been quite conflicted and inconclusive suggesting that the reliability of demographic profiling is also influenced by the psychographic properties of the learner population.

Thus, demographic variables are routinely included in survey instruments to complement psychographic items. Psychographic variables include attitudes, opinions, interests, personality, habits, and preferences – a collection of durable and transposable dispositions that have been collectively defined in the literature as ‘psychographic’ variables (Bressler, Bressler and Bressler, 2011; Chiu et al., 2015; among others). Studies like Assael’s (2005) equally and effectively used demographic and psychographic variables to profile heavy internet users. Other studies explore correlation and causality between demographic variables and independent variables.

Many other studies however rely on only psychographic variables as their main profiling criteria. Psychographic variables focus on an individual’s dispositions to behave, react and interact toward a given context. Unlike, age, gender, and other demographics, the interplaying psychographic variables are more susceptible to manipulation and dynamic changes, alluding to the presence of heterogeneity and dynamicity within the learner population.

2.5.2. Defining heterogeneity and dynamicity

As a brief preamble to the next section on profiling learners based on dispositions, and in providing clarity to the discussions throughout this thesis, we have to define ‘heterogeneity’ and ‘dynamicity’. On heterogeneity, Merriam-Webster generally defines the term as “the quality or state of consisting of dissimilar or diverse
elements” (Merriam-Webster, 2017). This section has so far described how different demographic variables contribute to learners’ heterogeneity. The combination of these demographic indicators creates a more heterogeneous profile of learners, such as studies investigating gender and race (Diette and Oyelere, 2014; Meyer, 2016), and nationality (Salamonson et al., 2012).

However, my earlier review established that the influence of demographic traits on learning is usually conflicted. In contrast, a tremendous body of educational research (Section 2.5.3) has established that psychographic traits have strong influences on learning effectiveness. These studies utilise measurements of personality, attitudes, opinions, interests, habits and preferences, durable and transposable dispositions that are more prone to manipulation than demographic traits.

With the existing diversity in psychographic properties personifying learners into different types, learners are bound to be heterogeneous. As suggested by Quintana, Krajcik and Soloway (2000), “learners do not necessarily share a common work culture, background, or understanding, so designers need to consider a larger degree of diversity in background, development, and learning styles in the learner population” (p. 257). Learning styles is an example of a learner theory that acknowledges, albeit in its own constraints, the heterogeneity of learners based on their learning preferences.

The heterogeneity of learners has been investigated according to online learner aptitudes, abilities and aspirations (Bates, Hardy, Hill and McKain, 2008), learners’ satisfaction of their demographic profiles (Sawatzky et al., 2009), differentiated learning based on learner theories (Subban, 2006); and heterogeneity in habitus types (Lueg, 2011). Fundamentally, studies that refer to learner theories investigate and document the heterogeneity of learners based on their respective target dispositions, collectively contributing to a lengthy list of learner types such as INTJ, Kinaesthetic, Pragmatist, Logical-Mathematical, Cognitivist and so on. However, as
dispositions are more prone to changes, these learner theories must take into account that learners are not only heterogeneous but also dynamic.

Learner dynamicity is a far less explored area of educational research. The term *dynamicity* itself is absent from the repository of Collins, Merriam-Webster, Cambridge and Oxford dictionaries. Nevertheless, *dynamicity* is a term that has persisted in literature and in several disciplines such as grammar studies, medicine, and computer programming as a technical jargon to describe ‘the state of being dynamic’.

More relevant to my research is the use of *dynamicity* in describing the state of dynamic learners. In educational research, the term has been used by several studies to indicate the dynamic properties of dispositions towards ICT in education (Mazman and Usluel, 2011), the dynamic status of groups in a university student population (Walter, 2013, p. 5) and the dynamic shifts in learners’ identities influenced by social constructs, experiences and language (Romo, 2015, p. 13). On learning competencies, Isaeva (2007) defines dynamicity as “the individual’s ability to work on multilevel intellectual and practical tasks very rapidly and accurately, flexibly moving from one set of tasks to another” (p. 39-40, emphasis added). On the use of dynamic e-portfolios, Lacouture and Saber (2007) acknowledge both the dynamicity of the e-portfolio learning system and its user-groups when they stated that, “in order to satisfy group dynamicity, the structure of the group should change as members evolve” (p. 63; emphasis added).

Drawing from Vygotsky’s work on the Zone of Proximal Development, Poehner and van Compernolle (2011), associate dynamicity to the capacity of learners developing their emerging abilities as they move between collaborative and cooperative learning situations (p. 187). Hence, despite dynamicity not being lexically defined in established dictionaries, the term has its use in describing the capacity of learners to evolve, to shift dispositions, and to be flexible in their learning processes. Legrottaglie and Ligorio (2017) state that ‘dynamicity’ is “not necessarily understood, because identity is always continuously changing, day by
day or even hour by hour” (p. 60; emphasis added). Dynamicity in my research thus relates to the changes in learners’ dispositions over time.

2.5.3. Profiling learners based on their dispositions

Katz (1988) defines dispositions as ‘habits of the mind’ whereby the mind tends to respond to certain situations or contexts in certain predisposed ways (p.30). In relation to learning, Carr (2001) describes learning dispositions as “situated learning strategies plus motivation-participation repertoires from which a learner recognises, selects, edits and responds to, resists, searches for and constructs learning opportunities” (p.21). Collectively, learning dispositions are predisposed habits that manifest when triggered by certain learning contexts or tasks. These dispositions take the forms of study habits; situated learning strategies that can be accounted for by learning styles; motivational factors that can be related to personality and technology acceptance; and the repertoire of skills that can be attributed to digital literacy and intellect among many others.

‘Learner dispositions’ for my research is thus a fitting umbrella term that encompasses all psychographic properties of the learner. Their mood, their habit, their attitude, their skills, their bias, their aversions, their grit, their conscience, their values; the list is somewhat endless. ‘Learner dispositions’ is thus the sine qua non of learning effectively for it represents the many traits that influence learning, including within the context of learning online.

‘Learner dispositions’ itself is a term liberally used in educational research and thus far has been repeatedly referred to in this thesis as a term to refer to a certain set of learner characteristics. A literature search on its origin traced the generic term ‘disposition’ in psychology research as far back as the 18\textsuperscript{th} century in the works of Rauch (1841, 1844) on how the mind influences one’s dispositions; Spurzheim (1846) on how dispositions are innate mental forces possessed by man and animals alike that influences one’s behaviours; and Combe (1850) on the mental functions
of the brain. Like Rauch and Spurzheim, Combe (1850) drew upon the earliest mention of discernible dispositions by Dr Gall in 1815, a physician in Vienna, whose observations he narrated as follows:

From an early age [Gall] was given to observation, and was struck with the fact that each of his brothers and sisters, companions in play, and schoolfellows, was distinguished from other individuals by some peculiarity of talent of disposition. Some of his schoolmates were remarkable for the beauty of their penmanship, some for their success in arithmetic, and others for their talent for acquiring knowledge of natural history of languages. The composition of one were elegant, the style of another was stiff and dry, while a third connected his reasoning in the closest manner, and clothed his arguments in the most forcible language. Their dispositions were equally different; and this diversity appeared also to determine the direction of their partialities and aversion. (Combe, 1850, pp.1-2)

The above anecdote suggests that dispositions are not only regarded as workings of the mind, but are also observably different from one another. Dispositions are very diverse, and represent themselves in the processes and products of learning. During the 18th century, the term dispositions evolved from an abstract concept that hinged mainly on its semantics to a more tangible and defined term. Bradley (1900) defines disposition in psychology as “a mere way of stating that when some things have happened there will be a ‘tendency’ for other things to happen-we may expect them to happen, that is, under favourable conditions-and, so far as these tendencies are reduced to rule, they are used properly to explain the occurrence of particular fact” (p. 34). He identifies dispositions as conation (p.35), which bodes well with Gall identifying dispositions as partialities and aversions.

Recent literature on online learning extensively employed predetermined theories to profile online learners based on their partialities and aversions towards learning
online. These include learning styles and psychometric models such as Kolb’s (1999) Learning Styles Inventory (LSI) as used by Dringus and Terrell (2000) and Manochehr (2006); Honey and Mumford’s (1992) Learning Style Questionnaire (LSQ) as used by Sabry and Baldwin (2003) and Downing and Chim (2004); the Myers-Briggs Type Indicator (MBTI) (Myers, 1962) as used by Dewar and Whittington (2000) and Mupinga, Nora and Yaw (2006); and the Felder and Silverman (1988) Learning Style Model (FSLSM), which itself is a hybrid instrument drawing from Kolb’s LSI and the MBTI, as used by Kinshuk (2007) and Özpolat and Akar (2009) in the form of Soloman and Felder’s (2005) Index of Learning Styles (ILS). Evidently, these learner theories have been utilised in studies on online learning.

Beyond learning styles, several research studies focused on the use of technologies. These include several versions of Venkatesh’s Technology Acceptance Model (Venkatesh et al., 2003) and the Online Learning Acceptance Model (Saadé and Bahli, 2005). Other studies opted to design their questionnaires around the conceptualised portrayal of the digital learners. These include the Digital Native Assessment Scale (Teo, 2013), and the Online Learning Readiness Scale (Hung et al., 2010). There have also been several studies on the digital literacy of university students (Nazim, 2008; Blignaut and Els, 2010; Conway, 2011; Millawthanachchi, 2012; Kumar and Mahajan, 2013).

It is thus evident that there are many ways to investigate learners’ dispositions towards learning. My overall review of these learner theories informs me that each theory has its own sets of arguments on why online learners could be profiled based on their respective constructs. Expanding from this, I systematically reviewed the separate literature on learning styles, personality, study strategies/habits and technology-based theories respectively; for these dimensions cover a diverse collection of theoretical models and inventories.
I. Learning styles

The concept of learning style is widely mentioned in the field of online learning and even more so in educational research. I conducted an extensive search on literature pertaining to learning styles, which generated more than 234,000 studies. These are predominantly context-specific such as in the disciplines of medicine, engineering or business, with the use of learning style in describing an eclectic population of learners being less common. Due to the extensive array of this model being used for various research purposes, I conducted a scoping search to identify highly relevant literature to sufficiently create a discourse on the strengths and weaknesses of learning styles. The scoping search narrowed down the most relevant literature to 1,161 articles comprising mainly of proponents to the learning style concept. Only selected contents of this search are mentioned in this abridged review on learning styles.

The impetus held by proponents of learning styles is that learners are diversified based on their preferred learning styles, and recognising these learning styles is key to effective learning in a given learning system. Federico (2000) states that “understanding [learning] styles can improve the planning, producing, and implementing of educational experiences, so they are more appropriately compatible with students’ desires, in order to enhance their learning, retention, and retrieval” (p. 367). Such is the importance of learning styles in education that over 80 models have been extensively researched in literature. A study by De Bello (1990) that compared just 11 models of learning styles resulted in many variations of types that cannot be conflated with each other due to the different interpretations of styles. Irrespective of these variations, researchers continue to use it as a conceptual framework in investigating learner characteristics, with two of the most utilised models being (1) the Kolb’s Learning Styles Theory and (2) the VAK model.

Kolb and Kolb (2012) defined learning styles as “a dynamic state resulting from synergistic transactions between the person and the environment [that] arises
from an individual’s **preferential** resolution of the dual dialectics of experiencing/conceptualizing and acting/reflecting” (p. 1699; emphasis added). Their perspective on learning styles is based on “an individual’s relative preference for the four modes of the learning cycle described in experiential learning theory: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation” (p. 1699). Their theory is complemented by an inventory (the Kolb Learning Style Inventory (KLSI), 1999; 2012) that can be used to assess learners’ experiential learning perceptions and preferences. A study on online learning using the KLSI established that there is a significant difference of effective learning among different learning styles and due to such diversity, acknowledging and catering for the differences is a main priority for designers of online courses (Lu et al., 2007, p. 194).

Another popular learning styles theory, the VAK model, incorporates cognitive learning styles based on stimulus. These are Visual, Auditory and Kinaesthetic for visual, audio and action stimuli respectively (Schreurs and Moreau, 2006, pp.2-3). The current development in online learning hypermedia and interface is saturated with constant visual, auditory and haptic stimuli with emerging technologies harnessing the kinaesthetic properties of augmented and mixed reality. It is therefore natural to refer to the VAK model to analyse the available web-based technologies and how their future developments relate to learning styles.

With regards to online learning, several studies suggest that online learners have specific learning styles and these differences affect learning effectiveness (Halsne and Gatta, 2002; Lu et al., 2007; among others); while conversely other studies suggest that the differences in learning styles do not contribute to differences in learning effectiveness (Aragon, Johnson and Shaik, 2002; Dringus and Terrell, 2000; Neuhauser, 2002; among many others).

There has also been a group of studies that, through the use of learning style models in determining differences of learning experience, its researchers have
come to the conclusion that the presence of discernible online learning styles is questionable (Mupinga et al., 2006). These many different propositions reflect the situation of general learning style research whereby some proponents of learning styles differ in their opinions on its impact towards learning effectiveness, and beginning the 21st century a growing number of critical papers have questioned the learning styles theory itself (Reynolds, 1997; Stahl, 1999; Garner, 2000).

A meta-analysis study by Dunn, Beaudry and Klavas (2002) concluded that “no learning style is either better or worse than another”, because they found that “most children can master the same content; how they master it is determined by their individual styles” (p.88). It is due to this revelation that they forewarned educators, “since each style has similar intelligence ranges, a student cannot be labelled or stigmatized by having any type of style” (p.88). On the reliability of learning styles as a profiling mechanism, Pashler et al. (2008) argued that the significance of learning styles has never been observed through experimental studies, that it is solely based on self-assessment rather than in a scientific test setting. Pashler et al. (2008) concluded that the influence of different learning styles towards learning is not certain.

Nevertheless, even with recent developments arguing against learning styles, the concept has persisted in many research circles and has penetrated into the field of online learning itself. In fact, the sole piece of Brunei literature on e-learning referred to learning styles (Seyal and Rahman, 2015). Riener and Willingham (2010) allude to the perseverance of learning styles due to three reasons. Firstly, there is a simplified logic to differentiating learners into their styles of learning (p. 34). Secondly, due to its widespread acceptance, many educators and researchers regard its popularity as compelling reasons to believe it due to ‘confirmation’ bias (p. 35). Thirdly, the concept caters to an egalitarian view that learners have equal strengths that are to be unearthed through a specific style of learning (p. 34). Riener and Willingham (2010) however argued that learning styles is merely one of many characteristics that affect learning and these include among others background knowledge and interests (p. 34). Indeed, the observations made by
Riener and Willingham do not dispute that learners have differences, but they question the use of learning styles in exclusively defining these differences.

A recent thorough review by Pashler et al. (2008) on ‘learning styles’-based research established that most are of below research design standards with fragmentary and unconvincing evidence for learning styles, and the remainder of studies that indeed employed appropriate research design contradicted the learning-style hypothesis (p.116). Thus, the limitations of learning styles, not only due to its narrow dimensional scope but also of the critical verdicts presented by recent literature, call into question its appropriateness in holistically profiling learners.

II. Personality

An alternative to using dedicated learning styles models is the use of personality psychometrics. For many decades, personality has long been advocated as strong indicators of learning effectiveness (Wiggins, Blackburn and Hackman, 1969). Based on a systematic literature review conducted for this research, the use of personality psychometrics is extensive in literature with the Myers-Briggs Type Indicator (MBTI) being referred to in more than 416,000 studies, of which around 1,830 are exclusive to MBTI; and the Big Five Personality test being referred to in more than 222,000 studies, of which around 2,900 are exclusive to Big Five. However, unlike learning styles, a sizable portion of these studies is attributed to non-educational research.

Nonetheless, psychometrics such as the Myers-Briggs Type Indicator have been used in both general educational research (Erhman and Oxford, 1990; Cooper and Miller, 1991; among others) and online learning research (Dewar and Whittington, 2000; Mupinga et al., 2006; among others) as equivalent of, if not a learning style itself. The Big Five personality psychometric is less used in education but has its proponents as the theory of choice to profile learners (Chowdhury, 2006;
Komaraju et al., 2011; among others) and online learners (Ghorbani and Montazer, 2015; Kaveri et al., 2015; among others).

In their study on profiling online learners’ personalities based on the Big Five Personality model, Ghorbani and Montazer (2015) developed an automatic learner’s personality identifier system (ALPIS) that profiled learners’ behaviour within the learning system using what they called fuzzy rule algorithms. They shared one example of their fuzzy rule as follows: “IF participation in forums (PICF) is high AND number of friends (NF) is high AND adding post in forums (APF) is high, THEN extroversion is high” (Ghorbani and Montazer, 2015, p. 45). Algorithms such as this compute several observable variables together to formulate a measure of an intangible disposition, in this case ‘extroversion’.

Although their experimental study did not arrive to any conclusive evidence on the relationship between personality and online learning performance, what is more interesting information for my research is their suggestion that profiling personality based on self-assessment questionnaires alone is unreliable because results tend to be affected by hypocrisy and incorrect perceptions (Ghorbani and Montazer, 2015, p. 51). Their preference for an automated system to profile the personalities of learners is because it has the capacity to minimise bias and record behaviours as they are observed in the learning system (p. 51).

Despite the tendency for self-assessed personality tests being exposed to bias, many studies in educational research have insisted that personality tests have strong correlations with learning performance. Several studies have correlated the interaction in online learning environments to personality traits. Motivation and self-discipline have been associated with acceptance to virtual classrooms (Hiltz, 1994, p. 67), while Agreeableness, Stability and Openness were established to have high correlation, and Extroversion and Conscientiousness to have moderate correlation to learning performance (Kim and Schniederjans, 2004, p. 96).
Regardless of the widespread use of personality psychometrics, conclusions from its body of literature have been found to contradict each other. For example, one study concluded that extroverted learners are more active participants of web-based discussions because they are task-oriented and they have strong dispositions towards collaborative problem-solving, while introverted learners struggle in web-based discussions because of their passive characteristics (Lee and Lee, 2006, p. 92). They further remarked that a web-based discussion is prone to lack of activity if the learner population comprise predominantly of introverted learners. (2006, p. 92).

However, a more recent study found that it is actually the other way around. Pavalache-Ilie and Cocorada (2014) concluded that introverts have stronger dispositions towards learning and discussions in online forums because the environment is less threatening, while extroverts have stronger dispositions towards face-to-face consultations and on-campus learning (p. 118). Both studies present convincing arguments yet formed conflicting findings. As alluded to by Ghorbani and Montazer (2015) in their fuzzy algorithms, it seems plausible that other external variables do interplay with personality traits to influence the overall dispositions of a learner to learning online.

III. Study habits (skills and strategies)

As with learning styles and personality psychometrics, study habits have also been used to gauge learning effectiveness whereby habits that are more organised and conducive to learning are expected to result in more effective learning. Like personality, ‘study habits’ is a learner theory that has established itself for more than 60 years. Brown (1941) attributed good practice in habits such as note-taking, reading and revision, to effective learning outcomes (pp.205-207). Several inventories have been designed that incorporated these habits to determine their influence on learning performance (Malleson, Penfold and Sawiris, 1968; Wrenn, McKeown and Humber, 1941), but recently interest in its construct has since
waned with the increasing popularity of learning styles. Its last enclave is in the study of test anxiety (Cassady and Johnson, 2002; Spielberger, 2010). However, a similar representation of study habits can be found in study skills and study strategies, both concerning with the study methods of learners and the simple notion that good learners have good habits while weak learners do not.

According to Wenden (1985), the idea that good learners have learner strategies whereas poor learners do not is not necessarily true (p.7; cited in Vann and Abraham, 1990, p.190). Contrary to this belief, several studies have confirmed that poor learners in fact have the same gamut of learner strategies as good learners. Vann and Abraham (1990) confirmed from their microanalysis of students that the taxonomy of learner strategies possessed by weak learners is “remarkably similar to successful learners” (p. 177). They then concluded that the poor learners are in fact “active strategy-users, but they often failed to apply strategies appropriately to the task at hand” (p. 177). This suggests that the learner strategies are dispositions that are influenced by other external variables such as pedagogical approaches or motivation to name a few.

Vann and Abraham (1990) pointed to the fact that poor learners lack “certain necessary higher-order processes, what are often called meta-cognitive strategies or self-regulatory skills which would enable them to assess the task and bring to bear the necessary strategies for its completion” (p. 177). This statement regarding the importance of meta-cognitive strategies bears more credence as not only it is claimed by Vann and Abraham as the prerequisite to effectively using learner strategies but also, as Hedge (2000) points out, is considered as a type of learner strategy (p.77) that involves the planning, thinking, self-monitoring, and evaluation of one’s own learning (p. 78).

‘Learner strategies’ is reflective of study habits in the form of revising, reading, organising and so on (Brown, 1941). They are intangible concepts that are difficult to observe because “they necessarily involve cognitive processes which neither the learner nor the teacher may be able to specify” (Rubin, 1975, p.45). Rubin’s (1975)
definition on learner strategies as being “the techniques or devices which a learner may use to acquire knowledge” (p. 43) aided in the fine-tuning of subsequent taxonomies on good learner strategies and study-habit type inventories.

With regards to online learning however, a study by Odell et al. (2000) on college students revealed that students who spent more time studying were influenced by the study habits that they have employed in their previous learning experiences, and in turn they spend more time studying online and use the internet more for learning (pp. 861-862). It is thus plausible to use study habits as a means to profile online learners, as even though there may be differences in the habits of how learners study in the traditional classroom and in the online learning environment, essentially good habits from one mode of learning are transferable to the other.

IV. Technology-driven dispositions

With regards to how technology influences a learner’s disposition towards online learning, several studies with this focus have confirmed that learners indeed have varying dispositions towards different affordances, artefacts and online learning approaches. Hargittai (2005; 2009) explored the impact of socioeconomic status and found that even within the population of what he described as ‘digital natives’, web-use differs due to social inequality, which impinges on access to technology.

This information suggests that dispositions to web technology is influenced by more than simply being born in the internet age as claimed by Prensky, because other variables such as socioeconomic background contribute to the individual’s dispositions as well. Hargittai’s (2005; 2009) investigations into the concept of digital literacy also found differing literacy dispositions amongst learners, even within samples that are supposedly digital natives. Digital literacy is a measure of how fluent individuals are in digital technology, with the apex of fluency being the conjectural ‘digital natives’. It is important to conceptualise what digital literacy is. Digital literacy is defined as...
...the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse, and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situation, in order to enable constructive social action, and to reflect upon this process. (Martin, 2005, p.135-136, emphasis added)

The attributes mentioned in this definition are synonymous to the academic endeavours of higher education students and have been adapted into several digital literacy framework such as the European Union Digital Literacy Framework (DigEuLit) (Martin, 2005) and the Digital Literacy Assessments and Curriculum Framework used in the United States (International ICT Literacy Panel, 2002), among several others. There have also been several studies on the digital literacy of university students (Nazim, 2008; Blignaut and Els, 2010; Conway, 2011; Millawithanachchi, 2012; Kumar and Mahajan, 2013) as well as several consortiums such as the JISC Digital Literacy Project.

These studies in general explore how digital literacy can be improved and the external factors that it is affected by. However, none of these studies exclusively focused on how differing levels of digital literacy affect students’ internet use. Nonetheless, these studies unanimously agree that digital literacy is important in university level learning, as identified by a study conducted by Blignaut and Els (2010) who found that ‘one in six South African students fail to graduate due to having meagre computer literacy skills’ (p. 101). Another study found that university learners with better mastery of the 7 digital literacies were found to have more technological versatility (Omarali, 2017b).

Other than digital literacy, many studies have also investigated on the influence of technology ownership, use and acceptance. Teo (2013), and Margaryan, Littlejohn and Vojt (2011) found that learners having different technological dispositions tend
to function differently in online learning. These studies revealed how learners are afflicted by what technologies they own and how predisposed they are towards using certain technologies. Having gauged learners’ reception of these technologies, Venkatesh et al. (2003) designed the Unified Theory of Acceptance and Use of Technology (UTAUT) to investigate users’ acceptance of a newly introduced technology based on their technology dispositions. UTAUT, and its predecessors the Technology Acceptance Model variations (TAM), are notable technology user profiling models in the industries-related disciplines with 1,210 dedicated articles upon a scoping search.

UTAUT is an improved technology acceptance model that was refined from 8 standalone earlier technology acceptance models by providing robust statistical evidence that outperformed the other models (Venkatesh et al., 2003). UTAUT can be defined as a model that accounts for the dynamic influences of organisational context, user experience and demographic characteristics (Venkatesh et al., 2003, p.471), extrapolating them into four measurable key constructs, viz. 1) performance expectancy, 2) effort expectancy, 3) social influence, and 4) facilitating conditions.

Venkatesh et al. (2003) define UTAUT’s four constructs respectively as (1) the end-user’s perception on how the technology will improve his/her performance (p.447), (2) the end-user’s perception on how easy it is to use the technology (p.450), (3) the end-user’s perception on how other end-users in his/her social circle influence their use of the technology (p.451), and (4) the end-user’s perception on the presence of adequate technical features and infrastructure to use the technology. These constructs are transposable to online learning where they become reliable measures of online learning success (Saadé and Bahli, 2005; Lin and Anol, 2008).

The UTAUT constructs have been established as fit for purpose in collectively investigating the effectiveness of new technology from the end-user perspective, which is their technology acceptance. Identifying the technology end-user as online learners, the UTAUT model therefore is a sensible construct to profiling online
learners as used in studies by Šumak, Polančič, and Heričko (2009) who through the model established the significance of social influence and personal intentions on learners’ acceptance of virtual learning environments; a study by Wang, Wu and Wang (2009) on how social influence and self-management affect learners’ adoption of mobile learning; and a study by Chiu and Wang (2008) on how performance expectancy and effort expectancy affect continuous use of web-based learning. Evidently, the UTAUT model has been used to identify and measure different forms of learner variables and their influence on technology use.

It can thus be argued that the expectancies and extrinsic influences of UTAUT are not themselves dispositions. However, the expectations the learner has on the technology and the influence of others in the learner’s social circle, evoke specific behaviour from the learner; behaviour that is scripted by dispositions. Thus, UTAUT is relevant to measuring dispositions in this manner as certain dispositions are based on technology. Rojas et al. (2004) refer to these technology-instigated dispositions as techno-dispositions (p.115-116); a term that will be revisited at the end of this chapter as part of my discussions on Bourdieu’s theory and its relevance to dispositions. Overall, UTAUT is the most multidimensional model that has so far been discussed in this review and is also one that to a certain extent acknowledges that learners’ dispositions have the tendency to dynamically change.

2.5.4. A summary on learner profiling using learner theories

Based on my reviews of these four diverse groups of disposition theories, on how they have been used in profiling learners and online learners, and the shortcomings highlighted by critics of these respective theories, I conclude that standalone learner theories do profile the learners to a certain extent. Rummel (1977) in his book on war and conflict addresses the social reciprocity of expectations and dispositions, “as we behave toward others, we not only perceive them as distances vis a vis ourselves but we also apprehend how our behavior [sic] will affect them and what we can expect in return” (para. 2). He further advocated that, “these
expectations clearly modify our dispositions, but how this relation manifests itself ... requires a more detailed analysis of social behaviour” (para. 2). It is thus imperative that analysis via a standalone learner theory on its own is not sufficient in understanding the behaviours of learners when faced with online learning technology.

I found that there is a tendency for each learner theory to justify findings based on the limited scope of their theoretical framework. I attributed this to Campbell’s Law (Campbell, 1979) whereby a phenomenon based on the theory is explained through the use of the same predetermined theory. In turn, I found that learners are profiled into predetermined taxonomies respective of each theory, and I found it difficult to determine which theories are better indicators than others. In addition, I found that, as suggested by Bloomer and Hodkinson (2000), changes in dispositions over time are not acknowledged by many of these theories. Most importantly, I found that each theory only provided a limited description of who the learners are; learners who are dynamic and represented by a collection of interplaying theories from habits to styles, motivation to technology acceptance, intelligences to social presence.

Confirmation bias and being compelled to justify based on predetermined taxonomies also denied the holistic profiling of learners and their myriad dispositions; a holistic picture that encompasses styles, literacy, motivation, habits, acceptance, personality, technology skills and so on. Like how Brunei has taken to the moral panic of the homogeneous digital natives (Bennett et al., 2008, p. 776), there is a danger of basing our understanding of learners through yet another limited perspective. What is needed is a theoretical framework that is inclusive of these known disposition types. The next section reviews on studies that have attempted to combine models together in order to have a wider profiling range.
2.6. Profiling learners based on a combination of learning models

Learner dispositions consist of a vast collection of overlapping character constructs represented by differing learner theories. The reviews in the previous section presented that the majority of previous research focused on a self-confined standalone learner theory; arguing that a learner can be understood with the use of a single focus model. Bloomer and Hodkinson (2000) identify this group of research as research that advocates learners having “relatively fixed preferences and capacities for learning” (p.584).

Another characteristic of these standalone models is that “the origin of learning preferences are [sic] not made explicit [and] on some occasions, their roots are loosely traced to earlier cultural experiences (Bloomer and Hodkinson, 2000, p. 584; emphasis added). This can be seen with the learning styles models, for example the VAK, whereby learners are grouped into visual, auditory and kinaesthetic learners. Based on this model, learners are grouped as is. Visual learners have visual learning style but very little is contributed to exploring other factors that may play a part in forming the dispositions towards visual stimuli, or if there are other learner theories that explain better the observed phenomenon.

Thus, the presence of several different research studies each with their proxy model suggests the possibility that no one theory is dominant in explaining a given phenomenon but all are reciprocal. There is no denying that each theory contributes to understanding a dimension of the learner, like pieces to a jigsaw puzzle, and that the embodiment of the ‘learner’ is the amalgam of these dimensions. Bourdieu (1977) suggests that, “it is necessary to abandon all theories which explicitly or implicitly treat practice as a mechanical reaction, directly determined by the antecedent conditions and entirely reducible to the mechanical functioning of pre-established assemblies, ‘models’ or ‘roles”’ (p.73). This big-picture perspective alludes to Bourdieusian’s theory in that, as opposed to a dominant standalone dimension, multiple dimensions not only provide a more
holistic description, but also they interact with one another and the exclusion of one dimension may affect the contribution of other dimensions.

Unfortunately, current literature lacks studies consistently incorporating multiple learner dimensions in tandem. Silver, Strong and Perini (1997) and Denig (2004) combined learning styles with multiple intelligences alluding to their being a more robust hybrid model when complemented together. Busato et al. (1998) combined learning styles with the Big Five personality psychometric as a more accurate measure of learning effectiveness than when used separately in isolation. Winke (2007) went beyond pairing two models by combining learning styles, cognitive styles, personality, aptitude, and motivation measurements as a multifaceted measure to differentiate individual learners. Evidently, combining models together in these studies intended for a more holistic profiling measurement. However, these combinations were rarely replicated as different studies opted for combining different models to suit their respective agenda. In addition, a governing overarching framework to guide which models to be combined is yet to be formulated.

Nevertheless, inspired by the use of a diverse combination of demographic and psychographic variables to more holistically profile online learners, I decided that what was needed was an overarching theoretical framework; one that is all-encompassing that it is able to represent all types of dispositions within its liberal frame without overlaps and conflicts. My search for such mechanism led to the adaptation of Bourdieu’s (1977) social theory as a theoretical framework whereby learners are profiled based on their socio-economic, cultural, intellectual, technological capitals and dispositions. These criteria fittingly represent all the dispositions that I have mentioned during my reviews of different learner theories.
2.7. Bourdieu’s theory as a theoretical framework

Bourdieu’s theory revolves around “the interlocking nature of his three main “thinking tools”: (...) habitus, field and capital” (Maton, 2014, p.50). Bourdieu believes that individuals have a portfolio of capital that shapes them notably, socio-economically (economic and social capital), academically (intellectual capital) and culturally (cultural capital) (Crossley, 2014). More recently, Rojas et al. (2004), realising that emerging technology is shaping individuals with newfound characteristics and dispositions, expanded the concept further with the term ‘techno-capital’. These capitals exist as **objectified** possessions (e.g. money, computers), as **embodiment** of the learner (e.g. intellect, ICT literacy) and as **symbolic** representations (e.g. support network) (p.115-116).

Collectively, these different capitals represent both demographic and psychographic traits. Demographic features include religion and ethnicity as represented by cultural capital, academic qualifications and level of education as represented by intellectual capital, and social status and family income as represented by socioeconomic capital. In tandem, capitals can also be psychographic, such as digital literacy as represented by techno-capital, values and principles as represented by cultural capital and so on. Capitals can thus be either ‘objectified’ or ‘embodied’ (Moore, 2014, p. 102); ‘objectified’ means more than as mere objects but as tangible traits such as age and smart-phone ownership, and ‘embodied’ in terms of psychographic traits such as maturity in reacting to situations that come with age, and being able to use a mobile browser due to ownership of a smart-phone.

2.7.1. Defining the habitus

The interplay of these capitals within a context results in the learner exhibiting a collection of dispositions called habitus. According to Moore (2014), “unlike objectified and embodied capital, habitus does not have a material existence in itself in the world since it includes attitudes and dispositions” (p. 108; original
emphasize). Habitus is essentially dispositions that have been formed through the interplay between capitals. For example, owning an iOS phone is an objectified capital. Having the knowledge of how to use an iOS phone due to owning one is an embodied capital. Having preferences for iOS devices and other Apple related software is a disposition, specifically a disposition for iOS technology. This disposition contributes to the individual’s habitus.

Moore (2014) suggests that habitus is “known only through their realizations in practice” (p. 103). Thus, the habitus becomes observable when the context is presented to the individual, such as when given the choice between iOS or Android based learning system. Figure 2 below is my attempt in illustrating the interplay between capitals and how they manifest as dispositions when presented with the context of learning in a school or, relevant to my research, a probable virtual learning environment (VLE).

![Diagram](image)

*Figure 2. The habitus: The interactions of capitals and dispositions within a learner*
Context is important in Bourdieu’s theory because context provides a space and reason for dispositions to manifest and interact. According to Bourdieu (2005), “to explain an event or social phenomenon, it was insufficient to look at what was said, or what happened. It was necessary to examine the social space in which interactions, transactions and events occurred” (p. 148, cited in Thomson, 2014, p. 65). With regards to my research, these actions are applicable to both human-computer interactions and human-to-human interactions in online learning. It is upon interaction with the ‘field’, the online environment, the system and its affordances and artefacts that a learner’s habitus influences his or her learning. In tandem, the ‘field’ influences the learner’s habitus in a two-way exchange (see Figure 3).

![Figure 3. The 'practice': The interaction of the learner habitus and the field](image)

As defined by Bourdieu (1977), “the structures constitutive of a particular type of environment (...) produce habitus, systems of durable, transposable dispositions” (p.72; original emphasis). Therefore, the transposable dispositions that interplay together to compose the habitus are not only influenced by capitals, but at the same time habitus is conditioned by the ‘field’. As explained by Bourdieu and Wacquam (1992), “on one side it is a relation of conditioning: the field structures the habitus . . . On the other side, it is a relation of knowledge or cognitive
construction. Habitus contributes to constituting the field as a meaningful world” (p. 127). As rightly pointed out by Moore, habitus is that intangible element that represents the interaction between the learners’ characteristics and the learning system. Figure 3 above is my attempt in illustrating this interaction at the same time introducing terms that Bourdieu has used - ‘doxa’, ‘modus operandi’ and ‘opus operatum’.

In his extensive work on profiling individuals, Bourdieu (1977) exemplified that “in the interaction between two agents or groups of agents endowed with the same habitus (...), everything takes places as if the actions of each of them were organized in relation to the reactions they call forth from any agent possessing the same habitus” (p.73). This implies that learners (as agents) who share similar sets of dispositions (habitus) behave and interact with online learning systems in a similar manner. This predisposed behaviour is what Bourdieu refers to as the modus operandi. At the same time, the online system presents its various affordances and artefacts and expects learners to interact with them. This expectation from the system side is the opus operatum. When the expectation is unrealistic, for example, in the case of expecting learners to all be digital natives, then it is said that that ‘field’ has an attached ‘doxa’. Deer (2014) describes doxa as “unquestioned opinions” as well as “the assumptions of an epoch which are taken for granted and lie beyond ideologies (orthodoxies), yet which can generate conscious struggles” (p. 115). A doxa is basically a predetermined expectation of favoured habitus types.

2.7.2. The interplay between Bourdieu’s key constructs

The theory based on the discussion above is that learners who share the same dispositions are representative of a habitus type. The next step is to establish if having the same habitus type invokes similar modus operandi when introduced to a new learning ‘field’ (i.e. a new online learning system), so that informed assumptions can be made on what affordances and artefacts can be included in the
system to match learners’ dispositions. In addition, in situations where their *modus operandi* is incompatible with the task at hand, it would be beneficial if the system is itself able to make formative judgments to revise its approaches, or *opus operatum*, in matching the habitus, because dispositions are after all durable and transposable.

Since habitus is constantly evolving, this dynamism “allows for the relationship between the structure of a ‘field’ and the habitus of its members to be one of varying degrees of fit or mismatch” (Maton, 2014, p.56); a situation that Bourdieu terms as ‘hysteresis’. The problem that Brunei has with technology implementations is thus a perfect example of hysteresis. If an online learning system is to be introduced, it needs ‘intelligence’ to ensure that the system always adapts in providing the *opus operatum* that matches the learner’s *modus operandi*. This suggests the AOLS alternative. A less technical solution is in providing a multimodal learning system with universal affordances and artefacts that provide learners opportunities to be durable and transposable with their dispositions if they see fit. This suggests the MOLS alternative.

The relevance of Bourdieu’s theory to identifying an appropriate online learning system does not end with his key constructs of ‘capitals’, ‘habitus’ and ‘field’. The identification of ‘doxa’ is relevant to preventing the same mistakes being made when aligning learners’ preferences with the online learning systems. According to Bourdieu (2000), doxa is “a set of fundamental beliefs which does not even need to be asserted in the form of an explicit, self-conscious dogma” (p. 16). Changing dogmas is never a straightforward affair in policy management.

Another of Bourdieu’s concepts is his rendition of ‘conatus’, which itself is a term traceable to Aristotle and Newton (Fuller, 2014, p. 170). As defined by Bourdieu (1988), conatus is “that combination of dispositions and interests associated with a particular class of social position which inclines agents to strive to reproduce at a constant or an increasing rate the properties constituting their social identity, without even needing to do this deliberately or consciously” (p. 176). Conatus is an
acknowledgment of the ‘dynamicity’ of individuals shifting through social space where certain individuals are more inclined to change than others.

The habitus is the profile of the learner, and the conatus is the element or process that inclines a learner to evolve from one habitus to another. Conatus is the catalyst for the learner to either move to a different habitus or to remain content to his/her habitus. Fuller (2014) interprets it succinctly through his analogy that, “habitus is to conatus in a living human as position is to momentum in a moving body” (p. 176). In other words, habitus pinpoints the learners’ positions onto a map of different habitus types, but it is the conatus that catalyses their inclination to move from one habitus to another or the inclination to remain associated with one habitus type.

To summarise, Bourdieu’s theory provides appropriate explanations to the research elements that previously were ambiguously defined. ‘Capitals’ and ‘dispositions’ represent learners’ demographic and psychographic traits. The different combinations of these capitals and dispositions form different types of ‘habitus’. The online learning system is the ‘field’. The observable learner behaviour when interacting with the field is the ‘modus operandi’. The interactions that the field expects of the learner are the ‘opus operatum’. When the expectations are bound by dogma, they are referred to as ‘doxa’. When there is a mismatch between learners’ predispositions and the system’s expectation, this state is called ‘hysteresis’. The dynamicity of habitus with its durable and transposable dispositions is influenced by the ‘conatus’. Based on how Bourdieu’s various constructs above fittingly describe the elements involved in my research, I have chosen it as the theoretical framework to inspire and guide my research.

2.7.3. Criticisms on Bourdieu’s theory

Admittedly, Bourdieu’s theory is not without its critics. Several researchers have challenged Bourdieu’s interpretation of his constructs. Notable oppositions include
Schatzki (1997), who employed a Wittgensteinian perspective to scrutinise Bourdieu’s supposedly over-intellectualisation of human activity; Pudsey (1996), who employed a Weberian perspective to highlight Bourdieu’s approach of reflexivity as too scientific that it paradoxically reduces reflexivity; Loyal (2016), who employed an Eliasian perspective to suggest that Bourdieu’s theory is deterministic and objectivist; Rancière (2004), who commented that Bourdieu’s emphasis on inequality involved placing the poor in society as objects of study and the sociologists who study them as intellects (elaborated in Pelletier, 2009); and Alexander (1995; 2003), who commented that Bourdieu’s view of human behaviour as weak because of how he objectifies human attributes such as culture into capitals rather than as autonomous constructs.

These criticisms do have their own counter-arguments. For example, Pudsey admitted that paradoxes in reflexivity cannot be overcome (1996), and Rancière admitted that Bourdieu’s theory offer the best explanation when there is a need to scientifically analyse social arrangements through detaching them from the naiveties of social optimism (Peltelier, 2009, p. 140). These critics nevertheless are apprehensive of Bourdieu’s reliance on scientific methods within which empirical, objectivist and deterministic approaches to explaining behaviour and dispositions are pervasive.

Thus, one main criticism of Bourdieu’s theory is that it tends to be deterministic (King, 2000). It is not the habitus theory per se but of Bourdieu’s interpretation of it and its associated constructs. Norbert Elias, whose extensive work also on habitus and field in the 1980s is regarded as parallel to that of Bourdieu’s (Pickel, 2005, pp. 3-4; Loyal, 2016, para. 1), found Bourdieu’s concrete descriptions of the habitus and field to be different to his more abstract interpretations. Taking the two sociologists’ argumentative discourse on the ‘state’ as an example (the ‘state’ being a nation and its governance), Bourdieu (2014) views nation building as involving four very concrete and sequential stages of state formation determined by symbolic and objectified types of capitals. In contrast, Elias views the abstract presence of dynamic social relationships and social figurations as more influential.
on the change and development of the state (Elias, 1978; Mennell, 1992). The alternative perspectives above, of concrete and abstract viewpoints, have been accepted as evidence that Bourdieu’s constructs are more deterministic compared to Elias’s speculative interpretations. On this distinction, Loyal (2015, para. 10) distinguishes Bourdieu’s interpretation of habitus as more attributed to a Durkheimian view, while Elias’s interpretation is more reflective of Weber’s view.

Interestingly, both Durkheim and Weber are recognised to have contributed to the early origins of habitus, with Elias’s habitus drawing from Weber and Simmel’s work (Quilley and Loyal, 2004, p. 4), and Bourdieu’s habitus drawing from Durkheim and Mauss’s work (Lizardo, 2004, p. 376). Durkheim is also known for his commitment to the deterministic approach (Gartman, 2007) as he views members of the society collectively as “a determinate system with a life of its own” (Durkheim, 1984, pp. 38-39). When transposed to my theoretical framework, Bourdieu’s deterministic approach is reflected in his definition of the habitus, while Elias’s abstraction of dynamic and undetermined factors is perhaps more reflective of my interpretation of the conatus.

Parallel to Bourdieu’s work being deemed deterministic, his methods in identifying his constructs have also been deemed objectivist (King, 2000). Indeed, various theorists have suggested that habitus itself is an objectivist construct (Jenkins, 1993; Bouveresse, 1995; Schatzki, 1997; among others). On the other hand, other critics have argued that Bourdieu’s concept of habitus is too interpretive, for example by Sullivan (2002) who suggested that Bourdieu’s habitus in the area of educational research is "a concept with some intuitive plausibility, but is at once too all-inclusive and too vacuous to be of any use to empirical researchers" (p. 163; emphasis added). Alexander (1995; 2003) shared a similar view, to the extent of criticising Bourdieu’s theory as being a weak effort to describe human behaviour due to Bourdieu’s empiricist interpretation in the forms of habitus.

Alexander’s criticism however is itself criticised by Gartman (2007) who claimed that Alexander was narrowing the sociology of behaviour and dispositions to the
single dimension of culture, whereas Bourdieu with his arguably deterministic interpretation of behaviour into the all-inclusive habitus allows it to tangibly define the dynamism and relationship that exist between these behaviours. My stance is that this all-inclusive feature is more a strength than a flaw of Bourdieu’s theory. It indicates that Bourdieu’s theory is encompassing and versatile, able to explain types of behaviour and dispositions in a deterministic manner yet within this determinate system there exists an extensive space allowing for a liberal and subjective interpretation of behaviour and dispositions.

Based on the conflicting opinions above among his critics, the criticisms of Bourdieu’s theory being deterministic and objectivist may be regarded as situational. In fact, Bourdieu’s work has been interpreted as two contrasting strands; the first being a deterministic and objectivist view of society, and the second being more attuned to virtuosic interactions that allowed Bourdieu to interweave between subjectivism and objectivism (King, 2000, p. 417). In addition, these two seemingly conflicting attributes can actually be used complementarily, such as in a mixed-method investigation that employs empirical and interpretive inquiries where one informs the other. My research utilises these two contrasting strands interchangeably to leverage on the empiricist and interpretivist capacities in profiling learners. For studies which involve subjective interpretation of social relationship and figurations, Loyal (2016) suggests that habitus, having been “fashioned from empirical work [its] usefulness is tied to [its] power of generating insightful substantive analyses” (para. 52).

It is important to note that Bourdieu’s theory evolved across decades, and many of the ambiguity commented on by his critics were made clear in his lecture notes and responses to his critics (Bourdieu, 1990; 2000). During my review for a suitable theoretical framework, I explored Foucault’s work on classifying the human population and its relevance to the student population but found that his emphasis on using discourse analysis is more suited for research that is in its advanced stage of theory testing; of which my research is not. My reading of Goffman’s (1959; Miller, 1995; Papacharissi, 2002) dramaturgy theory can be interpreted to
investigate how one’s dispositions internally construct one’s own self; and Giddens’s (1984) structuration theory can be used to explore whether structured patterns or arbitrary choice defines learner behaviour. These theories indeed have their roles in defining the habitus, but are seemingly more relevant only after when the habitus element itself is extensively interpreted.

My research thus required an initial framework to define all the elements of my observation so I could systematically analyse and formatively infer interpretations comprehensible to the casual reader. My search for alternative theories also led me to the work of Durkheim and Wacquant who are respectively the inspiration and the one inspired by Bourdieu’s work on habitus. Due to Bourdieu’s various constructs being more applicable to describing aspects of my research in addition to their use in academia more prevalent than other alternative viewpoints (Loyal, 2016, para. 3), I remained with the Bourdieusian approach of interpreting habitus. Ultimately, Bourdieu’s theory became my theoretical framework and the inspiration for my research questions.

2.8. Research questions

My literature review above has elaborated on the different types of online learning systems and consequently the different types of learner profiling mechanisms called learner theories. These two possible areas of research foci, viz. the technology and the technology user, have a considerably synergic relationship of the giver and receiver of knowledge; the back-end and the end-user; for intelligent systems - the teacher and the learner; and for Bourdieu’s theory - the ‘field’ and the ‘player in the field’ (‘player’ is another of Bourdieu’s constructs similar to his ‘agent’ terminology) (Bourdieu, 1990).

Based on the significance of these two research foci, I opted to prioritise my research efforts towards the learner aspect because, returning back to the premise of my research, policy-makers have a misconstrued understanding of our learners.
Furthermore, because history of technology implementation in Brunei insofar has shown that emphasising the technology before the learner has ramifications, I feel compelled to prioritise my queries and therefore my research questions around the learner entity.

My research attempts to gain a more nuanced understanding of our Bruneian learners so that any future effort in implementing online learning will be more informed and more responsive to learners’ dispositions. In the review, I have identified Bourdieu’s habitus construct as an overarching profiling mechanism to discern learners’ dispositions towards online learning. However, as Bruneian learners have never been exposed to online learning systems their use of digital technologies has been integrated as measures under this habitus construct instead. Thus, the habitus construct is used in my research to distinguish types of learners based on their dispositions towards not just learning with online technology but also digital technology.

At this juncture, the types of learners and how many types are present are yet unknown. My first research question aims to address this enquiry through identifying learners based on their habitus types. Expanding from this first question, my second research question intends to identify how different habitus types might influence the use of and dispositions for online learning tools, affordances, artefacts, approaches and so on. The information gathered on how different habitus interacts with these technologies and approaches, if at all, are expected to informatively guide policy-makers on what components to integrate in an online learning system. Consequently, because my investigation based on this second question will axiomatically re-enter the discussion of online learning systems, my third research question intends to identify a suitable online learning system for these habitus types – acting as an initial guide for policy-makers before embarking and committing to the process and investment of online learning implementation. These three research questions are as follows:
RQ1.
What are the different types of learner habitus?

RQ2.
How might a learner’s habitus influence how he or she performs in an online learning system?

RQ3.
What online learning systems are capable of catering for the different types of learner habitus?

Collectively, these three questions above are expected to contribute to a better understanding of the learners and their dispositions towards online learning systems. In addition, inferred between the lines of these queries are my beliefs and principles as a researcher on how these questions will be processed, notably on how I view and interpret my observations. This combination of research beliefs and principles is referred in academic research as a research paradigm. Since the paradigm bridges the information from the literature with the methodology, I will introduce it as part of my preliminary research strategy in the next chapter.

2.9. Chapter summary

The review of the literature has highlighted the challenges and shortcomings of previous studies in profiling the online learner population. These are particularly attributed to the prevalent use of standalone theories and models, which reflect on the selective nature of previous research, including those that attempted to understand the relation between the learner and effective learning fait accompli. My literature review helped in the eventual construction of my research questions by specifying the learners’ habitus as the main focus of my enquiry. The review of current learner profiling practices informed me of researchers’ fascination with learner heterogeneity as well as how their taxonomisation of heterogeneity has been based on specific learner profiles rather than a more holistic approach. These
learner theories address my first research question to a certain extent, but I believe that there is a bigger opportunity to produce a more comprehensive and holistic profiling system based on habitus types.

This chapter further suggested a link between the learning system and the learner, whether it is based on the relationship of ‘learner satisfaction-learning effectiveness’, ‘modus operandi-opus operatum’, ‘habitus-field’ or the imbalance referred as ‘hysteresis’. There is an opportunity to explore how learners’ dispositions influence their learning experience and performance, and I intend to address this through my second research question. At this stage, my review only went as far as suggesting that there might be a link between different habitus types having different learning outcomes but stopped short of providing substantial evidence. The answer to this second research question largely depends on the outcome of my research.

With regards to the third research question, early in this chapter I briefly mentioned several types of online learning systems, and consequently reviewed three specific types of learning systems. Anticipating the diversity of dispositions within the learner population, and with arguments on unquestioned dogma (doxa) and a mismatch between the learning system and the learner (hysteresis) further supporting the use of adaptable, diversified, or user customisable systems respectively, this review has indeed suggested answers to the third research question. My third research question will revisit these recommended systems within the context of its empirical and interpretive findings to establish if any of them are indeed compatible for the Brunei learner population.

Other than the gaps addressed by the three research questions, my research also recognises a possible gap in Bourdieu-inspired literature, particularly of its use as a learner profiling mechanism. My review of Bourdieu’s theory concluded that Bourdieu’s theory is not a supreme theory, but rather a higher calibre raconteur of learners and their dispositions; a caveat that is maintained throughout my research to ensure that the online learners and their diverse dispositions for learning online
are the constant impetus of my thesis. Bourdieu’s key constructs of ‘capitals’ and ‘dispositions’ are able to encompass every demographic and psychographic variable possible and thus has the potential to holistically profile learners into dynamic and interplaying clusters called ‘habitus’. The habitus construct is also both empiristic and interpretive which allowed me to strategise my methodology based on a flexible research paradigm as how I describe it in the next chapter.
Chapter 3. Preliminary research strategy

3.1. Introduction

As the main proprietor of this research, it is my onus to present a clear and informed account of the beliefs and principles that have influenced me in selecting my methods of collecting, analysing and interpreting data. In this regard, this chapter accounts for the preliminary thought processes and decision making that I cogitated on and eventually applied to the eventual methodology of my research. It is during this preliminary process that I aligned my decisions according to a research paradigm, albeit in certain parts my decisions preceded and informed aspects of the paradigm instead.

Regardless of how my research paradigm materialised, it is apparent that my review of the literature, in particular the revelation from my critical review of Bourdieu’s theory as being able to transcend between objectivist and subjectivist precepts, has set the foundations for my research stance as that of a particular paradigm – the pragmatist. This chapter therefore begins with describing my research paradigm, and further to this its ontological, epistemological and methodological underpinnings that define the empiricist and interpretivist features of my Bourdieu-inspired research.

In order to test these Bourdieusian features in practice, I piloted two data collection instruments each focusing on empirical and interpretive information respectively in reflection of the first and second research questions. The first pilot study utilised a survey design involving a quantitative questionnaire while the second pilot study utilised a qualitative design involving the interpretation of individual interviews. Following from my abstraction of my research paradigm are sections on the two pilot studies that I have conducted with regards to the design and content of the instruments, the delivery and procedures of administrating the
instruments, the methods of selecting participants and sampling, and the methods of data analyses employed in making sense of the data. Ultimately, this chapter justifies the reciprocity of the two instruments as complementary data collection mechanisms for a mixed-method design, a discussion that I will expand further in Chapter 4.

3.2. Establishing the research paradigm

Drawing from Lincoln, Lynham and Guba’s (2011) work on research paradigms, Gringeri, Barusch and Cambron (2013) succinctly describe a paradigm as “a set of beliefs that guide the process of social inquiry” (p. 762). Denzin and Lincoln (2011) state that these sets of beliefs shape how the (...) researcher sees the world and act in it (p. 13). With regards to my research, this set of beliefs defines how I view and interpret my own social inquiry on the matter of online learning in Brunei, starting from my decision to follow a specific pathway for this research that emphasises the learner and their dispositions as my main focus of inquiry. My preceding review of the literature and the selected theoretical framework became the first manifestation of my beliefs because several researchers regard the theoretical framework as contributory if not a main constituent of a research paradigm (Patel, 2015, para. 1).

In his elaboration of the research paradigm and its elements, Patel (2015) discerns two main pathways to discerning one’s paradigm based on the purpose of the given research. If the objective of the research is to fill a knowledge gap, then it follows the strand of positivism. If however the research objective is to solve a problem, then it follows the strand of interpretivism. The challenge for me as a researcher is that my research addresses these two objectives as mutual inquiries. My research intends to solve the problems as listed in Chapter 1, but in tandem my literature review revealed that a precursor to addressing these problems is to firstly fill the gap in knowledge on holistic profiling of learners, including the non-existent literature on Brunei learner profiles. Because my research covers both
objectives, I believe it has to sit between the two extremes, transitioning from the positivist paradigm to the interpretivist paradigm and finally positioning my discussions somewhere in the middle.

Patel (2015) argued that the two paradigms are not necessarily distinct dichotomies but rather a research can sit between these two extremes. In fact, with the increasing pluralism in research through the use of various mixed-method designs, different paradigms can exist and collaborate within one single research (Sommer Harrits, 2011). My preceding review of the Bourdieusian theoretical framework has suggested that Bourdieu’s theory can either be positivist, interpretivist, or both. This mixed approach has been strongly advocated by Bourdieu who tend to complement knowledge attained from empirical science with knowledge attained from subjective interpretations (Bourdieu, 1973).

Sommer Harrits (2011) further elaborates on how Bourdieu transitions from one paradigm to the other, certainly as a necessity in producing a well-rounded research. As documented by Sommer Harrits (2011), Bourdieu firstly builds a foundation to his research based on ‘objective knowledge’, which is “knowledge from an observer’s outside perspective (…) as an epistemological advancement within the social science” (p. 156). This objective knowledge according to Sommer Harrits is made possible by “the use of statistical techniques and access to systematically collected data” (p. 156). Bourdieu himself is fond of correspondence analysis in generating his objective knowledge (Bourdieu, 1977; 1988; 1998).

However, as practiced by Bourdieu in his research, objective knowledge is not sufficient in describing how people act in practice because there is a risk of ‘hypostatizing’ objective knowledge as the only reality (Sommer Harrits, 2011, p. 156). Thus, Bourdieu tends to complement his scientifically derived objective knowledge with what he called ‘praxeological knowledge’, which is knowledge attained from incorporating “reflexivity into scientific discussions” (Sommer Harrits, 2011, p. 156) as well as the “explicit investigation of the modus operandi, that is, the logic of practices that produce the systematic patterns in actions and
events that we observe” (p. 157). Sommer Harrits regards Bourdieu’s habitus concept as serving the exact function in systematically observing these patterns; a capability that I have identified as purposeful for my research.

Sommer Harrits (2011) also documented that Bourdieu extensively complemented the “correspondence analysis of survey data with interpretive analysis of texts, pictures, and interviews, providing a unique combination of statistical models, identifying patterns of, for example, behavior and attitudes, and interpretive “stories,” moving closer to an understanding of practice and habitus” (p. 157). Hence, Bourdieu’s research on habitus incorporates a mixed-method approach combining both empirical and interpretive methods to pragmatically comprehend habitus scientifically and in practice. Fittingly, mixed-method research has been extensively attributed to a specific research paradigm called ‘pragmatism’ (Biesta, 2010; Rossman and Wilson, 1985; Howe, 1988; among others). Johnson, Onwuegbuzie and Turner (2007) associate pragmatism as “the primary philosophy of mixed research” (p. 113). My research, with its social inquiries eliciting a mixed-method approach, thus follows the ‘pragmatist’ research paradigm in accordance to my set beliefs and justified further by its use in research designs similar to mine.

The main elements of a research paradigm as agreed by various researchers (Guba, 1990, p. 17; Gringeri et al., 2013; Denzin and Lincoln, 2011; among others) are its ontology, epistemology and methodology. Patel’s (2015) simplified guide allows me to juxtapose his description of these elements onto my research.

I deduce my research **ontology** as an inquiry to ‘what is a learner’ (Patel, 2015). In this regard my ontology when addressing my first research question firstly takes the objectivist stance whereby I anticipate learners to be systematically categorised into habitus types. I then transition into a subjectivist stance when addressing my second research question whereby I interpret and reason how habitus types may influence learners’ learning effectiveness. This consolidation of two ontological approaches together is analogous to pragmatism, as “pragmatism believes that
In tandem, I deduce my research epistemology as revolving around ‘how do I know more about the learners’ (Patel, 2015). In this regard, I take an empiricist stance when analysing the objective knowledge I attained to understand more about the learners through inductively analysing for patterns in their dispositions. Subsequently, I use this objective knowledge to inform me on how I can observe and understand habitus as they manifest in practice in the forms of dispositions. This involves incorporating an interpretivist stance through deductive and abductive reasoning. The combination of these three approaches in one research is the pragmatist’s pattern of logical inquiry (Peirce, 1992) and is synonymous to pragmatism as a philosophy (Migiro and Magangi, 2011, p. 3759). This reasoning approach allowed me to constantly negotiate understanding between the learners’ interpretations, Bourdieu’s theory and my own set beliefs - in an attempt to construct knowledge that would answer my research questions.

Finally, the methodology of my research addresses ‘how do I go about finding out more about the learners’ (Patel, 2015), which involves the techniques of data collection and analysis. Since my research questions require objective and praxeological knowledge, I opted for a mixed-method methodology that incorporates both a quantitative questionnaire and a qualitative interview. However, as the effectiveness of combining these two self-designed instruments is yet uncertain, these methods had to be piloted beforehand. In this regard, I decided to pilot the questionnaire in one survey-designed study (Omarali, 2016), followed by piloting the interview in an ‘Informed Grounded Theory’-inspired study to test for the systematic coding of its collated data (Omarali, 2017a). For clarity, the fundamental elements of their processes are described in the next two sections.
3.3. First pilot study

The first pilot study involved the piloting of a self-designed questionnaire on a sample of Brunei higher education students studying in the UK and in Brunei. The study collected data on their dispositions toward online learning based on the various types of capitals and dispositions. The objective of this pilot study was two-pronged. Firstly, it provided me an opportunity to informatively decide from a design and content standpoint the effectiveness of the questionnaire in collecting relevant data. Secondly, it allowed me to trial specific statistical methods to explore if the items are capable of generating empirically significant findings (Oppenheim, 1992). Ultimately, the findings based on both objectives would allow for the refinement (Gillham, 2008, p.25-31) and the creation of a more robust instrument.

3.3.1. Designing the pilot questionnaire

The design of the questionnaire began with pre-pilot work (Omarali, 2017e) that was conducted concurrent to the review of the literature on combining learner theories to profile learners. Intrigued by the efficacy of this approach, I designed a questionnaire instrument through combining items from digital natives, digital literacy, learning styles and technology acceptance. These were integrated together with items from study habits, personality, as well as three additional measures, viz. internet usage, information handling and social presence.

The pre-pilot questionnaire consisted of 83 Likert-scale items and was treated as a pre-pilot exercise. The target population was undergraduate and postgraduate Brunei students studying in the United Kingdom, with a size of approximately N=300. The eventual respondent size was n=20. Upon statistical analysis, I was unable to conclude the presence of a dominantly informative model. In fact, through several correlation tests, I found that items from these combined learning models overlapped in terms of the dimensions that they were intended to
measure, as indicated by high collinearity among items from different models. The pre-pilot work informed the research that when items from various learning models were used together and analysed together, certain items thematically converged which suggested interplay between latent themes that were hitherto unknown.

This pilot study is thus a redesign of the pre-pilot questionnaire, which involved major revisions in both its content items and framework. In response to overlapping items, the relevance of the 83 items were reanalysed both statistically and subjectively. Items that exhibited strong statistical multicollinearity were deleted from the list, leaving only one item per variable measured. Furthermore, items that had ambiguous phrasing - such as negatively worded, double-barrelled and ambiguous questions - were rephrased to align with Bourdieu’s theory. Significant to this process is the detachment of these remaining items from their respective learner theories and their realignment to Bourdieu’s (1977) theory of practice as a guiding profiling framework in accordance with the various types of ‘capitals’ and ‘dispositions’. In addition to these revisions, 17 new items were further added to fill gaps in the types of dispositions represented in the list of items.

This framing of the dispositions exclusively on Bourdieu’s theory minimised the overlapping of items and allowed for a clear categorisation of capitals into three temporary classifications, viz. 1) technology and internet skills, 2) personality, and 3) intellectualised skills. Concurrently, items that represented dispositions were re-categorised into 4) social dispositions, 5) study dispositions and 6) techno dispositions. These 6 categories were merely temporary placeholders that were not meant to be indicative of the eventual taxonomisation. As a result of this redesign, the new pilot questionnaire consisted of 55 items representing three types of capital, and 66 items representing three aspects of dispositions (see Appendix A).
3.3.2. Sampling and piloting the questionnaire

The new 121-item questionnaire was delivered via the online platform LimeSurvey and was kept active for 5 weeks within which it managed to collect 126 complete responses and 23 incomplete responses. The sampling strategy employed was convenient sampling with a URL link to access the survey distributed to Brunei student societies residing in various countries as well as to the three higher institutions in Brunei (i.e. Universiti Brunei Darussalam, Institut Teknologi Brunei and Politeknik Brunei). This targeted the higher education students who have characteristics comparable to the target population of the eventual main study.

The approximate population for this pilot given the sampling strategy is roughly N=4,000, with n=149 responding to the questionnaire (3.8%). However, what is more important is that the response managed to exceed the minimum n=100 requirement for factor analysis (MacCallum et al., 1999) and leaning towards the Rule of 150 minimum requirement (Hutcheson and Sofroniou, 1999). The respondent sample has a gender distribution of 76 females (60.3%) and 50 males (39.7%). The mean age is 21.8, with median = 21.0, and range = 19.0 (minimum=17.0, maximum=36.0). Their academic background comprised of Pre-National Diploma (PND) with n=3, National Diploma (ND) with n=11, Higher National/ Advanced Diploma (HND/AD) with n=5, First Degree with n=86, Master’s Degree with n=9, and PhD with n=2.

On experience with formal online learning, n=64 have experienced online learning while n=62 have not. According to Morrison (1993), “an unrepresentative, skewed sample, one that is too small, can easily distort the data, and indeed, in the case of very small samples, prohibit statistical analysis” (cited in Cohen, Manion and Morrison, 2011, p. 209). However, in all three demographic profiling, the data indicated acceptable ratio and spread reflecting the general population, albeit with the clear distinction that experience in online learning is attributed to either a student studying in Brunei (hence no online learning) or abroad (hence possible online learning). Overall, the sample was adequate for statistical analysis.
3.3.3. Analysing the pilot questionnaire

The resulting data set comprising of 149 responses were imported to SPSS. The extent of completion among the 23 incomplete responses widely varied and therefore these cases were omitted from the actual data set instead of performing multiple and/or fractional imputation (Durrant, 2009) to maintain 126 complete responses for further analysis. In order to identify the interplay among the items in the data set, the items were analysed separately into ‘capitals’ data and ‘dispositions’ data subsets, with emphasis on identifying via Factor Analysis the types of dispositions exhibited in varying extent by all respondents.

Statistical analyses of the 55 items on capital revealed that respondents had very similar techno-capital measures, to the point where certain items had a 100% agreement throughout the sample. Respondents did have less similar measures on intellectualised skills and personality, but correlation tests between respondents’ capital and disposition scores revealed no statistical significance. In other words, a learner’s dispositions could not be identified through their capitals alone. A decision was made at this point to narrow my quantitative enquiry to only the dispositions to establish the presence of latent variables.

According to Hutcheson and Safroniou (1999), “exploratory factor analysis identifies relationships among variables which are often far from obvious in the original data” (p. 218). The 66 items representing dispositions are actually manifest variables and they determine a yet unclassified set of latent variables. When an initial exploratory factor analysis was attempted, the computation however resulted in a ‘not positive definite’ matrix with rotation failing to converge in 25 iterations. This finding suggested the possible presence of still redundant items that were not accountable during the redesigning stage. Thus, items with 2-tailed statistical significance with moderate correlation coefficient $r \geq 0.5$ were maintained whereas items that were below the coefficient threshold were omitted, resulting in 35 items of recognised correlations.
Omitting the other 31 items not only improved the case-item ratio favourable for factor analysis but also strengthened the analysis because, as advised by Hutcheson and Safroniou (1999), “variables that do not appear to be related to other variables will not easily form factors and should be removed from the analysis” (p.223). Consequently, a second factor analysis was performed on the 35 items, resulting in a definite positive matrix with a Varimax rotation converging in 12 iterations (see Appendix B, Table B.1). Examinations on sampling adequacy suggested that the sample was favourable (KMO=.609) and on sphericity with Bartlett’s significance index of $p < .001$ respectively verified the statistical reliability of the factor analysis process, and successfully generated an 8-factor model.

3.3.4. Results of first pilot study

The previous mentioned two-pronged objective of this pilot study has been fulfilled by the results. Firstly, it redesigned the earlier 83-item questionnaire that was based on 9 learner theories, to a more effective 35-item questionnaire that represents a single theoretical framework. Secondly, it suggested the possibility of generating significant finding, in this case, evidence of latent variables that represent covariant and interplaying dispositions.

In this pilot study, these dispositions are represented by an 8-factor model that this pilot has thematically categorised into 1) conditioned skills and expertise (automaticity), 2) maintaining control of one’s learning, 3) simplifying the learning process, 4) desire to learn together or with assistance, 5) having information at one’s fingertips, 6) what the internet expects from the students, 7) learning processes made possible by the learning environment, and 8) dependent on access to technology. These 8 factors are the preliminary constituents of the habitus.

The conclusion of this pilot study is that the process of profiling learners based on habitus is potentially more holistic compared to using existing standalone models or a combination of standalone models as attempted in the pre-pilot work. Based on the due diligences conducted in this pilot study, I acknowledged that a larger
sample size is recommended for my main study to improve the level of confidence, and simultaneously, a more comprehensive factor analysis is required to increase the validity of the statistical findings. I also recognise that the statistical information from this study is reflective of only the objectivist’s explanation of the habitus, and that a reciprocal qualitative pilot study was required to interpret a more subjective explanation of the habitus.

3.4. Second pilot study

The second pilot study piloted a self-designed interview schedule and its accompanying method of analysis. It has been designed to complement the questionnaire instrument from the first pilot study, with the intent of eventually using both instruments together reciprocally in my main research. The interview method was performed on selected participants from the first pilot study. Its main objective was to inform the design of an interview process that would complement the questionnaire data.

The complementary roles, which would be expected of the interview schedule in the main study, included 1) adding context-rich data to existing empirical information, 2) generating new information not observed in the questionnaire, and 3) triangulating empirical findings. The interview process consisted of the interview schedule, sampling, methods of analysis and reasoning.

3.4.1. Designing the pilot interview schedule

On deriving the interview questions to be included in the interview schedule, I considered information from both Bourdieu’s theory and the prerequisite questionnaire. My interview strategy was to enquire learners’ use of internet technology in general and learning using internet technology in particular. I decided to maintain my interview completion time to be 45 minutes, which allowed me between 5 to 12 questions. To maximise response types without waiving consistency across sessions, I constructed a hybrid interview that
integrated together a semi-structured+non-directed phase followed by a structured+focused phase and finally an unstructured+non-directed conversation phase, delivered sequentially in the same session with the intent of adding in-depth information to existing statistical data, triangulating both data together, and providing an opportunity for new heuristic data to emerge respectively.

I structured an interview schedule that contained four phases. It is initiated by an introductory phase (Q1-Q5) that among others addressed consent for participation, recording methods, confidentiality and the purpose of the interview itself (Robson, 2011, p. 284). This was followed by a maximum of 5 semi-structured item questions (Q6-10, see Fig. 4) so as to “supply a frame of reference for respondents’ answers, but put a minimum restraint on the answers and their expression” (Kerlinger, 1970, cited in Cohen et al., 2011, p.416). The items each had prompts that if needed would ‘funnel’ responses towards specific queries (Cohen et al., 2011, p.416). The five main semi-structured questions with their prompts are illustrated in Figure 4.
**B: SEMI-STRUCTURED PHASE (15 minutes)**

Q6. Can you describe your study life?

   Intellectual capital.
   i. What are your favourite ways of studying/ study habits?
   ii. Are you performing well in your studies?
      if (resp==YES) ask what factors have helped (family/money, etc.)
      if (resp==NO) elaborate on Q6.iv.
   iii. Are you satisfied with your performance?
   iv. How do you think can your performance be improved?
   v. Do you have anything else to add on your study life?

Q7. Can you describe your use of the internet in everyday life?

   Technological capital.
   i. What do you use your mobile phone for?
   ii. What kinds of entertainment do you get from technology?
   iii. How do you use them for learning?
      if (resp==YES) elaborate on Q8.
   iv. Do you have anything to add on your internet use?

Q8. How about for your study, how do you use the internet in your studies?

   Cultural capital.
   i. Give a recent example on how you used the internet for your studies?
   ii. Does your school promote using the internet for learning? (e.g. online assignments, online learning systems)
   iii. What are the challenges to using the internet for your studies?

Q9. Have you tried online learning before?

   if (resp==YES)
   i. Can you describe the online learning that you did?
   ii. What was good about it? What was not good about it?

   if (resp==NO)
   iii. <Researcher describes OL> What do you think of it?
   iv. What do you think is good about it? What is not good about it?
   v. Do you think OL systems should be used more in schools?

Q10. What would be an effective online learning system for you?

   i. What features do you think should be in the system?
      (e.g. Videos, Sync/Async CMC, group editing – allow interviewee creativity)
   ii. How should students be assessed (examined)?
   iii. If a system has been created, do you think you can adapt to its features?
   iv. Do you have anything else to add to this matter?

---

Figure 4. Phase B interview: Semi-structured interview questions

The five semi-structured items abovementioned were adapted from the same key concepts of Bourdieu’s theory, viz. capital for Q6, Q7 and Q8 and dispositions for Q9 and Q10. The main difference between these items and their quantitative questionnaire counterparts is that the interviews allowed respondents an opportunity to expand their opinions further, following a funnel approach whereby
the key items have an open-ended query. According to Cohen et al. (2011), such open-ended questions “result in unexpected or unanticipated answers which may suggest hitherto unthought-of relationships or hypotheses” (p. 416).

I complemented the semi-structured phase with a structured items phase (Phase C). Cohen et al. (2011) refer to structured items as ‘closed quantitative’ with the characteristic that “questions and categories are determined in advance (…), responses are fixed [and] respondent chooses from among these fixed responses” (p.413). During this phase, I revealed that the first pilot study generated an 8-factor model. The 8 items in this phase corresponded with the 8 factors identified in the first pilot study. This triangulation mechanism would enquire interviewees’ agreement to these 8 items prior to my revealing their individual results from their questionnaire response (see Figure 5).

C. STRUCTURED PHASE (5 minutes)

Researcher revisits results from the preceding questionnaire

Q11. Runs through and elaborates on several close-ended questions confirming their level of agreement with their associated habitus type.

   11a. You believe you have inherent skills and expertise.
   11b. You like to maintain control of your own learning
   11c. You prefer a simplified learning process
   11d. You desire to learn together or with assistance
   11e. You like to have information on your fingertips
   11f. You know what the internet expects of you
   11g. Your learning process is made possible by your learning environment.
   11h. You are dependent on technology.

   Figure 5. Phase C interview: Structured and formal interview questions

Following from the above structured items, the final ‘unstructured+non-directed’ conversation phase (Phase D) provided a platform for respondents to share their opinions on their associated habitus type, and more importantly if they perceived themselves as sufficiently dynamic to move from one habitus type to another. The key questions for this phase were relatively informal (Figure 6).
D. INFORMAL PHASE (5-10 mins)

Researcher allows interviewee to react to their revealed 8-factor habitus.

Q12. Prompt interviewee to find out if they believe they are adaptable to other habitus types.

Q13. Ask interviewee if being aware of their 8 factor habitus would help them to effectively learn and expect how to learn.

Figure 6. Phase D: Informal interview questions

Ultimately, this pilot study employed an interview schedule using a hybrid mix of interview types. The eventual pilot interview schedule had 13 main questions with an expected completion timeframe of within 45 minutes.

3.4.2. Sampling and conducting the pilot interview

The sample for this pilot interview study was selected through purposive sampling. I selected 4 respondents from the 126 sampling size of the first pilot study who agreed to be interviewed. The first two interviewees contributed to dry-run interview sessions that informed me of the logistical aspects of the process, including technical tests, timekeeping, interview etiquette, and familiarising with the interview schedule. The latter two interviewees were used as sample for this pilot study and thus referred to as Interviewee A and Interviewee B. There are several variants of purposive sampling but for this particular study, only typical case sampling was exercised in which the sample was representative of typical types (as opposed to deviant cases) identified by the questionnaire (Teddlie and Tashakkori, 2009, p. 174).

3.4.3. Analysing the pilot interview

The preliminary analyses of the pilot interview dataset utilised a combination of inductive and deductive reasoning and the extraction of its relevant data involved the use of systematic coding cycles (Saldana, 2016) to reflect the two stages of reasoning. Inductive reasoning was applied during the first coding cycle through In
Vivo and Process coding, followed by deductive reasoning during the second coding cycle through Focused and Axial Coding.

I. First Cycle Coding

The First Cycle Coding did not refer to any predetermined coding scheme. The interpretation of significant codes was fully data-driven. Each transcript underwent In Vivo coding where I identified and extracted in verbatim from the available data interesting words and phrases. I analysed each transcript a second time through Process Coding where I identified depictions of dispositions and disinclinations in the forms of behaviour and action statements. Finally, I analysed each transcript a third time through Initial Coding where I made subjective and inferenced observations. This third coding strategy acted as a failsafe mechanism to catch any significant opinions that were not identified through In Vivo and Process Coding. These three coding strategies produced a more manageable list of statements that potentially represented patterns of dispositions (see Tables C.1 and C.2, Appendix C).

II. Second Cycle Coding

The Second Cycle focused on establishing patterns from the first cycle codes. During this cycle, I employed deductive reasoning to discern these patterns, notably referring to the preceding learner theories that represented types of dispositions. This cycle involved Focused Coding followed by Axial Coding. Through Focused Coding, interviewees’ statements and self-assessed opinions converged into several encompassing themes, notably 1) interviewee’s background, 2) personality, 3) societal support, 4) learning weakness, 5) learning skills, 6) learning catalysts, 7) study habits, and opinions on 8) technology, 9) online learning, and 10) learning in general (see Tables C.3 and C.4, Appendix C). After discerning the data into thematic categories, I employed Axial Coding to identify dominant statements and interpret these as possibly significant representations of the interviewees’
dispositions. Tables 1 and 2 below are extracted parts of how Interviewee A’s codes were refined using Focused Coding and then followed by Axial Coding for the categories ‘ONLINE LEARNING’ and ‘LEARNING CATALYSTS’. The complete lists of coded data can be viewed in Appendix C.

<table>
<thead>
<tr>
<th>ONLINE LEARNING (Focused Coding)</th>
<th>ONLINE LEARNING (Axial Coding)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• OL (FB Chat and emails)</td>
<td>• Communicative features</td>
</tr>
<tr>
<td>• OL (Using google)</td>
<td>• Summarised information (bite-sized)</td>
</tr>
<tr>
<td>• OL (Wikipedia) (Wiki printouts)</td>
<td>• Easy to access resource</td>
</tr>
<tr>
<td>• OL (assessment)</td>
<td>• Be aware of false information</td>
</tr>
<tr>
<td>• Don’t talk a lot in Blackboard</td>
<td>• Multimedia makes learning</td>
</tr>
<tr>
<td>• Like to learn online</td>
<td>interesting</td>
</tr>
<tr>
<td>• Wikipedia better than textbooks</td>
<td></td>
</tr>
<tr>
<td>• Wikipedia is a summary very</td>
<td></td>
</tr>
<tr>
<td>good to read</td>
<td></td>
</tr>
<tr>
<td>• Wikipedia can’t be trusted</td>
<td></td>
</tr>
<tr>
<td>• Getting gist of topic from</td>
<td></td>
</tr>
<tr>
<td>YouTube</td>
<td></td>
</tr>
<tr>
<td>• Learning in Facebook is</td>
<td></td>
</tr>
<tr>
<td>interesting</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CATALYSTS (Focused Coding)</th>
<th>CATALYSTS (Axial Coding)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pressure from family</td>
<td>• Appeasing family</td>
</tr>
<tr>
<td>• Scholarship</td>
<td>• Scholarship</td>
</tr>
<tr>
<td>• Speak up more</td>
<td>• Self-improvement</td>
</tr>
<tr>
<td>• There’s always things to</td>
<td>• Future career</td>
</tr>
<tr>
<td>improve</td>
<td></td>
</tr>
<tr>
<td>• Need to work on</td>
<td></td>
</tr>
<tr>
<td>assertiveness</td>
<td></td>
</tr>
<tr>
<td>• Be more organised more</td>
<td></td>
</tr>
<tr>
<td>independent</td>
<td></td>
</tr>
<tr>
<td>• Studying is important for</td>
<td></td>
</tr>
<tr>
<td>work</td>
<td></td>
</tr>
<tr>
<td>• Priorities</td>
<td></td>
</tr>
<tr>
<td>• Demanding (success)</td>
<td></td>
</tr>
</tbody>
</table>

The tables above illustrate how Focused Coding identified significant codes from an initial extensive list of codes and how Axial Coding further thematised these codes.

**III. Post-coding and results**

The two cycle coding process allowed the pilot study to refine interviewees’ response from a seemingly disorganised list of codes, to a more categorical system.
More importantly, the interview revealed the significant and primary themes that represented interviewees’ opinions that were possibly frameable against Bourdieu’s theory of capital and disposition types. For this task of framing the results against Bourdieu’s theory, I employed a post-coding strategy called ‘code-weaving’ (Saldana, 2016). According to Saldana, “codeweaving is the actual integration of key code words and phrases into narrative form to see how the puzzle pieces fit together” (p. 276).

Thus, using the previously derived empirical 8-factor model, and referring to Bourdieu’s habitus construct, I weaved findings from the coding cycles to generate a description of each interviewee based on disposition types. I also considered their self-professed personality traits as complementary to this description. Finally, I included the empirical information in the form of the interviewee’s corresponding 8-factor model, to depict the difference between different habitus types. Collectively, this information created the habitus descriptions below (Figures 7 and 8).

**Habitus Type A**

<table>
<thead>
<tr>
<th>Learning dispositions</th>
<th>Techno-dispositions</th>
<th>Social dispositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Organised learning.</td>
<td>• Learning from videos.</td>
<td>• Learning alone.</td>
</tr>
<tr>
<td>• Summarised notes.</td>
<td>• Technology-mediated communication.</td>
<td>• Specific group of peers.</td>
</tr>
<tr>
<td>• Individualised learning.</td>
<td>• Pictures and charts to summarise.</td>
<td>• Inquisitive parents</td>
</tr>
<tr>
<td>• High achiever.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Competitive.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type A learners prioritise their learning and performance due to their background and have devised preferred mechanisms to learn. They may unlikely adapt to new ways of learning without being vocal of their disinterest. They can eventually adapt and reorganise their learning to regain control either through multitasking or pushing themselves beyond their comfort zone in order to achieve the end objective of learning and performance.

![Figure 7. Habitus Type A (pilot study)]
Type B learners are ambivalent towards general academic learning, particularly when it involves rote, routine and standardised tasks such as reading and writing, but their tenacity help them in succeeding. Hard work is key in trying to determine the best means of retaining information while entertainment is key in maintaining attentiveness. They are more focused in performing tasks when facilitated by teachers, their peers, and to an extent instruction based animated designs (e.g. gamification). They are not technology dependent but prefer technology as a facilitation mechanism.

<table>
<thead>
<tr>
<th>Learning dispositions</th>
<th>Techno-dispositions</th>
<th>Social dispositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Printed or printables.</td>
<td>• Games and gamification.</td>
<td>• Requires constant support.</td>
</tr>
<tr>
<td>• Teacher consults.</td>
<td>• Interactive features.</td>
<td></td>
</tr>
<tr>
<td>• Facilitated learning.</td>
<td>• Technology-enabled features (e.g. page zoom, annotations).</td>
<td></td>
</tr>
<tr>
<td>• Group work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Learning from others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fond of creative, novel, and artistic tasks.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 8. Habitus Type B (pilot study)**

The end outcome of the analyses generated two empirical and subjective descriptions of habitus. Although these descriptions are detailed, one important caveat from this second pilot study with its small sample is that these descriptions are conjectural. The objective of this pilot study was after all to test the interview process and its capacity to produce detailed findings. In theory, the coding processes performed in this study indicated that such task is possible; that patterns can be coded from interview responses, and these patterns can be framed into themes that reciprocate the empirically formulated habitus from the questionnaire and explained using Bourdieu’s constructs.

This second pilot study indicated that the interview schedule was able to collect useful subjective information. Thus, the structure of the schedule has been maintained for use in the main research. This pilot study however highlighted the
danger of overgeneralising. With two interviewees producing two types of habitus descriptions, the sample size for the main research must be sufficiently large to be able to observe several interviewees converging to one habitus type. The main research would thus follow Creswell’s (2014) minimum sample size of n=15 for interviews (p. 189).

3.5. Research strategy and research approach

Having piloted the two methods of data collection and analyses and finding them to be adequate in generating findings relevant to my inquiry of learners’ habitus, I finalised my research strategy into three sequential phases. These three phases are represented in my thesis as three sequential chapters that transition in a multilevel manner to address the three research questions. Figure 9 below illustrates the relationship and role of each element in reaching the outcome of my research.

![Figure 9. Research strategy flowchart](image)

My research approach is thus rooted on the statistical identification of habitus or its constituents in order to be able to proceed to hypothesising how habitus
influences learning in an online learning system. The synthesis of both stages and their respective elements create an abductively and hypothetically driven investigation in identifying the suitable online learning systems for the Bruneian learners.

3.6. Conclusion

This chapter explicitly described my research paradigm because subsequent chapters will engage in discussions within which I justify my interpretations based on my view of the research and my thought processes as the researcher. The pilot studies that I have conducted suggested that there might be 8 factors contributing to the habitus, and that each habitus has a set of dispositions. Acknowledging the underlying paradigm that constitutes my research allows others to understand and perhaps relate to how I derived to these speculations. Gringeri et al. (2013) stated that, “a clear account of the paradigm helps readers understand and evaluate the philosophical foundations and assumptions that shape the work” (p. 762). Through underlining my research paradigm, I am sharing with other researchers on how I address my questions in accordance to the common agreements shared among researchers (Kuhn, 1962) - the ontology, epistemology and methodology of research.

Thus, these preliminary strategies conducted prior to my main research were integral in not only identifying my stance as a pragmatist researcher, but also in convincing me of how to pragmatically conduct my research processes. As a result, I ensured that my questionnaire and its calculative analytical processes remained objective through inductive reasoning and statistical inferencing; and my interview and its structured analytical processes remained interpretive through the use of deductive reasoning and subjective coding cycles. These align with the observations made by Lincoln et al. (2011) of quantitative methods being objectivist and hermeneutical methods being subjectivist. The next stage in this
objectivist-subjectivist approach is thus in marrying the two knowledge types together to create a holistic formulation of habitus types.

In this regard, the next chapter is an improved expansion of the mixed-method methodology that I had tested through my pilot studies. The next chapter also introduces abductive reasoning into the analytical process, with instruments streamlined to be more accurate, methods of analyses made more pragmatic and procedures better designed to cater for larger sample sizes.
Chapter 4. Methodology

4.1. Introduction

This chapter is an extended discussion on the research methodology that I have finalised from the elements identified and designed during my preliminary research. In this chapter I elaborate on the final design of my research, which is the Sequential Transformative Mixed Method design, and the significance of its transformative approach compared to other mixed-method variants. This chapter then presents 1) the final design of my questionnaire instrument and of how it eventually became a 28-item questionnaire; 2) the final design of my interview procedure and how I have refined a more comprehensive coding cycle; and 3) several considerations that I made in my methods of analysing the two data sets, notably the use of Exploratory Factor Analysis and the subjective manipulation of large, empirical and interpreted data.

A key discussion in this chapter is the role of abductive reasoning to inform my analysis of mixed-method data. This task of creating descriptions of habitus types containing both empirical and interpreted habitus knowledge was briefly introduced in the final part of the previous chapter, and is now described further in this chapter in a dedicated discussion on mixed-method analysis. The remainder of this chapter details logistical considerations of my research, including a description of the target population, the sampling, and the procedures in conducting my data collection, and the recording and handling of data and their analyses. Throughout the chapter I present brief discussions to justify my selection of these procedures including where appropriate comparisons with other alternative procedures.
4.2. Sequential Transformative Mixed Method design – An overview

Labaree (2009) defines research design as “the overall strategy (...) to integrate the different components of the study in a coherent and logical way [that] it constitutes the blueprint for the collection, measurement and analysis of data” (para. 1). In line with my pragmatist stance and the quantitative-qualitative inquiries conveyed by my research questions, the design of my research required a mixed-method variant. Creswell has identified several types of mixed method designs (2014, pp. 219-238), but the one that is most fitting considering the factors above is the Sequential Transformative Mixed-Method design.

According to Robson (2011), sequential transformative design is when “one method precedes the other with either the qualitative or the quantitative method first. Priority may be given to either method, (...) results are integrated during interpretation [and] this design is guided primarily by a theoretical perspective” (p.165). Several studies that had utilised this design advocated that it produces more robust results compared to single method designs (Makrakis and Kostoulas-Makrakis, 2016), that allows a more thorough identification and understanding of investigated issues (Groleau, Pluye and Nadeau, 2007), that it allows the convergence of multiple perspectives (Onwuegbuzie and Johnson, 2006), and that it complements research that is based on a strong theoretical perspective (Beckner, 2014).

My research takes all these factors as justifications for its design, but above all, the strong emphasis on Bourdieu’s theory made this mixed-method variant the most relevant. The transformative role of Bourdieu’s theory not only primarily guides the research design, but also informs my methods of analyses and ultimately my attempts in making sense of the results. Therefore, this sustained transformative approach allows me to thoroughly scrutinise the ‘habitus’ construct and negotiate my understanding of it within the Brunei context using abductive reasoning (Thornberg, 2012, p. 247). This multifaceted scrutiny in turn produces a pragmatic, multi-layered discussion on habitus, thus defining it not only as a possibly useful
profiling indicator but also as an intricate concept of interplaying dispositions in its own right.

In addition to the transformed findings, transformation not only refers to the way I transform data using theoretical sensitivity, but also to the grand outcome of research through what Sweetman, Badiee and Creswell (2010) describe as ‘transformative lens’. The transformative design has been associated with research that intend to initiate transformation in the setting that it is conducted in, at times becoming ‘advocates’ of real world change (Hanson et al., 2005; Ponterotto, Mathew and Raughley, 2013). Related to this, Sweetman et al. (2010) propose that, “the mixed method transformative researcher should not stop at simply describing the problem but suggest solutions for how these problems might be overcome” (p. 452). My research addresses this through its third research question, whereby findings from my analyses are juxtaposed against findings from my review of the three emerging online learning systems.

Overall, the sequential transformative mixed-method design aligns with the purpose and focus of my research. It positions the research paradigm in stating the proclivities of my handling of this research; it emphasises the role of the theoretical framework in responding to the sequence of research questions; it utilises the whole gamut of reasoning (inductive-deductive-abductive) to interpret empirical and interpreted knowledge and it attempts to solve problems with this collective information. In addition, the design allows for confirmatory mechanisms such as triangulation and reflexivity thus adding further profundity to the whole research process. The roles of all these elements are illustrated in the sequence that they occur in my research in Figure 10 below.
All these roles required to realising my research made the sequential transformative mixed-method design more applicable than other research design alternatives. With the three sequentially linked research questions, the use of single method designs is impracticable. With the strong theoretical framework, the sequential transformative design has selected itself. And to further justify this choice, Sweetman et al. (2010) have alluded that many existing mixed-method studies are more transformative than previously thought (p. 452). The design thus fittingly encapsulates my two chosen research methods, which I have piloted earlier. I have opted to maintain the instruments viz. the 35-item questionnaire and the hybrid interview for my main research. The next sections are justifications for my selecting these instruments and my chosen methods in analysing their respective data.
4.3. Justifications for using a questionnaire

My research employed a questionnaire as its first data collection instrument in response to the first research question: **what are the different types of learner habitus?** The scarce literature on ‘learner habitus’ or studies associating learners with habitus (not more than 18 pieces of literature) only superficially refers to the notion of learner habitus as prima facie. One Bourdieu-inspired study by Luke (2008) focused on how learners alter their learner habitus types “prior to and in initial encounter with the field” (p. 11) and a study by Jeong and Yi (2017) concluded that there exist different habitus types representing different learning tendencies. However, both studies, and more so in the remaining others, did not investigate on the various alterations of habitus types.

My research intends to elaborate on these habitus types by creating very discernible and holistic descriptions of each habitus type so that learners may be profiled holistically. This profiling task is distantly similar to how existing learner theories profile learners into their narrow taxonomies. I gathered that these narrow profiling studies, from learning styles to MBTI, utilised questionnaires to collect objective data based on their predetermined scales and inventories. For this reason I chose the questionnaire method as my instrument for my quantitative research phase.

Another reason is that, unlike qualitative methods with its various instruments for data collection, conventional quantitative method is limited to questionnaires, tests and computational data manipulation such as web analytics. The questionnaire method befits this quantitative phase because among others it is a straightforward approach to collecting data from a large population, it can be adapted to collect data from various other population, and the data that it collects is standardised resulting in an objective account of each respondent’s values, belief, attitudes and motives (Robson, 2011, p. 241).
My research utilised the online questionnaire format, which was made accessible via any web browser on a computer or mobile device. Significant to this accessibility is that respondents were provided with a URL address to limit access to only the intended sample (Cohen et al., 2011, p.279). It could be completed outside of school hours wherever internet is accessible and in the leisure of one’s own time (Cohen et al., 2011, p.280). For researcher’s convenience, an online questionnaire is able to automatically update and process data as soon in real-time, generating tabulated and graphical organisations of the data to be collected (Cohen et al., 2011, p.280) to the extent of performing formulaic calculations for analysis if needed.

**4.4. The final design of the questionnaire**

The design of the Online Learner Profiling questionnaire involved several stages as depicted by Figure 11 below.

![Figure 11: The 12 stages of designing the OLP questionnaire](image)
I. Stages 1 to 4

The design of this questionnaire started with the 83-item pre-pilot questionnaire (Omarali, 2017e) conducted concurrent to the literature review. This first version, called the Online Learner Profiling Questionnaire V.1 (OLPV.1), incorporated 5-point Likert scale responses. Its items were drawn from various existing learner theory inventories and scales. Upon analysis, this pre-pilot was unsuccessful in creating an instrument capable of profiling learners and was thus not extensively reported. However, it was useful in redirecting me towards amending the underlying framework of the questionnaire from a combination of learner theories to Bourdieu’s theory. This Bourdieu-inspired design became Online Learner Profiling Questionnaire V.2 (OLPV.2).

II. Stages 5 to 8

The design of the OLPV.2 had already been elaborated in its dedicated section in the previous chapter, including how I re-organised the items into capital and disposition types, and how I added and deleted items from the list, arriving to a more streamlined questionnaire of 55 items on capitals and 66 items on dispositions. These were categorised into the 6 temporary placeholders reported previously. Results generated from the OLPV.2 pilot study eventually reduced the number of items to 35 statistically significant items with its primary focus being dispositions, thus creating the third version of the Online Learner Profiling Questionnaire (OLP-35). During stage 8, I was able to speculate from the analysis that these items represented several latent variables, in the case of the pilot study, an 8-factor model. The formulation of this 8-factor model was also replicated in two small-scale studies conducted on two different multinational cohorts of online learners in 2016 and 2017 with sample sizes n=26 and n=14 respectively.
III. Stages 9 to 12

By this stage, the OLP-35 was administered on the target population. Its design has been relatively retained with the exception that the items were compiled together as a single list, instead of being categorised under the 6 temporary placeholders. The first Factor Analysis performed on the OLP-35 generated an 8-factor model similar to the pilot study findings. An item-reduction process eliminated 7 items based on their low correlation coefficients. This final design process of the OLP questionnaire refined it to its finalised 28-item version, the OLP-28. In turn, with fewer items, the Factor Analysis conducted on the OLP-28 also shifted the resulting model from the earlier 8-factor model to a more refined and finalised 6-factor model. The following section is a justification on the use of Factor Analysis to analyse the data.

4.5. Analysing quantitative data using Factor Analysis

The idea of collating items together and having them define their own categories (as opposed to referring to a predetermined taxonomy) prompted the use of a type of multivariate data analysis. In the pilot study, I trialled the use of Exploratory Factor Analysis, which generated statistically inferred categories. Bourdieu has extensively used the method of Correspondence Analysis in many of his research such as *Homo Academicus* (1988) and *The State Nobility* (1998). Correspondence Analysis is similar to Factor Analysis as both generate latent categories in the form of factors. Doey and Kurta (2007) stated that “CA [correspondence analysis] and factor analysis are both exploratory methods that attempt to explain the variance in a model and decompose this variance into a low-dimensional representation [whereby] both these techniques attempt to reduce the variability of a model by calculating the minimum number of factors that can explain the most variability in the model (Claußen, 1988; Statsoft Inc., 2010)” (p.6).

However, what is more significant is the difference in application of both methods whereby “factor analysis determines which variables go together to explain the
most covariance between descriptors, whereas CA determines which category
variables are associated with one another” (Doey and Kurta, 2007, p.6). In other
words, Correspondence Analysis in the case of my research would focus on the
variances in dispositions, while Factor Analysis would focus on the combination of
dispositions. My research is based on the premise that habitus can be identified
through identifying the possible combinations of dispositions. My research focuses
not on the categories per se but what information I generate from combining
categories together. Thus, Exploratory Factor Analysis is more aligned with the
objective of my research.

Factor Analysis is a prevalent technique in educational research and is the only
available reduction technique predominantly used in dealing with the grouping of
variables thus infallibly ruling out other forms of quantitative statistical analyses.
Cohen et al. (2011) concisely define it as a “method of grouping together variables
which have something in common. It is a process that enables the researcher to
take a set of variables and reduce them to a smaller number of underlying factors
which account for as many variables as possible” (p.674, emphasis added). To an
extent it resembles Correspondence Analysis by first assuming that there exist “a
system of underlying factors and a system of observed variables [and that] there is
a certain correspondence between these two systems [which] factor analysis
“exploits” (...) to arrive at conclusions about the factors” (Kim and Mueller, 1978,
p.8).

Beyond similarities, one advantage that Factor Analysis has over Correspondence
Analysis is that once factors are known, there is an opportunity for the analysis to
be extended in further research through Confirmatory Factor Analysis which is
“more stringent, testing a found set of factors against a hypothesised model of
groupings and relationships” (Cohen et al., 2011, p.675). Although this is beyond
the timescale of my research, the prospect of furthering this thesis into a
Confirmatory Factor Analysis study added more credence to this method.
Another justification for the use of Factor Analysis is its juxtaposability with qualitative data through the Factorial Analysis of Mixed Data approach (FAMD), where “one set of individuals [is] described by variables taking into account both quantitative and qualitative variables” (Pagès, 2011, p.4). This use of factor analysis on mixed-method data is still in its infancy and its procedures only made available and refined in the R package Factominer. However, its implication to further research suggests that Factor Analysis data can indeed be systematically complemented with qualitative data.

The decision to use Exploratory Factor Analysis was ultimately justified because of its capacity to form themes from seemingly arbitrary items. Exploratory Factor Analysis is appropriate for theory-building approaches, because it is the multivariate analysis of choice when “researchers have little idea about the underlying mechanisms of the target phenomena, and therefore, are unsure of how variables would operate vis-à-vis one another” (Matsunaga, 2010, p. 98). Prior the collection of my data, there were no preliminary indications of how the dispositions would converge and interplay, how many habitus would result from the analysis, or if the list of habitus generated would be finite; accounting for every combination of dispositions possible. There was no concrete evidence that any of these observations would be found apart from relying on findings from learner theories and the theoretical framework that indicated learner heterogeneity and dynamicity based on durable and transposable dispositions.

The pilot studies however generated findings that hinted to the presence of different habitus types each constituted by different combinations of dispositions. When the items were based on learner theories, Factor Analysis resulted in a ‘not positive definite’ matrix. But when the OLP was meticulously refined and reframed into Bourdieu’s theory, its Factor Analysis generated the 8-factor model. This workable 8-factor model suggested that a theory could be built from the approach. Thus, Exploratory Factor Analysis became the statistical approach of choice for my main research.
4.6. Justifications for the qualitative interview method

Qualitative methods have more alternatives to collecting data, which include among others case studies, observations, action research, focus groups, interviews, portfolios, diary writing, visual data and so on. Initially, I identified the use of Netnography as an efficient way to observe learners and their dispositions towards online learning. Netnography was initially a marketing research method but has been increasingly applied to educational research such as in ethnographically studying online communities (Kulavuz-Onal and Vásquez, 2013) and MOOC communities (Saadatdoost et al., 2014). According to Kozinets (2002), as an online environment data collection method, Netnography is “more naturalistic and unobtrusive than focus groups and interviews” (p. 61). Its strength is therefore in observing naturalistic behaviour, including dispositions that might involve subconscious interactions between the learner and the online learning system.

However, for my research, Netnography would have required a longitudinal study within an existing online learning system (or one purposefully prepared beforehand) and the disruption of participants’ on-campus learning, which was why it was more idealistic than realistic. In the absence of an online learning system, I opted to use individual interviews. Individual interviews allowed me to present respondents with hypothetical online learning system scenarios, as well as enquire about their habits and preferences in using digital technologies.

In contrast to self-assessment questionnaires where respondents are not given the opportunity to expand on their opinions of the questionnaire items (Oppenheim, 1992, p. 115), the interview is a method in which the interviewer and interviewee exchange views in that it “enable participants - be they interviewers or interviewees - to discuss their interpretations of the world in which they live, and to express how they regard situations from their own point of view” (Cohen et al., 2011, p. 409). The interview thus allowed me to interpretively enquire on learners’ dispositions.
Firstly, the interview can generate context-relevant data (Schultze and Avital, 2011, p.9) through discussions of learners’ disposition when faced with different learning and technology scenarios. These descriptions may be new information or an in-depth detail of already existing information, and they are regarded as “repositories of facts, reflections, opinions and other traces of experience” (Holstein and Gubrium, 2011, p.152). These rich responses represent opinions negotiated through meaningful discussions as opposed to Likert scale replies to fixed statements. In my mixed-method approach, its interpreted information serves to confirm (or contradict) learners’ opinions generated through the questionnaire as valid and trustworthy (Kerlinger, 1970, cited in Cohen et al., 2011, p.411), and acts as a validation mechanism through data triangulation that enhances the rigour of the whole research (Robson, 2011, p.158). The interviews also humanised my representations of habitus as more than buzzword taxonomies. While the questionnaire responses were treated as Case IDs, as is the common practice with large-scale data, I gave my interview participants proper names as pseudonyms. This process is described as “humanising” findings or bringing them “to life” (Huber, 2007, p.179).

4.7. The final design of the interview

In designing the interview, I considered many types of interviews used in educational research and social sciences. Cohen et al. (2011) identified 14 types of interviews that were amassed from the work of LeCompte and Preissle (1993), Bogdan and Biklen (1992), Lincoln and Guba (1985), Oppenheim (1992, p.65), and Patton (1980, p. 206)’ (p. 412). Cohen et al. (2011) further alluded that different purposes call for different types of interviews, and that at times a research need a specific type or a hybrid of different types so long as the objective is ‘fitness for purpose’ (p. 412).

Cohen et al. (2011, p. 414) and Robson (2011, p. 285-290) both emphasised the general distinction between four types of interviews, viz. 1) the structured
interview, 2) the unstructured interview, 3) the non-directive interview and 4) the focused interview. The first two concern with the standardisation of the questions being asked (Figure 12), while the latter two concern with the role of the researcher as either being interviewee-driven (3) or being interviewer-driven (4) (Figure 13).

![Structured-unstructured interview type antipodes](image)

*Figure 12. Structured-unstructured interview type antipodes*

![Focused non-directed interview type antipodes](image)

*Figure 13. Focused non-directed interview type antipodes*

As reported earlier, my second pilot study employed a hybrid interview schedule that consisted of four phases. This early version was then revised to accommodate the slightly different target population and the larger sample size. The redesigned interview was thus simplified into an introductory phase, a semi-structured phase and a structured phase.

To maintain comparability, the semi-structured questions employed a more stringent technique whereby “all interviews are asked the same basic questions in the same order” (Cohen et al., 2011, p. 413). The standardised format was intended to increase “the comparability of responses” (Cohen et al., 2011, p. 413) and at the same time intended to “supply a frame of reference for respondents’ answers, but put a minimum restraint on the answers and their expression” (Kerlinger, 1970, cited in Cohen et al., 2011, p.416).
This phase comprised of 18 standardised semi-structured guiding questions. The semi-structuredness refers to the protocol that only certain questions would be delivered depending on the conversation and interviewees’ contributions, and that questions would not be delivered in verbatim but rephrased in situ based on the interviewer’s discretion. The phrasing of these items did not explicitly follow any specific protocol but rather it was inspired by the guidelines and examples of semi-structured questions suggested by Weiss (1994), Drever (2003) and Cohen et al. (2011, p. 418-419) among many others. I have also reworded the semi-structured items to simplified English. This was an informed decision based on the findings that around 20% of the main research respondents answered the Malay language version of the questionnaire. In anticipation of language difficulties, the language was simplified and a translated Malay language version was prepared for interviewees who preferred to be interviewed in the Malay language.

Another revision is in the structured phase. In the second pilot study, the schedule consisted of 8 items to correspond to the 8-factor model that was generated by the OLPV.2. In the main research however, the schedule consisted of 6 items to correspond to the 6-factor model that was generated by the OLP-28. For each item, interviewees were given two alternatives (Agree or Disagree). After interviewees responded to one item, I informed them of their individual level of agreement as per their questionnaire results. The primary role of this interview phase was thus in triangulating the learners 6-factored habitus combination that was statistically derived through factor scores, with their 6-factored habitus combination derived from their self-assessed accounts in the interview.
Phase 1 – Semi-structured phase (informal items depending on situation)

Let’s talk about your studies

1. What are your favourite ways to study? / How do you like to study? / How do you study?
2. How is your study going? Do you think it’s good or bad?
3. What do you think would make you study better?
4. Do you want to say anything else about your study life?
5. Do you have a mobile phone? Is it a smart phone?
6. What is your mobile phone for?
7. Do you use a lot of technology? Can you give me examples?
8. What do you use your computer for? What do you use your tablet for?
9. Do you use them for learning?
10. What do you do on the internet (online)?
11. Do you use the internet for your studies?
12. How about talking with your friends or teachers?
13. Do you have any educational websites or apps that you like?
14. Do your teachers tell you to use the internet?
15. Have you tried online learning before?
16. Nowadays, people can do their studies online, what do you think?
17. What should an online learning have?
18. Do you think your school should have online learning? Why?

Phase 2 – Structured phase

19. Runs through and elaborate on several close-ended questions confirming their level of agreement with their associated habitus type.

19a. Habitus trait A – Agree / disagree
19b. Habitus trait B – Agree / disagree
19c. Habitus trait C – Agree / disagree
19d. Habitus trait D – Agree / disagree
19e. Habitus trait E – Agree / disagree
19f. Habitus trait F – Agree / disagree

Figure 14. The pilot interview schedule

4.8. Two-Cycle Coding as the method of analysing qualitative data

Two-Cycle Coding is a process recommended by Saldana (2016) as a systematic approach to coding qualitative data through a series of coding strategies in cycles. These cycles encompass the initial identification of codes to the eventual formulation of categories. According to Saldana (2016)...

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coding is a cyclical act. Rarely is the first cycle of coding data perfectly attempted. The second cycle (and possible the third and fourth, etc.) of recoding further manages, filters, highlights, and focuses the salient features of the qualitative data record for generating categories, themes, and concepts, grasping meaning, and/or building theory. (p. 9)

For my research, the two-cycle coding process allowed me to analyse the data continuously, with reflexivity and theoretical sensitivity of Bourdieu’s theory. Thus, the two-cycle coding was not a method of analysis on its own but a systematic technique that allowed for my analysing the data inductively and deductively.

Coding of the qualitative data started during the process of transcribing the audio recordings into texts. In fact, even during the interview itself I began to analyse the data through Holistic coding by means of memo writing and preliminary jottings. According to Dey (1993), this coding strategy is “an attempt to grasp basic themes or issues in the data by absorbing them as a whole [the coder as ‘lumper’] rather than by analyzing them line by line [the coder as ‘splitter’]” (p.104, cited in Saldana, 2016, p. 166).

Fittingly, Saldana (2016) identified Holistic coding as “a preparatory approach to a unit of data before a more detailed coding or categorisation process through first or second cycle methods” (p. 166). Thus, immediately after the transcription of each interview, I interpretively read and re-read the resulting transcript to attain a holistic overview of the interviewee’s responses before I succumbed to the forgetting curve (Ebbinghaus, 2013).

For the second pilot study, I coded the interview transcripts manually using Microsoft Word because the sample consisted of only 4 interviews. However, for my main research, because of the amount of data, I decided to import the 17 transcripts and interview memos into NVivo software to allow for a more systematic coding process. Using NVivo, I applied Saldana’s Two Cycle Coding process to gradually extract themes and categories.
During the first coding cycle, each transcript underwent In Vivo Coding whereby interesting and relevant words and phrases were coded in verbatim. The transcript then underwent Process Coding whereby semblance of interviewees describing their behaviour and action in relation to learning, using technology and learning with technology were also identified into codes. I then analysed the transcript a third time through a more open interpretive manner via Initial Coding whereby interesting statements were inferred and my inference of these instances in the form of short notes became codes. Collectively, these codes were represented as colour-coded NVivo nodes.

The First Cycle Coding followed the same procedures as applied in the pilot study. When it came to the Second Cycle however, instead of using Focused Coding and Axial Coding approaches as per the pilot study, I decided to use Pattern Coding to analyse my main research data. According to Miles, Huberman and Saldana (2014), Pattern Coding “pull[s] together a lot of material from first cycle coding into more meaningful and parsimonious units of analysis. They are a sort of meta code” (p. 86). Hence, Pattern Coding was performed not on the transcripts but on the NVivo nodes themselves; categorising and revising them into discernible themes and categories, and eventually scrutinised to interpret if they represented any meaning that reciprocated Bourdieu’s concept of dispositions.

The Two Cycle Coding allowed for both inductive and deductive coding. Basically, the first cycle was data-driven (inductive) where codes were extracted wholly from the transcript, followed by the theory-driven (deductive) second cycle where I interpreted themes and categories from the extracted codes. My interpretations were guided by the theoretical framework, and the 6-factor model that was derived from the OLP-28.
4.9. Abductive inferencing as the method of analysing mixed data

The analyses of data did not end after both quantitative and qualitative data sets had been interpreted. My research questions required identifying learners based on their habitus profiles as well as in understanding how their profiles might influence their learning. In Bourdieu’s terms, how ‘dispositions’ constitute ‘habitus’, and in turn how ‘habitus’ influence ‘dispositions’ towards the ‘field’. As habitus is identified by both dispositions and field, my research must culminate into the analysis of both data sets together. This is where the Transformative component of my research design became important; in the analysis of mixed data.

In this regard, I employed the method of abductive reasoning (Timmermans and Tavory, 2012) in negotiating meaning from both data sets combined. According to Thornberg (2012), “a researcher who uses abductive reasoning constantly moves back and forward between data and pre-existing knowledge or theories, and make comparisons and interpretations in the searching for patterns and best possible explanations” (p.247). This is applicable to my research pursuit of trying to make sense the concept of habitus.

Drawing upon its earliest definition by Peirce (1958) who has also significantly contributed to the foundations of pragmatism (Peirce, 1905; 1974), Thornberg (2012) describes the abductive reasoning method as...

...a selective and creative process in which the researcher carefully investigates how far empirical “facts” (or data) agree with theory or hypothesis and how far they call for modifications of it. It is about discovering new concepts, ideas or explanations by finding surprising events, which cannot be routinely explained by pre-existing knowledge. Thus, by abduction, the researcher goes beyond data as well as the pre-existing theory or theories. It is an innovative process because every new insight is a result of modifying and elaborating prior knowledge or putting old ideas together in
new ways as the researcher explores and tries to explain the new data. (p. 247)

This process is thus a prominent pragmatist feature of my research as I intend to not succumb into the pitfall of taxonomising learners based on empirical measures alone. As ascribed by Peirce (1868), “abduction proposes hypotheses, deduction articulates their consequences, and induction evaluates them” (cited in Nordmann, 2009, p. 315) and in this regard the end product of my research is not in producing a definitive theory, but rather a grand hypothesis on habitus types; a habitus theory. Thus, the abductive process proposes a habitus-inspired theory, the deductive process articulates how the habitus influences learning consequences, and the inductive process identifies quantitative and qualitative evaluation mechanisms.

Therefore, abductive reasoning is not only a known pragmatist’s tool to complete a multifaceted approach of interpreting data, it also advocates resulting hypotheses as useful as definitive findings. Abductive reasoning is synonymous to ‘hypotheticity’ and both are analogous to pragmatist research. Peirce’s philosophy outlines the role of abductive reasoning and hypotheticity in pragmatism. Firstly, “hypotheses do not serve as epistemic qualifiers of belief but as productive anticipations of reality” (Nordmann, 2009, p. 314). Secondly, “hypothesis is a truth seeking enterprise and unending quest in which everything remains revisable” (p. 314). Thirdly, “hypotheses do not signify loss of truth, but are instrumental in the production of truth” (p. 314). Certainly, the use of Bourdieu’s theory has extensively informed this research, but I anticipated the hypothetical result of my research to be a modification on Bourdieu’s conception of habitus and use his key constructs to explain and profile learners in a new light.

I decided to integrate abductive reasoning into my post-coding codeweaving to weave the quantitative and qualitative data sets together. I used codeweaving to weave not only the qualitative codes but also the quantitative 6-factors and habitus types together in what Saldana (2016) would describe as a heuristic
process to “explore the possible and plausible interaction and interplay of (...) major codes’ (p. 276). Shook (2016) postulates that, “the roles of abductive inference in dynamic heuristic allows [sic] scientific methodologies to test novel explanation for the world’s ways” (p. 157). Abductive inferencing as Peirce (1974) described it relies on the ‘recollection of observed facts, rearranging them, and view [sic] them in such new perspective that the unexpected experience shall no longer appear surprising’ (p.36). I employed abductive reasoning at the very end of my analysis and continued its use in the codeweaving process in respond to my research questions in the discussions chapter.

Essentially, the ultimate objective of this mixed-method abductive reasoning is in making sense of the combined data-driven empirical knowledge and theory-driven subjective knowledge to produce logical and contextualised descriptions of the habitus construct. This three-pronged strategy (deductive, inductive and abductive) is supported by Shook (2016) who state that, “deliberate reasoning often follows abductive patterns, as well as patterns dominated by deduction and induction, but complex mixtures of these three modes of inference are crucial for scientific explanation” (p. 157).

4.10. Population and sample

4.10.1. Background of the target population

My target population comprised of Bruneian learners who are currently students of technical vocational education. In Brunei, technical vocational education is considered post-secondary education. It provides a pathway for general education school leavers to pursue further education in technical fields, as opposed to continuing academic pursuit under the GCE Cambridge A-Levels pathway. It functions similarly to higher education whereby students are trained for the world of work. It is however more common to find that technical vocational students are those who attained 4 O-Levels or below in the GCE O Levels because of its low entry requirements. Nonetheless, the Technical Vocational Education and Training
(TVET) section of the education system for many years has played an adequate role in producing skilled technicians in a myriad of technical vocations and in providing a second opportunity for less academically inclined students (or more technically inclined students) to partake in life.

Seven technical institutions are given the responsibility to train these students in more than 90 technically oriented programmes. These institutions are as below:

1. Sultan Saiful Rijal Technical College
   Specialties: Aircraft engineering, hospitality, ICT, electronics
   Population: 1,030

2. Jefri Bolkiah Engineering College
   Specialties: Marine Engineering, ICT, technical industries
   Population: 795

3. Sufri Bolkiah Vocational School
   Specialties: Business, technical industries, ICT, fashion.
   Population: 366

4. Nakhoda Ragam Vocational School
   Specialties: Civil engineering, architecture, electronics, fashion.
   Population: 453

5. Wasan Vocational School
   Specialties: Agriculture, pharmacy
   Population: 276

6. Business School
   Specialty: Business
   Population: 334

7. Mechanic Training Centre
   Specialties: Automatic engineering, mechanical industries
   Population: 210
The details of each institution are accurate based on 2014 statistics. It is expected that these numbers will vary in coming years but not by a significant margin due to the constraints of teaching workforce and the physical classrooms. The target population therefore comprised of students from the 7 technical-vocational institutions of approximately N=3,500. They are generally competent internet users within the age of 16-20, sharing similar socioeconomic demographic and at most a 1:1 male-female gender ratio.

Adapting the German ‘Dual-Ausbildung’ system of apprenticeship, the seven technical institutions above have effectively worked with the industry sector to train their students. However, this established ecosystem despite its success was found to be ‘no longer relevant or responsive in a modern day competitive economy’. As international best practices of industrial training changed with the coming of digital technologies, the practices taught in these institutions became apparently outmoded.

Simultaneously, students enrolling in these programmes were increasingly digitally adept as described in several national census (Authority for Info-Communications Technology Industry of Brunei Darussalam, 2012) as well as local and global research (International Telecommunication Union, 2013b), and thus bring with them a set of dispositions that might not be compatible with the traditional teaching pedagogies ingrained in current TVET practice.

In 2014, the Brunei Technical Education Transformation was announced and launched concurrent with the publication of the BTE Transformation White Paper, a BTE Transformation Upgrading Plan for 2014-2017 and a revision of the constitution under the Institute of Brunei Technical Education Order 2013. Among its absolute revamp is the eventual merger of the seven institutions into firstly a mega campus in 2018 and subsequently a satellite mega campus in 2020, and the shift of governance from the Department of Technical Education to an executive board structure with more autonomy for change. My correspondences with
executive board members informed me that online learning is a profound interest in the upgrading plan of the Technical Education Transformation.

4.10.2. Sample and sampling criteria

The research made use of the sampling frame $N=3500$ and aimed to attain a minimum sample size of more than $n=347$. This provides the research, taking into consideration sample mortality, a confidence level of 95% with the confidence interval of 5% (Cohen et al., 2011, p.146).

Conforming to the sequential mixed-method design, this research undertook two stages of sampling. Sampling in mixed-method research, or for instruments contributing to mixed-method research, is slightly different to that of single method studies. Teddlie and Tashakkori (2009) associated sequential mixed-method sampling as having “one kind of sample [that] precedes another and influences the proceeding sample” (p. 162) exemplifying that “numerical data set the scene for in-depth interviewing, perhaps identifying extreme or deviant cases, critical cases, variables on which the results are either homogeneous or highly varied” (p. 162). Therefore, a first sampling stage was performed on the target population ($N=3,500$) for the questionnaire, and sequentially a second sampling stage for the interview was performed within the population of respondents of the questionnaire (i.e. questionnaire $n =$ interview $N$).

For the interview process, the sample was identified through purposive sampling, whereby researchers “hand-pick the cases to be included in the sample on the basis of their judgment of their typicality or possession of particular characteristics being sought” (Cohen et al., 2011, p. 156). Like the second pilot study, typical case sampling was employed in which the sample was representative of typical types (as opposed to deviant cases) identified by the questionnaire (Teddlie and Tashakkori, 2009, p. 174). For example, if the questionnaire generated 8 types of habitus, the sample size criterion was at minimum 2 representatives per habitus ($\therefore n=16$). In
In this case, 7 types of habitus were identified in the next chapter, and in turn 17 interviewees were recruited as the sample to represent these habitus types.

4.10.3. Ethical considerations

Prior to contacting eligible participants, I submitted a Research Risk and Ethics Assessment Form (RREA) to the University of Manchester Research Ethics Committee, which specified details of among others the research methodology and participants. Included with the submission were the OLP-28 questionnaire, the OLP interview schedule, the participant consent form (see Appendix D) and the participant information sheet (see Appendix E). Based on the RREA checklist, the research was identified as Low Risk and approval was granted two months after submission. The criteria for participation included learners who are aged 16 or above who are able to provide consent without force or coercion and who would willingly participate in the research.

Consent is vital to maintain the integrity of data through protecting the best interests of the participants by granting them control of their participation. As underlined by Ryen (2004), “research subjects have the right to know that they are being researched, the right to be informed about the nature of the research and the right to withdraw at any time” (p. 231). Therefore, participation for this research was absolutely voluntary and, as stipulated in the Participant Information Sheet, participants were free to withdraw at any point in time. This right was observably applied by certain participants throughout the course of the research, as implied by the incomplete responses for the OLP-28 (n=86) and non-replies from the e-mail recruitment of interviewees (n=361).

Consent for participating in the OLP-28 questionnaire and the possible recruitment for consequent interviews were sought through an online consent form that prefixed the online OLP-28 questionnaire. Consent was also verbally sought prior to starting the documentation of each interview session, and reconfirmed at the end of each session. This practice of seeking consent throughout the process is
suggested as good ethical practice (Silverman, 2014, p. 149) to ensure that participants were not deceived to participate.

Due to the sequential design of the research, the questionnaire required participants to key-in their e-mail address, thus granting only a degree of anonymity. Anonymity in educational research means “not using the names of the participants or any other personal means of identification” (Cohen et al., 2011, p. 91). Regardless of the e-mail addresses bearing instances of real names or cyber-pseudonyms, anonymity was maintained during the analysis and presentation of the data.

For the OLP-28 data set, students were identified based initially on the case ID numbers automatically determined by the LimeSurvey platform. Several educational research studies have used numerical pseudonyms in practice (Martin, 2007; Due, Riggs and Mandara, 2015). For interviews, the interviewees were given proper name pseudonyms. Name pseudonyms imply a humanistic figure as the source and provide an opportunity to add to the voice gender and culture qualities that, according to Clark (2006), could be crucially “representative of particular social constructions” (p. 14). With social constructs being part of Bourdieu’s conceptualisation of social capital, these qualities could not be dismissed.

Based on the considerations above, this research opted for the use of pseudonyms that were gender-specific without compromising further the identities of participants. A final mechanism to maintain the link between pseudonym and habitus type was the use of proper name pseudonym with first letters that relate to their habitus types. For example, the names Amal and Amirul relate to Habitus Type A, Badrul relates to Type B, and so on. To ensure that the pseudonyms reflected common names, a lengthy list of Bruneian examination candidates spanning 5 years was analysed through a concordancer to generate the most common names respective of the first letters required.
In addition to anonymity, maintaining confidentiality is also a requirement of standard ethical practice. Allen and Wiles (2015) differentiated anonymity from confidentiality by establishing that anonymity obscures the identity of the respondent so that they cannot be linked to their responses, while confidentiality enables responses to be linked to the source respondents without compromising anonymity (p. 3). Being a sequential design, this research was reliant on linking respondents’ quantitative and qualitative response, particularly during mixed-method analysis. The means by which confidentiality was maintained was through the secure storage of data (see Section 4.11.4).

4.11. Conducting the research

4.11.1. Recruitment of participants

The recruitment of participants employed several pathways. Prior to contacting the target population, an e-mail request with details of the research and the target population was sent to both the Director of Technical Education and the Permanent Secretary of Higher Education who responded and approved of the research. In turn, principals of the seven institutions concerned were informed by e-mail of the research endeavour. Simultaneously, teachers of these institutions were contacted to assist in informing students of the questionnaire. The research was made accessible via a shared URL link, which in turn directed learners to the questionnaire.

The eventual recruitment of interviewees relied on the findings of the OLP-28 data. Based on the habitus types identified by the OLP-28, the target was to recruit at least 2 interviewees per habitus type. Anticipating non-replies and withdrawal from interviews, a generic e-mail was sent to the e-mail list. The response rate was gradual and very low accounting for less than 12% of the sample, but the recruitment was able to select two representatives from each habitus and several others from habitus sub-types.
4.11.2. Online administration of the OLP-28 questionnaire

The questionnaire was designed on LimeSurvey using a mobile-responsive template that allowed access from a computer or any hand-held internet device. Prior to gaining access to the questionnaire, prospective participants were directed to a welcome page that briefly described the research. The welcome page also provided a link to change language from English to Malay. The accompanying Participant Information Page was made printable if required by participants for their record. Clicking the Start button to access the questionnaire form indicated that participants agreed to the terms of the research. Nonetheless, an online consent form was also integrated into the questionnaire as a prefix. The consent form prompted participants for their consent in being contacted if chosen for a subsequent interview study. For this purpose, participants were required to provide their e-mail address.

Participants were given the opportunity to choose either the English or Malay version of the questionnaire. Items were presented in sections and participants filled in blank fields with answers and chose their responses from multiple-array radio buttons. Upon completion, the questionnaire redirected participants to a thank you page that indicated the end of the online administration. The OLP-28 questionnaire was made available for four weeks, after which the .CSV file was transferred to SPSS for analysis.

4.11.3. Performing interviews via web-conferencing

Arrangements regarding time, preferred language and the web-conferencing technology were agreed via e-mails. Interviewees indicated that they preferred late evenings for interviews to take place. Web-conferencing was performed either on Skype, Facetime or WhatsApp; Facetime being the most popular. Interview sessions were set to be 30-45 minutes long. As per the interview design, interviewees were initiated with introductions to build a rapport and reduce anxiety. The questions started after interviewees had settled down. Interviewees
were informed that only audio was being recorded. The audio was recorded via an audio application called Cubasis on a connected iPad. This allowed for manipulation of sound quality during and post-recording. Audio files were saved as .mp3s attributed to the respective interviewees. In addition, I took notes throughout the interviews to keep track of interesting responses and behaviour.

4.11.4. Organising and storing data

For quantitative data, the data was transferred from LimeSurvey to SPSS as is. For interview data, each interview audio file was transcribed to text to allow for the translation of Malay to English, and to refine conversations that contained code-switching and code-mixing. The transcripts were transferred to NVivo for organisation and storage. Two examples of the full transcripts are in Appendix K.

The transcription of audio data adhered to Gibb’s guide on data preparation (2008, pp. 10-22). According to Gibbs (2008), “transcription, especially of interviews, is a change of medium and that introduces issues of accuracy, fidelity and interpretation” (p. 11). However, Robson (2011) stated that, “[while] some forms of qualitative data analysis, such as conversation or discourse analysis call for very detailed transcripts ... thematic analysis does not require the same amount of detail” (p. 478). My research sought thematised opinions on learners’ dispositions. Therefore, during the transcription process, discourse markers, semiotics and prosodies were not transferred from audio to text. This, according to Gibbs (2008) is ‘tidying up’ the speech, whereby “tidy, grammatical scripts are easier to read and hence analyze” (p. 14), suggesting that this process was acceptable when the study “is not much concerned with the details and expression of language use and is more interested in the factual content of what is said” (p. 14). The transcription format was ‘verbatim’ style with its main strategy of transcribing spoken word-for-word utterances and nothing else (Gibbs, 2008, pp. 14-15). Transcriptions were typed on Microsoft Word.
4.12. Chapter summary

The components of my methodology as described in this chapter work together to address the final aspect of my research paradigm, ‘how do I go about finding more about the learners’ (Patel, 2015). This chapter complements the planning, design, piloting and redesign features of the preliminary strategies through presenting further justifications as to my selection of certain procedures. Undoubtedly, there will be other methods that would produce results for this research, but I am of the opinion that a maiden research endeavour should employ methods that reflect similar studies. Bourdieu’s research has been associated with pragmatic mixed method designs with the use of a multivariate analysis complemented with various types of qualitative methods from interviews to photographs. In addition, the tradition of learner profiling has predominantly been questionnaire based.

Hence, the methodology ascribed for this research has been structured in consideration of the three research questions. This chapter documented my justifications in selecting the design and methods involved so as to be transparent of their purpose that each contributed. The sequential transformative mixed method design employed a series of meticulous stages, some conventional while others unorthodox, to allow for the inferencing of information through statistical, inductive, deductive and ultimately abductive approaches in developing new information as presented in the next two chapters. With the many methodological components in play as described by this chapter, it is absolutely important for me to not lose sight of what is essentially a series of approaches sequenced together.
Chapter 5: Quantitative analyses, results and findings

5.1. Introduction

This chapter presents the quantitative phase where I addressed the first research question by generating objective, empirical data on habitus. To achieve this, the analysis of quantitative data performed three functions.

Firstly, through factor analysis it identified latent variables in the form of a 6-factor model. The analysis involved a series of statistical analyses of the OLP-28 data, starting from the descriptive statistics of the sample, followed by a Principal Component Analysis procedure to justify item-reduction, and then the series of statistical due diligence performed before and during Exploratory Factor Analysis (EFA), which included tests for normality via a Shapiro-Wilk test and graphical observations; sampling adequacy via Kaiser-Meyer Olkin test; and sphericity via Bartlett’s Test, confirmation tests via Monte Carlo PCA Parallel Analysis and Reliability Analyses, and ultimately the Exploratory Factor Analysis (EFA) procedure. The end product of this analysis is a 6-factor model that is indicative of the constituents of habitus.

Secondly, through a series of mathematical algorithms and subjective decision-making, the learners’ individual questionnaire responses were juxtaposed against the 6-factor model. This involved the use of learners’ individual factor loadings, truncated into manageable whole integers and finally a subjectively simplified 6-string combination that reflect the 6-factor model. The use of Likert score averages and cluster analysis are given consideration in this stage as alternatives to consolidating learners’ questionnaire responses with the factor model.

Thirdly, through speculative tabulation and mapping techniques, yet still rooted to mathematical reasoning, the characteristics of the habitus types were deduced, including the identification of a mathematically possible 64 possible habitus types and their order of prevalence in the sample, their interlinking properties to creating
maps and a 3D lattice representation, and the theoretical concept of incremental change. Of the 64 possible habitus type, 44 were observed in the sample, and 7 types were heavily represented by the sample of my research.

5.2. Identifying latent variables through Factor Analysis

The data set for this quantitative phase was generated using OLP-35. However, before I performed Factor Analysis on the data, I performed an item-reduction process. Items with 2-tailed statistical significance with moderate correlation coefficient \( r \geq 0.5 \) were maintained whereas 7 items that were below the coefficient threshold were omitted, leaving 28 correlated items; hence OLP-28. I performed an initial Principal Component Analysis (PCA) on the OLP-28. The resulting Pattern Matrix of the PCA generated a 6-factor model that has more discernible factor loading values compared to the 8-factor model generated during the pilot study (see Appendix E, Table E.1). This indicated that the data, with its larger sample and improved item to case ratio, was likely more robust than the pilot data set. A thorough descriptive analysis was then conducted, followed by statistical due diligences in preparation for a systematic and comprehensive Factor Analysis.

5.2.1. Descriptive statistics

Descriptive statistical analysis was performed to ascertain the characteristics of the sample response. 407 complete responses from a total of 493 were transferred from the Lime Survey database. From the 407 respondents, 81 (19.9%) answered the Malay version, and 326 (80.1%) answered the English version of the OLP-28. On gender distribution, 198 (48.6%) were females and 209 (51.4%) were males with \( x = 1.51, \ s = .5 \). The distribution is as illustrated in Figure 15 below:
With regards to the age of respondents, the range is 5 (min = 16, max = 21) with $x = 17.93$, $s = .897$. In terms of distribution, 17 (4.2%) respondents were 16 years old; 109 (26.8%) were 17 years old; 181 (44.5%) were 19 years old; 91 (22.4%) were 19 years old; 4 (1%) were 20 years old; and 5 (1.2%) were 21 years old. The distribution followed an almost normal distribution with skewness $= .284$ (see Figure 16).

*Figure 15. Gender distribution of sample*

*Figure 16. Age distribution of sample from 16 to 21 years old*
On the ownership of internet devices, based on singular ownership, 407 (100%) own a mobile phone; 153 out of 407 (37.6%) owned a tablet device; 141 out of 407 (34.6%) owned a laptop; and 96 out of 407 (23.6%) owned a desktop computer. Based on ownership of multiple devices, 177 (43.5%) owned only a mobile phone; 58 (14.3%) owned a mobile phone and tablet; 51 (12.5%) owned a mobile phone and laptop; 14 (.03%) owned a mobile phone and desktop computer; 35 (.09%) owned a mobile phone, tablet and laptop; 27 (0.07%) owned a mobile phone, tablet and desktop computer; 22 (.05%) owned a mobile phone, laptop and desktop computer; and 33 (.08%) owned all four devices. In essence, every respondent had access to at least one internet-enabled device.

On previous online learning experience, 214 (52.6%) had experienced online learning compared to 193 (47.4%) who had no experience. The distribution is almost normal with $x = 1.47$, $s = .500$, and skewness = 1.04 (see Figure 17).

![Histogram](image)

*Figure 17. Distribution based on respondents’ previous online learning experience*

Several analyses on the nominal demographic items were performed to explore any possible correlation. Firstly, there was observably no significant difference between males and females with regards to online learning experience (Table 3).
Table 3. Relationship between gender and previous online learning experience

<table>
<thead>
<tr>
<th>1. Gender</th>
<th>5. Do you have any previous online learning experience?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Female</td>
<td>103</td>
</tr>
<tr>
<td>Male</td>
<td>111</td>
</tr>
</tbody>
</table>

Secondly, the relationship between age and online learning experience was inconclusive (see Table 4). Both accounts generally showed comparable frequency, with those aged 19 years old having the widest difference of 54 against 37; a range of 17 respondents.

Table 4. Relationship between age and previous online learning experience

<table>
<thead>
<tr>
<th>1. Age</th>
<th>5. Do you have any previous online learning experience?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Count</td>
</tr>
<tr>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>17</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>86</td>
</tr>
<tr>
<td>19</td>
<td>54</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>4</td>
</tr>
</tbody>
</table>

Thirdly, relationship between technology ownership and online learning experience was found to be comparable (see Table 5). There was no observable discrepancy that suggested the combinations of technologies owned having an influence on a learner having or not having online learning experience. In general, the difference between the two was not wide. The biggest difference was observed in those who only owned mobile phones (M) whereby 92 ‘mobile-phones only’ owners have online learning experience compared to 75 who have not (range = 17).
Based on these attempts to cross-tabulate different demographic variables, I inferred that demographic items are not clear indicators of a student having or not having prior experience in online learning. Throughout the demographic, there seemed to be an almost equal number of students having or not having online learning experience regardless of age, gender or technology ownership.

### 5.2.2. Frequency and distribution of responses on individual items

After scrutinising the demographic items above, the next analysis focused on the 28 disposition items, in particular the frequency in the range of responses between the Likert scale of 1 to 5. The scale represented levels of agreement according to *Strongly Disagree, Disagree, Neither Agree or Disagree, Agree, and Strongly Agree.*

The frequency distribution for each individual item was statistically described to establish the distribution of responses as tabulated in the series of tables below:

<table>
<thead>
<tr>
<th>Table 6. Frequency of response for item 6 and its 3 sub-items</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. I believe that I have…</td>
</tr>
<tr>
<td>a. [Strong cultural values due to the support I have]</td>
</tr>
<tr>
<td>b. [Strong ICT skills due to the support I have]</td>
</tr>
<tr>
<td>c. [Sufficient money to spend on what I need]</td>
</tr>
</tbody>
</table>
The overall level of agreement to the three items above (Table 6) inclined more towards agreement than disagreement. It could be observed that Strongly Disagree responses were far fewer than Strongly Agree responses indicating that the sample collectively has a strong agreement towards having strong cultural, social and financial capital.

Table 7. Frequency of response from item 7 and its 10 sub-items

<table>
<thead>
<tr>
<th>7. I prefer learning through...</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [Reading printed books or notes]</td>
<td>6</td>
<td>16</td>
<td>37</td>
<td>206</td>
<td>142</td>
</tr>
<tr>
<td>b. [Watching videos]</td>
<td>8</td>
<td>8</td>
<td>108</td>
<td>191</td>
<td>92</td>
</tr>
<tr>
<td>c. [Watching how others do their work]</td>
<td>0</td>
<td>8</td>
<td>47</td>
<td>205</td>
<td>147</td>
</tr>
<tr>
<td>d. [Browsing the internet for information]</td>
<td>0</td>
<td>0</td>
<td>62</td>
<td>194</td>
<td>151</td>
</tr>
<tr>
<td>e. [Interactive software]</td>
<td>3</td>
<td>42</td>
<td>107</td>
<td>180</td>
<td>75</td>
</tr>
<tr>
<td>f. [Online groups]</td>
<td>3</td>
<td>72</td>
<td>120</td>
<td>126</td>
<td>86</td>
</tr>
<tr>
<td>g. [Mobile apps for activities and accessing notes]</td>
<td>6</td>
<td>56</td>
<td>62</td>
<td>154</td>
<td>129</td>
</tr>
<tr>
<td>h. [Online notes that are readable/downloadable]</td>
<td>6</td>
<td>20</td>
<td>81</td>
<td>186</td>
<td>114</td>
</tr>
<tr>
<td>i. [Consulting my teachers]</td>
<td>8</td>
<td>9</td>
<td>80</td>
<td>206</td>
<td>104</td>
</tr>
<tr>
<td>j. [Group work]</td>
<td>17</td>
<td>21</td>
<td>122</td>
<td>169</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 7 comprises of the list of dispositions on learning preferences. Similar to responses for items 6a to 6c (Table 6), responses for 7a to 7j observably inclined more towards agreement than disagreement. For ‘7c’ and ‘7d’, none of the 407 respondents selected Strongly Disagree, with ‘7d’ having no negative responses.

Table 8. Frequency of response for item 8 and its 5 sub-items

<table>
<thead>
<tr>
<th>8. In my studies, I...</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [Seek the opinions and advice of others]</td>
<td>8</td>
<td>9</td>
<td>80</td>
<td>190</td>
<td>120</td>
</tr>
<tr>
<td>b. [Firstly plan on how I will do my work]</td>
<td>0</td>
<td>20</td>
<td>102</td>
<td>173</td>
<td>112</td>
</tr>
<tr>
<td>c. [Am always calm and stress-free]</td>
<td>25</td>
<td>72</td>
<td>129</td>
<td>161</td>
<td>20</td>
</tr>
<tr>
<td>d. [Am motivated to learn when using the internet]</td>
<td>8</td>
<td>18</td>
<td>108</td>
<td>215</td>
<td>58</td>
</tr>
<tr>
<td>e. [Work at my own pace]</td>
<td>0</td>
<td>5</td>
<td>44</td>
<td>175</td>
<td>183</td>
</tr>
</tbody>
</table>
Table 8 is a list of the dispositions on students’ behaviour and personality when studying. Similarly to previous items, the sample collectively inclined more towards agreement than disagreement. ‘8b’ and ‘8e’ have no Strongly Disagree responses.

Table 9. Frequency of response for item 9 and its 10 sub-items

<table>
<thead>
<tr>
<th>9. When I use the internet, I…</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [I first go to websites that I am most familiar with]</td>
<td>4</td>
<td>10</td>
<td>37</td>
<td>175</td>
<td>181</td>
</tr>
<tr>
<td>b. [Never get lost in the large amount of internet information]</td>
<td>3</td>
<td>42</td>
<td>135</td>
<td>146</td>
<td>81</td>
</tr>
<tr>
<td>c. [Do multiple things at the same time (multitask)]</td>
<td>0</td>
<td>0</td>
<td>93</td>
<td>159</td>
<td>155</td>
</tr>
<tr>
<td>d. [Communicate with people easier online]</td>
<td>0</td>
<td>30</td>
<td>93</td>
<td>192</td>
<td>92</td>
</tr>
<tr>
<td>e. [Am careful with the truthfulness of information]</td>
<td>3</td>
<td>3</td>
<td>98</td>
<td>182</td>
<td>121</td>
</tr>
<tr>
<td>f. [Choose the easiest/ most convenient internet feature]</td>
<td>0</td>
<td>16</td>
<td>91</td>
<td>210</td>
<td>90</td>
</tr>
<tr>
<td>g. [Skip information that I don’t like or find boring]</td>
<td>3</td>
<td>30</td>
<td>58</td>
<td>216</td>
<td>100</td>
</tr>
<tr>
<td>h. [Concentrate better when doing activities online]</td>
<td>4</td>
<td>55</td>
<td>166</td>
<td>143</td>
<td>39</td>
</tr>
<tr>
<td>i. [Use it continuously throughout the day]</td>
<td>1</td>
<td>8</td>
<td>99</td>
<td>209</td>
<td>90</td>
</tr>
<tr>
<td>j. [Expect to quickly find the information I need]</td>
<td>0</td>
<td>33</td>
<td>89</td>
<td>196</td>
<td>89</td>
</tr>
</tbody>
</table>

Table 9 comprises of the list of dispositions toward using the internet. Once more, collective responses were more leaning towards agreement than disagreement, with ‘9c’, ‘9d’, ‘9f’ and ‘9j’ having zero Strongly Disagree responses. Sub-item ‘9c’ on multitasking exhibited no negative response.

From the descriptive analysis of all the items in isolation, it is evident that respondents’ levels of agreement were more favourable towards the item statements. However, this research is not concerned with micro-level agreement because a single item alone does not represent an online learning system. Rather, it is the collective interplay between these dispositions that hypothetically influences how a student learns and prefers to learn. The next step in the analysis therefore explored the presence of latent variables that would in turn be useful in holistically profiling learners beyond the descriptive statistics above.
5.2.3. Identifying the suitability of the data for Exploratory Factor Analysis

The method of Factor Analysis involved the “identification of factors (...) based on correlations between variables [and that] for a good solution, groups of variables need to be correlated” (Hutcheson and Sofroniou, 1999, p.233, emphasis added). Therefore, in order for the ‘solution’ to be robust, it must be determined beforehand that the variables computed into the analysis were indeed correlated. The procedures performed are presented here in tandem with justifications based on selected literature pertaining to multivariate analysis approach (Hutcheson and Sofroniou, 1999; Matsunaga, 2010; Field, 2013; and Bishara and Hittner, 2014).

A Shapiro-Wilk normality test was first performed on the 28 disposition items to establish their respective distributions. All the items were observed to be non-normally distributed ($a= .000$) (see Table F.2, Appendix F). In addition, individual graphical analysis of each item using Q-Q plots and histograms showed non-linear and non-normal distribution. Nevertheless, Bishara and Hittner (2014) advised that, “in the social sciences, non-normality is common that it is arguably the norm” (pp. 1-2). This supported Micceri’s (1989) study where he found that, of the several hundred psychometric and achievement data distributions in education and psychology, “31% were extremely asymmetric, 29% had more than one peak, and 49% had at least one extremely heavy tail” (cited in Bishara and Hittner, 2014, p.2).

The non-normality of the data posed a problem because factors are commonly determined by Pearson correlation. This however was a good outcome, because Bishara and Hittner (2012) cautioned that, “Pearson’s $r$ may inflate Type I error rates and reduce power” (p. 10). In addition, the default computation of Pearson’s $r$ is not suited for non-normal data because, “Pearson $r$ could be exaggerated by non-normal data [whereby] bias could be as high as +.14, particularly with a Heavy-Tailed distribution for one variable and a small sample size (n=10)” (Bishara and Hittner, 2014, p.10). The oversensitivity of Pearson’s $r$ for non-normal data led to the option of either data transformation to restore normality, or the use of other correlation methods.
I chose the latter option and used Spearman’s rho as the correlation method of the analysis. It is less sensitive to non-normal data and to outliers compared to Pearson (Abdullah, 1990; Balakrishnan and Lai, 2009), taking into consideration that the data contained a few outliers. From the resulting correlation matrix, it was observed that each of the 28 items at least correlated by .30 with another item, which suggested factorability as stipulated by Tabachnick and Fidell (2007, p. 614).

Kaiser-Meyer-Olkin’s Measure of Sampling Adequacy suggested that the sample was favourable (KMO=.802) based on the recommended value of .6 and above. Bartlett’s Test of Sphericity (see Table 10) generated an approximate $X^2$ of 12728.028 with 378 degrees of freedom, and is significant with at least 0.99 level of confidence ($\alpha=0.01$). Furthermore, the communalities of all items (see Appendix F, Table F.1) were above 0.5 confirming that each item shared a degree of common variance with other items (Field, 2013, p. 684). The tests above have all suggested and confirmed the suitability of Exploratory Factor Analysis in analysing the data.

<table>
<thead>
<tr>
<th>KMO and Bartlett’s Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</td>
<td>.802</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td>Approx. Chi-Square</td>
</tr>
<tr>
<td></td>
<td>df</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
</tr>
</tbody>
</table>

**5.2.4. Exploratory Factor Analysis**

The Exploratory Factor Analysis involved three runs of Factor Analysis. The first factor analysis identified the possible number of factors based on eigenvalues and investigated this possibility using Monte Carlo Parallel Analysis. The second factor analysis established if the identified factors were correlated (oblique) or uncorrelated (orthogonal). The third and last factor analysis identified which items represented which factors.
The **first factor analysis** used a Principal Components extraction with no specified rotation. 6 factors were generated. A Monte Carlo PCA for Parallel Analysis was performed using O’Connor’s syntax for SPSS (2000), with the setting of 1000 parallel dataset permutations using Principal Component and a 95% percentile. The permutations were relative to the actual dataset. It revealed that the eigenvalues of the actual data were above the mean values based on 1,000 permutations; as presented in the output in Figure 18 below:

<table>
<thead>
<tr>
<th>Root</th>
<th>Raw Data</th>
<th>Means</th>
<th>Prctyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000000</td>
<td>12.137033</td>
<td>1.517185</td>
<td>1.589947</td>
</tr>
<tr>
<td>2.000000</td>
<td>2.615152</td>
<td>1.443413</td>
<td>1.496414</td>
</tr>
<tr>
<td>3.000000</td>
<td>2.173337</td>
<td>1.386688</td>
<td>1.434124</td>
</tr>
<tr>
<td>4.000000</td>
<td>1.703152</td>
<td>1.337294</td>
<td>1.378818</td>
</tr>
<tr>
<td>5.000000</td>
<td>1.482657</td>
<td>1.294398</td>
<td>1.331589</td>
</tr>
<tr>
<td>6.000000</td>
<td>1.331398</td>
<td>1.254257</td>
<td>1.289049</td>
</tr>
<tr>
<td>7.000000</td>
<td>.982269</td>
<td>1.215707</td>
<td>1.247375</td>
</tr>
<tr>
<td>8.000000</td>
<td>.873199</td>
<td>1.180659</td>
<td>1.209517</td>
</tr>
<tr>
<td>9.000000</td>
<td>.711275</td>
<td>1.147659</td>
<td>1.176398</td>
</tr>
<tr>
<td>10.000000</td>
<td>.575431</td>
<td>1.114830</td>
<td>1.142595</td>
</tr>
<tr>
<td>11.000000</td>
<td>.563397</td>
<td>1.083734</td>
<td>1.11328</td>
</tr>
<tr>
<td>12.000000</td>
<td>.489624</td>
<td>1.052907</td>
<td>1.078894</td>
</tr>
<tr>
<td>13.000000</td>
<td>.389956</td>
<td>1.022657</td>
<td>1.049873</td>
</tr>
<tr>
<td>14.000000</td>
<td>.365399</td>
<td>.994051</td>
<td>1.018653</td>
</tr>
<tr>
<td>15.000000</td>
<td>.287771</td>
<td>.965372</td>
<td>.990419</td>
</tr>
<tr>
<td>16.000000</td>
<td>.233846</td>
<td>.937502</td>
<td>.961631</td>
</tr>
<tr>
<td>17.000000</td>
<td>.168935</td>
<td>.910107</td>
<td>.936027</td>
</tr>
<tr>
<td>18.000000</td>
<td>.156839</td>
<td>.881846</td>
<td>.907507</td>
</tr>
<tr>
<td>19.000000</td>
<td>.138006</td>
<td>.854627</td>
<td>.880936</td>
</tr>
<tr>
<td>20.000000</td>
<td>.115001</td>
<td>.827074</td>
<td>.852239</td>
</tr>
<tr>
<td>21.000000</td>
<td>.110169</td>
<td>.799769</td>
<td>.826577</td>
</tr>
<tr>
<td>22.000000</td>
<td>.086382</td>
<td>.771820</td>
<td>.797657</td>
</tr>
<tr>
<td>23.000000</td>
<td>.084839</td>
<td>.744650</td>
<td>.771183</td>
</tr>
<tr>
<td>24.000000</td>
<td>.063200</td>
<td>.716948</td>
<td>.744261</td>
</tr>
<tr>
<td>25.000000</td>
<td>.056305</td>
<td>.687995</td>
<td>.715055</td>
</tr>
<tr>
<td>26.000000</td>
<td>.042362</td>
<td>.656177</td>
<td>.685438</td>
</tr>
<tr>
<td>27.000000</td>
<td>.034748</td>
<td>.621818</td>
<td>.652520</td>
</tr>
<tr>
<td>28.000000</td>
<td>.028319</td>
<td>.578855</td>
<td>.616464</td>
</tr>
</tbody>
</table>

*Figure 18. Output from raw data Parallel Analysis of OLP-28 showing cut-off at 6 factors*
A scree plot (see Figure 19) generated from the same analysis graphically confirmed the cut-off point at 6 factors, as shown by the blue line (representing actual OLP-28 raw data) intercepting with the green line (representing 1,000 permutations) on 6.0 of the x-axis. In other words, the Parallel Analysis confirmed that if the data was permuted differently 1,000 times, every single different permutation indicated that the likeliest number of factors that could be generated from the OLP-28 data was 6-factors.

Figure 19. Scree plot eigenvalue comparison of raw data (OLP-28) and permutations

A second factor analysis was performed to identify if the items were correlated or uncorrelated. Correlated items are best analysed using an oblique rotation, while uncorrelated items are better analysed using an orthogonal rotation. To investigate this, the factor analysis retained its extraction method criteria, but with a Direct Oblimin rotation to determine the correlation of items. Based on the generated Component Correlation matrix (Table 11) whereby no values were above .5, the test indicated uncorrelated items and thus an orthogonal rotation such as Varimax was more suitable.
A **third factor analysis** was performed to finally generate a 6-factor model and subsequently determine the items that represent each factor. This final factor analysis used a Varimax rotation method. As with the first and second analyses, this final analysis generated a 6-factor model (see Appendix F, Table F.2). A Reliability Analysis was performed for each factor and significant values of Cronbach alpha above .6 was observed for all 6 factors (Table 12) indicating that there was internal consistency among items in each of the 6 factors.

**Table 12. Summary of reliability statistics of the 6 factors**

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of items</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Cronbach’s Alpha</td>
<td>.934</td>
<td>.889</td>
<td>.852</td>
<td>.744</td>
<td>.796</td>
<td>.721</td>
</tr>
</tbody>
</table>

**5.2.5. Labelling the 6 Factors**

I labelled the factors as presented in Figure 20, each with the questionnaire items that they represent. The 6 factors were each given descriptive labels to represent the items that contribute to each factor. The naming of factors has always been regarded as contentious. As highlighted by Yong and Pearce (2013), “factor names may not accurately reflect variables within the factor” (p. 81). In fact, the literature on the naming of factors from Factor Analysis has for many decades been regarded as not having any exact science behind the process. Many agree that factor naming
is very subjective (Everitt, 1975; Eysenck, 1992) and even arbitrary (Lerman et al., 1980).

<table>
<thead>
<tr>
<th>F1. Perceptive use of the internet (Skills and abilities)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6a. Strong cultural values due to the support I have</td>
</tr>
<tr>
<td>6b. Strong ICT skills due to the support I have</td>
</tr>
<tr>
<td>7a. Reading printed books or notes</td>
</tr>
<tr>
<td>7g. Mobile apps for activities and accessing notes</td>
</tr>
<tr>
<td>7h. Online notes that are readable/downloadable</td>
</tr>
<tr>
<td>9a. I first go to websites that I am most familiar with</td>
</tr>
<tr>
<td>9e. Am careful with the truthfulness of information</td>
</tr>
<tr>
<td>9f. Choose the easiest/most convenient internet feature</td>
</tr>
<tr>
<td>9g. Skip information that I don't like or find boring</td>
</tr>
<tr>
<td>9h. Concentrate better when doing activities online</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F2. Control of one's learning process (Accountability and autonomy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7b. Watching videos</td>
</tr>
<tr>
<td>7f. Online groups</td>
</tr>
<tr>
<td>8b. Firstly plan on how I will do my work</td>
</tr>
<tr>
<td>8c. Am always calm and stress-free</td>
</tr>
<tr>
<td>8d. Am motivated to learn when using the internet</td>
</tr>
<tr>
<td>8e. Work at my own pace</td>
</tr>
<tr>
<td>9b. Never get lost in the large amount of internet information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F3. Dependence on negotiating understanding with others</th>
</tr>
</thead>
<tbody>
<tr>
<td>7i. Consulting my teachers</td>
</tr>
<tr>
<td>7j. Group work</td>
</tr>
<tr>
<td>8a. Seek the opinions and advice of others</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F4. Dependence on external assistance to gain understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>7c. Watching how others do their work</td>
</tr>
<tr>
<td>7d. Browsing the internet for information</td>
</tr>
<tr>
<td>9d. Communicate with people easier online</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F5. Internet dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td>9c. Do multiple things at the same time (multitask)</td>
</tr>
<tr>
<td>9i. Use it continuously throughout the day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F6. Wants and indulgences</th>
</tr>
</thead>
<tbody>
<tr>
<td>6c. Sufficient money to spend on what I need</td>
</tr>
<tr>
<td>7e. Interactive software</td>
</tr>
<tr>
<td>9j. Expect to quickly find the information I need</td>
</tr>
</tbody>
</table>

The names given to the six factors above were guided by the considerations in factor naming suggested by Pett, Lackey and Sullivan (2003), which included interpreting a factor name that represents the variables and comparing the factors to existing taxonomies (pp. 207-211). I named the 6-factors based on what I perceived as thematically indicative of the items each factor is attributed to while
at the same time ensuring that each factor do not overlap in terms of their descriptions.

5.3. Identifying respondents’ profiles using the 6-factor model

The formulation of the 6-factor model enabled me to profile respondents based on their factor levels. One pragmatic strategy to realising this is through the use of respondents’ individual factor scores, because these scores are contributory to the 6-factor model.

5.3.1. Generating respondents’ factor scores

The factor loadings were cross-referenced against each case via their factor scores that were generated through SPSS Bartlett factor scoring. A total of 407 varying factor score combinations were generated. An excerpt of the factor scores from Case IDs 003 to 024 is illustrated in Figure 21 below:

<table>
<thead>
<tr>
<th>Case ID</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Factor 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>003</td>
<td>-1.85540</td>
<td>-0.8314</td>
<td>-0.01804</td>
<td>1.87350</td>
<td>0.09724</td>
<td>0.12684</td>
</tr>
<tr>
<td>004</td>
<td>-1.4005</td>
<td>0.27823</td>
<td>0.10974</td>
<td>0.04164</td>
<td>-0.33849</td>
<td>0.20081</td>
</tr>
<tr>
<td>005</td>
<td>-0.20681</td>
<td>-0.70365</td>
<td>-1.05167</td>
<td>0.25939</td>
<td>0.48865</td>
<td>0.36981</td>
</tr>
<tr>
<td>006</td>
<td>-0.07471</td>
<td>-0.76657</td>
<td>-0.10239</td>
<td>-1.18091</td>
<td>-1.80161</td>
<td>-1.0910</td>
</tr>
<tr>
<td>007</td>
<td>-0.06768</td>
<td>-0.05534</td>
<td>-0.03233</td>
<td>-0.34071</td>
<td>-0.55753</td>
<td>-1.3575</td>
</tr>
<tr>
<td>008</td>
<td>-1.51761</td>
<td>-0.59924</td>
<td>-0.50232</td>
<td>-1.81626</td>
<td>1.68162</td>
<td>1.20201</td>
</tr>
<tr>
<td>009</td>
<td>0.79333</td>
<td>1.36313</td>
<td>0.06466</td>
<td>0.81169</td>
<td>-1.41517</td>
<td>0.68906</td>
</tr>
<tr>
<td>010</td>
<td>-1.12643</td>
<td>-1.02153</td>
<td>-1.16697</td>
<td>-1.87270</td>
<td>-1.8587</td>
<td>1.47865</td>
</tr>
<tr>
<td>011</td>
<td>0.99316</td>
<td>0.73851</td>
<td>1.26928</td>
<td>0.54874</td>
<td>-0.00203</td>
<td>-2.1126</td>
</tr>
<tr>
<td>012</td>
<td>-1.25137</td>
<td>-1.40228</td>
<td>0.47870</td>
<td>-0.40788</td>
<td>1.76914</td>
<td>1.59734</td>
</tr>
<tr>
<td>013</td>
<td>-0.28753</td>
<td>-0.28941</td>
<td>0.71627</td>
<td>-0.76978</td>
<td>1.93326</td>
<td>0.47500</td>
</tr>
<tr>
<td>014</td>
<td>-0.82852</td>
<td>-0.63105</td>
<td>-0.93555</td>
<td>2.22492</td>
<td>1.23784</td>
<td>0.73632</td>
</tr>
<tr>
<td>015</td>
<td>-0.51215</td>
<td>-0.57578</td>
<td>-0.51201</td>
<td>-0.63134</td>
<td>1.19778</td>
<td>0.4902</td>
</tr>
<tr>
<td>016</td>
<td>-0.79328</td>
<td>-0.83843</td>
<td>0.36091</td>
<td>-1.41362</td>
<td>-0.26277</td>
<td>-1.2970</td>
</tr>
<tr>
<td>017</td>
<td>-0.09567</td>
<td>-0.27065</td>
<td>-1.12354</td>
<td>-2.21713</td>
<td>1.28570</td>
<td>0.32254</td>
</tr>
<tr>
<td>018</td>
<td>-0.70901</td>
<td>-0.54334</td>
<td>0.18744</td>
<td>0.49282</td>
<td>0.28758</td>
<td>0.67711</td>
</tr>
<tr>
<td>019</td>
<td>-3.53450</td>
<td>-1.02682</td>
<td>0.60515</td>
<td>2.36008</td>
<td>0.48880</td>
<td>0.04408</td>
</tr>
<tr>
<td>020</td>
<td>-0.67253</td>
<td>-0.24200</td>
<td>-0.38833</td>
<td>2.12533</td>
<td>-0.70291</td>
<td>0.97544</td>
</tr>
<tr>
<td>021</td>
<td>0.11379</td>
<td>-0.24603</td>
<td>-0.03667</td>
<td>-0.07291</td>
<td>0.70758</td>
<td>1.28471</td>
</tr>
<tr>
<td>022</td>
<td>0.03716</td>
<td>-0.77310</td>
<td>-0.05486</td>
<td>-0.13454</td>
<td>1.07453</td>
<td>1.51640</td>
</tr>
<tr>
<td>023</td>
<td>-0.26337</td>
<td>-0.60278</td>
<td>-0.66837</td>
<td>-0.17138</td>
<td>0.97194</td>
<td>-3.92979</td>
</tr>
<tr>
<td>024</td>
<td>1.30170</td>
<td>0.53250</td>
<td>0.54076</td>
<td>0.77347</td>
<td>-1.03970</td>
<td>1.24390</td>
</tr>
</tbody>
</table>

Figure 21. Excerpt of respondents’ factor scores based on Bartlett’s factor scoring (cases 3-24)
During this stage, I found that inspecting the diverse factor scores posed a challenge due to the differing values to at least five significant figures. Furthermore, when generating graphical charts for a visual assessment, the graph appeared illegible (see Figure 22). Identifying cases with similar factor combinations through graphical and numerical observation proved impractical.

![Stack bar chart of 6-factor score combinations for 407 cases](image)

**Figure 22. Stack bar chart of 6-factor score combinations for 407 cases**

### 5.3.2. The subjective truncation of factor scores

In an attempt to simplify the values further to comparable values, I applied a common TRUNC SPSS syntax to round the factor scores to the closest whole integer. The logic used by the TRUNC command is determined by the common midpoint value to discern its range. In other words, the integer 0 is rounded from values within -0.49 to 0.49, 1 from 0.50 to 1.49, 2 from 1.50 to 2.49, 3 from 2.50 to 3.49 and so on, based on a range of 0.99. For negative integers, -1 = -0.50 to -1.49, -2 = -2.49 to -1.50 and so on, with a range of 0.99. This command changed the factor scores to more discernible integers (-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5) as illustrated in Figure 23. This however generated many zero values and, in various
instances throughout dataset, it generated cases with 0 values across all six factors. One example is highlighted in Figure 23 below:

```
-2  0  0  -2  0  0
0  0  0  0  0  0
0  -1 -1  0  0  0
0  -1  0 -1 -2  0
0  0  0  0 -1  0
-2  1  1 -2  2  1
1  -1  0  1 -1  1
-1  1  0  -2  0  1
1  1  1  1  0  0
-1  1  0  0  1  2
-0  0  1 -1 -2  0
-1  1  -1  2  1  1
1  1  1  -1  1  0
-1  1  0 -1  0 -1
0  0  -1  0  1  0
-1  1  0  0  0  1
-4 -1  1  2  0  0
-1  0  0 -1  1  1
0  0  0  0  1  1
0  -1  0  0  1  2
0  1  1  0  1  -4
1  1  1  1 -1  1
```

*Figure 23. Excerpt of closest integer truncated factor scores (cases 3-24)*

When managing factor scores with Bartlett factor scoring, a zero factor score represents the mean score of each factor (Odum, 2011, p. 13; DiStefano, Zhu and Mindrilla, 2009, p. 4). The issue with this TRUNC method is the truncation of possibly useful values, no matter how subtle, to the mean score (zero factor score), which might be interpreted as a case having no variance in their Likert-scale responses. I scrutinised the item-level data case wise and found that cases with prevalent zero factor scores did not reflect uniformity in their responses at all. For example, for the case highlighted in Figure 23 who has zero factor scores across all 6 factors, he/she selected *Neither Agree or Disagree* only for Items ‘6a’ and ‘9h’. His/her other 26 items were opinionated responses.

I introduced at this point a degree of subjectivity into my handling of the data so that these opinionated responses were not hidden behind a zero factor score. I
thus decided on an alternative interpretation to these zero factor scores. I made the decision to instead round numbers to its nearest floor integer (round-down) for negative values, and the nearest ceiling integer (round-up) for positive values. I simplified the 407 factor score values to their nearest floor/ceiling integers using the SPSS syntax command depicted in Figure 24 below:

```
COMPUTE FscoreN = TRUNC(Factor1) + (-1)**(Factor1 < 0)*(ABS(Factor1) > TRUNC(ABS(Factor1)))).
EXECUTE.
```

*Figure 24. SPSS syntax command to truncate scores into floor/ceiling integers*

Through this method I bypassed the issue of null values because a -.01 and a .01 would be truncated to -1.0 and 1.0 respectively, rather than a 0 value. In addition, despite using a different midpoint, this method maintained the same range of 0.99; that is 1 = 0.01 to 1.0, 2 = 1.01 to 2.0, 3 = 2.01 to 3.0 and for negative values, -1 = -0.01 to -1.0, -2 = -1.01 to -2.0 and so on. The exception is 0, which with this method has been reinterpreted as having a value other than null. Thus, the syntax command generated simplified factor scores that were devoid of null values (see Figure 25).
Arguably, this strategy also affected how other values would be inferred and the subjectivity employed has taken a degree of objectivity out of the data. For example, it can be argued that a 1.01 value is closer to 1 than 2, but I made the subjective stance to magnify dispositions no matter how subtle. At this juncture, I admit that this truncation strategy was a simplification exercise to reduce these factor scores into statistically manageable numbers. What resulted from this truncation to ceiling/floor integer values is that where previously the dataset comprised of very accurate but unmanageable list of factor scores, the data is now arguably less accurate but more manageable.

With the new set of values, a stack bar chart was again generated and was observed to begin to show similar combination patterns (see Figure 26). It was visually inferred from the stack bar chart that the heights and constituents of factor combinations became less arbitrary. However, the combinations were generated as negative and positive values.
5.3.3. The subjective simplification of truncated factor scores

A second subjective decision was made to simplify the values further in order to make the scores graphically and numerically comparable to a 5-point Likert scale. The integer factor scores were imported to Microsoft Excel, and manually simplified using Microsoft Excel’s ‘Replace All’ feature and referring to a conversion criteria (see Table 13). This generated scaled factor scores ranging from 1 to 5. The conversion criteria was very subjective as there was no science involved in deciding the threshold. Rather, it was based on the observation that a majority of factor scores were within the -2 to 2 range. As there were fewer factor scores below -3 and above 3, these were represented in the scale as 1 and 5 respectively.

<table>
<thead>
<tr>
<th>Truncated factor scores</th>
<th>-5</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaled factor scores</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample representation</td>
<td>3.55%</td>
<td>40.2%</td>
<td>0%</td>
<td>55.2%</td>
<td>1.05%</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 13. Criteria for conversion of truncated scores (-5 to 5) to scaled scores (1 to 5)
A majority of factor scores were in the 2 and 4 values (see Figure 27 as an example). In fact, a majority of the factor scores consisted of 2s and 4s with 40.2% and 55.2% sample representations respectively, while 1s and 5s were less common contributing to 3.55% and 1.05% respectively.

<table>
<thead>
<tr>
<th>2</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>4</th>
<th>4</th>
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<tbody>
<tr>
<td>2</td>
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<td>4</td>
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<td>4</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

*Figure 27. Excerpt of scaled factor scores (cases 3-24)*

Simplifying the scores down to this 2-point scale (2, 4) became the most manageable option for this research compared to a higher number. Simplification to the nearest whole with 11 values (-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5) would mathematically suggest 1,771,561 possible types of habitus. A further simplification of these 11 values to mirror a 5-point scale (1, 2, 3, 4, 5) would result in 15,625 possible types of habitus, while a 3-point scale would be 729 possible types.
5.3.4. The early indicators of habitus types

A stack bar chart was generated for the third time to visually analyse the change as a result of the simplification process above. The stack bar chart (Figure 28) illustrated a more legible pattern and bars began to look exactly like several others.

![Stack bar chart](image)

*Figure 28. Stack bar chart of scaled 6-factor score combinations for 407 cases*

Magnifying on a smaller range of cases in the stack bar chart (see Figure 29), it could be observed that several cases indeed share the exact same combination. For example, cases 8, 13 and 18 have the same combinations; cases 4, 7 and 11 have the same combinations. This similarity was therefore interpreted as indicative of a ‘habitus’. Referring to Figure 29, cases 8, 13, and 18 are representatives of one habitus type. Cases 4, 7 and 11 are representatives of another.
In addition to exact similarities, there were also near resemblances. For example, Case IDs 7 and 8 resembled each other except in Factor 3 where Case ID 7 has a scaled score of 4 compared to Case ID 8’s score of 2. Obviously, the stack bar chart was not a convenient method to compare factor combinations. Hence, I adopted the use of factor score combinations to depict similarities and differences. Using this approach, Case ID 7 has the combination 224222 while Case ID 8 has the combination 222222. I found that this method was more efficient in comparing different learners and consequently in inferring the different types of habitus.

5.3.5. Considerations of other simplification strategies

The simplification of respondents’ factor scores was a decision made with the intent of being able to describe each respondent based on the 6-factor model. The profiling of Case 4 as 244424 instead of -0.14005, 0.27823, 0.10974, 0.04164, -0.33849, 0.20081 for example allowed my research to match Case 4 with several other 244424 cases. The mechanism is subjective and less accurate, but arguably not as entirely factitious. There was a degree of logic involved in the ceiling/floor integer truncation, although its suitability in this instance is admittedly debatable.
What transpired was a phase in this quantitative procedure that needed reassessment. It was limited to my knowledge of other procedures or computational algorithms that better fulfils this task. My research post-analysis pointed towards the factor/cluster combo analysis (Dolnicar and Grün, 2008; Sarstedt and Mooi, 2014), whereby latent variables are identified as factors in a factor model, and respondents’ factor scores undergo cluster analysis to establish how many clusters can be derived.

For comparison of strategies, the factor scores underwent two hierarchical cluster analyses, firstly through ‘between-groups linkage’ method and then another through ‘nearest neighbour’ method. Both methods employed the interval measure of Squared Euclidean distance and the identification of clusters was through agglomeration schedules and dendrograms.

The ‘between-groups’ linkage computed an agglomeration schedule that showed dissimilar clusters being joined together, not surprisingly, given the arbitrariness of the un-simplified factor scores. The dendrogram, at its observable smallest rescale of distance showed 46 clusters, including 6 outliers. The next hierarchical stage showed 36 clusters including 2 outliers, and then 24 clusters including 2 outliers. This method is indicative of 46 existing clusters. A k-mean cluster analysis based on 46 set clusters suggests several prevalent clusters (see Appendix H).

The ‘nearest neighbour’ linkage computed an agglomeration schedule that also showed dissimilar clusters joined together. The dendrogram, at its observable smallest rescale of distance showed 50 clusters, including 10 outliers. The next stage showed 43 clusters including 4 outliers, and then 31 clusters including 1 outlier. A k-means analysis based on 50 clusters also suggests several prevalent clusters (see Appendix H).

Finally, instead of clustering factor scores, responses to the 28 items were clustered against cases. The dendrogram generated 61 clusters with 12 outliers. These cluster analyses informed me of how many clusters possibly represent the
sample, but fall short of analysing the variables that explain the clustering of cases. In retrospect, cluster analysis could have been pragmatically performed in tandem with the factor analysis, but this is an endeavour that can be revisited in future studies. Moving forward, I relied on the subjective and arbitrary result of my truncation strategy to infer the number and identity of possible habitus types. Interestingly, the number of types inferred in the next section is not very different from the number of clusters computed by the cluster analyses.

5.4. Inferencing the number and types of habitus

The simplified factor score combination of each learner was manually entered into the questionnaire dataset in SPSS as a new ID value. The new column was labelled as ‘habitus’ denoting that the combinations represent habitus types. Analysis of frequency showed several prevalent habitus types that were better represented compared to others as identified based on the threshold percentile of > 4% (see Table 14).
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The highest occurring combination was 422444 with NRes = 31, second highest was 224222 with number of respondents (NRes) = 21 and so on. Therefore, the highest occurring combinations were defined as main habitus types and were labelled in descending order of student representatives (NRes) as A, B, C, D, E, F, G types. In addition, the moderately occurring combinations were defined as variants of the main habitus types due to their near resemblances and as such were given labels as Ab, Ac for variants of Type A; Bb and Bc for variants of Type C and so on. This classification system is shown in Table 15 below:

<table>
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<th>Type/sub-type</th>
<th>Combination</th>
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<td>G</td>
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Ultimately, the analysis identified 7 habitus types each with variants called sub-types. I identified these 7 highly represented habitus types as requiring further investigation through qualitative interviews.
Only 2.2% of the sample exhibits factor combinations with at least one factor score of either 1 or 5. I therefore made the decision to prioritise for now factor combinations that were not leaning to extreme scores. In addition, I observed that a majority of these 1 and 5 scores were borderline 2 or 4; having a difference of $z \leq .5$ against scores in the 2 to 4 range.

Thus, I decided that the combinations of 2s and 4s represent habitus types. This allowed for a more manageable 64 possibilities ranging from 222222 to 444444. These combinations were then mapped to illustrate the relationship of one habitus with another based on an incremental increase or reduction by 1 factor. In other words, a change from 2 to 4, or 4 to 2 on only one of the 6 factors indicates one incremental change.

5.5. The Habitus Lattice

The incremental relationship between the 64 habitus types creates a hypothetical infinite 3D lattice. In some ways, the habitus types arrange themselves like atoms in a crystal. However, the habitus lattice is an infinite loop with no ends that closely resembles a Rhombic Triacontahedron. Figure 30 below is a rendered model of the 3D lattice, with each of the 64 habitus types represented by a dot called a hedron’s vertex. Each habitus type is linked to 6 other habitus types and altogether the habitus types create an infinite lattice.
The interactive version (available at http://www.shaiomarali.net/2013/habitus-theory/), enables users to select a specific habitus type and view its 6 interconnected habitus types. As this interactive depiction of each habitus type could not be presented in this thesis, the lattice is simplified here as 4 planar maps that connect with each other (Figures 31 to 34). Each map illustrates the incremental movement of habitus types indicated here as connecting lines. It is important to note that these lines on the maps are for illustration purpose and they are in no form representing any accuracy other than representing connected paths. Since the lattice has no discernible starting and ending points, I chose as indicators two extreme habitus that flank the other habitus types. These extreme points, which I called Prime Habitus, are 222222 and 444444.
Figure 31. Habitus Map 1: Incremental map of habitus from +prime habitus to +1st and +2nd tier types

Habitus Map 1 (Figure 31) illustrates the link between the prime habitus combination 444444 to the six possible 1st tier habitus types that it can shift into based on one incremental change, viz. 244444, 424444, 442444, 444244, 444424 and 444442. In turn, each of these 1st tier combinations can shift into one of five possible 2nd tier habitus types. For example, 444442 can shift into 244442, 424442, 442442, 444242 or 444422. It can also revert back to 444444 in one increment. Thus, a 1st tier habitus type can either shift to a prime habitus or a 2nd tier habitus type. However, shifting from a 2nd tier habitus type to a prime habitus would take two increments. A 2nd tier combination is further capable of shifting into one of four 3rd tier combinations as illustrated by Habitus Map 2 (see Figure 32).
Figure 32. Habitus Map 2: Incremental map of habitus between +2\textsuperscript{nd} tier types and 3\textsuperscript{rd} tier types

Habitus Map 2 illustrates the possible shift from a 2\textsuperscript{nd} tier habitus to a 3\textsuperscript{rd} tier habitus. For example, the 224444 habitus on the top left corner of the map can shift to 222444, 224244, 224424 or 224442. These 3\textsuperscript{rd} tier habitus is each linked with six 2\textsuperscript{nd} tier combinations. For example, the 3\textsuperscript{rd} habitus 222444 is connected to the habitus combinations 224444, 422444 and 242444 as well as the habitus combinations 224244, 222444 and 222442. Due to the latter three combinations more leaning towards the 2s, they are not depicted in Habitus Map 2 but rather in Habitus Map 3 (see Figure 33, bottom right corner of Map 3). The bridge between Map 2 and Map 3 are the 3\textsuperscript{rd} tier habitus combinations, illustrated as black rectangles because they exist in both Maps.
The contents of Habitus Map 3 (Figure 33) are direct opposites of Habitus Map 2. In Habitus Map 3, as the combinations shift towards the lesser prime habitus 222222, there are more habitus combinations with 2s than 4s. Similarly, each 2nd tier habitus type (shown as circles) is linked to four 3rd tier habitus types (shown as black rectangles). However, only specific 3rd tier habitus types are associated with each 3rd tier habitus type, as depicted with different coloured lines.

The 2nd tier habitus types in Habitus Map 3 are able to shift to the 1st tier habitus types mapped in Habitus Map 4. (see Figure 34). For example, the habitus type 442222 can shift to either one of two 1st tier habitus types, viz. 422222 and 242222. In turn, these 1st tier habitus types can shift to the prime habitus 222222.
Thus, the four Habitus Maps can be used as visual guides to 1) locate a learner’s position in the map, and 2) predict possible habitus types that the learner can dynamically shift towards. Another use of the maps, particularly in future research, is assigning descriptions to each of the lines that link one habitus type with another, for it is in these lines that the driver of dispositional change – the conatus – might be observed.

During the conception of the maps above, I attempted to sequentially label combinations from 444444 to 222222. However, based on the results of the OLP-28, the main habitus types are arbitrary and do not follow the sequence of incremental change. Thus, I labelled the habitus based on the number of representatives of the respective habitus. Habitus A (422444) with 31 representatives became the first main habitus, Habitus B with 21 members became the second habitus and so on.
5.6. Validity and reliability

My considerations of validity and reliability began from the design stages of this quantitative phase. During the design of the instrument, I adapted items from established learner theories and structured my questionnaire based on questionnaire design protocols (Cohen et al., 2011, p. 402-403). I piloted the items twice and also conducted two small-scale standalone studies.

Analyses of the quantitative data included performing inter-item reliability, internal consistency strategies and item-reduction using collinearity tests and correlation coefficients to ensure questionnaire items contribute to the investigation of latent variables. In addition, the statistical due diligences performed prior to Exploratory Factor Analyses employed a series of tests to ensure the suitability of data, notably Tests of Normality, KMO’s test of sampling adequacy, Bartlett’s tests of sphericity, Monte Carlo PCA Parallel Analysis and post-analysis Reliability Tests. Furthermore, the main Exploratory Factor Analysis itself was performed three times to determine the most relevant types of rotations and iterations relative to the data set. Ultimately, I have documented these tests to present a clear audit trail of the measures taken in ensuring validity and reliability in deriving the 6-factor model.

On the derivation of habitus types however, inclusive of the subjective truncation of factor scores, validity and reliability is admittedly impacted by the zero factor score (mean score); that it is representative of the sample but not generalisable to other populations. Thus, the derived 64 habitus types, itself an arbitrary illustration based on subjective and speculative strategies, is dependent on the analysed sample. The statistical procedure of cluster analysis however did produce similar numbers of probable habitus types, notably 46 clusters from the ‘between-groups’ method that is close to the 44 observable habitus types out of 64 mathematically possible types suggested by my final analysis. Furthermore, the 7 main types were based entirely on their prevalence in my specific sample. At this point, the results are valid only to this particular research sample, and any attempt to generalise the theory on another population requires further adjustments and research.
5.7. Chapter summary

The analysis of quantitative data began with the conventional procedures of Exploratory Factor Analysis. However, in the pursuit of using the 6 factors as identifiers of habitus, several unorthodox strategies were used to truncate the erratic factor scores into more manageable integers, employing the use of syntax to circumvent the limitations of SPSS. Furthermore, the analysis and organisation of data including the visualisation of habitus into maps were performed manually as such computation was not currently catered for by mainstream software.

It can be argued that the method employed is atypical of how other studies infer their quantitative data. However, this research itself is exploring a new perspective of learner profiling where the generated factors are not the main findings but rather how different combinations of these factors reveal a set of types – the habitus.

Based on the quantitative analysis, the research managed to generate a 6-factor model that is statistically validated through audited procedures (Section 5.2.4). Each factor was then thematically characterised by its respective items and given labels so they could be easily referred to in the qualitative phase of this research. From my analysis of the 407 respondents, I concluded that there might be 64 possible habitus types, of which 44 were observed to represent the sample.

Through visually mapping these habitus types, I speculate that habitus can shift one increment at a time, but what will be eventually addressed in the Chapter 7 (Discussions) is what would catalyse the shift; a probable phenomenon that may be related to Bourdieu’s conatus. With the first research question answered wherein the different types of learner habitus have been identified, I then integrated my formulation of habitus types into the qualitative investigations described in the next chapter, in particular an investigation on these 7 most prevalent habitus types (Types A, B, C, D, E, F and G).
Chapter 6: Qualitative analyses, results and findings

6.1. Introduction

This chapter presents the analyses of the qualitative interview data. There were 17 interview sessions altogether representing 17 interviewees purposefully recruited from the sample of 407 questionnaire respondents. The previous chapter has suggested that the first round of qualitative data collection would prioritise the 7 prevalent habitus types. This chapter is thus an analysis of interview data of 3 representatives of Type A, 2 of Type B, 2 of Type C, 2 of Type D, 2 of Type E, 2 of Type F and 2 of Type G. Additionally, the analysis also included sub-type representatives; 1 from Type Ec and another from Type Fb. This chapter presents its analyses through three stages.

The first stage is the thick description of the sample and the interviewees. This stage involved consolidating together the demographic traits from the questionnaire with the observed behaviour and reported dispositions that were hermeneutically gathered from interview sessions. The first stage also involved the pseudonymising of interviewees.

The second stage involved an inductive and systematic series of Holistic, Initial, In Vivo and Process Coding procedures in NVivo. This First Cycle coding method identified, extracted and categorised from the interview transcripts relevant pieces of information, that were then further interpreted to produce a manageable repository of interviewees’ dispositions. These dispositions were negotiated in the interviews through heuristic and reflective moments and imagined scenarios and were grouped into 5 categories: 1) technology, 2) learning, 3) social agent, 4) environment, and 5) personal.

The third stage transitioned into a deductive investigation on these 5 categories through Pattern Coding. This theory-driven stage constantly referred to Bourdieu’s theory and the Bourdieu-inspired 6-factor model to further interpret the roles of
the 5 categories as subjective indicators of habitus. The coding of these habitus patterns in turn enabled further investigations on firstly the similarities and differences between habitus types and secondly the similarities and differences between members of the same habitus type. These juxtapositions revealed discernible differences between habitus types as well as members of the same type sharing many similarities.

In addition to these three stages, a triangulation mechanism employed in the interview provided another set of interpretations. Collectively, the findings from this phase contributed to an abridged description of the 7 habitus types based on theoretical and praxeological knowledge from the mixed data, the theoretical framework and the extended literature.

6.2. Describing the sample

46 (11%) students responded to the interview recruitment e-mail out of 407 sent. From the sample pool of 407, I selected 17 students as my interview sample (4.2% of the sample). To investigate the 7 prevalent habitus types, I selected two students per type, except for Type A, which was represented by 3 students due to it being most represented (n=31). I selected an additional two students who each represented a habitus sub-type. I based my selection criteria exclusively on habitus type regardless of demographic traits. 5 interviewees (29%) preferred a Malay interview and the remaining 12 interviewees (71%) preferred an English interview. However, I noted that the English interviews predominantly involved code mixing and code switching. 4 interviewees (23%) were females and the remaining 13 (77%) were males.

Demographic Information that was brought forward from the questionnaire to describe interviewees included age and online learning experience. There was no change in age for all 17 interviewees despite the sequential interview being conducted 3 months after the questionnaire. 9 students were 17 years old, 7 students were 18 years old, and 1 student was 19 years old. On online learning
experience, 9 (53%) students indicated that they had prior online learning experience while the remaining 8 (47%) did not. This last indicator was however found from interviews to be inaccurate. Extending from the quantitative phase, interviewees were initially given an identifying code to protect anonymity based on the combination of their habitus type and OLP-28 case ID. For example, a student with an OLP-28 case ID number of 261 who is of habitus type A was given the code ‘A261’. All these above-said descriptive information has been tabulated in Table 16 below:

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<th>Interview language</th>
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<td>17</td>
<td>Male</td>
<td>No</td>
<td>M+T+L</td>
</tr>
<tr>
<td>13</td>
<td>F169</td>
<td>Type F</td>
<td>English</td>
<td>17</td>
<td>Male</td>
<td>Yes</td>
<td>M+T+L+C</td>
</tr>
<tr>
<td>14</td>
<td>F379</td>
<td>Type F</td>
<td>English</td>
<td>17</td>
<td>Male</td>
<td>Yes</td>
<td>M+L</td>
</tr>
<tr>
<td>15</td>
<td>Fb101</td>
<td>Type F</td>
<td>English</td>
<td>18</td>
<td>Male</td>
<td>Yes</td>
<td>M</td>
</tr>
<tr>
<td>16</td>
<td>G285</td>
<td>Type G</td>
<td>Malay</td>
<td>17</td>
<td>Female</td>
<td>Yes</td>
<td>M</td>
</tr>
<tr>
<td>17</td>
<td>G305</td>
<td>Type G</td>
<td>Malay</td>
<td>18</td>
<td>Male</td>
<td>Yes</td>
<td>M+T+L+C</td>
</tr>
</tbody>
</table>

Upon preparing the analysis report for this qualitative phase, I found that the use of identifying codes adventitiously dehumanised the learners’ voice. As suggested by Van den Hoonoord (2003), “when the research involves many such participants, the use of pseudonyms becomes quite problematic because of the difficulty of the researcher to summon up the “voice” and spirit of the interview participant” (p. 145). The use of code pseudonyms reduced the student to a seemingly random acronym of letters and numbers that, to a reader not privy to its derivation, may be perceived as non-human. I then decided on pseudonyms that are not gender and
culture neutral so that the excerpts reflect a part of the learners and their demographic. The pseudonyms used, listed in Table 17 below, were selected from a comparable lengthy list of Bruneian Malay names with the most commonly occurring names adapted for interviewees to maintain anonymity.

<table>
<thead>
<tr>
<th>No.</th>
<th>Case</th>
<th>Pseudonym</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A261</td>
<td>Ahmad</td>
<td>0.903</td>
<td>-1.459</td>
<td>-0.043</td>
<td>0.580</td>
<td>0.758</td>
<td>0.608</td>
</tr>
<tr>
<td>2</td>
<td>A279</td>
<td>Amirul</td>
<td>0.037</td>
<td>-0.773</td>
<td>-0.055</td>
<td>0.135</td>
<td>1.075</td>
<td>1.516</td>
</tr>
<tr>
<td>3</td>
<td>A331</td>
<td>Amal</td>
<td>0.027</td>
<td>-0.704</td>
<td>-1.051</td>
<td>0.259</td>
<td>0.489</td>
<td>0.340</td>
</tr>
<tr>
<td>4</td>
<td>B049</td>
<td>Bakar</td>
<td>-0.287</td>
<td>-0.289</td>
<td>0.716</td>
<td>-0.770</td>
<td>-1.933</td>
<td>-0.475</td>
</tr>
<tr>
<td>5</td>
<td>B326</td>
<td>Bahrin</td>
<td>-0.710</td>
<td>-0.649</td>
<td>0.001</td>
<td>-0.108</td>
<td>-0.660</td>
<td>-1.299</td>
</tr>
<tr>
<td>6</td>
<td>C105</td>
<td>Chuchu</td>
<td>0.261</td>
<td>0.273</td>
<td>-0.086</td>
<td>0.106</td>
<td>-0.649</td>
<td>0.161</td>
</tr>
<tr>
<td>7</td>
<td>C410</td>
<td>Catrina</td>
<td>0.641</td>
<td>0.229</td>
<td>-0.318</td>
<td>1.420</td>
<td>-0.611</td>
<td>1.081</td>
</tr>
<tr>
<td>8</td>
<td>D185</td>
<td>Diana</td>
<td>1.075</td>
<td>1.035</td>
<td>1.497</td>
<td>0.061</td>
<td>-0.085</td>
<td>-0.966</td>
</tr>
<tr>
<td>9</td>
<td>D246</td>
<td>Danial</td>
<td>0.479</td>
<td>0.292</td>
<td>0.397</td>
<td>0.126</td>
<td>-0.884</td>
<td>-0.130</td>
</tr>
<tr>
<td>10</td>
<td>E159</td>
<td>Emran</td>
<td>-1.518</td>
<td>0.599</td>
<td>0.502</td>
<td>-1.816</td>
<td>1.682</td>
<td>1.202</td>
</tr>
<tr>
<td>11</td>
<td>E272</td>
<td>Eddy</td>
<td>-0.673</td>
<td>0.242</td>
<td>0.388</td>
<td>-1.257</td>
<td>0.721</td>
<td>0.544</td>
</tr>
<tr>
<td>12</td>
<td>Ec309</td>
<td>Erawan</td>
<td>-0.140</td>
<td>0.278</td>
<td>0.110</td>
<td>0.042</td>
<td>-0.338</td>
<td>0.200</td>
</tr>
<tr>
<td>13</td>
<td>F169</td>
<td>Faisal</td>
<td>0.825</td>
<td>1.124</td>
<td>0.666</td>
<td>0.610</td>
<td>0.096</td>
<td>0.860</td>
</tr>
<tr>
<td>14</td>
<td>F379</td>
<td>Fakrul</td>
<td>0.736</td>
<td>1.248</td>
<td>1.002</td>
<td>0.423</td>
<td>0.447</td>
<td>0.458</td>
</tr>
<tr>
<td>15</td>
<td>Fb101</td>
<td>Fadillah</td>
<td>1.302</td>
<td>0.533</td>
<td>0.541</td>
<td>0.773</td>
<td>-1.010</td>
<td>1.244</td>
</tr>
<tr>
<td>16</td>
<td>G285</td>
<td>Gina</td>
<td>-1.210</td>
<td>-0.492</td>
<td>-1.053</td>
<td>0.153</td>
<td>-0.638</td>
<td>0.561</td>
</tr>
<tr>
<td>17</td>
<td>G305</td>
<td>Ghaffar</td>
<td>-0.194</td>
<td>-0.593</td>
<td>-1.097</td>
<td>0.794</td>
<td>-1.438</td>
<td>0.449</td>
</tr>
</tbody>
</table>

In addition to their pseudonyms, the table above also presents each student’s accurate factor scores before simplification. The factor scores suggested factors that range from borderline to extreme. For example, even within the same habitus type, Ahmad and Amirul both perceived themselves as having low control of their learning processes (F2). But from the factor scores Ahmad has a stronger disinclination (F2 = -1.459) compared to Amirul (F2 = -0.773). The discrepancy in the degree of agreement was taken into consideration when interpreting the interview data, including in generating thick descriptions of the 17 learners.

### 6.3. Describing the interviewees

Denzin (2001) describes the process of generating thick description as “necessarily interpretive” (p. 116) and the process itself involves the “triangulated use of the
several methods of recording and capturing life experiences” (p. 116) one of which is the method of interview. He also defines the thick description generated from this method as involving the presentation of “detail, context, emotion, and the webs of social relationship that join persons to one another, (...) the significance of an experience, or the sequence of events, for the person or persons in question” (Denzin, 1989, p. 83). The thick description of each learner based on most of the aspects above is used in my research to humanise the learners as individuals with personality, emotions, preferences and experiences that in turn influence their dispositions.

These thick descriptions below are based on the interview transcripts, as well as the interview memos that I made during the 30-45 minute window invested during the interview sessions. My observations were limited to the visual space of the rectangular web-conferencing field-of-view and the meta-communicative and spoken responses that were relayed through it. The learner-specific transcripts and memos were sent to their respective source as a member checking mechanism, but none of the 17 respondents replied. It is imperative to note that as stipulated in the correspondence with learners that not replying after 3 weeks implied approval.

These descriptions may not be accurate representations of the students in real life, but apart from succumbing to the Hawthorne Effect and the rationale for doing so, their representations through the limited space and time was considered as authentic. Unlike the transcripts, these thick descriptions were not conveyed to the interviewees for member-checking due to my interpretations of these descriptions based on my observations and notes of learners’ narration of themselves as individuals rather than their self-assessed responses to the interview questions.

1. Type A interviewees

   1. **Ahmad**, 18, is a male student studying Aircraft Maintenance Engineering. He currently enjoys his studies and is studious. He is career focused and
wants to do something with his life. His fear is failing as he has failed once through the general academic stream. He is resourceful and quite trusting of his teachers. He was talkative and thoughtful in his responses. He is a physically active student.

2. Amirul, 17, is a male student studying Light Vehicle Mechanics. He is not fluent in English but when conversing in Malay he is talkative and tends to use informal Malay catchphrases. He is studious only when writing is not involved as he likes problem-based learning. He is trusting of his teachers. As a person, he is free-spirited and outgoing and likes to play video games.

3. Amal, 17, is a female student studying Business and Finance. She is talkative and confident in her responses. She likes reading notes and studying in groups which is an opportunity for her to socialise with her many friends. She is trusting of teachers.

II. Type B interviewees

4. Bakar, 18, is a male student studying Culinary Operations. He said he was struggling with his studies but feels he has matured in his thinking. He is now career focused and enjoys cooking. His interview responses were short statements. When he did elaborate he spoke in structured steps and apparently visualised the steps mentally. He prefers a small group of close friends. When asked about technologies, he knows them but is unclear of their benefits.

5. Bahrin, 19, is a male student studying Food Processing and is in his final year. He hopes to continue his studies at Brunei Politeknik but will be content if he goes into employment. His interview responses were short statements and in structured steps. He tended to get confused with questions and interpreted them as statements instead which he willingly agreed with. He uses the Internet a lot but is not aware of and cannot recall what the internet has to offer. He has a close group of best friends who together with him, failed twice in the general academic stream.
III. Type C interviewees

6. **Chuchu**, 18, is a male student studying Welding. During the interview, he initially responded with short answers but eventually responded with more structured answers. He was very descriptive and used examples. He debated against statements he didn’t agree with. He enjoys modifying cars and overhauling engines. He is innovative with technology and knows how to creatively optimise their benefits. He projected a personality that can be described as being ‘street-smart’, because he emphasised safety in life and online.

7. **Catrina**, 17, is a female student studying design and draughting. She is a creative person and likes to draw. She believes she is good with Maths and logic. She answered with descriptive statements and readily countered opinions she didn’t agree with. She talked about ideas and inspiration and attaining them from real life observations. She is observant and meticulous. She knows what makes good technology and how to use it innovatively.

IV. Type D interviewees

8. **Diana**, 18, is a female student studying to be a Pharmacy Technician. Based on her accounts, she came across as a pious person. She was timid and answered in short phrases. She prefers direct instructions and being instructed. She prefers to observe than participate in activities. She is extremely organised. She is conscious of her own and other people’s personal space and is quite respectful with her teacher and friends. She tends to confuse technology types and only focuses on their functional purpose.

9. **Danial**, 17 is a male student studying Aircraft Maintenance Engineering. He currently enjoys his studies as it is his dream job. He is impressed by machinery and tangible technology. In his previous and current studies, he prefers memorisation and rote learning. He favours notes that are summarised and he prints out Wiki notes. Beyond Wikipedia and Pokémon
Go which he is a fan, he has a limited familiarity of online technology. He likes being amused with funny videos online.

V. Type E interviewees (and Ec variant = Erawan)

10. Emran, 18, is a male student studying Marine Engineering. He came across as a person ambivalent with student life. He puts minimal effort into his studies (as well in the interview). He answered with short and simple, oftentimes generic phrases which was a challenge to infer information from. On using the internet in his studies, he finds answers on the internet but not concerned with the trustworthiness of answers.

11. Eddy, 17, is a male student studying Light Vehicle Mechanics. He believes college is better than school as there is a lighter workload. He tends to doodle or feel sleepy in class. He answered with short and vague phrases and only opened up when talking about his past time, Ultimate Frisbee. He often strayed off topic and talked from the viewpoint of others instead of himself. He takes interest in the narrative of others in social networks and talks to strangers as he believes he is giving them moral support. On websites, he prefers fun, cool, interesting and beautiful websites or he will get bored easily. He enjoys puzzle and game activities and likes field trips.

12. Erawan, 17, is a male student studying Welding. He expressed that learning in general is tiring for him. He answered with very short and generic answers, at times misinterpreted questions and replied with totally different answers. He doesn’t read except for Malay language comics. He became animated when talking about his hobby Tamiya Racing. He loves anything to do with cars. He uses technology but superficially. He owns a jail-broken phone to access more content and features but showed no realisation that it compromises his device.
VI. Type F interviewees (and Fb variant = Fadillah)

13. Faisal, 17, is a male student studying Information Technology. He is independent and likes the freedom of college life. He has an acute awareness of his learning pathway, is well organised, has plans for life and able to contemplate on his past decision-making. He is aware of real-life issues like employment and financial situations. Although he was talkative, his answers are exact and well-articulated and he mentioned by name websites and apps and how they benefit him. He is constantly online and optimises the uses of technology. He is aware of technology benefits and learning processes.

14. Forkful, 17, is a male student studying Information Technology. He believes college is alright but the teaching approach is old-fashioned. He reads and writes a lot and watches videos a lot particularly of internet celebrities (local and international). He is constantly online and takes part in several online discussion forums. He knows when to use technology in the right situation and when necessary. He professes to favour a ‘hipster’, ‘indie’ lifestyle and is a simple person. He hopes to further his studies either at Politeknik Brunei or privately funded colleges. His next goal is to get a driver’s license as he finds this to be important to him.

15. Fadillah, 18, is a male student studying Computer Networking. He prefers learning with the backdrop of music or television as it helps him concentrate. He is organised in his studies and is resourceful. The internet is his first port of call for information but he professed that he equally relies on notes, textbooks and his teachers. He hopes to venture into start-ups and small medium entrepreneurship. He indulges in his favourite past time of playing musical instruments.

VII. Type G interviewees

16. Gina, 17, is a female student studying Information and Library Studies. She feels obliged to study in college but her dream is to be a make-up artist. Her
preferred method of studying is following instructions before performing the task required. She is not a heavy user of the internet other than watching make-up video tutorials. She is not fond of reading (N.B.: which the interviewer felt was contradictory to her studies as a librarian). She answers in short phrases, at times answering with yes or no. She appears as a timid person, but sees friends and family as important. She enjoys social family outings like BBQs.

17. Ghaffar, 18, is a male student studying Welding. He feels that college life is socially fun but not the learning. He prefers learning through class quizzes and games. He is also fond of mobile and video games and socialises with others through playing games. He goes online but feels unfamiliar with most of its English based content. He finds WhatsApp very useful and uses it a lot to chat with friends, sometimes on matters related to learning. He spends his free time doing sports like football, hanging out with friends and social gatherings, and playing video games.

The 17 descriptions above were based on subjective but informed interpretations of interviewees’ responses and meta-communication during the interview. One obvious challenge was the difficulty in attaining information from interviewees who did not expand on their opinions. Hence, a majority of the interview sessions incorporated the interview schedule fully to attain just enough content for analysis. The length of transcripts widely varied between interviewees, as several interviewees were more articulate and extroverted than others. These personality impressions have been integrated into the thick descriptions above.

6.4. Coding the interviews

The purpose of the coding process was to extract themes and categories so the codes could in turn be used to interpret further findings. The coding process started with Holistic Coding, followed by an inductive First Cycle consisting of
Initial, In Vivo and Process Coding, and finally the deductive Second Cycle involving Pattern Coding. As the coding referred directly to pieces of data from the transcripts, the derivations and justification for these codings are accompanied with interview excerpts.

6.4.1. Holistic Coding

The coding process firstly involved the broad-brush strategy called Holistic Coding. It was employed during the interview, during the transcribing process and on initial readings of completed transcripts. This coding strategy inductively identified overarching themes that were noticeable and reiterated across several interviews. The themes that emerged were related to a new learning environment, the use of technology in life, and the role(s) of social agents.

I. Holistic code 1: The impact of moving to college (environment)

A majority of the interview sample were students new to the environment of technical vocational education. A majority of interviewees agreed to be interviewed in the evening after a school night. Most expressed post-secondary education as taxing and career-inspired, yet were resolute to complete their education as a second chance to enter employment. There was a sense of maturity from the learners atypical of secondary level students particularly when agreeing to be interviewed for half an hour by someone relatively unknown apart from being a Brunei teacher. Although not representative of the sample, those who agreed to be interviewed exhibited the willingness to cooperate and were perhaps aware of the positive impact that profiling learners can have on the education ecosystem, particularly when they have experienced failure once. The excitement of a student starting a new chapter in a new learning environment is one probable factor for their willingness to contribute to this research.
Ahmad associated the new learning environment with having ‘new friends, modern school and funny teachers’; Bahrin sees it as a new stepping stone to further education; Faisal cherishes the personal freedom and the free time it brings; and Danial believes it is aligned with his ambition and found his calling. These perceptions catalysed by being in a new environment were observable through meta-communicative indicators of excitement, as well as lengthier responses when talking about their new college life. It is interesting how a change of environment could affect a student’s personality and character as shared by learners when comparing themselves as learners in high school and college. This relationship is reflective of Bourdieu’s theory on how experiences, in this case new experiences, influence dispositions. This is perhaps transposable to online learning implementation because it can be surmised that being in a new online learning environment, particularly one that is in contrast of a previous non-effective environment, may possibly renew students’ motivation to learn as found by Liu et al. (2011), when they explored the positive impact of moving to a new media enriched environment on students’ learning motivation (pp. 260-261).

II. Holistic code 2: Technology in everyday life (technology)

One incidental observation from the interviews was the efficiencies of interviewees in connecting for the interview. All of the interviews were choppy and had latency issues but this did not faze the interviewees as they adjusted to the latency seemingly subconsciously. This became more interesting when several interviewees self-reflected/ suggested that they were not heavy users of technology. Contradictory to their self-assessment, 15 interviewees were observed to glance at their mobile phones at least once; the remaining two were using WhatsApp on their mobile phones as the interview was happening. Several interviewees also shared of ‘jail-broken’ phones implying a degree of sophistication in their use of smart-phone technology.
At times, the sound of alerts could be heard from their mobile phones. **Chuchu** became very animated when he spoke of his mobile phone and the tasks that he could do with it. Interviewees were also generally enthusiastic when prompted to verbally list out internet features and apps. Those who were not using their mobile phones for the interview were on laptops and tablets that they owned or borrowed from a family member. There was also a tendency to move around with the device being used and this again seemed natural for them. A majority when asked during the introduction phase confirmed they had a household wireless broadband connection. All the above indicated a degree of technology immersion in their daily lives. Whether this immersion transitions to their engagement with technology in learning is a different matter, and is one of several areas that I intended to explore through the interviews.

**III. Holistic code 3: The role of other people (social agents)**

Interviewees regularly mentioned parents, siblings and friends. Their mentioning of these other people, especially of friends, was accompanied with positive emotions observed during the interview (e.g. smiles, looks of excitement). **Danial** attributed his inclination towards anything military to his two soldier brothers. Faisal plays games because his brother is a semi-pro gamer and acknowledges the usefulness of e-mails because his father extensively uses them. In contrast, **Gina** was limited to learning in the school compound because her father controls her movements outside of school and with friends. ‘Teachers’ however evoked mixed reactions. In certain instances, the way they perceived their teachers suggested that teachers contribute to their learning dispositions.

Results from the Holistic Coding above on the **Learning Environment, Technology** and other people (**Social Agents**) provided me with information on what themes I would have to pay close attention to during my First Cycle coding.
6.4.2. First Cycle Coding: Inductively identifying codes and categories

The First Cycle involved a process of creating codes. As I went through each transcript, I gradually built a collection of coded pieces of speech ranging from single words to a few paragraphs. Each data piece, which I refer in this section as a data item, was tentatively coded into a growing list of themes. From this point onwards, my thesis will present codes in CAPITAL letters to differentiate them from the surrounding text; and data items will be presented in Boxes, to differentiate them from the Figures and Tables in this thesis. A large portion of these data items had grammatical and spelling errors, so it is important to note that these were minimally corrected without affecting the meaning expressed by the interviewees.

The First Cycle employed Initial Coding and In-Vivo Coding, which I performed concurrently. I also employed Process Coding, which involved the coding of gerunds, but generated few observations possibly due to the translated transcripts. In Malay, gerunds are not a common part of speech and ‘that’ verbs are ambiguous (Mohamed, Omar and Aziz, 2015, p. 13). I did not refer to any coding scheme, but rather to the impressions identified from the Holistic Coding and the data within the transcripts. The First Cycle was therefore a process of gradually building a list of codes through extracting any instances of data that represented dispositions and any of Bourdieu’s other concepts (i.e. field, doxa, hysteresis, and conatus).

With recurring patterns developing in the forms of codes, the eventual criteria for my coding included (1) opinions for or against an environment, other people, technology or dispositions, (2) examples and experiences of learning, (3) examples and experiences of using technology, and (4) examples and experiences of using technology for learning. These explored the different dispositions and behaviour a learner might exhibit in practice. Data items ranged from phrases to a short dialogue. Several data items represented multiple codes. The data item below is one example of an item coded as several data:
**Interviewer:** For your hobbies, do you have to read a lot? Research on the internet?

**Erawan:** No. Just learn from friends. See their modify. See their skill, and I ask them ‘hey, how you did that?’ and then they always share. Always share. Sharing is caring.

*Box 1. A data item contributing to several codes (Erawan)*

The transcript above about Erawan’s hobby (Tamiya Racing Cars) was coded as OL – GENERAL INTERNET; FRIENDS – PROS; and LEARNING – OBSERVE. Another example is the data item below, which was coded as TECH – MOBILE PHONE; LEARNING – VIDEO; LEARNING – GROUPWORK; and TEACHERS – PROS.

**Chuchu:** Thirdly, I can use the mobile phone for recording like video of project for group or example by the teacher on how to do it.

*Box 2. A data item contributing to several codes (Chuchu)*

After codifying 17 transcripts the first-cycle generated 65 types of codes. These early codes ranged from verbatim phrases to a short dialogue and were annotated in NVivo as nodes. These 65 codes accounted for 815 data items. The five highly referenced codes included:

- ONLINE LEARNING – PROS (50 items from 16 transcripts);
- TEACHERS – PROS (48 from 14 transcripts);
- MATERIAL – NOTES (40 from 12 transcripts);
- FRIENDS – PROS (35 from 14 transcripts) and
- TECH – MOBILE PHONE (33 from 15 transcripts).

A complete list of the codes with their number of references and number of sources is in Appendix G.
6.4.3. Mapping the First-Cycle codes

After completing the First Cycle and before moving into the Second Cycle, Saldana (2016) suggests several techniques to prepare for the coding of coding, one of which is code mapping. Code mapping according to Saldana is when a full set of codes is reorganised into a selected list of categories and eventually into a condensed list of themes (p. 218). In this regard, the Holistic Coding has already inferred three categorical themes, which were further reflected by codes from the First Cycle coding. When I performed code mapping on the First Cycle codes, I was able to identify two further categorical themes, viz. the Personal category and Learning category.

Firstly, the Personal category was identified through interviewees’ reflections of their own selves. The codes that converged under this theme were SELF-PERCEPTION (32 data items), TIME MANAGEMENT (5 data items) and SOCIALISING (5 data items). Several of these data items are listed in the Boxes 3 and 4 below:

| Amal: | I don’t like talking on the phone [laughter] I feel embarrassed talking to people. I think I’m a shy person. |
| Bakar: | Before this it was very difficult to cope. Because my “brain” (NB: mentality?) was too “old” (NB: inflexible?) to learn. It’s like it’s difficult to retain information. |
| Bakar: | I will feel embarrassed if I ask them (teachers) because that shows that I wasn’t paying attention. |
| Interviewer: | Do you find your age as the reason why you are not close with your classmates? |
| Bahrin: | No, no. Because everyone is cleverest than me and my friends. So maybe because my shame. Because I feel strange. They are good in class. I know they will be good with internet and learning online. |

Box 3. Data items on SELF-PERCEPTION (Amal, Bakar, Bahrin)
Diana: I like to study 2 hours a day at home. Usually after prayers I study some more. And before sleep I revise some important points.

Interviewer: Do you think you have enough free time to do your study?

Erawan: [laughter] No.

Interviewer: I mean personally. How do you organise your time for study?

Amirul: Mmm, I don’t know. Sometimes I study when I feel like it.

Box 4. Data items on TIME MANAGEMENT (Diana, Erawan, Amirul)

The second category that I inferred was Learning. This category of codes revolved around the topic of learning in general, learning online and learning materials. This category alone represented 28 codes. Collectively, the 65 codes that were generated from the first cycle were thematically categorised into:

I. Technology category,
II. Learning category,
III. Social agents category,
IV. Environment category,
V. Personal category.
In turn, these codes were also further categorised into sub-categories of similarly themed codes. Eventually, the code mapping produced the coding scheme as shown in Figure 35 below:

Fundamentally, these sub-categories highlighted data items from which patterns could be explored in the next cycle. These categories, like the OLP-28 factors, became indicators for comparing habitus types. In fact, the 5-categories is similar to the 6-factor model (see Table 18), with the exception that it was formulated from subjective analysis unlike the empirical 6-factor model.
Table 18. Comparison between OLP-28 Factors and OLPi coded categories

<table>
<thead>
<tr>
<th>6 Factors</th>
<th>5 categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2. Control of one’s learning process (autonomy and accountability).</td>
<td>Learning category.</td>
</tr>
<tr>
<td>F4. Dependence on external assistance to gain understanding. (researching)</td>
<td>Environment category.</td>
</tr>
<tr>
<td>F5. Internet dependence.</td>
<td>Technology category.</td>
</tr>
</tbody>
</table>

These categories allowed for the subjective investigation of latent themes through comparing between habitus and within habitus, an *a posteriori* approach not possible from the interviewer or interviewee’s standpoint during the interview itself. The next coding cycle employed both the 6-factor model and the 5-categories to further seek patterns in interviewees’ responses through **Pattern Coding**.

**6.4.4. Second Cycle Coding: Deductively comparing habitus types**

**Pattern Coding** according to Saldana (2016) is performed to develop ‘an emergent theme, configuration or explanation through using codes from the first cycle as components to develop meaningful and parsimonious units of analysis’ (p.236). One of the strategies involved in Pattern Coding was the juxtaposition of data items from interviews to infer similar or contrasting patterns. During Second Cycle coding, the codes identified earlier were further scrutinised to explore patterns of similarities and differences between habitus types, particularly within the framing of the 6 factors.
I. Technology category

The Technology category represents Factor 1 (Perceptive use of the internet) and Factor 4 (Internet dependence). Under the Technology category the interviewees mentioned various devices and applications that they use in general, with TECH-MOBILE PHONES being one of the most referenced codes (33 items from 15 transcripts). The opinion was unanimous across habitus types in that mobile phones are useful for general purposes, but the frequency and purpose of their use varied between habitus types. This reflects the OLP-28 data that found mobile phone ownership being 100%. However, when mobile phones were discussed in the context of learning, interviewees shared a more diverse account of use, or lack of use. The excerpts in Box 5 of Type A, C, D and F suggested several uses of mobile phones for learning.

**Interviewer:** Do you use mobile phones in your study?

**Ahmad:** Yes it’s very helpful.

(...) **Ahmad:** We cannot use them for games or chatting.

(...) **Ahmad:** We can bring mobiles to record practical. Because in practical you do many things. The teacher shows many things so now we can record. Not his face but his hands his actions.

**Diana:** It’s better I ask my friends online or just SMS them because sometimes they don’t have Wi-Fi signal and they don’t have 3G.

**Interviewer:** Do you study on your mobile phone then?

**Amal:** Yes I read some of my notes online. There is one online textbook that my teacher told us to read so we use that.

**Interviewer:** Do you email your notes to your mobile? Or you brought your mobile to school so you can save the notes?

**Chuchu:** No no no in secondary school students not allowed to bring phones.
Because of safety and copying problems maybe it gets stolen, or naughty students they copy from internet or chat with their friends. For me my mobile is jail-broken. So I use a special cable to save from pen drive to mobile.

**Interviewer:** How about for your studies? Do you use your mobile phone in your studies?

**Fakrul:** Recording practicals. And as emergency notebook. Also to find definition and explanation of terms and topics online. It’s easy and straightforward.

Box 5. Ahmad, Diana, Amal, Chuchu and Fakrul on mobile phone use in learning

**Type A, C, D and F use their mobile phones for learning, albeit for different purposes** including but not limited to its use for video recording, communicative platforms, data storage and transfer, note-taking and searching for online information. In contrast, **Type B, Ec and G do not use theirs for learning at all.** They were also very generic through their short replies (see Box 6). Even when queried further, as with Ghaffar, it further reinforced the assumption that the 3 latter types used mobile phones primarily for entertainment purposes.

**Interviewer:** Do you use your mobile to read or write notes? Do your teachers give you online notes to read?

**Bakar:** No never.

**Interviewer:** Do you ever use your mobile for learning? Like reading notes, recording a lesson?

**Erawan:** No.

[N.B: when alluding to using mobile phones for learning without explicitly asking]

**Interviewer:** What else do you use your mobile phone for?

**Ghaffar:** For chatting. For other games.

Box 6. Bakar, Erawan and Ghaffar on using mobile phones for learning
With regards to the 6-factor model, the difference between Type A, D, C, F, and Type B, E, G lies in Factor 1 where Type A, D, C, and F exhibit dispositions toward using mobile phones, in particular mobile apps and reading online notes. Type B, E, and G on the other hand have disinclinations for using mobile apps and online notes for learning.

Extending from the use of mobile phones for learning, the use of specific apps and software was also analysed from the perspective of the technology chosen and the learning process preferred. These were explored based on the analyses of data items categorised under Subcategory 6: online tools and Subcategory 10: online learning of the coding scheme. The first subcategory was concerned with applications and software such as Twitter, YouTube and Facebook. The second subcategory was more directly concerned with the process of learning online such as learning in online groups, watching online videos and reading notes online. From the codes on online learning, the code OL-FACEBOOK has the most data items with 32 references from 15 interviewees allowing for a comprehensive comparison of all habitus types. Box 7 below presents several data items on how Facebook is being used by different habitus types.

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**Amal:** I use my mobile phone for Facebook and WhatsApp. We have a class Facebook group so we post comments in there. Sometimes to do with our studies like notes and good videos, but most of the time it’s about gathering and CCA* activities!

* CCA = Cross-Curricular Activities

**Interviewer:** What do you like about Facebook? I mean what features of it do you like?

**Bakar:** I like videos, photos, and chatting.

**Interviewer:** Ok. You also mentioned Facebook. Are you on your Facebook a lot?

**Eddy:** Yes just chitchat and read ‘curhat’ (confessions)

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Interviewer: You are quite involved with community forums yeah?

Fakrul: Yes. I’m also admin to some Facebook pages, like buy and sell pages, comedy pages.

Diana: I Facetime with my friend in the Philippines. She’s half Filipino she was my classmate in secondary but she moved back to follow her mom. So I Facetime with her always. But sometimes the Facetime is lagging so we just private message.

Box 7. Amal, Bakar, Eddy, Fakrul and Diana using Facebook in different ways

The data items above show **Type A, B, D, E and F using Facebook, but usage varied in terms of the affordances Facebook offers**. I observed that these preferences are attributed to several of the 6-factors. For example, Type A indicates dispositions for using mobile apps and communicating with people (Factor 1). Amal’s statement on using mobile apps and further using them as communicative tools corroborated the assumptions of Factor 1. Type Fs are assumed to have strong dispositions across all 6 factors, which justifies why Fakrul contributes to Facebook activities involving communicating with others to the extent of maintaining a community; dispositions reflective of Factors 1 and Factors 3. Type Ds prefers watching videos and communicating with people, which reflects Diana’s use of Facebook’s video chat and private message features.

However, there were also cases that seemed to contradict the findings based on the 6-Factor model. Type B was assumed to have disinclinations towards watching videos and communicating with others. However, Bakar uses Facebook for videos and chatting, which are atypical of Type B. Similarly, Eddy has the tendency to communicate with Facebook users including strangers in Facebook and to read Facebook posts and comment on them. This is atypical of Type Es who are assumed to have disinclination towards mobile apps and communicating with people and reading online. The observations are not exclusive to one code. Under the code OL-WHATSAPP where the technology focus is on the WhatsApp app, there were also opinions when the interviewees’ statements contradict with their habitus profiles. Box 8 below presents data items from members of Type B and E who are assumed
to be not as keen in communicating with people. WhatsApp however seemed to override such disinclinations.

**Interviewer:** So do you Facetime with them or chat with them on Facebook?

**Bahrin:** Some on Facebook, but many more on WhatsApp. If we want to talk or send message we just WhatsApp.

**Interviewer:** Do you use your mobile phone to communicate?

**Emran:** WhatsApp and Facebook. Maybe chat but it is better I chat WhatsApp because it is easy we already have contacts and friends.

**Box 8. Bahrin and Emran on interviewees’ use of WhatsApp**

The pattern forming on OL-FACEBOOK and OL-WHATSAPP generated contradicting findings but only for Type B and E. These two types were also identified earlier as non-users of mobile phones for learning, suggesting that their use of Facebook and WhatsApp, unlike other habitus types, was primarily if not exclusively for social and non-academic purposes. Thus, despite the contradictory findings of Type B and E, **a majority of findings based on other technologies did conform to the 6-factor habitus model.** For example, on the more overarching code OL-APPS, habitus types that have positive dispositions towards mobile apps (Factor 1) shared opinions that reflect this profile as suggested by the data items in Box 9.

**Chuchu:** For mobile phones if there is one app for my subjects like welding game or pictures of different welding technique different welding type and patterns.

**Interviewer:** when do you use your mobile phone? In what situation?

**Diana:** For GPS map, for calling my mom and dad, taking photos, Instagram, Yassin and Al-Quran, finding Qiblat, WhatsApp, calculator...

**Interviewer:** Are there any particular apps that you like? Maybe educational apps?

**Faisal:** I like streaming apps like Mobdro. I get to watch channels that we cannot get
Based on the analyses of the Technology category, several patterns have been identified. Except for the atypical patterns exhibited by Type B and E, the other types conformed to the assumptions of the 6-factor model. The patterns are as follows:

i. Mobile phones are used across habitus types but with varying degrees.

ii. Type A, C, D and F use mobile phones for learning.
   a. Type A – Recording videos, Online notes.
   b. Type C – Communication.
   c. Type D – Online notes, data storage and transfer.
   d. Type F – Recording practical, online notes, searching information.

iii. Type B, Ec and G do not appear to use mobile phones for learning.

iv. Type A, B, D, E and F use social network apps but with varying degrees.
   a. Type A – Communication for social and learning purposes.
   b. Type B – Video and chatting for entertainment only.
   c. Type D – Video and text communication.
   d. Type E – Communication for social purposes only.
   e. Type F – Communication and community of inquiry purposes.

v. Type C, D, F have potential to use mobile for learning.
   a. Type C – Multi-formatted information for learning.
   b. Type D – Multifaceted use of apps for diverse purposes.
   c. Type F – Video streaming.

II. Learning category

The Learning category represents Factor 2 (Control of one’s learning process). It consists of data items on learning in general, learning materials, and online learning. Due to the expansiveness of this category, only selected findings that
were deemed to be substantial in adding context-rich data to the habitus profiles are presented here.

On learning in general, codes that were highly referenced include LEARNING-GROUPWORK and LEARNING-READING. The former is itself related to OL-GROUPS as both represent group activities, albeit in the classroom and online environments respectively. The OLP-28 was similarly explicit with this distinction, where there was an item on working in online groups and another item on group work in general. Logically these two items would be interchangeable. However, the OLP-28 factor analysis found that they were not, with the first item contributing to Factor 1 (perceptive use of internet) and the second item contributing to Factor 3 (dependence on negotiating understanding with others). The data items in Box 10 below are examples of opinions on group work in general.

**Interviewer:** Do you like doing group work?

**Amal:** Yes. It’s easier to do work in groups. And it’s competitive also. We always want our group to win because the teacher gives us presents. Those who wins the best I mean.

**Chuchu:** I like group work because we can learn from each other and the group can have different parts, different jobs. Like one can learn to be a leader, one can learn to design. When in group work I can also make, we can also make bigger project than before.

**Interviewer:** How did you do the group project? Did you have group study, or did you meet online?

**Emran:** Many group study in school and after school.

**Interviewer:** Do you like doing group work?

**Fadillah:** Yes. It’s easy to make work. Faster and good answers.

*Box 10. Amal, Chuchu, Emran and Fadillah on group-work in learning*
The comments above by Emran and Fadillah on how they participate in group-work conform to the assumption that *Type E and F have a positive disposition for group work* (Factor 3).

However, Amal and Chuchu also expressed preferences for group work despite the assumption that Type A and C do not prefer group work. Type A and C are also assumed to find it easier to communicate with people (Factor 4), which may explain why their aversions toward group work has been overridden by a stronger disposition towards negotiating understanding with others. Chuchu for example emphasised on the ‘learning from others’ aspect of group-work, while the competitive aspect of group work may have influenced Amal to embrace group work. In addition to this, both Type A and C are assumed to have disposition for online group work as prescribed by their agreement with Factor 1.

Another highly referenced code is LEARNING-READING which concerns with reading habits and preferences of interviewees. Their opinions are presented in Box 11 below:

**Ahmad:** We study like normal of course. We read and read and read. Many notes to read and so confusing and also make me sleepy.

**Chuchu:** Any books. I like to read books to improve my English. I read Harry Potter and Marvel books. I like car magazines and car books. Also on war like World War II and tanks.

**Interviewer:** Oh so you read novels? English novels or Malay novels?

**Diana:** Malay novels. I only buy Malay novels like ‘Adam Interviewer: Hawa’ (Adam Interviewer: Eve), ‘Miss Pisau Cukur’ (Miss Gold digger), ‘Suamiku Paling Sweet’ (My Husband is the Sweetest).

(...) I only read magazines, English magazines but only the ones I find at home.
Interviewer: What kind of books do you read?

Emran: Textbooks. Sometimes magazines.

Interviewer: Are the magazines related to your studies?

Emran: No not related.

Interviewer: So, do you like reading books?

Erawan: No. I want to read. I want but difficult. Maybe comic.

Interviewer: Which way would you prefer? Learning on the computer or learning from notes and books?

Faisal: Both. Both is important.

Interviewer: How about reading, do you read from notes, from books, from the internet for example?

Fadillah: Some from photocopies, some from textbooks, sometimes internet also.

Interviewer: You can translate websites to Malay. There is a feature.

Ghaffar: Yes but I cannot concentrate when reading online. I’m not used to reading long texts.

From the accounts above, the choice of reading materials is influenced by one’s English fluency. Assuming that the ‘reading’ emphasised here is the skill itself regardless of language, **Type C, E, F and Fb prefer to read notes and textbooks for learning purposes**, as represented by Chuchu, Emran, Faisal and Fadillah. Apart from Emran of Type E, the accounts of others are reflective of their dispositions towards Factor 1, which includes tendencies for reading books and printing online notes. The atypical observation on Emran might be explainable based on his reading limited to only textbooks and his other reading materials were non-academic magazines. Of the four types, Faisal of **Type F exhibited the most versatility by relying on both physical notes and online notes**.
To a lesser extent, Ahmad, Erawan and Ghaffar of Type A, Ec and G, have the drive to read for learning but are hindered by challenges. Ahmad is determined to read despite not taking pleasure from it. Erawan is also determined but has no interest in the way the reading is presented unless accompanied with pictures (e.g. comic format). Ghaffar has an aversion towards lengthy texts.

Diana of Type D is an avid reader regardless of her language of choice. As established by the OLP-28, Type Ds are assumed to have dispositions toward reading. Although Diana didn’t explicitly mention her reading for learning habit, in her interview she mentioned her use of ‘dictionaries’ and learning from ‘English translation from movie closed captions’ as helpful for her acquisition of the English language. These allude to her active reading skills. Based on the analyses of the Learning category, I interpreted several patterns as follows:

i. Type E and F have dispositions toward group work.
   a. Type E – Group work in school and after school.
   b. Type F – Group work made task easier and faster to complete.

ii. Type A and C can be involved in group-work provided it allows for negotiation of understanding with others.
    a. Type A – Group work makes it easier and competitive.
    b. Type C – Group work allows learning from others.

iii. Type C, E, F and Fb read notes and textbooks for learning purposes.
    a. Type C – Any type of reading material.
    b. Type E – Textbooks only.
    c. Type F – Capable of learning from both physical and online notes.
    d. Type Fb – Reads from multiple formats.

iv. Type A, Ec and G want to read
    a. Type A – Reading is laborious.
    b. Type Ec – Accompanying pictures help to add context with reading.
    c. Type G – Aversion towards lengthy texts.

v. Type D are avid readers.
III. Social Agent category

The Social Agent category represents Factor 3 (dependence on negotiating understanding with others). It consists of 133 data items. Family members were the least mentioned (13 items), while friends (41) and teachers (59) were mentioned repetitively.

In general, comments on friends and teachers were mainly positive. On FRIENDS, 16 interviewees found friends important except for Bakar who said ‘he is studying better because he has fewer friends and only works with 2-3 friends’. This is similar to how another Type B learner regards friendship being a group of selected friends, as conveyed in his opinion in Box 12 below:

**Interviewer:** Do you talk with your teachers or classmates online on the internet?

**Bahrin:** No. Teacher no. Friends only my crew, my best friends.

*Box 12. Bahrin on the topic of 'friends'*

In contrast, other habitus types did not put emphasis on having a selected group of friends and were content with having ‘new friends’, ‘class friends’, ‘seniors’ and ‘friends from different schools’. They instead expressed positive opinions about being with friends as exemplified by their opinions presented in Box 13 below:

**Interviewer:** How is your college study so far? Is it fun? Is it difficult?

**Ahmad:** Fun yes. A lot of new friends. And my best friend with me also. I like it.

**Interviewer:** Do you always ask your teachers for help?

**Danial:** Sometimes. If no teachers just ask class friends who are clever. Or seniors.

**Interviewer:** How do you know what to look for?
**Emran:** Sometimes friends. Sometimes seniors. Sometimes just search online.

**Interviewer:** How about in Facebook, do you chat in Facebook as well? Maybe about school?

**Ghaffar:** Yes in Facebook. But usually with friends from different schools.

**Interviewer:** You mean your friends from former school?

**Ghaffar:** Yes that too.

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**Box 13. Excerpts on different types of friends (Ahmad, Danial, Emran, Ghaffar)**

These responses from Type A, D, E and G, are different from Type B. **Type A, D, E and G are more open to working with others beyond their immediate social circle,** while Type B is more selective with whom they communicate and interact with. Perhaps it is because as established by OLP-28, **Type B is not so keen on ‘communicating with people’** (Factor 3: negotiating understanding with others).

With regards to TEACHERS, negative comments were either on not having access to a teacher when needed, or having a teacher that is not as helpful. For example, **Diana and Erawan of Type D and Ec suggest a disposition towards having teachers available for consultations** (Factor 3: negotiating understanding with others). Boxes 14 and 15 below are their comments on their attitudes towards teacher consultations:

**Interviewer:** How about talking with your classmates now, or your teachers? Do you speak with them outside of school, maybe online?

**Diana:** Not always. Sometimes we WhatsApp. Some teachers we have their WhatsApp so we can talk to them but I don’t disturb them because they may be busy with family, or with work, or maybe it’s not appropriate. I try not to disturb them unless it’s emergency.

(...)
**Interviewer:** Do you think if you have that [discussion forum] online, do you think you will learn better from that alone, or do you think you like going to school better? Or how about a mix of both?

**Diana:** I think a mix of both because we have to ask teachers directly about some information.

**Interviewer:** Maybe you can ask in the online space?

**Diana:** Yes I can but teachers are not always there. They are busy with family, with their work, so it’s better to ask them in school.

*Box 14. Diana on teachers’ presence*

**Interviewer:** Do you think you will learn better at home using the internet?

**Erawan:** I don’t think so.

**Interviewer:** Why?

**Erawan:** Because there is no friends no teachers. No discussion.

*Box 15. Erawan on teachers' presence*

The excerpt above exemplified the importance of teachers’ presence for those who have dispositions towards teacher consultations. Other interviewees found their teachers’ approach to be ineffective. As presented in Box 16, Ghaffar expressed a disinclination of his teachers’ lecture-style approach and suggested instead the use of engaging classroom activities. **Type G is assumed to be less inclined towards teacher consultations** (Factor 3: negotiating understanding with others) and is reflected in the accounts of Type G members.

**Interviewer:** I mean of your studies. How do you study now?

**Ghaffar:** The same way like secondary school. The teacher talks in front and we do class work.
**Interviewer**: Do you like studying that way?

**Ghaffar**: No not really.

**Interviewer**: How do you like to study?

**Ghaffar**: Class discussion. Quiz. Games.

*Box 16. Ghaffar on teachers’ teaching approach*

The disinclination to lecture-style teaching is shared by fellow Type G member Gina who also argued that engaging classroom activities are better (see Box 17).

**Interviewer**: I think Librarianship is an interesting field, I’m certain there is a few. Why not I do a quick check (checks YouTube). Not that many, and the ones available you might not be interested in. It’s a person talking for 20 minutes about librarianship on video. Do you think that’s something you will watch?

**Gina**: No I don’t think so.

**Interviewer**: Why would you not?

**Gina**: 20 minutes talking is too long. Even 5 minutes is too long [laughter]

**Interviewer**: How about in school? Do your teachers spend a lot of class time explaining?

**Gina**: Yes.

**Interviewer**: What other ways other than talking would you think the teachers can do to make you learn better?

**Gina**: A lot of quizzes.

*Box 17. Gina on teachers’ teaching approach and consult time*

Based on the analyses of the Social Agent category, I interpreted several patterns as follows:
i. Type A, D, E, G are more open to work with other people.
   a. Type A – Working with many people is enjoyable.
   b. Type D – Able to interact with different social agents.
   c. Type E – Able to interact with different social agents and online.
   d. Type G – Able to circumnavigate spatial distances to communicate.

ii. Type B prefers working with immediate friends only.

iii. Type D and Ec are more dependent on teacher consultation than others.

iv. Type G is less inclined towards teachers consultations.

**IV. Environment category**

The Environment category represents Factor 4 (dependence on external assistance to gain understanding). This category was further subcategorised into ‘school’ and ‘internet space’. On the school environment, a few interviewees expressed their dispositions towards learning in school as opposed to learning online (see Box 18).

**Ahmad:** But it’s not easy to learn from videos because they only show one angle and I must go to the teacher to ask if it is the same tool or machine and is it the same technique. So I prefer watching in the classroom or in the workshop. The videos on YouTube are okay but in the workshop it’s better.

**Interviewer:** Do you use the internet to study at home?

**Eddy:** Yes I use internet for study but do other things also like read Facebook. Check cool websites, 9gag, Brunei memes. So better not online because too fun. If study only at school. Library or canteen or classroom then our brain will be like that (gestures focus).

**Interviewer:** How is class in school? Do you get distracted easily like you do at home?

**Eddy:** No. Just sleepy and do drawing on paper.

*Box 18. Ahmad and Eddy on learning in school vs. learning online*
Ahmad justified why observing in the classroom was more effective than watching videos because observing to Ahmad provides more information. This preference is in line with Type A’s dispositions towards learning from observing others represented by Factor 4. With regards to online learning, a system with observable learning processes can be interpreted as an affordance to consider for Type A. Unless the online system provides avenues through which learners can informatively observe others, it can be inferred that Type A will prefer classroom observation in classrooms compared to online representations.

Eddy of Type E also prefers the school environment (including classroom and library) compared to the online environment, but for different reasons than Ahmad’s. Eddy found that the online environment has more distractions compared to the school environment. However, Eddy did not disregard the usefulness of the internet in his studies either, more so when he alluded to using several parts of the school environment and the seemingly unstimulating time he has when studying in school. Unlike Type A, Type E is seemingly selective of their learning environment with avoiding distractions being a key factor.

The subcategory ‘internet space’ also suggested an interesting finding. A majority of opinions under this subcategory are better represented in the subcategory ‘online learning’, but one aspect of using the internet space that stood out was on the truthfulness of its information. Box 19 below presents three data items on the truthfulness of information.

**Chuchu:** We seen one. In video. It happened but not sure if the video is true. Some videos are not true like especially war videos.

**Interviewer:** What do you mean?

**Chuchu:** We must check if the information is true before saying it is true. In Facebook group many videos especially about Brunei is not true. They just want to make us angry. They are trollers. There was one video from Australia news, about Brunei which is not true but some people accept it’s true. There is also fake news like no drivers licence for people 18 years old, fake news about ghosts, about robbers using magic. So we have to use our brain to think, is this news real or fake? Like
Myth busters. We have to bust the myths.

Interviewer: So if I say that you are careful with information on the internet would you agree?

Chuchu: Yes of course 100%. We have to be careful and watch out for fake things on the internet. When we shop online we must make sure the thing is real and the seller is not a scammer. If you read Brunei FM Facebook page you read people complain about scammers. Many scammers now exist because it’s hard to find jobs.

Interviewer: So if I say that you are careful with information on the internet would you agree?

Chuchu: Yes of course 100%. We have to be careful and watch out for fake things on the internet. When we shop online we must make sure the thing is real and the seller is not a scammer. If you read Brunei FM Facebook page you read people complain about scammers. Many scammers now exist because it’s hard to find jobs.

Interviewer: Do you follow other news?

Danial: Yes. From Brunei Times, Borneo Bulletin, CNN, Al-Jazeera. Facebook also have news like video news but some not true like pictures.

Interviewer: Yes not many people would take news from Facebook.

Danial: But many people do. From Facebook.

Interviewer: Can you think of any danger of getting answers from the internet?

Emran: Yes I can think virus is dangerous. So we must install a strong anti-virus software.

Interviewer: I mean would the answers be correct?

Emran: The teacher will tell me if not.

Box 19. Chuchu, Danial and Emran on the truthfulness of online information

Chuchu and Danial both showed awareness about the truthfulness of information. Chuchu in particular had a lot of opinion on the issue. Both Type C and Type D scored high in Factor 1 (perceptive use of internet), which among others included the disposition of being careful with information from the internet. These opinions supports the assumption that Type C and D are aware of the truthfulness of online information.

In contrast, Emran was ambivalent about this topic, at first not comprehending the issue, and on the second time around expressed his reliance on the teacher’s intuition rather than his own to assess the truthfulness of information. Type E has less awareness of the truthfulness of online information, which corroborates their
low scores for Factor 1 (perceptive use of internet). Seemingly related to this is the earlier assumption that Type E are more predisposed towards consulting teachers as suggested in the analyses of the previous category (Social Agent category).

Based on the analyses of the Environment category, I interpreted several patterns as follows:

i. Type A will prefer classroom observations compared to online presentations.

ii. Type E is selective of their learning environment; whichever promotes their learning at the time.

iii. Type C and D are most aware of the truthfulness of information.

iv. Type E is least aware of the truthfulness of information.

**V. Personal category**

The Personal category represents Factor 6 (Wants and Indulgences), which revolves around learners’ expectations and anticipation of an online learning system. This category is unusual compared to the others, because the codes are predominantly represented by responses to the final question of the semi-structured interview. Compared to the other categories, which were derived from subjective but informed interpretations, the responses for this category directly describe and list interviewees’ technology and pedagogical preferences of an online learning system.

The interviews revealed that there is an almost unanimous pattern on the preferences for synchronous and asynchronous text-based discussion platforms referred to as ‘chat-rooms’, ‘discussion forums’ and ‘post-comments’ even for those whose habitus types are less inclined towards communicating with others. Another preference that is almost universal is the use of videos, either video tutorials or a video of the teacher presenting. Thus, it can be assumed at this juncture that the use of text-based communication platforms and recorded videos
are appropriate for the habitus types highlighted in this analysis. However, there are observably significant characteristics that differentiate one habitus type from another; as elaborated by the data items below:

**Ahmad**: The teacher must be there [laughter]. Like in school the teacher is always there so we can ask. We are not experts. Maybe a button to tell the teacher that we need help.

**Ahmad**: Chat-room will be good. So students can chat. Talk about what the classwork is. Videos on tutorials, videos with students presenting.

**Ahmad**: I think I will learn better online but I like notes on paper because I can bring them everywhere.

**Amirul**: It will be very easy. There is a teacher in the computer!

**Amirul**: Strong internet so we can use mobile phones to learn. In the car, in the restaurant. At home.

**Amirul**: We can communicate using chat, like Facetime or Facebook Messenger. Communicate like in the classroom but instead of talking we chat and use emojis or pictures or sketch.

**Amal**: It should have a place to tell us about extra information and where to find extra information. The teacher should ask questions in there, provide classwork and homework, talk about the class in school, talk about the class the next day. Maybe a place where we can post or share our videos and photos like Facebook. So we can share our work.

**Amal**: I prefer learning through reading Wikipedia and google answers. I don’t know. I think maybe I don’t like learning from watching videos but I like to watch videos that are not about learning? Maybe I get distracted or maybe I get bored listening, watching videos. Because when I read my notes it’s easier to understand because my teacher always give notes in bullet forms and PowerPoint slides?

**Box 20. Type A’s preferences for online learning**

In Box 20, members of Type A are unanimous on the usefulness of videos and chat features. However, what sets Type A apart from other habitus types is their emphasis on ‘teacher presence’. For Type A, teacher assistance is vital for their learning progress. There are other traits mentioned such as the usefulness of
mobility, and the use of emojis, sketches and pictures for communication as implied by Amirul but not mentioned by other Type A interviewees.

In contrast, the responses from Type B are less detailed and assured (Box 21). However, it can be inferred that Type B finds social presence significant. Even when the two members are of different disciplines, Bahrin explicitly suggested having social presence in the form of his personal photo, contacts, and favourites akin to social networking sites. Bakar is less explicit and more discipline-driven in that his social presence is a personal portfolio of the recipes that he made.

Box 21. Type B’s preferences for online learning

Bahrin: Ok ok I think maybe like have my bio-data. Like my photo, my contact, my favourites.

Bahrain: A chat-room for people in class to talk inside about the study. (...) Maybe classwork notes, just simple notes. Not hard notes so don’t have to ask teachers online.

Bahrain: ...no video better. Because video will lagging and makes the website crash

Box 22 shows how Chuchu from Type C has more opinions on his preferences for online learning systems than Catrina. Nonetheless, one feature that both members shared is preference for interactivity as alluded by Chuchu’s preferences for multiplayer games, students working together to create, interactive videos that allow zooming and angle selection and quizzes; while Catrina albeit less defined suggested the idea of an interactive game-like interface befitting her Interior
Design course. Regardless of the difference in discipline, both members prefer interactivity.

**Chuchu:** A teacher avatar that I can ask questions and the teacher answers. Games. Not only simple games, but multiplayer games like the students work together to build something or create something. And test it on the track or make it real.

**Chuchu:** Videos of course. Videos that I can zoom in to see details. I spin the angle like turn it around to have different views. Mmm what else. Quizzes about the right tools. Chatting place to talk about school or just hang out. I think the most important is the chat place so people can ask questions and have discussions about classwork or homework or project.

**Catrina:** It should be a modern website, maybe interactive and like a game? Where me and my friends can meet together and design. Yes maybe the best website design is it has a house, with many rooms? Do you know Disney Infinity game?

---

**Box 22. Type C’s preferences for online learning**

Type D members as presented in Box 23 suggested features that are echoed by other habitus types such as discussion forums and chat-rooms. Diana and Danial however touched on the ‘type of notes’ more specifically than others. Diana prefers short texts, pictures and diagrams, and lists akin to a glossary and definition of terms. Danial prefers notes set for different days of the study week.

**Diana:** I prefer short descriptions, not too many words. Pictures and diagrams to describe are better. A lot of quizzes and activities. A list of pharmacy words and their meanings. A list of medicines that you can click or search like Google. And a discussion forum (...) but for the class to talk about school, about meeting, about projects and work, about tests and hangout and extra class and ECA (extra-curricular activities).

**Danial:** A calendar to tell me what to study in what day. A time table. Notes for different days or videos recording the teachers talking like talking on a class. Test, maybe multiple choice or chatting with teachers and we answer. In chatting, chatting with friends maybe. Like group work group chat.

---

**Box 23. Type D’s preferences for online learning**
Of all the habitus types, Type E (and Eco) is least opinionated (Box 24). Erawan had less substantial opinion on what makes a good online learning experience for him, while Eddy was also less certain of what he prefers apart from possibly games and puzzles. Emran shared his opinions on using videos and online downloadable notes.

**Emran:** I like video like YouTube or SnapChat. Maybe chat but it is better I chat WhatsApp because it is easy we already have contacts and friends.

**Emran:** Notes I prefer my read on screen. Save in mobile, in memory card. So can bring anywhere. Like vacation, in the car, in ‘jemputan’ (attending a wedding). When no online then I can read. I can read still.

**Eddy:** Maybe a book where I can type my work in [long pause] I don’t know.

**Eddy:** Games and puzzle. Because games is interesting. Puzzle is like make you think and learn.

**Interviewer:** In online learning, the teachers and friends will be in the mmm, space as well. In the internet space. Everyone will be in it. There will be discussions but maybe chatting or web chat. What do you think?

**Erawan:** I think ok, this is good.

**Interviewer:** Do you think you will take part? Actively take part in the discussion?

**Erawan:** Mmm maybe. If have my friends.

*Box 24. Type E’s preferences for online learning*

Members of Type F emphasised on communicative features, notably chat-rooms, posts and comments, blogs, video chats and video broadcasts (Box 25). Faisal also highlighted note sharing and group study while Fakrul mentioned blogs, all of which are related to communication with others. In the absence of any significant traits, it can be surmised based on the diverse suggestions of communicative features, Type F has preferences for communicative tools and tasks.
**Box 25. Type F’s preferences for online learning**

As presented in Box 26, Type G echoed the opinions of other habitus types in that chat-rooms and videos are significant. Ghaffar has more specific preferences but Gina did not reiterate these opinions in her response. Based on their expectations of online learning systems, Type G has voiced no significant preferences unique to their type.
Gina: Maybe videos. And chatting so that I can talk with the teachers and friends.

Ghaffar: I think a place for discussion with friends. Like for group work. A place to chat and share notes or files, like photos and Microsoft word.

Ghaffar: Maybe tutorials on videos, video tutorials.

Box 26. Type G’s preferences for online learning

The analysis of the Technology category established significant dispositions for certain habitus types. For example, Type A emphasised teachers’ assistance, Type B on social presence, Type C on interactivity, Type D on the types of notes, and Type F on the diversity of communicative features. However, Type G did not exhibit any emphasised dispositions, while Type E is unaware of their own online learning dispositions. Perhaps, not every habitus type requires a unique trait that distinguishes it from others. Perhaps type E and G have not reached the sample saturation required to manifest what makes them different. In any case, this discussion will be carried into Chapter 7, where the theory of habitus types will be contextually discussed.

This section began by comparing members of the same habitus to establish if indeed they share similar dispositions within them, whilst being different from other habitus types. The derived patterns indicated that habitus are likely different from each other. The next section shifts the investigation into within habitus types, with analysis on whether members of the same habitus types share the same dispositions, or otherwise.

6.4.5. Comparing members of the same habitus

The second process of Pattern Coding was employed in comparing members within the same habitus, particularly in investigating patterns of similarities in dispositions. The previous analysis for patterns conducted in the previous section
compared habitus types against each other and through this arose fortuitous findings on how members from the same habitus are similar to each other. Several of these fortuitous findings included assumptions that:

i. Type B prefer working within their immediate friends.

ii. Type G are less inclined toward teacher consultations.

iii. Type G has dispositions towards engaging classroom activities.

In addition to these findings, the analyses of data items under the Personal category also suggested a significant similarity shared by members of the same habitus not witnessed in other habitus types. In light of the suggestive qualitative evidence already presented, this section is thus dedicated to the final subjective profiling of the habitus types based on 1) findings from the preceding analysis, and 2) a final analysis comparing members of the same habitus type.

**I. Type A - Ahmad, Amirul and Amal**

Based on the analyses in the previous section, Type A members were found to emphasise teachers’ presence and assistance throughout their learning (see Box J.1, Appendix J). They find learning, particularly reading notes, as laborious but they tend to persevere in spite of these challenges such as printing notes and summaries for revision (Box J.3, Appendix J). In terms of collaborative learning, they enjoy working with others in group-work and are driven by the benefit of learning from others (Box J.2, Appendix J). They use technology for learning in the forms of recording videos, reading online notes, and communicating with peers (Box J.4, Appendix J).

Ahmad, Amirul and Amal were found to practice the search for information online. However, as with their other learning activities, they expressed difficulties in finding the right information due to distraction and confusion involved with the load of online information (Box J.5, Appendix J) but still persevere to reach a desired outcome.
The findings above are all assumed behaviours and dispositions of Type A learners. In essence, they are learners with potentially limited information literacies but are resilient, hardworking and search for technologies or processes that make their learning effective. These traits identify them as conscientious and industrious individuals, which Hakimi, Hejazi and Lavasani (2011) define as learners who are “determined and resolved to gain high academic attainments” (p. 843). Hence, this habitus type has been given the name ‘Industrious Learners’.

II. Type B - Bakar and Bahrin

Based on the analyses in the previous section, Type B members were found to emphasise social presence with its bite-size and step-by-step conduits of information. In terms of collaborative learning, they are not inclined to group work and keep within a small network of immediate friends (see Box J.6, Appendix J). They are less inclined to learn through mobile devices as they use technologies and apps mainly for social and entertainment purposes (see Box J.7, Appendix J). They are however receptive to videos of short duration and this may be a possible medium for effective online learning.

These limited findings above arguably imply that the investigation on Type B may not have reached saturation point. It is assumed at this point that Type B learners tend to keep manageable fragments to avoid complications, such as a manageable network of immediate friends, the consumption of information in small chunks ranging from the length of videos to the staggered instructions in performing tasks. In addition, the learners’ use of mobile phones primarily for social purposes may be linked to their inclination for fragmented information. Fragmentary learning has been recently associated with mobile learning to leverage users’ fragmented engagement with mobile devices (Gaved et al., 2013; Chan, 2014). This term is thus adapted and applied to the traits above, identifying Type B as ‘Fragmentary Learners’.
III. Type C - Chuchu and Catrina

Based on the analyses in the previous section, Type C members were found to emphasise interactivity when engaging with the learning materials and learning process. Gamifying the learning process was mentioned as beneficial through multiplayer collaborative learning and improving cognitive focus (see Box J.9, Appendix J). They are receptive of various formats of notes such as texts, videos and other multimedia (see Box J.10, Appendix J), but the more interactive the format the more they are inclined to make use of them creatively as they already use technologies in interactive ways (see Boxes J.11 and J.12, Appendix J). In terms of collaborative learning, they are receptive to group-work for collaboration and in tandem use mobile devices and apps for communicative purposes (see Box J.12, Appendix J). They are aware of the truthfulness of information as they are prone to meticulously engage with the material in innovative ways.

The traits above suggest that Type C learners tend to approach their learning innovatively based on their expectations of interactive processes that would allow them to engage with multiple formats and technologies. Inspired by McCarthy’s (1990) interpretation of ‘innovativeness’ in her 4MAT learning system where innovative learners effectively learn through brainstorming and content integration activities, Type C learners are given the name ‘Innovators’; a slight differentiation from McCarthy’s ‘innovative learners’.

IV. Type D - Diana and Danial

Based on the analyses in the previous section, Type D members were found to emphasise the use of notes that are most convenient and easiest to comprehend (see Boxes J.14 and J.15, Appendix J). They partake in clearly defined activities and use technology that they believe will benefit them in making the learning process easier. This includes taking part in collaborative learning to lighten the workload, the dependence on teachers’ assistance to circumnavigate the demands of independent learning (see Box J.16, Appendix J), the use of various mobile and
online technologies to benefit from the many functions that it provides (see Box J.17, Appendix J) such as for communication and the handling of online notes and the engagement with information through drill-based activities (see Box J.19, Appendix J). They have the tendency to follow a schedule to ensure their direct engagement remains routine (see Box J. 18, Appendix J).

The traits above suggest Type D learners prefer direct pathways to effective learning. There is no inclination to explore other approaches and a risk aversion mechanism is to consult experts (teachers) or use technology that autonomises their learning. A conceptualisation echoing these traits is the Lazy User from Tétard and Collan’s Lazy User Theory (2009), but for the habitus nomenclature the name has been revised to ‘Direct Learners’, which portrays a more objective view of Type D learners.

V. Type E - Emran, Eddy and Erawan

Based on the analyses in the previous section, Type E members are possibly unaware of what they expect from learning online. Their preferences are made known to them by means of a trial-and-error approach, the only challenge being the low inclination to try new processes technologies and processes as they selectively judge before attempting. They prefer pictures to accompany their reading. They are hesitant to venture beyond the prescribed learning materials such as textbooks (see Box J.20, Appendix J). They are hesitant of using technology for learning (see Box J.21, Appendix J). They do search for information from others, in notes and online but their approach is arbitrary (see Box J.22, Appendix J). In terms of collaborative learning, they are able to be involved in group-work but are likely a passenger to the activity. They are dependent on the teacher to prescribe how they need to learn.

The traits above suggest that Type E learners are those who do not commit to understanding the effective ways in which they learn. It can be assumed that they
are sceptical of either their own abilities, the benefits of certain technology or learning approach, or both. They are in a continuous loop of selecting compatible ways to learn but are unable to reach that conclusion due to being comfortable with the selective learning demands associated in childhood (Bahtiyar, 2013). The lack of observably significant traits may indicate Type E as an intermediary habitus towards habitus that allow for higher order thinking skills. Only when they escape the continuous loop will they select and shift towards a different habitus. Type E is thus assumed to be a temporary niche, and this learner type is named “Selective Learners”.

**VI. Type F - Faisal and Fakrul**

Based on the analyses in the previous section, Type F members are found to be agile learners and use various means of communication on-site and online (see Box J. 23, Appendix J). They are able to optimally use/learn to use a diverse range of technology as they tend to interact with the technology or those who know how to use them (see Boxes J. 24, J. 26 and J. 27, Appendix J). In terms of collaborative learning, they can be active participants or passive observers when necessary. They are able to partake and even lead a community of inquiry (see Boxes J. 25 and J. 28, Appendix J). They are able to engage both traditional and online learning materials. This research assumed that Type F members are already adept in traditional learning to the extent that they are able to adapt and modify these skills and apply them onto online learning.

The traits above suggest that Type F learners are independent learners who can function based on andragogical and even heutagogical approaches. They are aware of their own preferences whilst at the same time are open to new pathways to learning provided they learn from the process. With this awareness, when scaffolded they have an informed understanding on how to reach their Zone of Proximal Development (Vygotsky, 1980). Related to this is the work of Neary (2010) who discussed on the theory of Student as Producer whereby learners are
scaffolded, through open-ended learning processes, to reach a state of being able to produce their own integrated meaning or even new knowledge. Neary (2010) briefly mentioned the avant-garde aspect of teachers and students given the autonomy and heutagogy of their own learning, but he did not conceptualise the term in-depth. This learner type is thus called “Avant-Garde Learners” based on the connotations that these learners are adept in producing information; a skill-set situated on the highest rung of information and digital literacy frameworks.

VII. Type G - Gina and Ghaffar

Based on the analyses in the previous section, Type G members have no significant emphasis on how they learn other than an aversion to over-lengthy texts (see Box J. 29, Appendix J) and being put under the spotlight to interact with the teacher. They are to a certain degree able to adapt and position themselves to use technologies (see Box J.30, Appendix J) and engage in learning tasks, but it is a gradual and self-paced process filled with uncertainties and not seeking outside help to alleviate these uncertainties.

In addition to the traits above, Gina and Ghaffar when responding to the final interview question on their ideal online learning system, expressed preferences for the use of videos, chat-rooms, group work, note sharing, photos and collaborative writing. However, none of these preferences were indicated prior to the final interview question. In fact, most of these elements were conflicting with their opinions throughout the interview. Type G learners have one perspective on the dispositions that they exhibit, and another perspective on dispositions that they believe would optimise learning effectiveness. Their response indicated a willingness to move from their comfort zone if given the right conditions. In their natural state, Type G learners are introverted and restrained learners, but given the right technology or learning process, they develop a temporary preference as a mechanism to allow them to benefit from the technology or learning process. This habitus type is named “synergic learners” because they are able to learn in their
naturally introverted state, but they have the potential to learn better when synergised with the technology or process that they perceive as effective.

6.5. Triangulation of responses on the 6 factors

An added confirmatory mechanism included in the interview is the use of structured items as a form of objective member-checking. The OLP-28 statistical information on habitus profiles was triangulated in the interview approach via enquiring interviewees’ agreement to the 6 generated factors. The items that generated these responses can be viewed at the end of the two selected transcripts in Appendix K. The overall results of 17 interviewees are as Tables 19 to 35 below:

Table 19. Comparison of responses to dispositional factors (Ahmad)

<table>
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<tr>
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<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
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<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>2</td>
<td>Control of one’s learning process</td>
<td>No</td>
<td>No</td>
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<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>No</td>
<td>No</td>
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<tr>
<td>4</td>
<td>Dependence on external assistance to gain</td>
<td>Yes</td>
<td>Yes</td>
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<td></td>
<td>understanding</td>
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<tr>
<td>5</td>
<td>Internet dependence</td>
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<td>6</td>
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Table 20. Comparison of responses to dispositional factors (Amirul)

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Table 21. Comparison of responses to dispositional factors (Amal)

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Table 22. Comparison of responses to dispositional factors (Bakar)

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Table 23. Comparison of responses to dispositional factors (Bahrin)

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Table 24. Comparison of responses to dispositional factors (Chuchu)

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Table 25. Comparison of responses to dispositional factors (Catrina)

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Table 26. Comparison of responses to dispositional factors (Diana)

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Table 27. Comparison of responses to dispositional factors (Danial)

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Table 28. Comparison of responses to dispositional factors (Emran)

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<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Table 29. Comparison of response to dispositional factors (Eddy)**

<table>
<thead>
<tr>
<th>F.</th>
<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Table 30. Comparison of responses to dispositional factors (Erawan)**

<table>
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<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
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<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
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<td>Yes</td>
</tr>
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</table>

**Table 31. Comparison of response to dispositional factors (Faisal)**

<table>
<thead>
<tr>
<th>F.</th>
<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Perceptive use of the internet</td>
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<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
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<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
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<td>Yes</td>
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</table>

**Table 32. Comparison of responses to dispositional factors (Fakrul)**

<table>
<thead>
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<th>F.</th>
<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
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<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
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<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
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<td>Yes</td>
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</table>
Table 33. Comparison of responses to dispositional factors (Fadillah)

<table>
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<th>Interview response</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Control of one’s learning process</td>
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<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Dependence on negotiating understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Internet dependence</td>
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<td>No</td>
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<tr>
<td>6</td>
<td>Wants and indulgences</td>
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Table 34. Comparison of responses to dispositional factors (Gina)

<table>
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<th>F.</th>
<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
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<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
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<td>3</td>
<td>Dependence on negotiating understanding</td>
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<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
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<td>5</td>
<td>Internet dependence</td>
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<tr>
<td>6</td>
<td>Wants and indulgences</td>
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Table 35. Comparison of responses to dispositional factors (Ghaffar)

<table>
<thead>
<tr>
<th>F.</th>
<th>Disposition</th>
<th>OLP response</th>
<th>Interview response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceptive use of the internet</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Control of one’s learning process</td>
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<td>Dependence on negotiating understanding</td>
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<tr>
<td>4</td>
<td>Dependence on external assistance to gain understanding</td>
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<td>5</td>
<td>Internet dependence</td>
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</tr>
<tr>
<td>6</td>
<td>Wants and indulgences</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

6.6. Trustworthiness

The qualitative phase and the mixed-method process of abductive inferencing involved an analytical process based on interpretation, theoretical sensitivity and subjectivity. The challenge I faced was in ensuring that these findings are trustworthy. A main issue of qualitative research is the influence of subjective bias whether it is researcher bias, instrument bias or selection bias.
However, bias in a human-made instrument is inevitable (Shenton, 2004, p. 72), particularly in interviews where according to Holstein and Gubrium (2004) the conversation is “framed as a potential source of bias, error, misunderstanding and misdirection ... [and] it is a persistent set of problem to be minimised (p.141). The attempts to maintain trustworthiness are thus discussed under the guidelines of Guba’s (cited in Shenton, 2004) four criteria of trustworthiness, viz. credibility, transferability, dependability and confirmability.

This research attempted to achieve trustworthiness through the pre-planned use of two different data collection methods to triangulate the same theory, through enquiring interviewees with statements that they have previously been asked based on findings from the quantitative pilot study. The mechanism of this triangulation is not through asking the interviewees the same items asked in the OLP-28, but rather the 6 factors that derived from the items. The method by which interviewees were prompted to agree or disagree with a factor statement was intended to verify their feedback on the items that contributed to the factors. Furthermore, upon completion of the structured questions, interviewees were given an opportunity to reflect on the quantitative findings as a member checking strategy (Shenton, 2004, p. 68).

According to Cohen et al. (2011, p.195), triangulation is an “attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint”. The triangulation employed in this research enriches the same data, but not deterministic of the data’s credibility because Bloor (1997) cautioned that two different methods cannot be equated and that the data’s specificity affects their comparability (cited in Bloor et al., 2001, pp.12-13). Thus, the discernible difference between these two similar data sets is that the quantitative study provided the range, while the interview the depth (Robson, 2011, p.298). Triangulation provided a measure of credibility while at the same time acknowledging that dissimilar methods have discrepancies. Credibility is not a surety, but as Creswell puts it, “if themes are established based on converging
several sources of data or perspectives from participants, then this process can be claimed as adding the validity of the study” (2014, p. 201).

I also employed other strategies to optimise credibility. Participants were informed of their right to refuse participation or withdraw at any time during these sessions. For the interview, several steps have been mentioned earlier of the measures taken to maintain a free and non-directed discussion, which attempted to elicit honest opinions (Shenton, 2004, p.66). For the interview, the interviewer incorporated member checking by ensuring that the interviewees each had an opportunity in the end to go through their salient contributions that have been noted throughout (Shenton, 2004, p.68). These two strategies added to the credibility of the study.

Dependability was also attempted through explicitly describing the methods and processes throughout this chapter, and further substantiated with significant excerpts and occurrences. These as Shenton suggested added to dependability through “addressing the minutiae of what was done” and “evaluating the effectiveness of the process of inquiry” (2004, p.72).

6.7. Chapter summary

The preceding qualitative analyses merited the need for explicit preliminary discussions near the end of the chapter. The triangulation of findings from the questionnaire and interview indicated a 94% similarity and is perhaps a testament to the theory that learners are represented by dispositions, in this case a set of 6 latent dispositions, that in turn become the constituents that determine different habitus types. However, the qualitative process is more than a confirmatory mechanism for the presence of habitus. It also elaborated and speculated on how different habitus types influence the way learners learn or prefer to learn.
The similarities in dispositions exhibited by members of the same habitus types, and at the same time the differences in certain dispositions between the seven habitus types informed me of the possible relationship between habitus and field. Through my multifaceted interpretation of this subjective information, I proceeded to refer to these seven prevalent habitus types as 1) industrious learners, 2) fragmentary learners, 3) innovators, 4) direct learners, 5) selective learners, 6) avant-garde learners and 7) synergic learners.

The quantitative phase, which adapted an empirical and objectivist stance, generated through Factor Analysis a 6-Factor model representing dispositions. The quantitative phase identified 64 possible habitus types, albeit through a process that integrated algorithms with subjectivity. The quantitative phase contributed to identifying the seven prevalent habitus types that became the main subject of the qualitative phase. The qualitative phase undertook a more interpretive stance and generated its findings through a systematic series of inductive and deductive coding, followed eventually by the beginning of abductive coding that contributed subjective evidence in support of the idea that different habitus types have different dispositions, and members of the same type share similar dispositions.

This chapter is an extended discussion on these findings and in response to the three research questions. Findings from the quantitative phase contribute to identifying the types of habitus. In brief, my identifying and mapping of habitus types contributed to addressing the first research question, and also partially addressed the second research question on identifying how different habitus types might influence learning.
Chapter 7. Discussion

7.1. Introduction

The previous two chapters on my quantitative, qualitative and mixed data analyses presented preliminary discussions on several relevant findings and emerging theories; some indicative while others are hypothetical given the limitations identified during these phases. These included in the sequence that they were established: a 6-Factor model that constitutes a habitus; the theory of 64 possible habitus types; the indication of having 44 represented habitus types 7 of which are prevalent in the sample; the interconnectivity and dynamicity of habitus as represented by the habitus lattice; and the arguments on the 7 prevalent habitus types being different from one another while at the same time on members of one habitus sharing similar dispositions. Considering the varying degrees of hypotheses in all of the above, this chapter is a two-part discussion on how the above findings contribute to my research.

The first part is a discourse on the habitus lattice theory. In this part I introduce the habitus lattice theory in terms of how it was derived, its constituents, followed by the traits that I perceive as characterising its heterogeneity and dynamicity, which are tiers, tendencies, incremental changes, and relation of the habitus to the conatus. This part also presents the limitations of the lattice theory and how it is a hypothetical rather than a definitive model.

The second part is a series of discourse that responds to the three research questions. In answering the research questions, I firstly present the seven habitus types that my research has identified as having discernible differences. The detailed descriptions and categorisation of these types become answers to the first research question. The discourse then extends towards describing how the dispositions of each habitus type might influence learning in online learning systems and present speculations on the learning patterns that discern these types from each other. Finally, in response to the third question, the research proposes
the combination of three emerging online learning systems to leverage on the features that would cater to the different types of learners’ habitus.

7.2. Part 1: Interpreting the habitus

My literature review has framed the concept of habitus as being both objectivist and subjectivist. Therefore, my own research draws from both expositions in my attempt to create an overarching learner profiling taxonomy based on the habitus construct. Since habitus is defined in literature as the diverse set of dispositions that ostensibly prescribes how individuals react and behave in certain real-life settings, I have identified it as a suitable theory to describe Bruneian learners’ dispositions towards learning in online learning systems. In addition, its accompanying constructs – doxa and hysteresis – are also applicable to the Brunei online learning situation.

The literature on learner habitus has also implied it as having features of heterogeneity (Lueg, 2011; Bertilsson, 2008) interconnectivity (Reay 2004; Stone, Underwood and Hotchkiss, 2012) and dynamicity (Reay, 1997; Lizardo, 2004). Thus, to enable me, and hopefully others, in comprehending this intricate theory for my research, I found it convenient to illustrate these features through the lattice that I have presented earlier in Chapter 5. From this point onwards, I thus refer to this theory as the Habitus Lattice Theory.

My subsequent arguments on how I have interpreted the habitus as heterogeneous, interconnected and dynamic are abductively driven. In other words, preceding literature has suggested these features, and in the absence of concrete evidence I applied the most rational explanation based on my pragmatic understanding of my findings. Therefore, the Habitus Lattice Theory is not a definitive theory but rather one that is protracted through hypotheticity.
It is important to note that while my research intends to be persuasive in its advocacy of this habitus profiling mechanism, the theory is ultimately a product of an assiduously organised sequence of statistical and subjective inferencing that may require a rethink of the procedures. Retrospectively, the use of factor-cluster analysis would have generated a more statistically inferred set of habitus types, but as suggested by Vågerö (2006), building a theory is “a slow process of repeating studies, correcting previous mistakes, designing new studies, collecting evidence, adding detail, changing minor aspects, and refining concepts” (p. 574). The role of my research is thus the beginning of what I perceive as an emerging theory that has a few imperfections.

If I were to describe my findings, they are subjective but pivots on the origins of empirical data. On one hand, my research outcome is context-dependent and predisposed to my own interpretations. On the other hand, I see its potential in being an alternative perspective to seeing Bruneian learners and their dispositions, allowing me to interpret the online learning situation through Bourdieusian optics. This section is thus my hermeneutical discussion of the habitus and its heterogeneity, interconnectivity and dynamicity, in my quest to understanding how the habitus construct can be very useful as indicators of Bruneian learners’ dispositions towards learning in online learning systems.

7.2.1. The heterogeneity of learner habitus

There is an implied consensus across Bourdieusian research that habitus is heterogeneous. Hakim (2000) commented that habitus is “a reflection of heterogeneous personal preferences and individual priorities” (p. 14), and Lueg (2011) acknowledged the heterogeneity of habitus in which he argued that, “university teaching must be geared, as far as possible, to different habitus groups and habitus situations in the classroom” (p. 30). However, the heterogeneity of habitus has never been explicitly documented. Lueg alluded to the current
information on habitus heterogeneity as superficial, as what he described as an 
“unfortunately few tangible data on habitus” (2011, p. 30).

In other learner theories, heterogeneity can be as simple as a dichotomy such as 
Prensky’s ‘digital natives-digital immigrants’ canon, or as diverse as MBTI’s 16 
personality types (i.e. ESFJ, INFP, ESTP, INTJ, ISFJ, ENFJ, ISTP, ENTJ, ESTJ, INFJ, ESFP, 
INTP, ISTJ, ENFP, ISFP and ENTP) (Kroeger and Thuesen, 2013). In between, there is 
the VAK model with three types (Visual, Audio and Kinaesthetic) or four with the 
addition of Read/Write (i.e. VARK model). Honey and Mumford (1992) has four 
with Activist, Pragmatist, Reflector and Theorist; and Multiple Intelligences has 
eight with Interpersonal, Intrapersonal, Linguistic, Logical-Mathematical, Naturalist, 
Spatial, Bodily-Kinaesthetic and Musical (Campbell, Campbell and Dickinson, 1996). 
Not only does each learner theory have its own taxonomy of how many ways in 
which a learner can be profiled, they also have a different rationale as to why 
learners are profiled. Regardless of this disparity, it cannot be denied that each of 
these theories has its value in learner profiling.

My hypothetical Habitus Lattice theory is an attempt to document the 
heterogeneity of habitus types – in this case through a taxonomy comprising of 64 
different types. In terms of coverage, the habitus lattice is more suggestive of 
heterogeneity compared to other learner theories. It is also I perceive to be more 
informative than the notion of a singular evolving habitus entity portrayed by 
existing habitus-based studies (Reay, 2004; Delly, 2016).

However, admittedly, the 64 possible types of the habitus lattice theory is a 
product of mathematical rule based on a 2-point 6-factor combination, or simply 
(2)^6. The formulation of the 6-Factor model is definitive, but the decision to 
complement it with a 2-point scale (disinclination-disposition) was an intuitive 
response to handling an arbitrary set of individual factor scores, because the 
alternatives were either the 729 types based on a 3-point scale, 15,625 types on a 1 
to 5 scale, or the most accurate but extremely inconvenient 1,771,561 types on a -5 
to 5 scale. In expense of precision, I opted for the most pragmatic taxonomy.
Table 36. All the 64 habitus types

| 222222 | 222224 | 222244 | 224444 | 444444 | 222242 | 222442 | 242442 |
| 422444 | 224444 | 222422 | 242422 | 424422 | 222424 | 224242 | 422442 |
| 444224 | 444244 | 242222 | 224222 | 442222 | 222422 | 242242 | 422242 |
| 424424 | 222444 | 242444 | 222442 | 224242 | 242424 | 422424 | 442424 |
| 222242 | 222442 | 242242 | 224242 | 422442 | 222424 | 242424 | 422442 |
| 422224 | 442224 | 224224 | 224424 | 244224 | 242224 | 424224 | 424424 |

On its own, the taxonomy of 64 types as listed in Table 36 above does not illustrate the dynamism of the habitus. For the habitus to be dynamic, it required me to then take into account the interconnectivity between habitus as expounded by several habitus inspired literature.

7.2.2. The interconnectivity of learner habitus

In terms of interconnectivity, the emphasis in literature has been more on the habitus interplaying with capital and the field (Bourdieu, 1990; 1993). The interconnectivity of habitus with other habitus however has not been explored as the majority of habitus conceptualisation I assume regards it as a singular entity rather than the segmented interpretation of my habitus lattice. Thus, my interpretation of habitus interconnectivity is based more on calculated assumptions than real-world observations.

To map the interconnectivity of the 64 habitus, I chose two points on the habitus lattice, which are the prime habitus 222222 and 444444, as reference points. In between the two extreme types are several tiers of habitus types, which I categorise as 1st tier, 2nd tier and 3rd tier. A 1st tier habitus is one that has 1 factor different from the prime habitus (e.g. 244444). A 2nd tier habitus is one that has 2 factors different from the prime habitus (e.g. 224444), and a 3rd tier habitus is one that has 3 factors different from the prime habitus (e.g. 222444).
In addition to organising the habitus types into a system of tiers, I assigned tendency markers on the tiers in the form of negative (-) and (+) symbols. Habitus types that are under a (-) tier have stronger tendencies to disagree with more than 3 of the 6 factors. Habitus that are under a (+) tier have stronger tendencies to agree with more than 3 of the 6 factors.

Table 37. All the 64 habitus types arranged by tiers and tendencies

<table>
<thead>
<tr>
<th>-Prime</th>
<th>1st tier</th>
<th>2nd tier</th>
<th>3rd tier</th>
<th>2nd tier</th>
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</tr>
</tbody>
</table>

Based on the assumption of tendencies, the (-) and (+) markers can be used to differentiate learners into two main classifications; those who are likely to have online learning dispositions that will increase their success, and those who don’t. Collectively, the tier and tendencies system in mapping the interconnectivity of habitus provided me with a structured understanding, albeit artificial, on the dynamicity of habitus.
7.2.3. The dynamicity of learner habitus

Bourdieu and many other researchers have expounded on the dynamicity of habitus. For Delly (2016), the habitus “influences and is evident in a person’s actions, attitudes and perceptions but it is not fixed because it is constantly exposed to further influences and experiences that will tend to reinforce or modify it” (p. A-24). Reay (2004, p. 441) perceives habitus as having a transpositional quality and a heightened dynamic nature, and Lizardo (2004) argues that “the habitus itself is a generative dynamic structure that adapts and accommodates itself to another dynamic mesolevel structure composed primarily of other actors, situated practices and durable institutions (fields)” (p. 376)

My interpretation is slightly different from these commentaries on habitus dynamicity. Instead of interpreting habitus itself as changing, I regard them as perpetual placeholders where we could observe a person’s actions, attitudes and perceptions change in that given time. The habitus lattice presents habitus types as ‘constants’. These constants serve as profile indicators, as emblematic loci where learners can be observed exhibiting that habitus in that snapshot in time. In another snapshot, the same learners may be found in other loci in the lattice.

Habitus changes that learners experience however cannot be perceived through a snapshot questionnaire alone. What I decided to do instead was to use the questionnaire data in interpreting possible conduits of change for researchers to track, maybe even predict, changes in learners’ dispositions. As these changes were not observable let alone determined through my research, I again employed calculative assumptions to depict change in the form of increments. The measure for 1 increment change is a single change in a single factor, for example a shift from a 222222 to a 222224.

The calculative logic that governs this system can be described based on several rules. For prime habitus types, they can incrementally shift to any of the six immediate 1st tier habitus types. This is the first rule of shifting across habitus
types. For example, the Avant-Garde Learner (444444) can shift either to 244444, 424444, 442444, 444244, or 444424. Below are the four rules that I have structured to explain one increment shifts:

1. For prime habitus, they can incrementally shift to their six immediate 1\(^{st}\) tier habitus types.

2. For 1\(^{st}\) tier habitus types, they can incrementally shift back to its immediate prime, or shift to one of the five immediate 2\(^{nd}\) tier habitus types.

3. For 2\(^{nd}\) tier habitus types, they can shift to two of its immediate 1\(^{st}\) tier habitus types, or four of its immediate 3\(^{rd}\) tier habitus types.

4. For 3\(^{rd}\) tier habitus types, they can shift to three of its immediate -2\(^{nd}\) tier habitus types, or three of its immediate +2\(^{nd}\) tier habitus types.

The underlying rule is that each habitus type can incrementally shift to its six immediate habitus neighbours. This is the theory of the habitus lattice being dynamic.

However, the possibility advocated above is objective and idealistic. For a start, the habitus lattice has been computed through a software application that considers every habitus-to-habitus link as equally possible. The possibility of a 222222 to shift to a 222242 is mathematically 1 in 6, because each habitus type can shift to six other types. But change in reality is not dictated by logic rules of increments, rather by reasons that are context-dependent. Lizardo (2004) refers to these contexts as the different actors, situations and institutions that prompt the habitus to adapt and accommodate (p. 376). I refer to these reasons for change as ‘conatus’.
7.2.4. Conatus: The causes for learner habitus to shift

Bourdieu perceives conatus as a specific set of dispositions of a specific group (1988, p. 176), positioning it as parallel to habitus in terms of describing dispositions. As described by Fuller (2014), “conatus provide habitus with its dynamic character by drawing attention to its operation within a field of social relations in terms of which individuals are engaged in an ongoing process of mutual orientation” (p. 176). This implies that the conatus is likely part of the habitus lattice, though which part it plays, other than being what I use to describe change, is uncertain.

From both the literature and my findings, I interpret the conatus as a fitting construct in explaining the dynamicity of habitus. The two constructs are mutual pairs describing the same entity but in different states. Reiterating Fuller’s (2014) perception of habitus and conatus, he suggested that, “habitus is to conatus in a living human as position is to momentum in a moving body” (p. 176), implying that habitus and conatus are not only distinct concepts but also that habitus is a stationary state while conatus is a dynamic state.

However, unlike the stationary habitus, which I have portrayed as constants in the lattice, the conatus is a fluid concept. At this final stage in my research, it is difficult without further data to discern if conatus is habitus in a state of change (A, Figure 36), if it is the process of change (B, Figure 36), or if it is an external variable that catalyses the change itself (C, Figure 36).
Figure 36. How the conatus influences shift between habitus types

Fundamentally, what is certain is that conatus represents change. It represents habitus shifting from one type to another in the lattice. It represents the catalyst(s) for the change, catalysts that are too abstract to comprehend in the habitus lattice. I perceive it as the empty white space that occupies the lattice. In other words, the habitus position the learners onto a map of different habitus types, but it is the conatus that catalyses their inclination to shift from one habitus to another. It may also represent the process of the change in the form of connecting lines in the lattice. What transpires along these lines may also be the conatus.

It is also possible that the conatus can be the habitus types. A habitus is the embodiment that the learner currently exhibits in the forms of dispositions. Interestingly, Bradley (1900) alluded to dispositions as conations due to their interchangeability in typifying preferences, inclinations and aversions. A conatus, on the other hand, is the habitus not currently representative of the learner, but another habitus type, which the learner aspires to change towards. In other words, the conatus is all of the three possible aspects labelled in Figure 35. Alternatively, apart from catalysing change, the conatus may also be the cause for resisting change.
The ‘conatus’ is thus a more complex concept than the habitus types in this research. It is an incidental finding during my theorisation of habitus. This research was not designed to identify it, let alone measure it if its fluidity is measurable. At this juncture, it is sufficient to mention the role of the conatus as the catalysts that drive learners to change their habitus, or resist change.

7.2.5. Limitations of the Lattice Theory

My elucidations above on the features of the habitus lattice theory intend to advocate it as a useful theory in profiling learners. When described based on these specifications alone, the habitus lattice theory seemingly emerges from this research as a methodical theory capable of documenting and illustrating heterogeneity, interconnectivity and dynamicity. These features, as requisitioned by several researchers (Bloomer and Hodkinson, 2000; Lueg, 2011), are preferred indicators in profiling learners.

However, the habitus lattice theory comes with a cardinal caveat. For all the convincing profiling features that the habitus lattice incorporates, it is important to stress that parts of its design have been fundamentally derived from artificial procedures and inferences. These included the use of an unorthodox truncation method, the subjective simplification of data, its reliance on mathematical possibility over realistic probability, and the interpretation of all these elements based on data from a sample that might just represent a unique context (i.e. Brunei).

Hence, the subjectivity infused in its current design educes several issues that limit the theory to being a model that is more speculative than definitive. At this point in the research, I acknowledge that any further refinement to address these issues would occur in consequent future studies as recommended by Vågerö (2006) in regard to theory building. Recognising these issues in this thesis however would
inform us on the discretion required in proceeding with this theory, particularly in answering the research questions.

The first issue is the arbitrariness of the lattice system, notably of the 64-habitus types. As already reitered in previous discussions, the 64-habitus types that binds the lattice theory together is the result of a mathematical product rule formulated from the 6-factor model and my subjective decision to measure each factor on a 2-point scale (i.e. disposition and disinclination). Although this formulation was prompted by the arbitrariness in respondents’ factor scores, in reality the idea that there are 64 habitus types was derived entirely from the 6-factor model. In other words, even in the absence of factor scores, it would still be possible to devise a lattice using product rule alone. Figure 37 below depicts how the lattice theory could be based on 64, 729 or 15,625 types yet still retain its lattice design.

This 64-type theory is thus absolutely dependent on how accurate one wants to measure the level of disposition. As a pragmatist, I chose the 64-habitus lattice as the most practical option. However, regardless of the desired level of accuracy, the habitus lattice is still fundamentally an arbitrary model that was devised to manage large amounts of diversified data. This arbitrariness may procreate misconceptions of absolute 64 types. One concern with the arbitrary 64 habitus types is if another
study were to use this lattice theory, researchers may feel inclined to conform their sample to these 64 habitus. Not only does this run the risk of experimenter bias (Robson, 2011, p. 95), it also has nuances of a predetermined taxonomy and eventually Campbell’s Law; a feature of other learner theories that this research wanted to avoid in the first place.

The second issue is the inaccuracies of its taxonomisation criteria. Whereas the 64-habitus types were derived from the 6-Factor model, the taxonomisation criteria to allocate learners into one of the 64 types were based on respondents’ factor scores. Unprocessed, the factor scores are precise yet lack the capacity to taxonomise learners into distinct groups as illustrated by the 15,625-habitus lattice (Figure 37). The truncation and simplification procedures made the scores comprehensible to be able to observe 64 converged clusters in the lattice, but the rounded integers are undeniably less accurate representations. Furthermore, the unorthodox truncation method of rounding to the ceiling/floor integer manipulated the scores to conform to eventually two scales – disinclination (2) and disposition (4).

One concern with inaccuracy is the misrepresentation of respondents under a wrong habitus type. For example, Case ID 4’s factor score was -.14005, 0.27823, 0.10974, 0.04164, -0.33849, 0.20081. A closest integer truncation would typify the case as 000000 instead of a 244424. However, inaccuracy is in this instance subjective. If the habitus lattice obligates the consistent use of ceiling/floor truncation rule across different samples, then the inaccuracy is more of overgeneralisation of the whole sample rather than manipulating specific individual scores to conform to specific habitus. Nevertheless, this research endeavours to revise the taxonomisation criteria, with one alternative being the use of cluster analysis and juxtaposing clusters against the 6-Factor model.

The third issue is the depiction of its perfectly symmetrical design being deceptive. The lattice was generated using a computer program and its algorithm assumes that every single habitus has equal standing in the lattice. Organised in a
polyhedron structure, the 64 habitus types represented by vertices, are distributed
equally on the surface and inside the polyhedron. Each line that links two vertices
has equal distance as the others. This perfectly symmetrical structure is based on
mathematical possibility and organises the habitus to conveniently allow for the
manual tracking of dynamicity.

However, this representation may mislead because it detaches the dynamicity from
the realistic context. The issue here is the reliance of possibility as the truth over
realistic probability. Indeed, it is possible for a learner to shift from his current
habitus to six other immediate habitus, but the probability of shifting in real
context may not be equal for all six possibilities. Change in reality is according to
Bourdieu’s theory influenced by the conatus, and the biggest feature missing from
this lattice theory as discussed earlier is the representation of the conatus. The
conatus represents realistic variables, what Lizardo (2004) describes as the actors,
situations and institutions of the real world.

All the above issues impose limitations to the habitus lattice theory. There is a risk
of the lattice dictating how heterogeneity and dynamicity should be perceived
based on arbitrary, inaccurate and idealistic information. Caveat utilitor is thus the
apt summation of this discussion. It needs to be stressed once more that the
habitus lattice theory, at this point, is a hypothetical profiling mechanism.
Nevertheless, despite its imperfections, as a pragmatist, it is my tendency to
understand that the processes of theory building do not always happen as
expected. The debatable theory that this research has arrived at is also not atypical
of pragmatism. Kratochwil’s (2007) arguments on how truth and accuracy are
handled in pragmatism revealed that research is more about getting on with the
process and learning from it. He posited that studies seldom result in clear answers
and that there is more that can be learned from undecidable questions than
processes that are clear-cut (2007, p. 3).

Kratochwil, who identifies Bourdieu’s work as representative of this pragmatist
thinking (2007, p. 13), advised that “letting go of unrealizable plans and notions
that lead us down the road to delusional projects and inquiring instead the ability to ‘go on’ in spite of uncertainties and the unknown is probably the most valuable lesson to learn” (2007, p. 11). Therefore, I perceive this situation as a learning curve of my research and one that will be rectified in future developments of the lattice theory (Vågerö, 2006). My recommendations of these will be presented in the final chapter of this thesis. The next part of this discussion is thus going forward with answering the research questions taking into consideration the cardinal caveat of this research.

7.3. Part 2: Responses to the research questions

The previously described habitus lattice theory provided a speculative viewpoint on the habitus being dynamic and heterogeneous. However, the specification of there being 64 habitus types has become academic because the quantitative process did not reveal if these types were characteristically different in realistic practice. It is from the interview responses and the qualitative phase that differences between habitus types were actually first explored.

Following from the quantitative phase, the qualitative investigation interpreted patterns of similarities and differences among the 17 interviewees. Because of the use of the speculative habitus lattice, it is possible that my sampling of the 17 interviewees have been affected by confirmation bias. I would however argue that the qualitative phase in its own accord did generate categories similar to the 6-Factor model, and I would like to believe that even in the absence of the knowledge of the 7 prevalent habitus types, the learners might organically cluster to several discernible types based on their feedback from heuristic and inquisitive processes. This second part of the discussion is thus a series of targeted responses to the three research questions based on findings from the quantitative theory-building phase, but more prominently from the abductive analysis that transpired during and after the qualitative phase.
7.3.1. RQ1: What are the different types of habitus?

My research has so far identified 7 different types of habitus. In turn, I selected from my sample 17 learners who exhibited possibly distinct sets of dispositions. My inquest on these learners suggested that they were likely differences that distinguish them to the 7 habitus types that they were purposively sampled from. Thus, the identification of these 7 habitus types was based on inductive quantitative speculation, followed by deductive interpretations of interview responses and eventually the categorisation of learners based on the theoretical framework, on selected literature that has identified distinct learner profiles, and the abductive reasoning of explanations that I perceive to be most logical and relatable to the Brunei context.

My answer to this first question consists of brief descriptions for each habitus type accompanied by a visual spider diagram and a list of characters and dispositions. During the naming process of these 7 main habitus types, I referred to existing taxonomies and adapted many of their profile justifications. The seven types are categorised as 1) the Industrious Learner, 2) the Fragmentary Learner, 3) the Innovator, 4) the Direct Learner, 5) the Selective Learner, 6) the Avant-Garde Learner, and 7) the Synergic Learner.

I. The Industrious Learner

Type A learners are categorised as Industrious Learners. The main characteristics that differentiate the Industrious learner include ‘the willingness to learn’ and ‘perseverance’. In regards to perseverance, Fernald (1912) posited that, “the success or failure of individuals depends largely on the ability to endure and to continue to strive for the sake of achievement, in spite of fatigue and discouragement” (p. 331). Drawing from the work of Hakimi et al. (2011), this habitus type is thus called the Industrious Learner for his/her industrious efforts to persevere.
The industrious learner is a hardworking individual and is willing to learn through reflection, communication, observation, and action. Errors are a means to learning and improving. They are diligent and willing to try new methods of learning.

**What might work:**
Project-based learning, mediated communication, online reading, group work, self-assessed quizzes, Bandura’s self-efficacy, discussion forums.

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**II. The Fragmentary Learner**

Type B learners are categorised as Fragmentary Learners. According to Pachler, Cook and Bachmair (2010), “the learning young people do with their smart-phones in their everyday lives are fragmentary, incidental, contextual, and episodic in nature” (cited in Chan, 2014, p. 34, emphasis added). This habitus type is given the name Fragmentary Learner because they are found to favour bite-sized information and step-by-step instructions and learning processes.

Fragmentary learners acquire knowledge in bite-sized structured chunks. They prefer systematic instructions and ‘user manual’ visuals that require minimal mental processing.

**What might work:**
Staggered learning, paced learning, formative feedback and assessment, social micro-blog (Instagram, Twitter), pop-quizzes, delegated group work, Cliff notes, motor/verbal chain learning, puzzles.

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**III. The Innovator**

Type C learners are categorised as Innovators. Innovators are thinkers. They think of their learning, and think of how they learn. When faced with a learning approach
or technology that they perceive as mundane, the Innovator seeks alternative learning strategies, oftentimes not prescribed by the online learning system to exercise their tendency for creativity. This habitus type closely sits at the extreme end of the Kirton Adaption-Innovation Inventory cognitive style profiling scale (Kirton, 2004). This predominantly business-based dichotomous model specifies that innovators are creatively disruptive and want to perform tasks differently.

Innovators are creative in circumnavigating around problems. They think before doing and are perceptive of external stimuli to be used as ideas. The more descriptive the stimuli the more can they infer and interpret from.

**What might work:**
Creative multimedia, abstraction, meta-cognitive thinking tools, knowledge creation, web quests, problem-based learning, leading group-work.

![Figure 40. The Innovator](image)

**IV. The Direct learner**

Type D learners are categorised as The Direct Learners. The Direct Learner type is inspired by the type of learner identified by Tétard and Collan in their Lazy User Model (2009). The concept of the Lazy User is that “the user will select the solution that demands the least effort” (Tétard and Collan, 2009, p. 3). This according to their study is influenced by the required time, money, energy or a combination of these to achieve the solution. In terms of online learning where the solution is learning or using the online learning system, then the energy is in the form of cognition; thus concerning cognitive load. In relation to online learning systems, cognitive load is defined as “the amount of information processing effort a user must expend to take notice of the (...) stimuli contained in an interface and comprehend its (their significance) or intended meaning” (Hu, Ma and Chau, 1999, p. 130). This habitus type represents learners who struggle with cognitive load.
Direct learners prefer simplicity and tasks not requiring higher order cognition. They effectively learn through rote learning and as such their choice of handling daily tasks are determined by the most direct and convenient pathways.

**What might work:**
Flashcards, spaced repetition learning, 2-5 minute videos, timed release content, adult Montessori-like approach, haptic interface, repetition.

![Figure 41. The Direct Learner](image)

**V. The Selective Learner**

Type E learners are categorised as Selective Learners. Selective learning was one of psychology’s growing areas of interest many years ago (Noble, 1966; Restle, 1957; Wallston, 1970), but there has been no recent development in its literature. The Psychology Dictionary defined selective learning as “when an individual decides to obtain knowledge of one thing, even though another is offered” (Nugent, 2013, para. 2). Selective learning has not been popular in the traditional classroom as the environment lacks the provision of alternative materials. Instead, the presence of a teacher practising differentiated learning has been the more realistic approach.

Selective learning however has been recently associated with the internet. Jang and Park’s (2012) study on learning from online mass media found that, “the internet and related media technologies allow for audiences’ selective learning” (para. 17). They have also adapted Bandura’s (1982) work to conclude that, “when individuals are allowed to seek their own path of interest, their motivation to learn grows, subsequently leading to a higher attention level” (para. 18). Selective learning is thus a learning approach that requires multiple pathways to reach the same outcome.
The selective learner requires enticing tasks. They tend to go off-task without active stimulation. They have the capacity to perform but the precursor is to attract their attention.

**What might work:**
Game-based learning, animated videos and presentations, multimodal (text, sound, images), multi-formatted notes, rewards system (online badges), behaviourist approach.

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**VI. The Avant-garde learner**

Type F learners are categorised as Avant-garde Learners. The Avant-garde learner is a close adaptation of Neary’s ‘Student as Producer’ (2010) where the learner has the potential, when scaffolded, to reach a heutagogical state. When they reach this state, they learn via minimal facilitation, to the extent of a higher andragogical state whereby they are able to progress through an online learning course relatively on their own (Cochrane and Antonczak, 2015, p. 127). It is imperative to note however, that these heightened states are idealistic possibilities. However, for Avant-garde learners, they are on the constant trajectory of learning through discovery and exploration.

Avant-garde learners prefer the liberty to make their own decisions. They are independent and free and assess information pragmatically. They are constantly online and therefore have a heightened awareness and autonomy towards their dispositions.

**What might work:**
Sandbox learning environments, discovery learning, ubiquitous learning tools, online presentations, andragogy, Web 2.0 blank canvas (blog).
VII. The Synergic learner

Type G are categorised as Synergic Learners. The Synergic learner is characterised by the natural state of introvertedness, a dimension detailed as an innate extravert-introvert continuum in Myers-Briggs Type Indicator (Myers, 1962). From their interview responses, the Synergic learners were found to have contradicting opinions on what they believe would improve their learning effectiveness and what actually improves their learning.

It is based on this revelation that my analyses revealed Synergic learners to have two states of being, a dichotomy with one end being an innate state and the other end being a heightened state reacting to external stimuli. A Synergic learner is latently introverted with aversions toward participation and being put under the spotlight. The conatus for these behaviours are uncertain but it has been long suggested that innate forces dictate this introversion (Okamoto, 1964, p. 101; Schat, 2012, p. 112; among others).

<table>
<thead>
<tr>
<th>THE SYNERGIC LEARNER</th>
<th>TYPE G (2 2 2 4 2 4)</th>
</tr>
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<tbody>
<tr>
<td>Synergic learners are latently introverted but grow in confidence and performance when matched with familiar external stimuli (e.g. close friends, families, technology). They transition between passive-active personalities, and interactive tasks or people will contain them to their active side.</td>
<td>Figure 44. The Synergic Learner</td>
</tr>
</tbody>
</table>

What might work:

The descriptions above present the observed dispositions and characteristics that a habitus type has that differentiate it from others. A majority of these suggestions emerged from the qualitative data and supported by existing observations in preceding literature. These suggestions are however only reflective of the Brunei
sample due to the learners having no experience with learning in online learning systems.

7.3.2. **RQ2: How might a learner’s habitus influence how he or she performs in an online learning system?**

Describing the 7 habitus types based on the research data, the theoretical framework and the relevant literature allowed me to identify distinctive dispositions of each habitus type. In turn, I utilised these dispositions as indicators of how learners prefer to learn and speculated on several online learning tools and online learning processes that would complement these dispositions. Generally, in response to the second research question, a learner’s habitus influences their selections and preferences of technologies and approaches that can be part of an online learning system.

However, before ruminating further on these seven descriptions, it is important to reiterate the hypotheticity of these assertions. Like the arbitrariness of the habitus lattice theory, the following information has been derived from abductive reasoning, meaning that these are informed predictions according to the simplest and likeliest explanations. The following are speculations on how habitus type might affect learners’ dispositions towards online learning system followed by the influence of habitus on extrinsic and intrinsic choices.

1. **The Industrious learner**

According to their description, Industrious learners are willing to attempt every strategy to learn regardless of their learning preferences because their ultimate objective is to acquire knowledge successfully. This objective is capable of overriding their personal preferences, because they have the intellectual capital that is associated with struggling to learn, and perseverance is their coping mechanism. Nevertheless, they do have several preferred strategies that would
allow for their perseverance to be motivated and encouraged. These strategies include teacher consultations, working in a group, the use of different forms of notes, and observing others.

Their willingness to learn also heightens their awareness of themselves and their weaknesses. This awareness allows them to develop their meta-learning capabilities (Biggs, 1985; 1987), and to a certain extent their meta-cognitive strategies (Flavell, 1979), because having an awareness of their own areas of weakness informs them on how to compensate for their struggles with the subject knowledge.

Biggs (1987) defines meta-learning as “students’ awareness of and control over their own learning process” (p. 12). With Industrious learners, they may be aware of what learning processes will be effective in respect of the online learning system, but eventual mastery over these processes is not a guarantee, particularly when they tend to struggle with learning. The data indicated that not all strategies work for the learners, but their perseverance trait enables them to identify the effective strategies by trial-and-error.

Thus, in addition to allowing for reaching the same learning outcome through different strategies, educators may reward learners’ perseverance through reinforcing learners with a sense of self-efficacy (Bandura, 1977). A study by Komarraju and Nadler (2013) found that “self-efficacious students are able to achieve academically because they monitor and self-regulate their impulses and persist in the face of difficulties” (p. 67). They further outlined the interventions educators can take to develop learners’ self-efficacy, which include 1) providing opportunities for learners to experience success, 2) pairing learners with excelling learners (perhaps a more successful Industrious learner) to gradually inculcate self-belief based on role models, 3) providing support in times of stressful situations, and 4) teaching time-management so that learners are self-regulatory in their learning and know when to pace themselves when faced with difficult tasks (Komarraju and Nadler, 2013, p. 71). The onus on the educator is in not allowing
the learner to give up, through using various support strategies and tasks that require just enough learner perseverance so they develop a sense of self-worth.

Findings from the interviews with these learners suggest that simply providing a ‘field’ where learners familiarise themselves with various learning strategies through trial-and-error may be a less intrusive and dictating approach. Allowing learners to self-regulate whilst having a system that models learning and moderates goals (Komarraju and Nadler, 2013, p. 71) will be conducive for Industrious learners to stay motivated and engaged through vigour, dedication and absorption (Bresó, Schaufeli and Salanova, 2011, p. 351) which has been found to even improve the performance of low achievers (Andrew and Vialle, 1998, p. 9).

For Industrious learners whose performance is driven by persistence towards self-efficacy, the online learning system may utilise Project Based Learning and self-assessment tasks to develop perseverance, whilst scaffolding their effort (Komarraju and Nadler, 2013, p. 71) through mediated communication, group work and discussion forums. Based on how Industrious learners favour teacher consults, these communication affordances will be complementary to their journey towards self-efficacy and towards shifting to other habitus types. Even when success becomes less realistic for some Industrious learners as perseverance sometimes do not result in success, the process of becoming self-efficient through scaffolding and motivation can itself be rewarding in maintaining learners’ effectiveness as Industrious learners.

II. The Fragmentary learner

Several studies view fragmentary learning as superficial and even detrimental to learning (Cristea and Tuduce, 2004; Kelly, 2013). However, a new group of studies on using online mobile technology for learning have advocated for the fragmentary approach as an effective approach, such as using micro videos in m-learning which allow for attaining complete knowledge in a short time and anywhere (Wang, 2015,
p. 434), and using micro-blogs to promote autonomous learning (Hao and Sun, 2010).

Therefore, the learner’s description suggests the use of social micro-blogs such as Instagram, Twitter and Tumblr as social media tools. Micro-blogging provides access to learning activities in smaller fragments for collaborative learning using “mashup tools already tested in education” such as blogs, photos and videos (Holotescu and Grosseck, 2009, p.78); for delivering specific and sequential instructions as well as scaffolding questions (Luo and Gao, 2012, p. 206); and as a ubiquitous teacher consultation channel for less outspoken learners to ask quick questions (Luo and Gao, 2012, p. 207). Beyond micro-blogging, activities based on bite-sized information may be integrated into the online learning system through micro videos, mini research diaries and discussion forums, mini pop quizzes, delegated group work when group work is attempted, and activities and assessments driven by short formative feedback. All these fragmented learning accumulates to a purposive learning engagement (Chan, 2014).

The objective of the online learning system is not to overload the Fragmentary learner with too much information or to expect a lot from the learner within a limited timeframe, which is why information is negotiated as mini- and micro-components. Their dispositions may be caused by variables (conatus) beyond intervention such as long-standing language barriers, incompatible cognitive and/or meta-cognitive skills, which is why the educator’s focus has to be on matching the learning with the dispositions as opposed to overplaying the variables causing these dispositions. Furthermore, the OLP analyses did not establish variables that were shared by learners of this habitus, implying that the ‘conatus’ may vary even within the habitus type.

Several approaches that may work with Fragmentary learners include staggered learning, paced learning and verbal chaining (motor-verbal chaining for hands-on disciplines). Staggered learning to help memorisation is not new (Ebbinghaus, 1913), but it did go out of fashion when drills and rote learning were criticised as
stifling thinking skills (Maiorana, 1991). Staggered learning detached from rote learning however has made its return with technology (Biech, 2012) in the form of a building series of sequential information as opposed to the repetition of the same information. Biech (2012) defines staggered learning as “learning that takes place over time, with processing breaks in between, as opposed to the all-in-one download of learning in one sitting” (p. 389).

The literature on MOOCs differentiates between staggered learning and all-at-once content, and concludes that staggered learning is less flexible than content published all-at-once (Mullaney and Reich, 2015, p. 194). However, as attested by Fragmentary learners, staggered learning may be effective for this specific habitus type because of their preference to process information in between delivery. This also suggests the benefits of formative feedback and formative assessment as a means to informatively scaffold learners to the learning outcome.

**III. The Innovator**

The core disposition of the Innovator is the degree of creative freedom in how they learn. Thus, the description suggests the use of creative multimedia, abstraction, meta-cognitive thinking tools, knowledge creation, Web Quests, Problem Based learning, and being the leader of group work. Based on the expositions shared by these learners during the interviews, their control of digital literacy enables them to search and integrate information from outside the prescribed learning field, such as integrating their knowledge of animation mechanics to purposefully enhance a slideshow assignment.

The idea of the Innovative learner is not new. McCarthy’s (1990) 4MAT System identifies four types of learners, one of which is the innovative learner. According to Jung (2014), highly innovative learners “adopt new learning technologies and are likely to be satisfied with the use of new technologies for their learning” (p. 104).
‘innovative learner’ profile, in that the learner is not only adopting the new technology, but also manipulating its use in creative ways through modifications with plug-ins and add-ons, supplementing with other software and apps, and redefining the purpose of the technology.

A model similar to this innovative use of technology is Puentedura’s (2010) SAMR model, which stands for Substitution, Augmentation, Modification and Redefinition. Each level indicates the role of the technology in a learning process. The SAMR model is more associated with the design and integration of technology by educators to the learning experience, but I believe that it can also be used to gauge learners’ innovative use of technology, particularly on the level of Redefinition. Puentedura (2010) defines Redefinition as when technology “allows for the creation of new tasks, previously inconceivable” (p. 3). It is not beyond the capability of an Innovative learner to take advantage of technology in interacting with the learning processes outside the prescribed task, thus redefining how technologies are used.

In one study conducted by Cochrane and Antonczak (2015), a group of students were instructed to create a portfolio on a platform called Behance, and it was found that students expanded their portfolio beyond the Behance platform into the use of Twitter, YouTube and Instagram, and integrating them together with the use of metadata hashtags (p. 136). This integration of other affordances on top of the prescribed affordances to be used is an example of how the task and its outcome were creatively redefined not by the teacher but by the learners. In other words, Innovators redefine the learning task by seeking approaches that are alternatives to the opus operatum of the learning system.

The learner’s dispositions suggest the use of Web Quest, which is “an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the internet, optionally supplemented with videoconferencing” (Dodge, 1995, p. 1); and problem-based learning, which is analogous with inquiry-oriented activities. Both methods are found to develop
learner autonomy (Akhand, 2015; Girón García, 2016, p. 9). This is why they are recommended for Innovators who operate autonomously to redefine their learning approaches and experiences beyond the mundane. Beside these two approaches, the learner’s dispositions also suggest the use of technologies and strategies that inculcate creativity, which includes but is not limited to creative multimedia to allow learners to present outcomes creatively.

IV. The Direct Learner

For a Direct Learner, the online learning system should not overload the learner with information. However, when information overload occurs, the Direct learner’s fall back plan is rote learning. According to Kalyuga (2011), “information could be difficult to understand if more interacting elements need to be processed in working memory than allowed by its capacity, resulting in rote learning” (p. 7).

While the Fragmentary learner benefits from chaining and staggered learning, the Direct learner finds efficacy in rote learning. Rote memorisation has been a mainstay of formal learning to improve information retention for centuries (Ebbinghaus, 1885). Literature however began questioning its effectiveness over thinking skills (Pogrow, 1988) until it eventually fell out of fashion to make way for creative thinking and inquiry (Wong and Patten, 2003).

Rote learning is embedded in the learning culture of South East Asia. Religious education in Brunei, due to it involving memorisation of verses, doctrines and sciences, is predominantly rote learning based, which may explain why there is a large representative of Direct learners in Brunei. Furthermore, in the two instances of the OLP instruments being used on multinational online students, only one student was identified as a Direct learner, and the student resides in the Far East Asia region. This is not surprising because, contrary to the belief that rote learning leads to poor performance, students in the Asian region have built a strong knowledge base through early rote learning experiences (Kember, 2016). Rote learning may not be effective in higher education, but due to the culture of rote
learning in general education, learners perceive the strategy as transferable to the higher education field despite the disciplines requiring higher order thinking skills. Rote learning is thus an example of how cultural capital influences dispositions.

Drill learning is one technique associated with rote learning as both involve the use of repetitive and memorisation. Drilling, like rote learning, has fallen out of favour in education. It has been described as shallow-level processing and not deep-level cognitive processing (Snowball et al., 2013, p. 989), described as decontextualised and meaningless in games-based learning (Gee, 2011, p. 228), and, as a detrimental technique that develops less effective neural pathways than through strategy learning (OECD, 2007, p. 16). Drill learning however is not entirely useless. Several studies acknowledge the supporting role of drill learning, such as in web-based courses to improve a learner’s retention (Terzieva, Todorova and Simeonova, 2004, p.23). A new learning environment where drill learning contributes in is in mobile learning systems, because according to Zeman, Hrad and Nevosad (2012) mobile learning requires content in simplified visuals and reduced textual forms that are reflective of drill learning (p. 16).

The role of the online learning system is to leverage these rote learning tendencies in order to gradually introduce other learning strategies, in the hopes of providing the Direct learner an opportunity to shift towards other forms of habitus types if they have the tendency to do so and abandon rote learning. In the dynamic system of the habitus types, drill learning is a means to shift to a new type; an intermediary to developing deeper cognitive learning processes. The learner’s dispositions suggest the use of Flash cards, spaced repetition training, 2-5 minute videos, timed release content, and a haptic interface to develop muscle memory and repetition.

Whether the online learning system employs rote learning or drill learning, the core technique to cater for Direct learners is to maintain a manageable cognitive load. Thus, the system should have a balance of these shallow-level processing techniques with more cognitively demanding alternatives. At the same time, Direct
learners are gradually scaffolded to develop their learning strategies so they can access these alternative learning approaches once they are ready.

V. The Selective Learner

Selective learning is a learning approach that involves multiple pathways to reach the same outcome. This can be catered by the multimodal learning system advocated by Moreno and Mayer (2007). The Selective learner is epitomised by their ever-changing preference for different modes of learning and learning materials. As the name suggests, they are selective of the technology and the learning approach used by the online learning system. Within the Selective learner type there exist different preferences. Some learners will prefer printable notes, others prefer video tutorials, others a lecture, and still others audio recording of notes.

Sankey et al. (2010) have identified various learning technologies that can concurrently be used to deliver the same content, such as videos, text, and audio version of the same lecture notes. Then there are others who prefer a combination of these notes, or to be extremely selective - none of these formats at all. Their selections are suggestively unpredictable and are influenced by variables not attributable to the whole group but rather as individuals undergoing different life experiences (again, a form of conatus).

Due to this selectivity, the learner’s dispositions recommend the online learning system to provide a variety of note formats delivering the same content. The multimodal notes will be a collection of text-based notes, videos, slideshows and audio files and learners are free to select whichever they deemed most effective. This multimodal approach is prevalent in MOOC courses such as the courses in Coursera that employ lecture videos, video transcripts, PDF notes and video embedded quizzes to deliver the same content. Veletsianos, Collier and Schneider (2015) attribute this multimodality as useful when there is diversity in the
population because “learners engage with content in multiple modes (e.g., video, digital transcript), and they do so in unique ways based on affordances imbued in the different modalities (e.g. pausing and replaying videos, taking notes on printed transcripts)” (p. 580).

The Selective learners have unique preferences that are driven by certain forms of conatus, which range from their familiarity with the technology to the affordances that are compatible with disabilities. Thus, having multimodal content and processes in an online learning system is a mechanism of inclusivity that caters for a broad-range of learners who are selective and less inclined to venture beyond their self-prescribed preferred technologies and affordances.

**VI. The Avant-garde learner**

According to Neary (2010) on the role of the educator and the learning, “the student is not simply consuming the final product of someone else’s labour, but is involved with the entire process of production of knowing” (para. 22). Thus, the online learning system that caters for the Avant-garde learner should be accommodating to the awareness of knowledge production. The learner’s dispositions suggest sandbox-learning environments such as virtual worlds, discovery learning, ubiquitous learning tools for situated learning, online presentations, and Web 2.0 blank canvases.

For heightened human-computer interaction (HCI) technologies, sand-box learning environments such as virtual worlds (e.g. SecondLife, Minecraft, massively multiplayer online games) provide Avant-garde learners both the space to discover knowledge individually and collaboratively and the affordances to produce new ways of acquiring the subject knowledge.

On a less interactive level of HCI, learners may benefit from interacting with Web2.0 affordances that allow for the creation and presentation of new
knowledge. Avant-garde learners perhaps share the same autonomous inclinations as the Innovator type with the exception that Avant-garde learners place more emphasis on curiosity than creativity as a motivation to engage with the learning.

VII. The Synergic Learner

One of the characteristics that seems to dictate the Synergic Learner is the level of introversion. Introversion has been misconstrued as a weakness in a collaborative environment, but it has been found to have its own strengths. Based on reviewing Cain’s (2013) work on introversion, Schat (2012) profiles an introvert as having “heightened sensitivity and the ability to notice subtleties others miss, and they often think in a more elaborate, complex fashion” (p. 112). These traits are certainly advantageous in learning approaches that require heightened sensitivity such as interactive games.

However, Schat (2012) further added that introverts require “gentle encouragement (...) to point out what they have observed” (p. 112). The Synergic learner is an introvert who benefits from encouragement, and thus when paired with the complementary peer or placed in a setting where the conatus activates their shift from introversion to extraversion, the Synergic learner is expected to benefit from both sides of the dichotomy. The learner is able to develop a synergy with the peer or technology, which in turn encourages a degree of extraversion.

This ability to change personality has been defined as the ‘rubber band theory’ whereby learners have an innate state (the unstretched rubber-band), but given the right conatus, in the case of the rubber band a pulling motion, the learner can stretch beyond their innate personality to a certain extent (Cain, 2013, ch. 5, para. 14; Clack, 2017, p. 1). During the learners’ innate state, the learner’s dispositions recommend the use of encouragement mechanisms such as buddy systems, and Kagan Cooperative learning. Kagan Cooperative learning is an approach that encourages a small group of learners having mixed abilities to leverage on each
other’s strengths (Kagan, 1989) allowing for discussions between learners to be comprehensible (Kagan, 1995, p. 2), and more importantly discussions rich in feedback due to being paired with learners who are identified to be synergistically compatible with the learner.

In the traditional classrooms, learners are grouped into four in a table. In an online learning system, Kagan strategies can be conducted through group wikis, breakout rooms in web conferencing platforms such as Adobe Connect or GoToMeeting, and private communication in social networking platforms. With this cooperative mechanism in place, it is anticipated that the Synergic learner becomes ‘stretched’ towards their potential. The learner however is not obliged to activate this side of their personality. Even during their innate state, the use of technologies that interact with heightened sensitivity may benefit the Synergic learner. As opposed to developing a synergy with peers, this approach develops a synergy with the technology. The learner’s dispositions suggest the use of interactive online games to tap into the intricate thought process and sensitivity to subtleties possessed by the Synergic learner.

The thick descriptions above of the 7 prevalent habitus types attempt to identify how each habitus type might be indicative of learners’ dispositions. The most extrinsic and expected is their influence on technology preference, a phenomenon that has been observed in several habitus-based studies. One such study is by Ganguin and Hoblitz (2012, p. 114) who found that ‘playful’ habitus types influence people to use and acquire technology at least twice as much as ‘non-playful’ habitus types. For example, they found that playful habitus types watch videos at least five times more than non-playful types, and read e-books at least four times more than non-playful types (p. 115). Their study alludes to playful types as those that are more creative in using mobile technology such as gamers. With regards to my research, playful types would be epitomised by the Innovator.

Apart from the apparent influence on technology usage, the descriptions also highlight the influence of habitus types on learning approaches. Several of those
suggested were of approaches that are not exclusive to online learning but nevertheless adaptable, such as Kagan Cooperative Learning, staggered learning and rote learning, to name a few. These suggestions were derived from collating the repertoire of preferences that are associated with each habitus type and then applying them to several generic measures, such as learner-centredness, cognitive requirements, pedagogical needs, teaching presence and so on.

Therefore, as much as how these habitus types differ, they can actually be compared against each other based on these generic criteria. For example, an Avant-garde Learner and an Innovator have certain similarities such as a preference for a more student-centred approach, while a Fragmentary Learner and Direct Learner have certain shared preferences such as tasks with lower cognitive load. Synergic Learners and Selective Learners are over-particular with the type of online technology or content being offered thus requiring constant pedagogical scaffolding, while an Innovator and to a certain extent an Avant-Garde learner being more andragogically facilitated would seek their own alternative learning pathways that they perceive attach added value to their learning than the ones offered by default through the online learning system.

Ingrained in these comparative criteria are the intrinsic processes that influence the learners in the forms of decision-making, making sense of the world in patterns and predictions, assessing their trajectories and essentially, thinking. The learners’ decision-making affects how they learn. Several studies have highlighted how habitus and having different habitus types influence the choices that learners make including their subject disciplines (Hodkinson and Sparkes, 1997; Morley, 2003; Bowman, 2005; Mathers and Parry, 2009).

Moreover, their decision-making, particularly the habitus types that demand specific technologies and pedagogical scaffolding like the Fragmentary, Selective and Direct Learners, limit how they can adapt and flourish in a generic online learning system. Couldry (2005) believes that “a person’s available set of dispositions (or ‘habitus’) closes off her possibilities for action, by constraining the
resources she has to act in the situations she encounters” (p. 5). Thus, limitations in communicative strategies (Ochs, Solomon and Sterponi, 2005), in how learners understand the world and the actions they believe are realistic (Hurst, 2010; Mazanti, 2007; Avdeeff, 2014), and in the opportunities for effective learning (Cabral, 2013, p. 22) are the results of a habitus’ influence on the learner’s decision-making; thus limiting the learners’ range of decisions. In other words, those with a narrow view of how the world works will base their decisions constrained by their own schemata of what is realistic, while those who see the world as a blank canvas believe that nothing is impossible. Thus, the habitus influences not only the preferred technologies and learning approaches, but also how many choices are available for learners, making certain habitus types more versatile than others.

The influence of the habitus on intrinsic processes extends beyond decision-making and the limited understanding of one’s own dispositions. Research in other disciplines found that habitus influences individuals to act in a pattern (Hematalikeikha, Coolen and Pourdehimi, 2014; Kamann and Bakker, 2004), and influences future behaviour (Strutz et al., 2011). These findings can certainly be implied for online learners, as learning in patterns and projecting future outcomes can be implied from the habitus descriptions.

The Industrious Learners for example, due to their habitus being prone to identifying and facing barriers to learning, follows a learning pattern where they probe and persevere through these barriers until they overcome them. The Fragmentary learner prefers to learn in a learning pattern consisting of manageable steps. The Direct learner opts for the pathway with the shortest pattern to the outcome. The Selective learner expects alternatives in his pathway, the Avant-Garde learner finds his own pathway, the Innovator attaches added value to his learning, and the Synergic learner fares better when paired with the right peer or technology. Whether these patterns are known to certain learners or whether they are fossilised or innate to some others, the learning patterns provide additional description to how learners interact with the online learning system. These
learning patterns are the result of the habitus influencing a learner’s decision-making. Figure 45 below illustrates the different learning patterns that each habitus type is prone to follow:

![Diagram of learning patterns](image)

**Figure 45. The assumed learning patterns of the 7 main habitus types**

The descriptions of the habitus types allude to these intrinsic learning patterns as integral information in identifying further extrinsic elements that would befit a learner based on their habitus type. In turn, it will allow for policy-makers and educators to devise an online learning system that caters for these influences and the learning patterns involved. On a macro level, these comparisons informed my research that the influence on habitus could be based on four measures. These
comprise of how habitus influences 1) a learner’s success or failure in functioning in the online learning system, 2) a learner’s acceptance or resistance to the online learning system, 3) a learner’s willingness to adapt or retain their habitus, and 4) a learner’s likelihood of struggling or flourishing in the system. The influence of the habitus is indeed central to these polarities, yet the influence of the online learning system and its opus operatum should never be downplayed. For example, a Synergic learner may succeed in a collaborative learning environment, but may fail in an individualised lecture course.

My thesis from this point will now shift its focus from the learner to the environment, as how the discussions on technology were meant to be axiomatically revisited by my research. Lueg (2011) insists that, “Bourdieu’s notion of habitus, are underpinned by the psychological and pedagogical assumptions that education is fully successful only if learners can settle in an environment that fully meets their habitus-based needs” (p. 31). The final part of this section therefore is a response to my third research question.

7.3.3. What online learning systems are capable of catering for the different types of learner habitus?

Prior to the findings in this chapter, my literature review on online learning systems had already identified three types of systems as being able to cater for a heterogeneous and dynamic learner population in their own ways. The first suggested system, the AOLS, manages learners using automated fuzzy logic and algorithms to adapt its affordances to its learners. This interaction is illustrated in Figure 46 below:
The key to the AOLS is its intelligent system that assesses learners’ habitus type, and then adapts and accommodates the learner through tailored learning approaches and technologies. The second suggested system, the MOLS, provides alternative learning pathways so that learners have the opportunity to select the most conducive affordances. Its interaction with different habitus types is illustrated in Figure 47 below:

Figure 46. Interaction between learner and learning in AOLS

Figure 47. Interaction between learner and learning in a multimodal online learning system
Different from AOLS, the MOLS learner-system interaction consists of a myriad of affordances and approaches creating a smorgasbord for learners to freely choose from. However, these options are limited to the features available in the system and are standardised for all. The third suggested system, the PLE system, gives absolute freedom to the learners on what affordances and artefacts to use regardless of their availability in the system. The autonomy of the learner in selecting their own affordances and artefacts is illustrated in Figure 48 below:

PLEs as described are often associated with social software each providing a purpose, such as WhatsApp for communication, Twitter for micro-blogging, YouTube for uploading videos, Pinterest for notes and so on. Several platforms provide social software that has single sign-on and cross synchronisation features. For example, Google has its collection of Google Apps, which include Gmail, Google Talk, Google Calendar, Google Site, Google Docs and Google Drive. In addition to these software and apps, Google has Google Classroom, which interacts with the Google software like a central dashboard. Microsoft has its Live@Edu, which
includes Outlook Live, MSN (now defunct), Skype, Microsoft Calendar, Skydrive, Microsoft Office Live Workspace and Windows Live Writer.

Personalised Learning Environments do not have to be exclusively comprised of social software. Several studies have shown that PLEs can be combined with prescribed VLEs (Severance, Hardin and Whyte, 2008; Zijdemans-Boudreau, 2011). There are three ways of combining PLEs with VLEs and these are 1) using a main VLE with a supplementary PLE, 2) using a main VLE with a complementary PLE, 3) using a VLE/PLE hybrid (iPLE), (vPLE) (Zijdemans-Boudreau, 2011). Regardless of which combination is chosen, the role of policy-makers and educators is in consulting with learners on what types of technology and affordances will be relevant to the online learning system.

However, despite the strengths of each system, the descriptions of the 7 habitus types surmised that not every learner might be receptive of being guided to specific learning pathways, being given an array of alternatives, or being given autonomy to choose affordances. Learners may feel constrained, may feel overwhelmed, or may feel unqualified to choose. The Direct Learner type for example is more receptive of prescribed instructions, while the Selective Learner may be appreciative of multimodality but not on having his/her learning pathway determined by an adaptive system. Based on the conflicts that may arise between the learner and the incompatible online learning system, my recommendation, and in response to this third research question, is an online learning system that adapts the advantageous features of the three previously mentioned systems; or in other words a hybrid online learning system.

A hybrid online learning system that incorporates 1) the computational intelligence in profiling heterogeneous learners, 2) the repertoire of affordances and artefacts conducive to learners wanting to develop or expand their learning strategies, and 3) the ownership of certain affordances and artefacts through personalised learning would in theory be capable of catering for the habitus types. The use of a hybrid online learning system has been reported by Peirce, Conlan and Wade
(2008) who presented a study on the use of Adaptive Educational-Game Environments (a system similar to AOLS but with added gamification affordances) to create personalised learning experiences; and by Conlan et al., (2002) who integrated the ideas of adaptive hypermedia, multi-model and personalised learning to enhance the success rate of their e-learning system.

One major development in hybrid online learning systems is the Heterogeneous Learning Management System (HLMS). It is based on an institution-prescribed LMS that either has the capacity to be adaptive, multimodal and customisable, or readily integrates itself with external artefacts and affordances that accomplish these required capacities. Several institutions have opted to pair their institution-prescribed locally hosted Blackboard LMS with remote-hosted LMSs such as Canvas (Shapiro, 2014; Davis and Zane, 2016) and Moodle (Basile and Murphy, 2010; Carvalho, Areal and Silva, 2011).

One HLMS study suggested on the use of a mediator system to monitor, manage and synchronise learners’ activities in multiple Learning Management Systems (LMS), which in the study involved learners interacting with at least one of Moodle, Ganesha, Claroline and Sakai learning management systems (Guettat, Farhat and Gemni, 2013) and their progress, regardless of LMS, propagated and synchronised onto their self-designed mediator system called Mediateur. Although the study did not specify if learners were able to customise and select their online tools or integrate external platforms, this HLMS system is undeniably multimodalled with its different LMS offerings, and adaptive with its system of mediation. Several other studies advocated on the adaptiveness of HLMS and similarly hybrid systems in not only responding to learners’ data, interaction and performance, but also in synchronising all the information retrieved from various platforms onto one central agent system (Mwinyi et al., 2013; Klebl, Krämer and Zobel, 2010; Masud, 2016).

Studies on combined systems found how learners perform differently when presented with multimodalled platforms. A study by Buzzetto-More (2012) found that although there is some duplication in terms of interaction and content delivery
when both Blackboard and Facebook were used simultaneously, the ways in which learners interact in both platforms, such as in the formality, immediacy and student-centredness were found to be different (p. 70). In addition, the statistical analysis that accompanied Buzzetto-More’s study provided empirical evidence that different learners have different preferences for discussions (p. 81) and content delivery (p. 83) based on Blackboard and Facebook. This is reflective of the different dispositions exhibited by the 7 habitus types on involvement in discussions, such as Synergic Learners’ introversion; and the delivery of content, such as the bite-sized information preferred by Fragmentary Learners and the succinct instructions expected by Direct Learners.

In response to this third research question, my research identifies the relevance of the AOLS, the MOLS and the PLE systems as capable in catering for certain types of habitus, but the system that has the most potential to cater for the heterogeneous and dynamic Brunei learner population is a hybrid system that is based on an institution-prescribed LMS, designed in accordance with the HLMS approach with a central agent system that mediates learning and adapts to learner dispositions.

However, the implementation of the hybrid online learning system, or any system for that matter, should be complemented with revised policies that ensure the selected system is not partial to only the elite users of digital technology as past one-size-fits-all systems have done. Browsing through white papers, speeches and policies released by the Ministry of Education, it is clear that the ministry is fond of the idea of ’digital natives’. Yet, clinging on to this conjectural learner profile has been detrimental to Brunei’s efforts in introducing digital technologies.

Notwithstanding, there has been a recent motion for the educational research sector to ‘stop talking about digital natives’ because “generation-based, essentialising accounts of technology use and affinity have been shown to be unhelpful both practically and conceptually (....) from a need for a total ‘disruption’ of educational systems, to supposed lack of capacity for reflection and attention on the part of young people” (Bayne and Ross, 2016, p. 123). Indeed, the
implementation of educational technology in Brunei has not only been disrupted by this doxa but also the misconstrued perception of Bruneian learners’ capacity to reflect and be attentive in learning has resulted in mismatched technologies. Thus, policy-makers should not misconstrue that use of online technologies for social and entertainment purposes is transferable to use for educational purposes. Ryberg and Dirckink-Holmfeld (2010) have already cautioned of the propensity in overgeneralising learners’ technology use.

They draw from the work of Clark et al., (2009) who establish a “‘digital dissonance’ between the learning potential of Web 2.0 as envisaged by researchers and innovative practitioners, and the actual Web 2.0 practices that the majority of young people engage with” (Ryberg and Dirkinck-Holmfeld, 2010, p. 171). Mindful of the differences in technology use between casual and learning purposes, Ryberg and Dirkinck-Holmfeld (2010) advised that, “educational institutions play an important role in ensuring that young people develop the skills necessary to become critical users and producers of digital media, and to support their own learning” (p. 171). This brings us back to the notion that for an online learning system to be successful, not only must it provide the matching affordances, artefacts and approaches, but also the constant opportunity for learners to organically develop their habitus that are predisposed towards learning online.

### 7.4. Chapter summary

This chapter presented a series of discussions that began with the theoretical construct of the habitus lattice. This lattice is a cluster of tiers that begin with its two extreme points (the prime habitus types) and branches out into 1st, 2nd and 3rd tier types. In addition, the habitus types have the tendency to change dispositions either negatively (-) or positively (+) from learning online. These branches, tiers and tendencies all contribute to the dynamicity of learners shifting from type to type, their tendency to shift being influenced by the conatus. The conatus, a construct that my research found serendipitously, either catalyses change or reinforces the
learner further to his/ her habitus. However, for all its features, the lattice theory at this point in time is essentially a hypothetical model of the under-researched habitus construct.

Based on my sample, my research scrutinised 7 possibly different habitus types through a three-pronged approach of inductive, deductive and abductive reasoning, creating thick descriptions of each type including their preferred affordances, artefacts and learning approaches. The thick descriptions suggested several ways in which the habitus influences learning effectiveness. Most notably, the habitus influences learners’ dispositions towards extrinsic components of online learning such as the technology and learning approaches. A further interpretation of the descriptions suggested that habitus influences certain intrinsic processes, including decision making, limitations of choices, learning patterns and future behaviours.

With the intricacies of the discussions in this chapter, involving at times abstract ruminations on Bourdieu’s constructs and how they describe the context of my research, this chapter is essentially a reflexive soliloquy of the very problem that has been highlighted at the very beginning of this research. The problem is the challenge in successfully implementing online learning due to the lack of understanding of who the learners are. By responding to the three research questions above, it is hoped that these new information would at the very least inform policy-makers that our Bruneian learners have distinct dispositions towards learning, towards digital technology and from these, dispositions towards learning online in online learning systems.
Chapter 8: Conclusion and recommendations

The rapid growth of online learning in the Asia region has placed a lot of expectations on the future development of education in Brunei. Being the only country in the South-East Asian community to not recognise online learning qualifications, let alone implement any semblance of structured online learning in its education system, Brunei is inadvertently denying its learners of the opportunity in using emerging online technologies and systems for learning, particularly when Bruneian learners already exhibit dispositions towards using internet technology, albeit for social and entertainment purposes.

It is not that Brunei has no aspiration towards online learning, because for almost two decades policy-makers and senior officials have repeatedly commented on the benefits of online learning in speeches and writing. Recent dialogues from policy-makers have explicitly expressed an intention to realise this aspiration. However, the lack of knowledge on Brunei learners and their dispositions has unfortunately hindered progress as past implementation of digital technologies proved that introducing incompatible or one-size-fits-all systems resulted in a waste of time and a waste of funding. Thus, learner profiling acts as a prerequisite to the proper implementation of online learning systems and logically should be part of the substantial planning process (Ministry of Education, 2014) when Brunei finally decides to follow through with implementation.

From the literature review and in responding to the research questions, this research has arrived at several conclusions that may contribute to both the local literature and the discourse on online learner profiling. It is important to note that the methods by which these conclusions were developed involved an intricate series of objective and subjective interpretations using a combination of inductive, deductive and abductive reasoning, all encapsulated under the pragmatist approach and guided by the pragmatist theory of Bourdieu’s habitus.
This final chapter summarises the findings from the literature review, followed by summarised answers to the three research questions. These summations are then followed by an account of the limitations of the research, and a series of recommendations on the research pathways that I, and possibly other researchers, may want to embark on in the future.

8.1. A summary of the literature

My series of systematic literature review on various bodies of literature were pivotal in informing my research strategy and approach. From the literature review, I was able to identify emerging online learning systems that I previously was not aware of. I found that learner theories had a narrow perspective of learners and that a majority of their taxonomies do not explicitly address heterogeneity and dynamicity. I found that the learning process could be explained more holistically based on Bourdieu’s theory of habitus. Upon describing the seven habitus types, I realised the extensiveness of learners’ dispositions and how these required further engagement with the literature to discover concepts such as avant-garde learner, Kagan cooperative learning, pedagogical-andragogical-heutagogical approaches and so on.

The significant role of the literature in constantly informing my reasoning and interpretation of the data and the eventual findings is thus a testament to the extensiveness and intricacies of the topic that I have engaged with. In my attempt to attain a more nuanced understanding of my research data, I applied two main sources of literature as my philosophical reference. Firstly, Bourdieu’s theory framed my research and gave me a Bourdieusian perspective of dispositions as heterogeneous, interconnecting and dynamic constructs. Secondly, Peirce’s inductive-deductive-abductive approach influenced my interpretation of the data from the onset until the very end of my discussion, spanning from Chapter 3 until Chapter 7 in its gradual process of transforming arbitrary data into hypothetically sound knowledge. In addition to their respective contributions, both references
epitomise the pragmatist maxim, with Peirce being one of its pioneers, and Bourdieu one of its advocates. The two sources of philosophical tenets inspired my research to becoming a Bourdiesian study that pragmatically produced hypothetical explanations to the three research questions.

8.2. A summary of the answers to the research questions

To conclude this thesis it is best to summarise the main findings of my research once more, particularly in answering its three research questions.

In line with the philosophy of pragmatism and the belief that hypotheticity has its purpose in developing theories, my inductive-deductive-abductive analyses of mixed data allowed me to informatively speculate seven different types of habitus. The answer to the first research question is that there are at least seven different types of habitus, which I have labelled as 1) Industrious Learners, 2) Fragmentary Learners, 3) Innovators, 4) Direct Learners, 5) Selective Learners, 6) Avant-garde Learners, and 7) Synergic Learners.

Further investigation based on abductive reasoning allowed me to speculate how the differences in dispositions among these 7 habitus led to differences in their learning effectiveness and experience in online learning system. Admittedly, this finding was derived from heuristic and inquisitive processes rather than observation in practice, but the praxeological knowledge derived from these processes considering the limitations provided knowledge on learners’ dispositions towards learning, using technology and learning using online technology.

The intricacies of how different habitus types are predisposed and reactive towards different technologies and approaches could not be summarised here, but in general, each of the 7 habitus type exhibit different learning pattern that can be alluded from their names. The industrious learner is persistent; the fragmentary learner learns in small stages and digest small fragments of information; the
innovators supplement and modify their learning as they see fit; the direct learners opt for the simplest most convenient learning path; the selective learner is particular with regards to technologies and approaches yet the right ones will make them productive; the avant-garde learner is autonomous in their learning; and the synergic learner requires a reciprocal peer or technology to elevate their learning. Collectively, these learning patterns to a certain extent answer the second research question.

The preceding information on how habitus types might influence learning in an online learning system addressed the third research question. Prior to identifying the seven habitus types, I identified adaptive online learning systems (AOLS), multimodal online learning systems (MOLS) and personalised learning environments (PLE) as potential candidates to being able to cater for these habitus types.

I have however refined my answer to the third research question; suggesting that the most ideal online learning system that might cater for these habitus types would be one that adapts the strengths of the three suggested systems above. In other words, a hybrid system that has the capacity to formatively assess learners’ dispositions and align the affordances and approaches to these dispositions, while at the same time provide a variety of built-in affordances and approaches to provide opportunities for learners to evolve in terms of their habitus; and be able to incorporate external affordances that the system is unable to provide. Thus, the answer to the third research question is an adaptive multimodalled personalisable online learning system.

Apart from the three research questions, one notable product of this research is the habitus lattice theory. Admittedly, the theory is a hypothetical model that has its limitations. Its 64-possible habitus theory is suggestive of different habitus types, but without a reconsideration of the statistical methods that handled the arbitrary quantitative data, the habitus lattice is speculative at best. Hence, the idea of profiling learners based on habitus types remains an intriguing concept and
one that I advocate to be used as indicators of learners’ dispositions towards online learning systems. As with many maiden research (Vågerö, 2006), there are certain flaws and gaps in this research that emerged upon its completion and acknowledging the limitations of this study would be the first step to improving and refining the habitus lattice theory.

8.3. Limitations of the study

Section 7.2.5 in the previous chapter had already presented the limitations of the habitus lattice theory. Due to its artificial and subjective procedures and its derivation from arbitrary and context-dependent data, the habitus lattice theory is more speculative than definitive. This section therefore discusses on the limitations of the research in its entirety, to recognise areas and aspects that could be approached more effectively.

Prior to my research, I sought to produce knowledge 1) that could be generalised onto other learner populations, 2) that was derived using a theory that had no predetermined taxonomy, and 3) that could be regarded as definitive. However, the eventual outcome of my research has seemingly detracted from these

Firstly, upon analysing the quantitative and qualitative data, I gradually realised how my findings were likely dependent on the context of Brunei and the Brunei learners in my sample. The fact that respondents shared several specific demographic characteristics, such as smart-phone ownership, the lack of online learning experience, being a student of vocational technical education, sharing similar cultures and academic background, the sample might represent a unique set of learners that may not be transferable in other contexts.

Secondly, upon advocating against the use of learner theories and their predetermined taxonomies, I realised that my habitus lattice theory was itself shaping into a predetermined taxonomy of its own, albeit with 64 possible habitus
types. Its saving grace was perhaps that it is a model that hypothetically maps heterogeneity and dynamicity.

Thirdly, the habitus lattice theory is not definitive. I have addressed this in detail in Section 7.2.5 where I highlighted the arbitrariness of the quantitative data, which in turn prompted me to employ subjective data simplification and consequently subjective interpretation. Therefore, my research and answers to the research question pivots on the Peirce’s precept of hypotheticity. In other words, the findings may be highly hypothetical but they are by no means meaningless.

8.4. Recommendations

Coming to the end of this thesis, we must not lose sight that this research is just the beginning of a new hypothesis. This research is an exploratory, theory-building endeavour that, taking into consideration its limitations and fallibility, would serve as the foundation for future studies. Vågerö (2006) has emphasised on how the first study is integral in setting the motion for more refined studies, and this research is absolutely the first of several studies investigating the use of the habitus as indicators of learners’ dispositions.

I perceive at this point in time that this research can develop along two different pathways. The first pathway involves the application of the research, its instruments, methods of analyses and theory as is; as a standardised toolkit. This entails continuing forward with this research and basing future studies on the current findings. This pathway acknowledges the cardinal caveat that is attached to the subjective methods of managing empirical data and the hypotheticity of the habitus lattice theory.

The second pathway involves taking heed of the cardinal caveat and take measures to revise, refine and improve the research strategy so that objective procedures are not affected by researcher bias and subjectivity, and that subjective interpretations
are more trustworthy with a larger and more saturated sample. This entails using alternative statistical methods in handling the data and more systematic strategies in maintaining trustworthiness of findings.

8.4.1. Moving forward: An online learner profiling toolkit

Data collection toolkits are commonly developed in various types of research to guide fellow researchers on the proper usage of its components. They refer to a combination of data collection instruments and their methods of analyses. The comprehensiveness of the toolkit depends on the requirements of the research. Athanases, Bennett and Wahleithner (2013) suggest that, “a broader data collection toolkit would include questionnaires, interviews, and other personal communication data” (p. 13). For my research, the toolkit comprises of the questionnaire, the interview schedule and the habitus lattice theory. In light of the hypotheticity of the habitus lattice, the following recommendations are food for thought in the event of the toolkit being employed in future studies.

Theoretically, there are two ways that the OLP-28 questionnaire might be used in other contexts. The first way involves replicating the Factor Analysis procedures to perhaps identify the latent variables of other contexts. Future studies can perform Factor Analysis on a new OLP-28 data set and discern a factor model. In turn, the differences in the factors between different contexts might develop further hypotheses on how context is influential to habitus types. This first use of the OLP-28 questionnaire is thus more concerned with developing hypotheses and theories.

The second and more layman’s way of using the OLP-28 is to use it as how it is eventually intended to be; a profiling instrument. This usage would not involve any Factor Analysis but rather involve manually averaging the sum of items for each Factor. Consequently, each respondent would have a set of six values, with each value being the average of their Likert-scale scores. These six values thus represent the respondent’s dispositions towards the 6 factors. Currently, the habitus lattice
theory is based on permutations of the Bruneian context, which makes its assertions context-dependent. It is possible that different learner populations would have different prevalent types, but speculating this is beyond the scope of my current research.

Discretion should therefore be exercised when attempting further research using what is fundamentally a context-dependent and hypothetical toolkit. Considering these risks, a better pathway to take immediately after this thesis, as suggested by Vågerö (2006), is to learn from the flaws of this maiden attempt to investigate on habitus profiles, correct these mistakes and refine aspects of my research to create a more resilient process of inquiry and consequently a more valid, reliable and trustworthy theory.

8.4.2. Moving forward: Revising the research

In light of the limitations and the flaws that I have highlighted throughout the thesis, my immediate action is to revise several aspects of my research, specifically in the methods of analysing the data.

My first recommendation is a reconsideration of the statistical method of analysis. Although the 6-Factor model derived from a meticulous process of Factor Analysis with its statistical due diligences, the derivation of learners’ factor combination was based on a truncation process where I subjectively decided to use a specific rounding strategy, followed by a simplification process where I subjectively simplified integers based on what I personally believe as thresholds representing dispositions and disinclinations. In this regard, I recommend that future research should consider the use of either a cluster analysis or a factor-cluster combo analysis. The use of a cluster analysis to analyse the raw questionnaire data would likely not reveal multivariances as well as reduce the variables to latent variables. However, a cluster analysis would firstly categorise respondents into groups and further analyses can be made based on these categorisations, such as a comparative analysis to seek differences between clusters.
My second recommendation involves adding an observation-based qualitative instrument to complement the questionnaire and the interview, so that dispositions could be observed in practice. I would recommend the use of Netnography. Netnography was initially a marketing research method but has been increasingly applied to educational research such as in ethnographically studying online communities (Kulavuz-Onal and Vásquez, 2013) and MOOC communities (Saadatdoost et al., 2014). According to Kozinets (2002), as an online environment data collection method, Netnography is “more naturalistic and unobtrusive than focus groups and interviews” (p. 61). Its strength is therefore in observing naturalistic behaviour, dispositions that include the subconscious interactions between the learner and the online learning system; the actual ‘practice’ as emphasised by Bourdieu.

My third recommendation is to consider investigating the representations of conatus. I would include enquiries that identify the variables that 1) influence learners to be content with their preferred way of learning, or variables that 2) rewire their dispositions in the perception that they will improve their learning performance in contextualised practice.

8.5. Final reflections

My reflexivity as a researcher, educator, technologist and part of the policy and management team has certainly contributed to my discussions throughout this thesis. Reflexivity is after all advocated by Bourdieu to enable researchers to comprehend the problems in ‘practice’. As defined by to Deer (2014), “reflexivity means that all knowledge producers should strive to recognise their own objective position within the intellectual and academic field” (p. 197). This thesis is a production of additional knowledge to an increasingly researched area of education. The dearth in the local body of literature on online learning and
eventually holistic learning profiling compelled me to undertake this investigation with constant theoretical and contextual sensitivity.

In Brunei, many implementations of educational technology in the past have been met with failure due to agencies in the education ecosystem working in isolated silos (Oxford Business Group, 2011, para. 7). Another was that the Bruneian learners, who are increasingly internet-savvy, “expect [the education system] to use new media to help them to learn” (Oxford Business Group, 2011, para. 13). The first concern is an informed account of a long-standing imbalance between the provided technology and the learners’ needs, attributed to the lack of structure in implementing ICT in education; ergo the issue of hysteresis. The second concern is the unquestionable dogma that the learner population is unanimous in their expectations and needs; ergo the issue of doxa. My focus on the learners allows me to relate hysteresis and doxa to the learners, and the education system’s perception and expectations of the learner. The learner is part of the hysteresis equation, as well as the misinterpreted doxa. It is thus par for the course to identify these learners so they are equally represented and rightly interpreted.

The key indicator of success for this research is if after its completion it ultimately contributes to the creation of a sustainable and all-inclusive online learning system that will be the core of Brunei’s fledgling online learning landscape. This research concludes with the finding made by Barbour et al. (2011) of the dilemma faced by a fledging online education system, “the biggest challenge for countries that have not implemented online learning is their government’s lack of vision and leadership. Many government officials may not even be aware of the practices happening in education or show no interest in them, which is indicated as another challenge” (p. 20). It is hoped through a meticulous method of understanding the learners, and acknowledging established practices and theories, policy-makers will now be able to make informed decisions. Ultimately, the significance of this research is that it will be that needed agent of change for Brunei’s education system.
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APPENDICES

Appendix A – Amendment of items from OLP V.1 to OLP V.2

Table A.1 – Refined demographic items from OLP V.1 to OLP V.2

<table>
<thead>
<tr>
<th>OLP V.1</th>
<th>OLP V.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your gender?</td>
<td>1. What is your gender?</td>
</tr>
<tr>
<td>2. How old are you?</td>
<td>2. How old are you?</td>
</tr>
<tr>
<td>3. What is your level of study?</td>
<td>3. What is your current level of study?</td>
</tr>
<tr>
<td>4. What is your programme of study?</td>
<td>4. What is your programme of study?</td>
</tr>
<tr>
<td>5. Do you have internet at home?</td>
<td>5. Do you have any online learning experience?</td>
</tr>
<tr>
<td>6. Which of the following devices do you own?</td>
<td>6. I own and actively use a/an...</td>
</tr>
<tr>
<td>(a) Mobile phone, (b) Tablet device, (c)</td>
<td>(a) Home internet</td>
</tr>
<tr>
<td>Desktop computer, (d) Laptop computer, (e)</td>
<td>(b) Computer/laptop</td>
</tr>
<tr>
<td>Video game console, (f) Wearable devices</td>
<td>(c) Smartphone</td>
</tr>
<tr>
<td>7. Which of the following do you have</td>
<td>(d) Tablet device</td>
</tr>
<tr>
<td>active accounts for?</td>
<td>(e) Personal website</td>
</tr>
<tr>
<td>(a) Apple iTunes/ Android ID, (b) Facebook,</td>
<td>(f) Facebook</td>
</tr>
<tr>
<td>(c) Twitter, (d) Instagram, (e) E-mail, (f)</td>
<td>(g) Instagram</td>
</tr>
<tr>
<td>Blogger/WordPress/Tumblr</td>
<td>(h) Twitter</td>
</tr>
<tr>
<td>(i) Forum</td>
<td>(j) Apple ID/ Android ID</td>
</tr>
<tr>
<td>(k) E-mail</td>
<td>(l) Chat App</td>
</tr>
<tr>
<td>(m) Online drive</td>
<td>(n) Skype/ Facetime</td>
</tr>
<tr>
<td>(o) Online diary</td>
<td>(p) Video games</td>
</tr>
<tr>
<td>8. On an average day, how regularly do you</td>
<td></td>
</tr>
<tr>
<td>actively use / access these web technologies</td>
<td></td>
</tr>
<tr>
<td>per day?</td>
<td></td>
</tr>
<tr>
<td>(a) Mobile phone, (b) Tablet device, (c)</td>
<td></td>
</tr>
<tr>
<td>Desktop computer, (d) Laptop computer, (e)</td>
<td></td>
</tr>
<tr>
<td>Video game console, (f) Wearable devices, (g)</td>
<td></td>
</tr>
<tr>
<td>Apple iTunes/ Android ID, (h) Facebook, (i)</td>
<td></td>
</tr>
<tr>
<td>Twitter, (j) Instagram, (k) E-mail, (l)</td>
<td></td>
</tr>
<tr>
<td>Blogger/WordPress/Tumblr</td>
<td></td>
</tr>
</tbody>
</table>

Table A.2. Refined capital items (technology and internet skills)

<table>
<thead>
<tr>
<th>OLP V.1</th>
<th>OLP V.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. I regularly read books, magazines and/or</td>
<td>7. I know how to...</td>
</tr>
<tr>
<td>newspapers online</td>
<td>(a) Design websites</td>
</tr>
<tr>
<td>12. I like listening to factual radio shows</td>
<td>(b) Type fast/ touch type</td>
</tr>
<tr>
<td>and podcasts which I listen to online</td>
<td>(c) Learn a new app on my own</td>
</tr>
<tr>
<td>13. I play online games whenever I have free</td>
<td>(d) Bookmark websites</td>
</tr>
<tr>
<td>time</td>
<td>(e) Identify harmful media</td>
</tr>
<tr>
<td>14. I am very attached to my online social</td>
<td>(f) Hack websites</td>
</tr>
<tr>
<td>networks</td>
<td>(g) Edit digital photos</td>
</tr>
<tr>
<td>20. I use internet tools to organize and</td>
<td>(h) Use social networks</td>
</tr>
<tr>
<td>share personal information such as photos</td>
<td>(i) Create an online group</td>
</tr>
<tr>
<td>or updates</td>
<td>(j) Manage my online profile</td>
</tr>
<tr>
<td>24. I am able to quickly learn on my own a</td>
<td>(k) Identify online icons/ logos</td>
</tr>
<tr>
<td>new internet feature such as an app or a</td>
<td>(l) Upload videos</td>
</tr>
<tr>
<td>network site</td>
<td>(m) Edit videos</td>
</tr>
<tr>
<td>84. I frequently tweet updates, post photos,</td>
<td>(n) Play online games</td>
</tr>
<tr>
<td>write blogs or upload my own videos on the</td>
<td>(o) use online software</td>
</tr>
<tr>
<td>internet</td>
<td>(p) Block internet spam</td>
</tr>
<tr>
<td>86. I have a personal web page which I</td>
<td>(q) Translate the language of online websites</td>
</tr>
<tr>
<td>maintain regularly</td>
<td>(r) Design 3D animation</td>
</tr>
<tr>
<td>OLP V.1</td>
<td>OLP V.2</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>20. I use internet tools to organize and share personal information such as photos or updates.</td>
<td>8. I consider myself as...</td>
</tr>
<tr>
<td>21. I use internet tools to organize and share school related information such as notes or homework.</td>
<td>(a) Friendly</td>
</tr>
<tr>
<td>24. I am able to quickly learn on my own a new internet feature such as an app or a network site.</td>
<td>(b) Talented</td>
</tr>
<tr>
<td>31. I can easily fix or assemble something through following printed instructions</td>
<td>(c) Enthusiastic</td>
</tr>
<tr>
<td>40. I always take more time to plan and think of my ideas thoroughly compared to completing the actual task in writing/practical/presentation</td>
<td>(d) Creative/innovative</td>
</tr>
<tr>
<td>45. I keep a daily/weekly planner to schedule my day-to-day activity</td>
<td>(e) Having good memory</td>
</tr>
<tr>
<td>46. I make sure I get enough sleep every night to be more focused in my studies</td>
<td>(f) Patient</td>
</tr>
<tr>
<td>50. I work better in small groups than alone</td>
<td>(g) Tolerant</td>
</tr>
<tr>
<td>51. I like to focus on one particular tasks instead of doing many things at the same time</td>
<td>(h) Able to take criticism</td>
</tr>
<tr>
<td>52. Whenever I have new work to do, I do it straight away</td>
<td>(i) Independent</td>
</tr>
<tr>
<td>53. I tend to start revising late for an exam (procrastinate; crammer)</td>
<td>(j) Precise</td>
</tr>
<tr>
<td>55. I keep my school notes organised and label/highlight important points</td>
<td>(k) Eager to learn new things</td>
</tr>
<tr>
<td>56. I can learn independently without much help from the teacher</td>
<td>(l) Studious</td>
</tr>
<tr>
<td>58. I like to add my own ideas to my work compared to following what the textbooks and teachers say</td>
<td>(m) Confident</td>
</tr>
<tr>
<td>64. I feel very anxious whenever I prepare and sit for a test or exam</td>
<td>(n) Communicative</td>
</tr>
<tr>
<td>72. I rather not do a task than to make mistakes while doing it</td>
<td>(o) Calm</td>
</tr>
<tr>
<td>73. I get stressed out easily</td>
<td>(p) Organised</td>
</tr>
<tr>
<td>74. I pay attention to details</td>
<td></td>
</tr>
</tbody>
</table>
### Table A.4. Refined capital items (intellectualised skills)

<table>
<thead>
<tr>
<th>OLP V.1</th>
<th>OLP V.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. I like solving riddles and puzzles</td>
<td>9. I am proficient in the subject/skill of…</td>
</tr>
<tr>
<td>54. I enjoy writing essays, narratives and compositions</td>
<td>(a) Math</td>
</tr>
</tbody>
</table>

(b) Core academic subjects  
(c) ICT  
(d) Critical thinking  
(e) Business  
(f) Playing music  
(g) Dancing/singing/acting  
(h) Teaching or training others  
(i) Sports  
(j) Mechanics of robotics  
(k) Public speaking  
(l) Handicrafts  
(m) Drawing (art) and design  
(n) Fixing things  
(o) Writing essays

### Table A.5. Refined capital items (socialised dispositions)

<table>
<thead>
<tr>
<th>OLP V.1</th>
<th>OLP V.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>61. I find my social networks helpful in getting my school work done.</td>
<td>10. I believe that I have…</td>
</tr>
</tbody>
</table>

...a supportive family network  
...a supportive network of friends  
...a supportive school environment  
...strong cultural values due to the support I have  
...strong ICT skills due to the support I have  
...relative academic success due to support I have  
...sufficient money to spend on what I need

### Table A.6. Refined disposition items (study dispositions)

<table>
<thead>
<tr>
<th>OLP V.1</th>
<th>OLP V.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. I regularly read paper-based books, magazines and/or newspapers</td>
<td>11. I prefer learning through…</td>
</tr>
<tr>
<td>56. I can learn independently without much help from the teacher</td>
<td>...reading printed books or notes</td>
</tr>
<tr>
<td>50. I work better in small groups than alone</td>
<td>...consulting my teachers</td>
</tr>
<tr>
<td>76. I prefer being told and instructed on what to do</td>
<td>...group work</td>
</tr>
<tr>
<td>69. I am more likely to stay focused learning from the computer than listening to a lecture.</td>
<td>...following step-by-step instructions</td>
</tr>
<tr>
<td>30. I usually spend several hours watching television per day</td>
<td>...listening to classroom lectures</td>
</tr>
<tr>
<td>44. I am usually engaged by and interested in watching documentaries</td>
<td>...watching videos</td>
</tr>
<tr>
<td>59. I like to learn from reading compared to doing hands-on activities</td>
<td>...watching how others do their work</td>
</tr>
<tr>
<td>48. I like going to the library to read and/or borrow books</td>
<td>...engaging practical or hands-on activities</td>
</tr>
<tr>
<td></td>
<td>...browsing the internet for information</td>
</tr>
<tr>
<td></td>
<td>...researching from books at the library</td>
</tr>
<tr>
<td>OLP V.1</td>
<td>OLP V.2</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>47. I have a special study area whenever I want to study</td>
<td>12. In my studies, I...</td>
</tr>
<tr>
<td></td>
<td>...have my own study area for private study time</td>
</tr>
<tr>
<td></td>
<td>...work at my own pace</td>
</tr>
<tr>
<td>55. I keep my school notes organised and label/highlight important</td>
<td></td>
</tr>
<tr>
<td>points</td>
<td>...write and label my notes to make it easy for me</td>
</tr>
<tr>
<td>56. I can learn independently without much help from the teacher</td>
<td>...seek the opinions and advice of others</td>
</tr>
<tr>
<td></td>
<td>...follow a strict daily/weekly schedule</td>
</tr>
<tr>
<td>45. I keep a daily/weekly planner to schedule my day-to-day activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>...need constant access to the internet</td>
</tr>
<tr>
<td>10. Having constant access to the internet is very important to me</td>
<td>...am not easily distracted by the internet</td>
</tr>
<tr>
<td></td>
<td>...search for information I need on the internet first</td>
</tr>
<tr>
<td>15. I am easily distracted from my studies by the internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>...firstly plan on how I will do my work</td>
</tr>
<tr>
<td>26. Whenever I need to know information, I search it on the internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>...do not tend to procrastinate (waste time)</td>
</tr>
<tr>
<td>40. I always take more time to plan and think of my ideas thoroughly</td>
<td></td>
</tr>
<tr>
<td>compared to completing the actual task in writing/practical/presentation</td>
<td>...read information over and over again</td>
</tr>
<tr>
<td></td>
<td>...remember information better when they have pictures</td>
</tr>
<tr>
<td>53. I tend to start revising late for an exam (procrastinate; crammer)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>...am always calm and stress free</td>
</tr>
<tr>
<td>33. Understanding new information is hard. I have to read or listen</td>
<td></td>
</tr>
<tr>
<td>to it over and over again</td>
<td>...have to complete my work straight away</td>
</tr>
<tr>
<td>34. I believe having pictures and graphics make information easier to</td>
<td></td>
</tr>
<tr>
<td>understand</td>
<td></td>
</tr>
<tr>
<td>73. I get stressed out easily</td>
<td></td>
</tr>
<tr>
<td>52. Whenever I have new work to do, I do it straight away</td>
<td></td>
</tr>
</tbody>
</table>
68. I find that using new technologies help motivate students like me to study...am motivated to learn when using the internet
89. I am very conscious of how others see my work...am not anxious of others seeing my mistakes

<table>
<thead>
<tr>
<th>Table A.8. Refined disposition items (techno-disposition)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OLP V.1</strong></td>
</tr>
<tr>
<td>9. I am on the internet several hours per day</td>
</tr>
<tr>
<td>32. I like reading and learning a lot of general knowledge</td>
</tr>
<tr>
<td>37. I find that I am at times overloaded by too much information from the internet</td>
</tr>
<tr>
<td>34. I believe having pictures and graphics make information easier to understand</td>
</tr>
<tr>
<td>25. Whenever I need to know information, I can find it really fast</td>
</tr>
<tr>
<td>16. I tend to do multiple things on the internet at once</td>
</tr>
<tr>
<td>90. I prefer talking face-to-face compared to text conversations</td>
</tr>
<tr>
<td>19. I use the internet more for studying than for entertainment</td>
</tr>
<tr>
<td>18. I usually express my opinions or share news on the internet first</td>
</tr>
<tr>
<td>84. I frequently tweet updates, post photos, write blogs or upload my own videos on the internet</td>
</tr>
<tr>
<td>36. I find it difficult to work out where truth about a subject lies</td>
</tr>
<tr>
<td>42. I exercise caution in using or believing information from the internet</td>
</tr>
<tr>
<td>68. I find that using new technologies help motivate students like me to study</td>
</tr>
<tr>
<td>38. I find it easier and faster to find the information I need from books compared to the internet</td>
</tr>
<tr>
<td>38. I find it easier and faster to find the information I need from books compared to the internet</td>
</tr>
<tr>
<td>38. I find it easier and faster to find the information I need from books compared to the internet</td>
</tr>
<tr>
<td>82. I like to participate in discussions</td>
</tr>
<tr>
<td>69. I am more likely to stay focused learning from the computer than listening to a lecture.</td>
</tr>
<tr>
<td>69. I am more likely to stay focused learning from the computer than listening to a lecture.</td>
</tr>
<tr>
<td>69. I am more likely to stay focused learning from the computer than listening to a lecture.</td>
</tr>
</tbody>
</table>
### Appendix B – Results from the OLP V.2 pilot study

#### Table B.1. Factor Analysis Rotated Component Matrix from the OLP V.2 pilot study

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Strong cultural values due to the support I have] 10. I believe that I have...</td>
<td>.765</td>
<td>.061</td>
<td>.257</td>
<td>-.047</td>
<td>.052</td>
<td>-.007</td>
<td>.432</td>
<td>-.049</td>
</tr>
<tr>
<td>[Strong ICT skills due to the support I have] 10. I believe that I have...</td>
<td>.546</td>
<td>.289</td>
<td>.492</td>
<td>.162</td>
<td>.162</td>
<td>-.290</td>
<td>.155</td>
<td>.340</td>
</tr>
<tr>
<td>[Relative academic success due to the support I have] 10. I believe that I have...</td>
<td>.657</td>
<td>.329</td>
<td>-.075</td>
<td>.135</td>
<td>.201</td>
<td>-.096</td>
<td>.547</td>
<td>.067</td>
</tr>
<tr>
<td>[Reading printed books or notes] 11. I prefer learning through...</td>
<td>.859</td>
<td>.173</td>
<td>-.029</td>
<td>.145</td>
<td>-.202</td>
<td>.215</td>
<td>.056</td>
<td>.199</td>
</tr>
<tr>
<td>[Watching how others do their work] 11. I prefer learning through...</td>
<td>-.051</td>
<td>.298</td>
<td>.348</td>
<td>.392</td>
<td>.331</td>
<td>-.115</td>
<td>.625</td>
<td>-.206</td>
</tr>
<tr>
<td>[Browsing the internet for information] 11. I prefer learning through...</td>
<td>.012</td>
<td>.331</td>
<td>.309</td>
<td>.185</td>
<td>.672</td>
<td>.205</td>
<td>.323</td>
<td>-.055</td>
</tr>
<tr>
<td>[Interactive software] 11. I prefer learning through...</td>
<td>.500</td>
<td>.418</td>
<td>.130</td>
<td>-.091</td>
<td>.189</td>
<td>.083</td>
<td>.056</td>
<td>.595</td>
</tr>
<tr>
<td>[Online groups] 11. I prefer learning through...</td>
<td>.367</td>
<td>.531</td>
<td>.254</td>
<td>.207</td>
<td>.511</td>
<td>-.157</td>
<td>.117</td>
<td>-.021</td>
</tr>
<tr>
<td>[E-mail or chats for communication] 11. I prefer learning through...</td>
<td>.558</td>
<td>.489</td>
<td>.138</td>
<td>.091</td>
<td>.501</td>
<td>-.127</td>
<td>.244</td>
<td>-.127</td>
</tr>
<tr>
<td>[Mobile apps for activities and accessing notes] 11. I prefer learning through...</td>
<td>.551</td>
<td>.159</td>
<td>.477</td>
<td>.109</td>
<td>.479</td>
<td>.250</td>
<td>.039</td>
<td>-.048</td>
</tr>
<tr>
<td>[Online notes that are readable/ downloadable] 11. I prefer learning through...</td>
<td>.652</td>
<td>.208</td>
<td>.381</td>
<td>.109</td>
<td>.220</td>
<td>.265</td>
<td>.165</td>
<td>-.042</td>
</tr>
<tr>
<td>[Seek the opinions and advice of others] 12. In my studies, I...</td>
<td>-.100</td>
<td>.223</td>
<td>.064</td>
<td>.829</td>
<td>.362</td>
<td>.200</td>
<td>.097</td>
<td>.112</td>
</tr>
<tr>
<td>[Follow a strict daily/ weekly schedule] 12. In my studies, I...</td>
<td>.552</td>
<td>.519</td>
<td>-.069</td>
<td>.419</td>
<td>-.100</td>
<td>.087</td>
<td>.065</td>
<td>.067</td>
</tr>
<tr>
<td>[Firstly plan on how I will do my work] 12. In my studies, I...</td>
<td>.192</td>
<td>.727</td>
<td>.202</td>
<td>.099</td>
<td>.086</td>
<td>.110</td>
<td>.258</td>
<td>-.061</td>
</tr>
<tr>
<td>[Am always calm and stress-free] 12. In my studies, I...</td>
<td>.381</td>
<td>.613</td>
<td>-.212</td>
<td>.291</td>
<td>-.153</td>
<td>-.034</td>
<td>-.015</td>
<td>-.211</td>
</tr>
<tr>
<td>[Am motivated to learn when using the internet] 12. In my studies, I...</td>
<td>.535</td>
<td>.606</td>
<td>-.012</td>
<td>-.134</td>
<td>.277</td>
<td>.119</td>
<td>.131</td>
<td>.050</td>
</tr>
<tr>
<td>[I first go to websites that I am most familiar with] 13. When I use the internet, I...</td>
<td>.808</td>
<td>.165</td>
<td>.094</td>
<td>.052</td>
<td>.129</td>
<td>.283</td>
<td>-.032</td>
<td>.130</td>
</tr>
<tr>
<td>[Never get lost in the large amount of internet information] 13. When I use the internet, I...</td>
<td>.446</td>
<td>.647</td>
<td>-.011</td>
<td>.467</td>
<td>.100</td>
<td>-.125</td>
<td>.019</td>
<td>.232</td>
</tr>
<tr>
<td>[Skim quickly through information] 13. When I use the internet, I...</td>
<td>.485</td>
<td>.355</td>
<td>.365</td>
<td>.089</td>
<td>.434</td>
<td>.179</td>
<td>-.051</td>
<td>.264</td>
</tr>
<tr>
<td>[Do multiple things at the same time (multitask)] 13. When I use the internet, I...</td>
<td>.308</td>
<td>.134</td>
<td>.330</td>
<td>.253</td>
<td>.259</td>
<td>.619</td>
<td>.376</td>
<td>.032</td>
</tr>
<tr>
<td>[Communicate with people easier online] 13. When I use the internet, I...</td>
<td>.140</td>
<td>.119</td>
<td>.831</td>
<td>-.084</td>
<td>.222</td>
<td>.232</td>
<td>.098</td>
<td>.102</td>
</tr>
<tr>
<td>[Am careful with the truthfulness of information] 13. When I use the internet, I...</td>
<td>.652</td>
<td>.374</td>
<td>.306</td>
<td>.045</td>
<td>-.153</td>
<td>.295</td>
<td>.034</td>
<td>.139</td>
</tr>
<tr>
<td>Feature</td>
<td>Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose the easiest/most convenient internet feature</td>
<td>.547</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Become more motivated to do my school work</td>
<td>.666</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skip information that I don't like or find boring</td>
<td>.731</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate better when doing activities online</td>
<td>.681</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consulting my teachers</td>
<td>.175</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group work</td>
<td>.178</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engaging practical or hands-on activities</td>
<td>.343</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work at my own pace</td>
<td>.298</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use it continuously throughout the day</td>
<td>.233</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefer looking at photos and videos</td>
<td>.244</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expect to quickly find the information I need</td>
<td>.141</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient money to spend on what I need</td>
<td>.069</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. When I use the internet, I...
### Appendix C – Results from the First Coding Cycle of the Second Pilot Study

#### Table C.1: List of first cycle codes for interviewee A’s interview feedback

<table>
<thead>
<tr>
<th>In Vivo</th>
<th>Process</th>
<th>Initial (Other)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pressure from family</td>
<td>• Tiring (study life)</td>
<td>• Personality (competitive)</td>
</tr>
<tr>
<td>• Come from top secondary school</td>
<td>• Learning non-stop</td>
<td>• Personality (co-curricular)</td>
</tr>
<tr>
<td>• Priorities</td>
<td>• Multitasking</td>
<td>• Personality (”nerd”)</td>
</tr>
<tr>
<td>• Attended tuition</td>
<td>• Reading story book</td>
<td>• Support (Family and money)</td>
</tr>
<tr>
<td>• Had a favourite teacher</td>
<td>• Going to library</td>
<td>• Support (Friends)</td>
</tr>
<tr>
<td>• 6\textsuperscript{th} form – best years</td>
<td>• Playing around</td>
<td>• Memory</td>
</tr>
<tr>
<td>• 6\textsuperscript{th} form – in control of studies</td>
<td>• Demanding (success)</td>
<td>• (experience)</td>
</tr>
<tr>
<td>• Scholarship</td>
<td>• Counselling – how to study</td>
<td>• Personality (Independent)</td>
</tr>
<tr>
<td>• Obsessed with cliffs, post its highlighters</td>
<td>• Gets us going (friendship)</td>
<td>• Study habits (Cliffs, post its, highlighters)</td>
</tr>
<tr>
<td>• My friends are the same too</td>
<td>• Studying is important for work</td>
<td>• Memory</td>
</tr>
<tr>
<td>• Never scolded</td>
<td>• Procrastinating</td>
<td>• (experience)</td>
</tr>
<tr>
<td>• Mom dad inquisitive</td>
<td>• Getting gist of topic from YouTube</td>
<td>• Personality (perfectionist) (organised)</td>
</tr>
<tr>
<td>• Going to friend’s house to study</td>
<td>• Describing videos</td>
<td>• Influence (friends)</td>
</tr>
<tr>
<td>• Speak up more</td>
<td>• Moving pictures and graphs help to understand</td>
<td>• Personality (Independent)</td>
</tr>
<tr>
<td>• There’s always things to improve</td>
<td>• Coming to classes using phone cameras</td>
<td>• Support (Family)</td>
</tr>
<tr>
<td>• Need to work on assertiveness</td>
<td>• Sharing notes</td>
<td>• Support (Family – Inquisitive)</td>
</tr>
<tr>
<td>• Watch online movies</td>
<td>• Learning in Facebook is interesting</td>
<td>• Study groups</td>
</tr>
<tr>
<td>• Take photos for social network.</td>
<td>• Making my own choices</td>
<td>• Support (Dad well educated)</td>
</tr>
<tr>
<td>• Use google and wiki a lot</td>
<td>• Having info when want them</td>
<td>• Support (Dad reminds) (Dad teaches) (Dad advises)</td>
</tr>
<tr>
<td>• Have to read over and over again</td>
<td>• Can’t see myself changing</td>
<td>• Personality (talkative)</td>
</tr>
<tr>
<td>• Remember better</td>
<td></td>
<td>• Personality (lack assertiveness)</td>
</tr>
<tr>
<td>• Can replay video in head</td>
<td></td>
<td>• Technology (possession)</td>
</tr>
<tr>
<td>• Like to learn online</td>
<td></td>
<td>• Laptop + iPhone</td>
</tr>
<tr>
<td>• Wikipedia better than textbooks</td>
<td></td>
<td>• Internet (video streaming live)</td>
</tr>
<tr>
<td>• Wikipedia is a summary very good to read</td>
<td></td>
<td>• Personality (Curious)</td>
</tr>
<tr>
<td>• Wikipedia can’t be trusted</td>
<td></td>
<td>• Internet (Google and Wiki) (YouTube)</td>
</tr>
<tr>
<td>• Communication is important</td>
<td></td>
<td>• Opinion (OL make learning easy)</td>
</tr>
<tr>
<td>• Facebook group</td>
<td></td>
<td>• OL (FB Chat and emails)</td>
</tr>
<tr>
<td>• Photos, chats, videos, good for learning</td>
<td></td>
<td>• Internet (chat – group)</td>
</tr>
<tr>
<td>• Always online</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

324
• Be more organised more independent
• Know where to find info
• Know how to work around problems
• Comes with age
• Working in a team

<table>
<thead>
<tr>
<th>Table C.2: List of first cycle codes for interviewee B’s interview feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In Vivo</strong></td>
</tr>
<tr>
<td>• Study (is) boring (J/K)</td>
</tr>
<tr>
<td>• Distractions (video games and friends)</td>
</tr>
<tr>
<td>• Saves money</td>
</tr>
<tr>
<td>• Print notes out</td>
</tr>
<tr>
<td>• Ridiculously expensive (books)</td>
</tr>
<tr>
<td>• Attention to learn</td>
</tr>
<tr>
<td>• Learning using books and attending lectures – boring</td>
</tr>
<tr>
<td>• Type random things on Google</td>
</tr>
<tr>
<td>• Past time – chatting</td>
</tr>
<tr>
<td>• Facebook – news from home</td>
</tr>
<tr>
<td>• Don’t use most default apps (phone)</td>
</tr>
<tr>
<td>• Done OL courses</td>
</tr>
<tr>
<td>• Lecturer invisible (OL)</td>
</tr>
<tr>
<td>• Satisfying in the end (OL)</td>
</tr>
<tr>
<td>• Internet is user-friendly</td>
</tr>
<tr>
<td>Having a real teacher</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Games – entertaining</td>
</tr>
<tr>
<td>Always on the phone</td>
</tr>
<tr>
<td>WhatsApping</td>
</tr>
<tr>
<td>Chatting</td>
</tr>
<tr>
<td>Spend a lot of time</td>
</tr>
<tr>
<td>drawing</td>
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</tr>
</tbody>
</table>
Table C.3: Focused categories of interviewee A

<table>
<thead>
<tr>
<th>BACKGROUND</th>
<th>OPINIONS</th>
<th>CATALYSTS</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Come from top secondary school</td>
<td>• Tiring (study life)</td>
<td>• Pressure from family</td>
<td>• Technology (ownership)</td>
</tr>
<tr>
<td>• Had a favourite teacher</td>
<td>• 6th form – best years</td>
<td>• Scholarship</td>
<td>• Laptop + iPhone</td>
</tr>
<tr>
<td>• Memory (experience)</td>
<td>• Opinion (OL make learning easy)</td>
<td>• Speak up more</td>
<td>• Internet (video streaming live)</td>
</tr>
<tr>
<td>• Memory (experience)</td>
<td>• Learning non-stop</td>
<td>• There’s always things to improve</td>
<td>• Internet (Google, Wiki) (YouTube)</td>
</tr>
<tr>
<td>• Playing around (secondary school)</td>
<td>• Comes with age (study skills)</td>
<td>• Need to work on assertiveness</td>
<td>• Internet (chat – group work)</td>
</tr>
<tr>
<td></td>
<td>• Can’t see myself changing</td>
<td>• Be more organised more independent</td>
<td>• Internet (trustworthy)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Studying is important for work</td>
<td>• Internet (Familiar with FB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Priorities</td>
<td>• Watch online movies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Demanding (success)</td>
<td>• Take photos for social network.</td>
</tr>
<tr>
<td>PERSONALITY</td>
<td>SUPPORT</td>
<td>STUDY HABITS</td>
<td>ONLINE LEARNING</td>
</tr>
<tr>
<td>• Personality (competitive)</td>
<td>• Support (Family and money)</td>
<td>• Study habits (Cliffs, post its, highlighters)</td>
<td>• OL (FB Chat and emails)</td>
</tr>
<tr>
<td>• Personality (co-curricular)</td>
<td>• Support (Friends)</td>
<td>• Study groups</td>
<td>• OL (Using google)</td>
</tr>
<tr>
<td>• Personality (“nerd”)</td>
<td>• Attended tuition</td>
<td>• Reading story book</td>
<td>• OL (Wikipedia) (Wiki printouts)</td>
</tr>
<tr>
<td>• Personality (Independent)</td>
<td>• Influence (friends)</td>
<td>• Going to library</td>
<td>• OL (assessment)</td>
</tr>
<tr>
<td>• Personality (perfectionist) (organised)</td>
<td>• Support (Family)</td>
<td>• Sharing notes</td>
<td>• Don’t talk a lot in Blackboard</td>
</tr>
<tr>
<td>• Personality (Independent)</td>
<td>• Support (Family – Inquisitive)</td>
<td>• Having info when I want them</td>
<td>• Like to learn online</td>
</tr>
<tr>
<td>• Personality (talkative)</td>
<td>• Support (Dad well educated)</td>
<td></td>
<td>• Wikipedia better than textbooks</td>
</tr>
<tr>
<td>• Personality (lack assertiveness)</td>
<td>• Support (Dad reminds)[Dad teaches][Dad advises)</td>
<td></td>
<td>• Wikipedia is a summary very good to read</td>
</tr>
<tr>
<td>• Personality (Curious)</td>
<td>• My friends are the same too</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 6th form – in control of studies</td>
<td>• Never scolded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Obsessed with cliffs, post its highlighters</td>
<td>• Mom dad inquisitive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Always online</td>
<td>• Going to friend’s house to study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Making my own choices</td>
<td>• Counselling – how to study</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gets us going (friendship)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUDY WEAKNESS</td>
<td>STUDY HABITS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Communication is important</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Facebook group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Photos, chats, videos, good for learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Describing videos</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Moving pictures and graphs help to understand</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Coming to</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

wished without internet) • Personality (working with others) (working alone)
Table C.4. Focused categories of interviewee B

<table>
<thead>
<tr>
<th>BACKGROUND</th>
<th>STUDY WEAKNESS</th>
<th>TECHNOLOGY</th>
<th>ONLINE LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Struggle moving from college to degree</td>
<td>- Distractions (video games and friends)</td>
<td>- Facebook – news from home</td>
<td>- Done OL courses</td>
</tr>
<tr>
<td>- Study [is] boring (J/K)</td>
<td>- Attention to learn</td>
<td>- Internet is user-friendly</td>
<td>- Satisfying in the end (OL)</td>
</tr>
<tr>
<td>- Saves money</td>
<td>- Learning using books and attending lectures – boring</td>
<td>- Internet – idiot proof</td>
<td>- Literally from no internet to internet</td>
</tr>
<tr>
<td>- Tired of studying</td>
<td>- Difficult to look for the information (book)</td>
<td>- Can live without it (internet)</td>
<td>- Some Online Learning during studies</td>
</tr>
<tr>
<td>- #speaking Malay#</td>
<td>- Lacking focus</td>
<td>- Technology isn’t everything</td>
<td>- Internet powerful for schools</td>
</tr>
<tr>
<td>- Spend a lot of time drawing</td>
<td>- Proofreading</td>
<td>- Becoming too dependent on technology</td>
<td>- Perfect option</td>
</tr>
<tr>
<td>- Personality (Perseverance)</td>
<td>- Not good in writing</td>
<td>- Internet has a lot of information</td>
<td>- More things to say (about OL)</td>
</tr>
<tr>
<td>- Personality (Tenacious)</td>
<td>- Aversion (real books)</td>
<td>- A lot of entertainment, distractions</td>
<td>- Learning experience</td>
</tr>
<tr>
<td>- Personality (Get distracted easily)</td>
<td></td>
<td>- Things we don’t need (internet)</td>
<td>- Using google edit for final project</td>
</tr>
<tr>
<td>- Personality (Art creative)</td>
<td></td>
<td>- Type random things on Google</td>
<td>- Humbling (working with others)</td>
</tr>
<tr>
<td>- Personality (can live without internet)</td>
<td></td>
<td></td>
<td>- Online learning (Research on CPU and iPad)</td>
</tr>
<tr>
<td>- Personality (working with others) (working</td>
<td></td>
<td></td>
<td>- Online learning (team-up)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Online learning (workload)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Online learning (discussion)</td>
</tr>
</tbody>
</table>
alone)

**OPINIONS**
- ridiculously expensive (books)
- Games - entertaining
- Opinion (better reader)
- (Technology) improve studies
- Opinion (Technology dependence a bad thing)
- Opinion (Online vs Traditional Learning)

**SUPPORT**
- Siblings help out
- Support (fiancé)
- Support (big family)
- Support (family)

**PREFERRED OL**
- Lecturer having time to answer Questions
- Listening to lectures
- Watching video
- Study space (library)
- Study habit (Annotate e-books)
- Study habit (Print notes)

**PREFERRED OL**
- Lecturer invisible (OL)
- Search for keywords
- E-books easier
- Real-time (doc edit)
- Times when I was lost
- Prefer teacher to answer
- Teachers not ‘super involved’
- Constant conversation
- f2f online
- Online Multi-Player Games can do conferencing
- Having a real teacher

**PREFERRED OL**
- Past time - chatting
- Don’t use most default apps (phone)
- Drawing on phone
- Googling and googling
- Always on the phone
- WhatApping
- Chatting
- Technology (iPad camera)
- Technology (iPad zoom)
- Internet (ease of use)
- Internet (variety)
- Internet (vastness)
- Internet (group chat)
- Internet (Facebook)
- Technology (mobile apps)
- Internet (search boxes)
- Internet (usefulness)
- Internet (Group edit)
- Internet (Proofreading)
- Internet (purposes)
- Internet (connection)
- Internet (wifi)
- Internet easy (Google, YouTube, FB)

**PREFERRED OL**
- Online learning (peer evaluation)
- Online learning (disadvantage)
- Online learning (online teacher)
- Online learning (tools and web widgets)
- Online learning (multi features)
- Online learning (online conferencing)
- Online learning (chatroom)
- DGBL
- Dangers of DGBL
**Table C.5. Axially coded categories of interviewee A**

<table>
<thead>
<tr>
<th>BACKGROUND</th>
<th>OPINIONS</th>
<th>CATALYSTS</th>
<th>TECHNOLOGY</th>
<th>ONLINE LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enjoyed her school years</td>
<td>• Study experience has ingrained her study habits</td>
<td>• Appeasing family</td>
<td>• Mobile device</td>
<td>• The social and group work aspect of online learning are both enriching to learning and provide supplementary features to learning</td>
</tr>
<tr>
<td>PERSONALITY</td>
<td>SUPPORT</td>
<td>• Family</td>
<td>• Scholarship</td>
<td>• Technology isn’t everything (he is not dependent on technology)</td>
</tr>
<tr>
<td>• Independent</td>
<td>• Family</td>
<td>• Studious friends</td>
<td>• Self-improvement</td>
<td>• Uses internet for various types of social and video entertainment</td>
</tr>
<tr>
<td>• Organised</td>
<td>• Studious friends</td>
<td>• Monetary</td>
<td>• Future career</td>
<td>• Can use many internet and technology features to perform various tasks</td>
</tr>
<tr>
<td>• Competitive</td>
<td>• Monetary</td>
<td>• Upbringing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Academically inclined</td>
<td>• Upbringing</td>
<td>• Mentor figure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Extroverted</td>
<td>• Mentor figure</td>
<td>• Awareness of studies by school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Autonomised</td>
<td>• Awareness of studies by school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adaptable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Skills**

- Multitasking
- Information literacy
- Problem-solving

**Opinions**

- Independent
- Organised
- Competitive
- Academically inclined
- Extroverted
- Autonomised
- Adaptable

**Study Weakness**

- Procrastination
- Concentration

**Study Habits**

- Organising study materials
- Needs a lecturer to guide learning
- Prints out notes

**Preferred OL**

- Communication features
- Hypermedia
- Visual graphics
- Mobile access

**Catalysts**

- Organising study materials
- Study groups
- Reading

**Online Learning**

- Communication
- Summarised information (bite-sized)
- Easy access resource
- Be aware of false information
- Hypermedia makes learning interesting

---

**Table C.6. Axially coded categories of interviewee B**

<table>
<thead>
<tr>
<th>BACKGROUND</th>
<th>SUPPORT</th>
<th>CATALYSTS</th>
<th>TECHNOLOGY</th>
<th>ONLINE LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• School hasn’t been enjoyable</td>
<td>• Family is consultative</td>
<td>• Is he continuing to learn to provide a future for his fiancé?</td>
<td>• Technology is not everything (he is not dependent on technology)</td>
<td>• The social and group work aspect of online learning are both enriching to learning and provide supplementary features to learning</td>
</tr>
<tr>
<td>PERSONALITY</td>
<td>• Family is consultative</td>
<td>• Scholarship</td>
<td>• Uses internet for various types of social and video entertainment</td>
<td>• Understanding how to use and be involved with the many features of online learning is necessary to operate in the environment</td>
</tr>
<tr>
<td>• Independent</td>
<td>• Fiancé is his pillar of strength</td>
<td>• Self-improvement</td>
<td>• Can use many internet and technology features to perform various tasks</td>
<td></td>
</tr>
<tr>
<td>• Creative</td>
<td>• Fiancé is his pillar of strength</td>
<td>• Future career</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>• Tenacious</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Opinions**

- Technology is a useful learning tool when used properly
- Reading in digital format is better and more economical

**Skills**

- Using iPad (mobile devices)

**Support**

- Family
- Studious friends
- Monetary
- Upbringing
- Mentor figure
- Awareness of studies by school

**Study Weakness**

- Lacks attentiveness
- Bored by traditional ways of learning

**Study Habits**

- Organising study materials especially digital materials
- Needs a lecturer to guide learning
- Prints out notes

**Preferred OL**

- Communication features
- Hypermedia
- Visual graphics
- Mobile access
| • Using internet apps and software | • Games based learning  
| | • The presence of a teacher to facilitate learning |
Appendix D – Consent form

Figure D.1. Online consent form front page

Figure D.2. Confirmation of consent with Yes/No response
Figure D.3. Consent to be contacted for interviews (insert e-mail)
Appendix E – Participant Information Sheet

Participant Information Sheet

You have been invited to take part in a research study being undertaken by a student on the PhD programme at The University of Manchester. The study aims to profile learners based on their ideas about and interests in learning online. It is initially targeted at students from Brunel.

Before you decide to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please contact me (Shafrizzabah Omerali) if there is anything that is not clear or if you would like more information.

Who will conduct the research?
The research will be conducted by Shafrizzabah Omerali, who is a student studying for a PhD at the Institute of Education, the University of Manchester.

Title of the Research
The title of the research is “The Implementation of Online Learning Systems: An investigation of online learning for students with different dispositions towards education”.

What is the aim of the research?
The research aims to explore how post-secondary school students use the internet to study. The research looks at whether learners in the 21st century have advantages when it comes to learning online and whether they have particular skills that aid learning and expectations about how learning will be. Having a better understanding of these issues will hopefully help us improve their online learning and consequently learning performance.

Why have I been chosen?
You have been chosen for this study because you are currently studying in a technical or vocational discipline.

What would I be asked to do if I took part?
You would fill in the questionnaire following on from this description and at the end asked if you would like to be involved in some follow-up interviews (details later). You can, of course, stop with this questionnaire and refuse to take part in the subsequent interview.

What happens to the data collected?
The data collected will be analysed to find out more about how students learn online. It will then be used as the basis of my PhD thesis and also as a part of research papers. All the data will be anonymous.

How is confidentiality maintained?
The identity of questionnaire participants will be anonymous, unless you choose to engage in further research. However, even if you do agree to a short follow-up interview, the analysis will not involve any identification of people who take part. We need your email address to identify your profile if we do interview you, but once data has been collected names will be removed and the data will be analysed anonymously.

What happens if I do not want to take part or if I change my mind?
It is up to you to decide whether or not to take part, if you don’t want to continue, just close down this page. If you do decide to take part you have this information page to print and keep and then simply click the Start button below to answer the questionnaire itself. If you decide to take part you are free to withdraw at any time without giving a reason, you can stop at any point during the questionnaire.

Will I be paid for participating in the research?
No payment will be made for taking part in the research.

What is the duration of the research?
I anticipate that the questionnaire should take no longer than 10-15 minutes to complete.

Where will the research be conducted?
The questionnaire is accessible once you click the Start button below. You are free to complete the questionnaire at your convenience provided that you finish filling in the questionnaire by the due date.

Will the outcomes of the research be published?
The outcomes of the study will be compiled and recorded in a report and may be mentioned in subsequent research.

What if something goes wrong?
If a participant wants to make a formal complaint about the conduct of the research they should contact the head of the Research Office, Christie Reckling, University of Manchester, Oxford Road, Manchester, M13 9PL.

Figure E.1. Online Participant Information Sheet
### Appendix F – Principal Component Analysis for item reduction purpose

**Table F.1. Principal Component Analysis for item reduction**

<table>
<thead>
<tr>
<th>Pattern Matrixa</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>[Strong cultural values due to the support I have] 6. I believe that I have...</td>
<td>.911</td>
</tr>
<tr>
<td>[Strong ICT skills due to the support I have] 6. I believe that I have...</td>
<td>.656</td>
</tr>
<tr>
<td>[Sufficient money to spend on what I need] 6. I believe that I have...</td>
<td>-.142</td>
</tr>
<tr>
<td>[Reading printed books or notes] 7. I prefer learning through...</td>
<td>.739</td>
</tr>
<tr>
<td>[Watching how others do their work] 7. I prefer learning through...</td>
<td>-.005</td>
</tr>
<tr>
<td>[Browsing the internet for information] 7. I prefer learning through...</td>
<td>-.018</td>
</tr>
<tr>
<td>[Interactive software] 7. I prefer learning through...</td>
<td>.238</td>
</tr>
<tr>
<td>[Online groups] 7. I prefer learning through...</td>
<td>.235</td>
</tr>
<tr>
<td>[Mobile apps for activities and accessing notes] 7. I prefer learning through...</td>
<td>.792</td>
</tr>
<tr>
<td>[Online notes that are readable/ downloadable] 7. I prefer learning through...</td>
<td>.830</td>
</tr>
<tr>
<td>[Consulting my teachers] 7. I prefer learning through...</td>
<td>-.053</td>
</tr>
<tr>
<td>[Group work] 7. I prefer learning through...</td>
<td>.331</td>
</tr>
<tr>
<td>[Seek the opinions and advice of others] 8. In my studies, I...</td>
<td>-.279</td>
</tr>
<tr>
<td>[Firstly plan on how I will do my work] 8. In my studies, I...</td>
<td>-.024</td>
</tr>
<tr>
<td>[Am always calm and stress-free] 8. In my studies, I...</td>
<td>.067</td>
</tr>
<tr>
<td>[Am motivated to learn when using the internet] 8. In my studies, I...</td>
<td>.085</td>
</tr>
<tr>
<td>[Work at my own pace] 8. In my studies, I...</td>
<td>-.095</td>
</tr>
<tr>
<td>[I first go to websites that I am most familiar with] 9. When I use the internet, I...</td>
<td>.566</td>
</tr>
<tr>
<td>[Never get lost in the large amount of internet information] 9. When I use the internet, I...</td>
<td>.004</td>
</tr>
<tr>
<td>[Do multiple things at the same time (multitask)] 9. When I use the internet, I...</td>
<td>.325</td>
</tr>
<tr>
<td>Statement</td>
<td>Value</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>[Communicate with people easier online] 9. When I use the internet, I...</td>
<td>.563</td>
</tr>
<tr>
<td>[Am careful with the truthfulness of information] 9. When I use the internet, I...</td>
<td>.570</td>
</tr>
<tr>
<td>[Choose the easiest/ most convenient internet feature] 9. When I use the internet, I...</td>
<td>.654</td>
</tr>
<tr>
<td>[Skip information that I don't like or find boring] 9. When I use the internet, I...</td>
<td>.859</td>
</tr>
<tr>
<td>[Concentrate better when doing activities online] 9. When I use the internet, I...</td>
<td>.708</td>
</tr>
<tr>
<td>[Use it continuously throughout the day] 9. When I use the internet, I...</td>
<td>.069</td>
</tr>
<tr>
<td>[Expect to quickly find the information I need] 9. When I use the internet, I...</td>
<td>.061</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 16 iterations.
### Tests of Normality

<table>
<thead>
<tr>
<th>Description</th>
<th>Stat</th>
<th>df</th>
<th>Sig.</th>
<th>Stat</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. I believe that I have...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Strong cultural values due to the support I have]</td>
<td>.284</td>
<td>407</td>
<td>.000</td>
<td>.861</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Strong ICT skills due to the support I have]</td>
<td>.221</td>
<td>407</td>
<td>.000</td>
<td>.889</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Sufficient money to spend on what I need]</td>
<td>.325</td>
<td>407</td>
<td>.000</td>
<td>.788</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>7. I prefer learning through...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Reading printed books or notes]</td>
<td>.291</td>
<td>407</td>
<td>.000</td>
<td>.780</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Watching videos]</td>
<td>.259</td>
<td>407</td>
<td>.000</td>
<td>.843</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Watching how others do their work]</td>
<td>.252</td>
<td>407</td>
<td>.000</td>
<td>.798</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Browsing the internet for information]</td>
<td>.253</td>
<td>407</td>
<td>.000</td>
<td>.791</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Interactive software]</td>
<td>.258</td>
<td>407</td>
<td>.000</td>
<td>.877</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Online groups]</td>
<td>.192</td>
<td>407</td>
<td>.000</td>
<td>.888</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
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</tr>
<tr>
<td>[Online notes that are readable/ downloadable]</td>
<td>.264</td>
<td>407</td>
<td>.000</td>
<td>.846</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Consulting my teachers]</td>
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<td>[Group work]</td>
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<tr>
<td>8. In my studies, I...</td>
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<tr>
<td>[Seek the opinions and advice of others]</td>
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<td>[Firstly plan on how I will do my work]</td>
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<td>[Am always calm and stress-free]</td>
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<td>407</td>
<td>.000</td>
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<tr>
<td>[Work at my own pace]</td>
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<td>407</td>
<td>.000</td>
<td>.779</td>
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<td>9. When I use the internet, I...</td>
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<tr>
<td>[I first go to websites that I am most familiar with]</td>
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<td>.766</td>
<td>407</td>
<td>.000</td>
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<tr>
<td>[Never get lost in the large amount of internet information]</td>
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<td>407</td>
<td>.000</td>
<td>.887</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Do multiple things at the same time (multitask)]</td>
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<td>407</td>
<td>.000</td>
<td>.797</td>
<td>407</td>
<td>.000</td>
</tr>
<tr>
<td>[Communicate with people easier online]</td>
<td>.267</td>
<td>407</td>
<td>.000</td>
<td>.857</td>
<td>407</td>
<td>.000</td>
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<tr>
<td>[Am careful with the truthfulness of information]</td>
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<td>[Skip information that I don't like or find boring]</td>
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<td>[Use it continuously throughout the day]</td>
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<td>.000</td>
<td>.838</td>
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<td>.000</td>
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<tr>
<td>[Expect to quickly find the information I need]</td>
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<td>.854</td>
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</table>

a. Lilliefors Significance Correction
Appendix G – Output from the final Exploratory Factor Analysis

Table G.1. Item communalities of OLP-28

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<thead>
<tr>
<th>Item Description</th>
<th>Initial</th>
<th>Extraction</th>
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<tr>
<td>Strong cultural values due to the support I have</td>
<td>1.000</td>
<td>.717</td>
</tr>
<tr>
<td>Strong ICT skills due to the support I have</td>
<td>1.000</td>
<td>.840</td>
</tr>
<tr>
<td>Sufficient money to spend on what I need</td>
<td>1.000</td>
<td>.824</td>
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<tr>
<td>Reading printed books or notes</td>
<td>1.000</td>
<td>.862</td>
</tr>
<tr>
<td>Watching videos</td>
<td>1.000</td>
<td>.642</td>
</tr>
<tr>
<td>Watching how others do their work</td>
<td>1.000</td>
<td>.754</td>
</tr>
<tr>
<td>Browsing the internet for information</td>
<td>1.000</td>
<td>.828</td>
</tr>
<tr>
<td>Interactive software</td>
<td>1.000</td>
<td>.799</td>
</tr>
<tr>
<td>Online groups</td>
<td>1.000</td>
<td>.707</td>
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<tr>
<td>Mobile apps for activities and accessing notes</td>
<td>1.000</td>
<td>.811</td>
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<td>Online notes that are readable/Downloadable</td>
<td>1.000</td>
<td>.736</td>
</tr>
<tr>
<td>Consulting my teachers</td>
<td>1.000</td>
<td>.862</td>
</tr>
<tr>
<td>Group work</td>
<td>1.000</td>
<td>.887</td>
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<tr>
<td>Seek the opinions and advice of others</td>
<td>1.000</td>
<td>.874</td>
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<tr>
<td>Firstly plan on how I will do my work</td>
<td>1.000</td>
<td>.729</td>
</tr>
<tr>
<td>Am always calm and stress-free</td>
<td>1.000</td>
<td>.614</td>
</tr>
<tr>
<td>Am motivated to learn when using the internet</td>
<td>1.000</td>
<td>.777</td>
</tr>
<tr>
<td>Work at my own pace</td>
<td>1.000</td>
<td>.734</td>
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<tr>
<td>I first go to websites that I am most familiar with</td>
<td>1.000</td>
<td>.737</td>
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<tr>
<td>Never get lost in the large amount of internet information</td>
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<td>.859</td>
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<tr>
<td>Do multiple things at the same time (multitask)</td>
<td>1.000</td>
<td>.854</td>
</tr>
<tr>
<td>Communicate with people easier online</td>
<td>1.000</td>
<td>.577</td>
</tr>
<tr>
<td>Am careful with the truthfulness of information</td>
<td>1.000</td>
<td>.736</td>
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</table>
[Choose the easiest/most convenient internet feature] 9. When I use the internet, I...
[Skip information that I don't like or find boring] 9. When I use the internet, I...
[Concentrate better when doing activities online] 9. When I use the internet, I...
[Use it continuously throughout the day] 9. When I use the internet, I...
[Expect to quickly find the information I need] 9. When I use the internet, I...

Extraction Method: Principal Component Analysis.

Table G.2. Rotated Component Matrix of final Exploratory Factor Analysis

<table>
<thead>
<tr>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
<th>Component 5</th>
<th>Component 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong cultural values due to the support I have</td>
<td>0.794</td>
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<td>-0.028</td>
<td>0.078</td>
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<tr>
<td>Strong ICT skills due to the support I have</td>
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<td>0.208</td>
<td>0.171</td>
<td>-0.320</td>
</tr>
<tr>
<td>Sufficient money to spend on what I need</td>
<td>0.067</td>
<td>0.083</td>
<td>0.298</td>
<td>-0.011</td>
<td>0.003</td>
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<td>Reading printed books or notes</td>
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<td>0.310</td>
<td>0.165</td>
<td>-0.446</td>
<td>0.184</td>
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<tr>
<td>Watching videos</td>
<td>0.148</td>
<td>0.608</td>
<td>0.293</td>
<td>0.297</td>
<td>0.122</td>
</tr>
<tr>
<td>Watching how others do their work</td>
<td>0.147</td>
<td>0.342</td>
<td>0.414</td>
<td>0.658</td>
<td>0.001</td>
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<td>Interactive software</td>
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<td>0.392</td>
<td>0.015</td>
<td>0.048</td>
<td>0.172</td>
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<td>Online groups</td>
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<td>0.199</td>
<td>0.439</td>
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<td>0.098</td>
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<tr>
<td>Online notes that are readable/downloadable</td>
<td>0.747</td>
<td>0.142</td>
<td>0.174</td>
<td>0.249</td>
<td>0.256</td>
</tr>
<tr>
<td>Consulting my teachers</td>
<td>0.099</td>
<td>0.146</td>
<td>0.887</td>
<td>-0.079</td>
<td>0.143</td>
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<tr>
<td>Group work</td>
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<td>0.760</td>
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<td>0.816</td>
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<td>0.120</td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>Am motivated to learn when using the internet</td>
<td>.328 .735 -.161 .082 .159 .266</td>
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<td></td>
</tr>
<tr>
<td>Work at my own pace</td>
<td>.209 .596 .096 .067 .469 .318</td>
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<tr>
<td>I first go to websites that I am most familiar with</td>
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<td>Never get lost in the large amount of internet information</td>
<td>.274 .687 .466 -.056 -.017 .303</td>
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<tr>
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</tr>
<tr>
<td>Communicate with people easier online</td>
<td>.504 -.026 .011 .523 .209 .073</td>
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<tr>
<td>Am careful with the truthfulness of information</td>
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<td></td>
</tr>
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</tr>
<tr>
<td>Skip information that I don’t like or find boring</td>
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<tr>
<td>Concentrate better when doing activities online</td>
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<tr>
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<tr>
<td>Expect to quickly find the information I need</td>
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Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 16 iterations.
## Appendix H – Results of cluster analyses

Table H.1. Clusters for 3 cluster analyses

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<th>46 clusters</th>
<th>50 clusters</th>
<th>64 clusters</th>
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<td><strong>No. of Cases in each Cluster</strong></td>
<td><strong>No. of Cases in each Cluster</strong></td>
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### Appendix I – List of codes as NVivo nodes generated from 17 interview transcripts

**Table I.1. Interview codes**

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Appendix J – Selected interview transcripts

I. Ahmad, Amirul and Amal

Interviewer: So let’s say your teacher creates an online learning classroom. What would you want the online classroom to have?

Ahmad: The teacher must be there [laughter]. Like in school the teacher is always there so we can ask. We are not experts. Maybe a button to tell the teacher that we need help.

Interviewer: Do you find searching for information easy?

Amirul: No. Sometimes it’s impossible. That is why it’s better to ask the teacher so he can show me what to look for. Like the word. Or the website address.

Interviewer: So for studies, you want the teacher to always be there to help?

Amirul: Yes. Absolutely. I am not clever enough to learn alone. I tried in my O Levels but I am just not good at studying. I don’t know. Maybe not paying attention. Maybe I don’t like studying.

Interviewer: And how about the teacher. Do you think it’s better to learn from the teacher in school or online?

Amal: I don’t think it is different. In school we get to see the teacher talk in front. Online we get to see the teacher in the screen. But the teacher must be there. It is very helpful to have the teacher so that I can ask things I don’t understand and he straight away tell me the answer or advice me on what to do.

Box J.1. Ahmad, Amirul and Amal emphasising the role of teachers

Ahmad: It is fun to work as a group because easier to understand when there is more than 1 person.

Interviewer: Do you like doing group work?

Amal: Yes. It’s easier to do work in groups. And it’s competitive also. We always want our group to win because the teacher gives us presents. Those who wins the best I mean.

Box J.2. Ahmad and Amal on working in groups
**Interviewer:** What kind of notes? Notes on paper or notes on computer?

**Ahmad:** Notes on paper. Like slides and also notes from people or textbook. Notes from experts.

**Amal:** Because when I read my notes it’s easier to understand because my teacher always give notes in bullet forms and PowerPoint slides?

**Interviewer:** You mean printed PowerPoint slides?

**Amal:** Yes, the one with the boxes and notes. My teachers use them a lot because in business PowerPoint is an important skill. Presenting and using PowerPoint.

---

**Box J.3. Ahmad and Amal on using printed notes**

**Ahmad:** We use comment to talk to each other but usually not many people talk. Just say hi and my name is [laughter]. Maybe for talking like this it will work. Like tutorial or class work, taking notes, group work.

**Interviewer:** So do you consider yourself as someone who chats online a lot?

**Amirul:** No. Not really. I don’t chat because my English is not so good.

**Interviewer:** How about communicating with your teacher or friends?

**Amirul:** We can communicate using chat, like Facetime or Facebook Messenger. Communicate like in the classroom but instead of talking we chat and use emojis or pictures or sketch.

**Amal:** I don’t chat because I like to read instead of expressing myself

---

**Box J.4. Ahmad, Amirul and Amal on not being avid chat users**
**Interviewer:** Other than YouTube, do you use other things on the internet?

**Ahmad:** No. Maybe Google. But nothing else.

**Interviewer:** Do you find searching for information easy?

**Amirul:** No. Sometimes it’s impossible.

**Amal:** Sometimes I get exactly what I am looking for but many times I cannot find the information because I either get distracted or there are different kinds of information, the right and wrong ones.

*Box J.5. Ahmad, Amirul and Amal on their habits of searching information*

## II. Bakar and Bahrin

**Bakar:** It’s just a fun WhatsApp. I only chat a lot with my close friends.

**Interviewer:** Do you talk with your teachers or classmates online on the internet?

**Bahrin:** No. Teacher no. Friends only my crew, my best friends.

*Box J.6. Bakar and Bahrin on their preference for a smaller learning social network*

**Interviewer:** Do you use your mobile to read or write notes? Do your teachers give you online notes to read?

**Bakar:** No never.

**Interviewer:** So for chatting and WhatsApp I assume you use your mobile phone?

**Bahrin:** Yes.

*Box J.7. Bakar and Bahrin’s short answers on not using mobile for learning*
III. Chuchu and Catrina

**Chuchu:** Any books. I like to read books to improve my English. I read Harry Potter and Marvel books. I like car magazines and car books. Also on war like World War II and tanks.

**Catrina:** Our teachers said to always read. Not just books, but newspapers, magazines.

*Box J.8. Chuchu and Catrina on why and what they read*

**Chuchu:** Games. Not only simple games, but multiplayer games like the students work together to build something or create something.

**Catrina:** Play games to keep our brains healthy.

*Box J.9. Chuchu and Catrina sharing their opinion on the benefits of video games*

**Chuchu:** The notes that is [sic] my favourite is online notes. Why? Because I can save in pen-drive and I can read on the computer or mobile.

**Interviewer:** Do you search for notes or articles to do with your learning?

**Catrina:** Sometimes. But mostly pictures are more important. Pictures, drawing, sketches, colours.

*Box J.10. Chuchu and Catrina on the type of notes they prefer*
**Chuchu:** What things I use my mobile phone for learning is for example I go online to check something that I don’t understand, or check words I don’t know what they mean.

**Interviewer:** What do you generally do on the internet?

**Catrina:** I usually stream music or videos. Download videos and music.

**Box J.11. Chuchu and Catrina on their habitual online activities**

**Chuchu:** A teacher avatar that I can ask questions and the teacher answers

**Catrina:** It will be the best way. Because many students can work on one building, and design different rooms. Then we can visit each other’s building, I mean room, and the teacher can look at the rooms and give marks or give support, suggestions to make the room better.

**Box J.12. Chuchu and Catrina on what an online learning system should have or look like**

**Chuchu:** What things I use my mobile phone for learning is for example I go online to check something that I don’t understand, or check words I don’t know what they mean. Secondly I can message or WhatsApp my friends or teachers about class work or homework or project or tests.

**Chuchu:** Can use the mobile phone for recording like video of project for group or example by the teacher on how to do it. Also if it’s just voice I can record the voice like the teacher speaking or explaining

**Interviewer:** Do you use mobile phones for your studies or for research?

**Catrina:** No. Just maybe online but I can wait until I have a computer. It’s easier and faster to use the computer.

**Box J.13. Chuchu and Catrina on using mobile phones for learning**
IV. Diana and Danial

**Diana:** I only read magazines, English magazines but only the ones I find at home.

**Danial:** I read and read and read. My notes, my textbook.

*Box J.14. Diana and Danial on why and what they read*

**Interviewer:** How do you prefer to learn on the internet?

**Diana:** I prefer short descriptions, not too many words.

**Interviewer:** Do you read online? Like read a website.

**Danial:** Yes I read about news. I read about aeroplanes, and cars, and army tanks, about soldiers. Like war.

*Box J.15. Diana and Danial on why and what they read online*

**Interviewer:** How about talking with your classmates now, or your teachers? Do you speak with them outside of school, maybe online?

**Diana:** Not always. Sometimes we WhatsApp. Some teachers we have their WhatsApp so we can talk to them but I don’t disturb them because they may be busy with family, or with work, or maybe it’s not appropriate.

**Interviewer:** Do you ask them in school? Or online for example like from WhatsApp?

**Danial:** School. Seniors in school I ask. But close friends yes WhatsApp,

*Box J.16. Diana and Danial on what they use WhatsApp for*
**Interviewer:** when do you use your mobile phone? In what situation?

**Diana:** For GPS map, for calling my mom and dad, taking photos, Instagram, Yassin and Al-Quran, finding Qiblat, WhatsApp, calculator, for e-mail, for emergencies,

**Interviewer:** What do you use your mobile phone for?

**Danial:** Same. For Pokémon, for games and chatting.

**Interviewer:** How about Facebook?

**Danial:** Facebooking only sometimes. Like at night when watching TV.

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**Box J.17. Diana and Danial on how they use their mobile phones**

**Diana:** I like to study 2 hours a day at home. Usually after prayers I study some more. And before sleep I revise some important points.

**Interviewer:** What do you think should the online learning website have to make you study and study better?

**Danial:** [pause] A calendar to tell me what to study in what day. A time table.

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**Box J.18. Diana and Danial on being time organised**

**Diana:** A lot of quizzes and activities.

**Danial:** Test, maybe multiple choice...

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**Box J.19. Diana and Danial on what an online learning system should have**

351
Interviewer: What kind of books do you read?

Emran: Textbooks. Sometimes magazines.

Interviewer: Are the magazines related to your studies?

Emran: No not related.

Interviewer: How about at home? How do you study at home?


Interviewer: So, do you like reading books?

Erawan: No. I want to read. I want but difficult. Maybe comic.

Box J.20. Emran, Eddy and Erawan on why and what they read

Interview: Do you spend more time on the internet studying or for entertainment? I mean for fun?

Emran: All the time for fun. Playing games like FPS games.

Interview: So what else do you do on your mobile phone?

Erawan: Online. Chatting, I play games and I Facebooking.

Box J.21. Emran and Erawan on what they do online
**Emran:** Type the words of the question like I type in the search and the internet give many answer.

**Interview:** How do you know what to look for?

**Emran:** Sometimes friends. Sometimes seniors. Sometimes just search online.

**Interview:** Is it easy for you to look for the information you want?

**Emran:** Yes very easy. Always on the first page we get the answers. Just click.

**Eddy:** If I don’t know what the answer is or the solve to the problem I can find it alone.

**Interviewer:** You mean you can find or you must find?

**Eddy:** Yes I must find it.

**Interviewer:** Where do you find your answers?

**Eddy:** In the notes. Maybe online.

**Interview:** Can you tell me a bit about what you do online? I mean how you study?

**Erawan:** Ok like this. Googling. Search the notes, the answers by Googling.

**Interviewer:** Do you find this way helps make you learn better?

**Erawan:** Sometimes.

**Interviewer:** What do you mean by sometimes?

**Erawan:** Sometimes hard to find the words we search in, online. Sometimes with video search it is easy to know. To understand the topic.

*Box J.22. Emran, Eddy and Erawan on how they look for information*
VI. Faisal, Fakrul and Fadillah

**Interviewer:** Which way would you prefer? Learning on the computer or learning from notes and books?

**Faisal:** Both. Both is important.

**Interviewer:** So how have you been studying so far? What do you do to revise, to learn new things about your subjects and do your school work?

**Fakrul:** I read notes. Read textbooks

**Interviewer:** How about reading, do you read from notes, from books, from the internet for example?

**Fadillah:** Some from photocopies, some from textbooks, sometimes internet also.

*Box J.23. Faisal, Fakrul and Fadillah on revising through reading*

**Interviewer:** So, you’re using your tablet or mobile phone?

**Faisal:** My mobile is good for surfing and chatting. And games like Pokémon so I always have it with me.

**Fakrul:** Also the Messenger Chat, and then the Facetime chat. Easy for students to do group work or just talk about school. Or even the teachers.

**Fadillah:** sometimes me and my friends share the address of website in WhatsApp and we talk about it.

**Interviewer:** Is that for group work or just random?

**Fadillah:** Sometimes for group work. Sometimes just discussion.

*Box J.24. Faisal, Fakrul and Fadillah on chatting*
**Interview:** Do you read them, or watch video tutorials, or do some free online course?

**Faisal:** A bit of everything. Mostly joining discussions in discussion boards. And try the things that are interesting. If it doesn’t run then the discussion board is a good place to ask for help.

**Interviewer:** And discussion boards?

**Fakrul:** I don’t think I learned from discussion boards. The pages I read are usually funny, are comedy humour pages.

*Box J.25. Faisal and Fakrul on interacting in discussion boards*

**Interviewer:** So, you’re using your tablet or mobile phone?

**Faisal:** My mobile is good for surfing and chatting. And games like Pokémon so I always have it with me.

**Interviewer:** How about for your studies? Do you use your mobile phone in your studies?

**Fakrul:** Recording practicals. And as emergency notebook. Also to find definition and explanation of terms and topics online. It’s easy and straightforward.

(...)

**Interviewer:** Do you use you mobile phone to organise your notes?

**Fakrul:** No.

**Interviewer:** Can you tell me what you use your mobile phone for?

**Fakrul:** For everything

*Box J.26. Faisal and Fakrul on using their mobile phones for learning*
**Faisal:** There are some special video websites like Younow that have live broadcast. YouTube also have live broadcast. I like Periscope, which I am on sometimes.

**Interviewer:** And videos, what do you think of videos in online learning?

**Fakrul:** Video tutorials will be useful. For me video tutorials are useful. Even live broadcast will be useful. Like the teachers record a lesson and instead of going to class we just watch the class online.

*Box J.27. Faisal and Fakrul on videos media and using videos for learning*

**Interviewer:** I mean features, that you think would make you learn better?

**Faisal:** A discussion board so students can ask questions, remind each other, share notes, study in groups.

**Fakrul:** Also the Messenger Chat, and then the Facetime chat. Easy for students to do group work or just talk about school. Or even the teachers.

*Box J.28. Faisal and Fakrul on what an online learning system should have*

**VII. Gina and Ghaffar**

**Interviewer:** Do you read books, novels? Malay novels?

**Gina:** No. Malay magazines like Wanita.

**Interviewer:** You can translate websites to Malay. There is a feature.

**Ghaffar:** Yes but I cannot concentrate when reading online. I’m not used to reading long texts.

*Box J.29. Gina and Ghaffar on their reading habits*
**Interviewer:** Let’s talk about mobile phones. Since you have one, what do you do with it?

**Gina:** WhatsApp with friends.

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**Interviewer:** How do you discuss your school work? With one or two friends, or maybe a WhatsApp group?

**Ghaffar:** WhatsApp group. Only sometimes we private chat if it’s urgent or me and my friends are partners.

**Interviewer:** Do you think it’s effective?

**Ghaffar:** Yes very effective.

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*Box J.30. Gina and Ghaffar on their use WhatsApp*

**Interviewer:** If for example your course is done online. Your teacher tells you to go online and join your class to learn online. They have videos, notes, quizzes, games maybe, a place to chat, a place to discuss. What way of learning would you like best? Discussion, chat, video, online notes.

**Gina:** Maybe videos. And chatting so that I can talk with the teachers and friends.

**Interviewer:** Other than games, what would make you be a better learner or learn better?

**Ghaffar:** I think a place for discussion with friends. Like for group work. A place to chat and share notes or files, like photos and Microsoft word.

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*Box J.31. Gina and Ghaffar on what an online learning system should have*
Appendix K – Sample transcripts

**Habitus A - 422444**
Case #331 – answered in English (codemixed Malay), age = 17, female
.20681 | -.70365 | -1.05167 | .25939 | .48865 | .36981
Owns: Mobile | OL: Yes

**Part 1**

Interviewer: I realise that you are still wearing your uniform. Did you just come back from school?

A331: Yes. We had extra learning. Not extra class, but... I guess it’s extra class.

Interviewer: So how was extra class then?

A331: It was interesting. We learned about starting a company.

Interviewer: What did you do exactly?

A331: Well. We learned about business proposals and then we got into groups and each one took a role. Like who’s the boss, who’s in charge of promotion and advertising, and there are staff members who do different things. We just started to learn.

Interviewer: Sounds interesting. Do you like doing group work?

A331: Yes. It’s easier to do work in groups. And it’s competitive also. We always want our group to win because the teacher gives us presents. Those who wins the best I mean.

Interviewer: Was this group work for today only or is it a long assignment?

A331: It’s a long project. 3 weeks maybe 4 weeks depending on the holiday that is coming up. We get some marks from this group work. We have done group work before so we know how it works.

Interviewer: So do you communicate with your group outside of school?

A331: Mostly in school. We have a table next to the canteen where we usually hang out. Like my gang [laughter] we hang out there. Different groups have different hangout space. Our place we know where we always meet so we do our group planning there. We also talk on WhatsApp and Facebook.

Interviewer: Do you mean text chat or calling?

A331: Text chat. I don’t like talking on the phone [laughter] I feel embarrassed talking to people. I think I’m a shy person.

Interviewer: So how do you talk with people in school? Like your friends and teachers?
A331: Talking in school is okay because there are people around. But I feel shy when talking online.

Interviewer: Even while text-chat?

A331: A bit. I don’t chat because I like to read instead of expressing myself. Is that right to say? I have friends who chat a lot but I’m not that confident.

Interviewer: So you see yourself as shy and a bit not confident?

A331: Yes.

Interviewer: You are doing well so far in this interview. I think you are confident right now.

A331: Well I think because you are a teacher, am I right?

Interviewer: Yes I am technically a teacher.

A331: Yes. I don’t have problems talking with teachers. I talk to teachers a lot to ask for advice. I just feel embarrassed when expressing myself, not when asking for advice. I think.

Interviewer: Well, that’s fair enough. Let’s move on to something else. Let’s talk about your studies in general, how has it been going? Okay or difficult?

A331: A bit difficult. There are a lot of new words and terms to learn and we have to write essays as well. So for this kind of work the internet helps a lot. Wikipedia makes terms easy to understand, like ‘equity’ and ‘capital’. These words are usually described clearly online.

Interviewer: Are you able to do this at school?

A331: At school we can just ask the teacher, but when the teacher is busy we can check online so that is easy?

Interviewer: You mean using your mobile phones?

A331: Yes mobile phones. We cannot watch YouTube video because it’s too big and slow. But we can use Wikipedia or google search.

Interviewer: Can you tell me a bit more about how you use your mobile phone for learning and for everyday life?

A331: I use my mobile phone for Facebook and WhatsApp. We have a class Facebook group so we post comments in there. Sometimes to do with our studies like notes and good videos, but most of the time it’s about gathering and CCA activities!

Interviewer: Do you study on your mobile phone then?

A331: Yes I read some of my notes online. There is one online textbook that my teacher told us to read so we use that. But most of our textbooks are books that we bring to school and notes that we write down from classes. I like writing the important information that I found on online textbooks and videos and websites. I think most of what I learned came
from the easy and clearly understood information online. Then I write them in my notes or make a summary of points and print them out. Because we write some essays, we need to know a lot of information.

Interviewer: That sounds like a lot of work. Do you consider yourself as calm when studying? Not stressed?

A331: There are times when I am stressed with my work, especially when the deadline to submit is near or the exam is coming. I get so stressed out and I panic. There is just too many things to learn to know and too little time.

Interviewer: Do you think learning in groups online would help? Or having a teacher online?

A331: I don’t think learning online in groups would be as good as having study groups in schools. I’ve never done study groups online. You mean by WhatsApp?

Interviewer: Yes. That’s one way.

A331: Oh ok then, yes then I’ve done it before and it’s useful. I still prefer study groups like going to a friend’s house to study there. You get to eat together and research using laptops and books. It’s faster that way, we get to look at the same book. We get to look at the same screen. It’s very easy.

Interviewer: How about if you live far away from your friends? Or a few of your friends cannot come because they are far away?

A331: Then we can do something like this. Facetiming.

Interviewer: And how about the teacher. Do you think it’s better to learn from the teacher in school or online?

A331: I don’t think it is different. In school we get to see the teacher talk in front. Online we get to see the teacher in the screen. But the teacher must be there. It is very helpful to have the teacher so that I can ask things I don’t understand and he straight away tell me the answer or advise me on what to do.

Interviewer: Do your teachers encourage you to use the internet? And adding to that, do they tell you where to look for information or and educational websites to look at?

A331: Yes they share with us some websites and they always tell us if you don’t know, google is the answer. Or google the answer? But google is definitely very helpful. Sometimes I get exactly what I am looking for but many times I cannot find the information because I either get distracted or there are different kinds of information, the right and wrong ones. If there is a place for us to find all the information we need, like the teachers make a place online where everything is available – notes, games, essays, tests I think it would be very useful. When I was in secondary school, my maths teacher had a blog website and he had everything in there. He also inform us of classwork and homework sheets to download and print that we can answer and then bring to school. I wish my teachers now can do the same thing. Then we don’t have to write our own notes and find extra information from the internet.
Interviewer: Sounds like something called online learning. A simple form of online learning. If for example, your teachers start teaching online, what do you think should the online class website have?

A331: It should have a place to tell us about extra information and where to find extra information. The teacher should ask questions in there, provide classwork and homework, talk about the class in school, talk about the class the next day. Maybe a place where we can post or share our videos and photos like Facebook. So we can share our work.

Interviewer: So do you think you can learn better with videos and photos?

A331: I think it will help. I don’t think I can learn from videos and photos because of my programme which is more about words and essays. But I think my friends they learn a lot from videos they say.

Interviewer: How about you? Do you think you learn better with videos?

A331: [long pause] Maybe if the video is fun or funny. But I prefer learning through reading Wikipedia and google answers. I don’t know. I think maybe I don’t like learning from watching videos but I like to watch videos that are not about learning? Maybe I get distracted or maybe I get bored listening, watching videos. Because when I read my notes it’s easier to understand because my teacher always give notes in bullet forms and PowerPoint slides?

Interviewer: You mean printed PowerPoint slides?

A331: Yes, the one with the boxes and notes. My teachers use them a lot because in business PowerPoint is an important skill. Presenting and using PowerPoint. And reading and memorising is also important so that I know what I am talking about. Or my teacher says, looks like I know what I am talking about.

Interviewer: Ok great. You’ve shared very interesting information. Now, next I will be asking you six questions, and you only need to answer yes or no. Remember, you need to think carefully before you answer. Just yes or no. And then in the end I will tell you what your questionnaire says about you, according to these six questions. So, we’re trying to match your opinions drawn from the questionnaire with your opinions here. Yes or no yeah.

A331: Yes.

Interviewer: Ready to start?

A331: Ok.

Part 2

Interviewer: Do you think that you are comfortable with using the internet and find it natural?

A331: Yes
Interviewer: Do you think you are in control of your own studies? I’m talking about being organised, calm, and know of the ways that make you learn better?

A331: No.

Interviewer: Do you think you are able to get information from various sources? Like from the internet, from watching others, from discussions.

A331: No.

Interviewer: Do you think you prefer getting information from asking others or working with others?

A331: Yes.

Interviewer: Do you think you are dependent on the internet and maybe as they say, cannot live without it?

A331: Yes.

Interviewer: Do you think you like to get the best from everything? Like when you are looking for information you want it in an instant, when you are learning you want it to interact with you?

A331: Yes.

Interviewer: Alright that’s it! So you answered yes no no yes yes and yes. I can tell you that your answers match your opinions from the questionnaire. 100%. What do you think?

A331: Yes I think it is interesting.

Interviewer: Would you like to add anything else to it? Or would you like to say something else?

A331: No. It is ok. Thank you. I enjoyed it. I learn some new things.

Interviewer: Ok. Thank you for everything that you have shared. I will now stop the recording to mark the end of this interview. Would you like to end the interview now?

A331: Ok sure.

Figure K.1. Habitus Type A full interview transcript
Habitus G – 222424
Case #305 – Malay, age=16, male
-1.9386 | -0.9268 | -1.09684 | .79362 | -1.43758 | .44938
Owns: Mobile, tablet, laptop, desktop | OL: Yes

Part 1

Interviewer: How is your studies so far?
G305: It’s good. It’s fun.

Interviewer: What is it that you like?
G305: The school. The classrooms and teachers.

Interviewer: I mean of your studies. How do you study now?
G305: The same way like secondary school. The teacher talks in front and we do class work.

Interviewer: Do you like studying that way?
G305: No not really.

Interviewer: How do you like to study?
G305: Class discussion. Quiz. Games.

Interviewer: You mean computer games?
G305: No. Like group games in class. Competing to answer the right answer.

Interviewer: Oh those kinds of classroom games. How about computer games. Do you play computer games in your personal time?
G305: Yes PS and Xbox. And also mobile games.

Interviewer: Yes. Yes. What mobile games do you play?
G305: Pokémon Go.

Interviewer: What do you like about Pokémon Go?
G305: Hang out with friends and sisters. Hunting. Levelling up.

Interviewer: So do you use your mobile phone for it?
G305: Yes.

Interviewer: What else do you use your mobile phone for?
G305: For chatting. For other games.

Interviewer: Who do you chat with?


Interviewer: Do you talk about school? About your school work?

G305: Sometimes.

Interviewer: How do you discuss your school work? With one or two friends, or maybe a WhatsApp group?

G305: WhatsApp group. Only sometimes we private chat if it’s urgent or me and my friends are partners.

Interviewer: Do you think it’s effective?

G305: Yes very effective.

Interviewer: How about in Facebook, do you chat in Facebook as well? Maybe about school?

G305: Yes in Facebook. But usually with friends from different schools.

Interviewer: You mean your friends from former school?

G305: Yes that too.

Interviewer: How about your teachers. Do you get to chat with your teachers?

G305: No. My teachers haven’t given their details, and I am also a new student so I just know my teachers.

Interviewer: I see. Do your teachers direct you to any extra learning materials? Like books or websites?

G305: Maybe but I can’t remember. Maybe next time. Now we are using textbooks. Maybe next time the teachers will give us websites to read.

Interviewer: Do you go online a lot? Surfing or browsing the internet

G305: Not a lot. Once in a while.

Interviewer: Why is that?

G305: Because the internet is in English.

Interviewer: You can translate websites to Malay. There is a feature.
G305: Yes but I cannot concentrate when reading online. I’m not used to reading long texts.

Interviewer: So what are the things that you do in life that you can spend a few hours on?


Interviewer: What kind of video games do you play? I know you play Pokémon go. But videos games, are there any educational ones like Minecraft.

G305: Not just Minecraft. I don’t play Minecraft a lot. I play Fifa, Call of Duty, Battlefield, Overwatch. Many games.

Interviewer: Ok sounds like you do play your games a lot.

G305: Yes [laughter]

Interviewer: Do you think you may learn better if your learning is like playing a game?

G305: Definitely.

Interviewer: There is something called game based learning. It’s when games are used to teach students. There are many apps and software available to teach things like language and maths for example. Science, Geography. I’m sure your subject would also have quite a few educational apps and software. Now, there is also something called online learning. Online learning is when students learn their subjects on the internet. They don’t have to attend school and they can learn from home of anywhere using their computers, tablets or mobile. What if we pretend that your course has online learning. That you can learn online. Other than games, what would make you be a better learner or learn better?

G305: I think a place for discussion with friends. Like for group work. A place to chat and share notes or files like photos and Microsoft word.

Interviewer: Anything else?

G305: Maybe videos of. Maybe tutorials on videos, video tutorials.

Interviewer: Ok. Sounds like you like specific things online. I’m now going to ask you a few questions, six questions, short ones. All you need to do for each one is answer yes or no ok?

G305: Ok

Interviewer: Ok so once we finish I will share your response to this six questions based on your questionnaire answer, and then we will compare at the end. Ok let’s start.

Part 2

Interviewer: Do you think that you are comfortable with using the internet and find it natural?
G305: Yes

Interviewer: Do you think you are in control of your own studies? I’m talking about being organised, calm, and know of the ways that make you learn better?

G305: No

Interviewer: Do you think you are able to get information from various sources? Like from the internet, from watching others, from discussions.

G305: No

Interviewer: Do you think you prefer getting information from asking others or working with others?

G305: Yes

Interviewer: Do you think you are dependent on the internet and maybe as they say, cannot live without it?

G305: No

Interviewer: Do you think you like to get the best from everything? Like when you are looking for information you want it in an instant, when you are learning you want it to interact with you?

G305: Yes

Interviewer: Ok, that’s it. You answered yes no no yes no and yes. In your questionnaire response your opinions were no no no yes no and yes. So it’s the first question that’s different. You now say you are comfortable using the internet. Are you in control of your use of the internet? Do you know what you are doing and don’t have any problems?

G305: No, no problems. I think because I use internet since primary school. Maybe that is why.

Interviewer: So you are saying you are an expert on the internet. What’s your opinion?

G305: Not really. Maybe. I don’t know. Maybe some parts. Like chatting or games.

Interviewer: Ok. We’ve come to the end of our interview. Before I stop the recording do you have anything else to add?

G305: No.

Figure K.2. Habitus Type G full interview transcript