

DIFFERENTIATION: A TAXONOMY OF ONLINE LEARNER TYPES
IN HIGHER EDUCATION

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Online learning is no longer considered novel within higher education. It has emerged as an accepted distinct channel and environment for instructional engagement. There is a notable deficit of works and theoretical constructs specifically addressing the identification and differentiation of online learner types and examining them as a distinct system within the learning environment. Learning effectiveness within an online instructional environment is affected by the individual student engaged in the instruction. The instructional experience of the learner is determined by their individual perceptions of and reactions to both internal and external factors. Therefore, it is critical to address the online learner holistically as a stand-alone systemic dimension of the online learning environment to truly understand their differentiating behaviors, motives, characteristics, and dynamics. The study classified and articulated the distinctive types of learners engaged in online instruction within the higher education context based on the key dynamics, factors, and influencers of the individual in order to provide a more comprehensive understanding of the individuals engaged in learning. Additionally, the study generated a new theoretical model, the taxonomy of online learner types (TOLT) to provide unique insights into the different types of learners and serve as an essential step towards developing awareness and facilitating deeper investigations in the future.

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CHAPTER 1

INTRODUCTION

Background of Study

The notion of online learning is no longer considered novel within higher education, but overall is accepted as a separate channel and environment for instructional engagement, with dynamics and capacities that differ in distinctive ways from face-to-face situations (Al Ghamdi, Samarji, & Watt, 2016). Conceptually, online learning is just an evolutionary step within the broader paradigm of distance education that “since its inception in the 1700s, was about making knowledge accessible to more than just a privileged few” (Kentnor, 2015, p. 30). As emerging technologies and new learning strategies have been introduced, the means of delivery has evolved, but this core principle has remained a driving force.

The broad adoption and growing selection of online instruction and educational programs (Broadbent, 2017) demonstrates that this distinctive learning environment represents a unique and separate channel of instructional delivery. As an evolving strategic and relevant sphere of instruction in higher education (Allen & Seaman, 2013; Lederman, 2018; León-Urrutia, Cobos, & Dickens, 2018; Online Learning Consortium, 2016; Shah, 2018), there are factors that impact the experience of the individual and influence the effectiveness of the course design and degree of success in achieving the intended learning outcomes. While attempts have been made to standardize approaches to instruction to accommodate a generalized conceptual learner, the studies taken within the context of online education have tended to neglect considerations of the online learner as being distinctive from one within a traditional environment (Dabbagh, 2007; Greene & Azevedo, 2007; Narciss, Proske, & Koerndle, 2007; Xu, Du, & Fan, 2015). Though the challenge of addressing individualized needs within learning in a traditional, face-to-face

environment are far from being resolved, the issue is further compounded when dealing with the unique attributes and elements associated with an online instructional medium.

Learning effectiveness within an online instructional environment is affected by the individual student engaged in the instruction. Within any learning situation, there are specific ways in which the learner will approach the instructional experience that are determined by their individual perceptions of and reactions to both internal and external factors. These directly impact learning success and therefore need to be investigated and articulated within a succinct and discernible construct. Individuality transfers into all aspects of life. Whether it is observed in the differences in the way individuals play games or in their approach to learning, differences are a reality (Heeter, 2009).

Statement of the Problem

Given the current and evolving role of online learning in higher education (Allen & Seaman, 2013; Broadbent, 2017; Lederman, 2018; León-Urrutia et al., 2018; Shah, 2018), a deeper understanding of the online learner is needed to ensure the effectiveness of the experience across all aspects (i.e., instructional design, capabilities of instructors, generation of meaningful and relevant learning outcomes, etc.). To provide quality experiential learning engagements that foster critical thinking, constructive learning, and the type of deep insightful understanding that is transitional to a more comprehensive knowledge for abstract application, it is essential that learners within this space be perceived and categorized differently in accordance with the online instructional context. Therefore, it is critical to address the online learner holistically as a stand-alone systemic dimension of the online learning environment to truly understand their differentiating behaviors, motives, characteristics, and dynamics.

This understanding holds potential for improving the structural and theoretical strategies and methods employed in online instructional design, and in terms of the activities and materials that are to be integrated (Stone, 2017). Though research has been undertaken with the intent of generating a generalizable means of quantifying indicators for predicting learner success and performance (Broadbent, 2017), the focus of inquiry has primarily targeted specific traits or behavioral patterns as the elements for measure. The current study, while building on the existing body of research, seeks to perceive the learner holistically within the context of multiple dimensions of identity to fully comprehend the individual within the learning environment.

A motivation for this study originates from the state of research concerning the comprehensive understanding of the distinctive types of learners engaged within the online instructional environment. The investigation of the dynamics of online learning is still a developing area, despite online education (i.e., instruction delivered through the Internet), having existed since the 1990s and before (Moore & Kearsley, 2011b). Though some studies have been undertaken to examine particular aspects of the learner in the online environment (Cohen & Baruth, 2017; Nakayama, Mutsuura, & Yamamoto, 2014; Tlili, Essalmi, Jemni, & Chen, 2016), holistic research specific to identifying and understanding the different types of online learners engaged in instruction within higher education is even more sparse, despite the importance of this dimension and its impact on online learning (Song & Hill, 2007). By gaining a deeper understanding of the different types of learners engaging in online instruction in higher education, it will be possible to empower instructors and enhance the quality of instruction through a stronger awareness of what constitutes effective engagements, interactions, communications, and participation for each type of learner. As for the learner, the experience of instruction within the online learning environment will potentially be more productive and

positive, the expectations clearer, the modes of participation more natural and intuitive, the goals and objectives more relevant, and the overall outcomes more meaningful.

To provide a more comprehensive understanding of the individuals engaged in instruction within online learning environments in higher education and facilitate deeper investigations in the future, it is necessary to develop a taxonomy which differentiates and describes the unique learners that are engaged in online instruction. While the work represents a critical contribution to the continuing evolution of online education, the quest to understand the learner is not a new one (Pintrich & De Groot, 1990; Schunk, 1991).

Purpose of the Study

Research related to online learning in higher education has predominantly focused on various aspects of the paradigm using quantitative methods with some emphasizing the criteria of effective online learning environments (Anderson, 2008; Lorenzo & Moore, 2002; March & Lee, 2016; Mashaw, 2012; McGahan, Jackson, & Premer, 2015; Outlaw & Rice, 2015; Puzziferro & Shelton, 2014; You, Hochberg, Ballard, Xiao, & Walters, 2015), and often exhibiting a "focus on 'how to' teach online and how to optimally utilize the various features available in most instructional platforms" (Beaudoin, Kurtz, & Eden, 2009, p. 276). While there have been studies that attempted to address the learner, they have dealt more with the various factors affecting the performance and success of learners (i.e., motivation, self-efficacy, personality, etc.) (Bolliger & Erichsen, 2013; Bouvier, Sehaba, & Lavoué, 2014b; Johnson, 2017; Judge & Ilies, 2002; Lucas, 2007; Poropat, 2009; Richardson, Abraham, & Bond, 2012), but did not address who the online learner is within the instructional environment.

The purpose of this study was to classify and articulate the distinctive types of learners engaged in instruction within an online learning environment in the higher education context

based on the key dynamics, factors, and influencers of the individual student. To achieve this, the researcher has built on the existing body of educational research and incorporated game player type research and models into the study. This inclusion provided a relevant insight into the individuals engaged within online experiential environments. There is a natural correlation between the dynamics associated with a game and those connected with engaging, experiential online learning (Bedwell, Pavlas, Heyne, Lazzara, & Salas, 2012). As such, the inclusion of game research represents a highly valuable perspective and key insights into the potential and execution of online learning constructs. The commonalities were observed by Bedwell et al. (2012), who noted, "[t]he serious games community is moving toward research focusing on direct comparisons between learning outcomes of serious games and those of more traditional training methods" (p. 729).

Additionally, this study generated a new theoretical model, the Taxonomy of Online Learner Types (TOLT), to provide a unique insight into the different types of learners engaged in learning within the online channel and garner a deeper understanding of why they do what they do, how they approach learning, and what to expect from them in terms of engagement, attitude, and outcomes. It is essential to understand the online learner within the appropriate context and not just as a general constant. As Song and Hill (2007) stated, "an understanding of learner attributes and how these impact what occurs in online learning contexts, however, is equally important" (p. 27). Overall, the study sought to perceive the learner holistically within the context of multiple dimensions of identity to fully comprehend who they are within the online learning environment.

In online, as within a face-to-face situation, there are specific ways in which the learner will approach the educational experience that are determined by responses and perceptions to

both internal and external factors. Identifying these factors and categorizing them into a model that converges commonalities among online learners provided a deeper understanding of who the engaged learners are, how they approach learning, and what facilitates meaningful outcomes for them. Understanding that, as Russell (2002) stated “[p]eople approach online learning in different ways” (p. 26), the distinctions between online learner types were investigated and a fundamental taxonomy was provided to help drive a stronger and more comprehensive awareness of their function within the online instructional environment. The results of this study were applied to the development of a general taxonomy and model of online learners in higher education, the TOLT, for potential use with online instructional design and in future research into effective online learning.

Primary and Secondary Topics of Inquiry

A wide and diverse range of studies regarding online learning exists within the current body of works in educational research, addressing topics that include the implementation of learning theories into online learning environments (Alzaghoul, 2012; Harasim, 2012)), instructional design considerations and structures (Cook, Hamstra, Brydges, Zendejas, Szostek, Wang, Erwin & Hatala, 2013), and the criteria for instructional effectiveness (Machtmes & Asher, 2000; Marsha, 2012, Sitzmann, Kraiger, Stewart, & Wisher, 2006). While there is a great deal of attention to the structure, theories, development, delivery, and technology associated with online learning, the efforts made to understand those engaged in the instruction within this channel are far from complete. What is known concerning the learner? Several studies have attempted to quantify successful online learners based on numerous factors, including characteristics and personality (Cohen et al., 2017; Irani, Telg, Scherler, & Harrington, 2003; Keller & Karau, 2013; Wojciechowski & Palmer, 2005), learning styles (Aragon, Johnson, &

Shaik, 2002; Lu, 2017; Manochehr, 2006; Manochehri & Young, 2006), engagement behaviors (Roffe, 2002; Wang, Chen, & Anderson, 2014; Whitton & Moseley, 2014), emotional intelligences (Berenson, Boyles, & Weaver, 2008), and temperament (Fomunyan & Mnisi, 2017; Stokes, 2003). The results suggest a formulaic model for expressing the ideal learner within this environment, and a means of predicting potential for success. As thorough as this approach is, it still looks to establish a predefined benchmark of the student that can be generalized across a broad spectrum of individuals with various, and often unpredictable influencing variables. This, then, is the central deficit with the current efforts to understand online learners. The current body of literature suggests a focus on efforts to establish a general conceptual definition but does not perceive the individual holistically within the context of the instructional medium. More so, this approach has further looked at multiple application contexts for online instruction, mixing individuals engaged in professional development with all levels of academic users. Higher education represents a distinctive context of learning and includes a learner population with unique and specific motivators and expectations.

Primary Topic of Inquiry

This study sought to classify and articulate the distinctive types of learners engaged in instruction within an online learning environment in the higher education context based on their differentiating characteristics and dynamics. It investigated the key dynamics, characteristics, and influencers of student learning engagements within the context of online instructional environments in a higher education setting and proposed a taxonomy defining distinct online learner types. Additionally, by infusing game player type research and models into the study, the proposed taxonomy provided a unique insight into the different types of learners engaged in learning within the online channel and garner a deeper understanding of why they do what they

do, how they approach learning, and what to expect from them in terms of engagement, attitude, and outcomes.

Secondary Topics of Inquiry

In support of the primary topics of inquiry, the following secondary points were assessed:

- How can we better understand who the online learners are and how they learn within an online instructional environment in higher education?
- What are the factors that differentiate online learners from one-another as distinctive learner types?
- How can distinctive online learner types be categorized and what are the unique types that should be defined within each of these categories?

Significance of the Study

Why is this study relevant, significant, and needed? With so many studies examining the characteristics and elements of the online learning environment (Blees & Rittberger, 2009; Chizmar & Walbert, 1999; Moore, 2013; Moore, Dickson-Deane, & Galyen, 2011a), the different considerations for generating successful learning outcomes (Al Ghamdi, Samarji, & Watt, 2016; Aragon et al., 2002; Machtmes & Asher, 2000), and identifying the specific traits associated with successful online learners, ranging from personality types to learning styles and preferences (Abdullah, Daffa, Bashmail, Alzahrani, & Sadik, 2015; Broadbent & Poon, 2015; Hamada, Rashad, & Darwesh, 2011; Moallem, 2007), it would appear that the full spectrum of investigation for online learning would have been explored. However, this is not the case. While previous studies, theories, and models addressing the dynamics, design, delivery, and profiles of successful participants may have been touched on from a host of perspectives and using a variety of methodologies, there are very few studies and models that seek to perceive online learners holistically (Hrastinski, 2009; Ilgaz & Gülbahar, 2015; Lloyd, Skyring, & Fraser, 2017; Tmimi,

Benslimane, Berrada, & Ouazzani, 2017; Chu & Tsai, 2009). Since its genesis in the late 1980s and 1990s, there has been an evolving awareness of the unique nature of online learning – as identified through various concepts and terms – within education. Valuable theoretical and design-specific contributions have been undertaken to provide insights into the particulars of designing and delivering instruction through this channel. As the prevalence and credibility of online learning has expanded through its acknowledgement and adoption by accredited institutions, the emphasis on and priority of ensuring the quality, availability, and success of online programs has served as a key catalyst for research. While the resulting body of work serves as a critical foundation from which a better understanding of the nuances and capabilities of this unique learning environment continues to be developed, and from which a number of theoretical models emerged that seek to explain the critical requirements for success in teaching and learning, the works addressing the online learners as being a distinct and diversified student population type are few and far between, if existing at all. This is particularly true in terms of the specific context of higher education. While most would agree that the online learning environment is a separate and distinctive channel and mode for providing instruction, the perceptions of the learner remain as being constants from one environment to the next. This assumption of individuals responding, interacting, engaging, and performing in an online learning environment the same manner as they do in a face-to-face situation oversimplifies the complexity of individuality and underestimates the factors involved. There is not a clear understanding of the increasing numbers of individuals engaged in online learning in higher education. The first step to ensuring the continuing relevance and effectiveness of online education is understanding who the learners are as distinct individuals and learner types instead of in terms of ideals. From a complete and holistic understanding of who the online learners are

in terms of the complex dimensions that define and differentiate their learning distinctions within the environment, more meaningful and productive outcomes can be achieved for online instructional design, delivery, and engagement. The significance of this study is perhaps best articulated by Dewey (2004) as he stated,

[T]he particular medium in which an individual exists leads him to see and feel one thing rather than another; it leads him to have certain plans in order that he may act successfully with others; it strengthens some beliefs and weakens others as a condition of winning the approval of others. Thus it gradually produces in him a certain system of behavior, a certain disposition of action. (p. 15)

Building on this, the first step is to fully know the learner. For this reason, the TOLT took intentional steps to realign inquiry towards a student-centric perception. This effort sought to address the deviation taken by other research that included institutional and circumstantial dynamics along with learner considerations (Berge & Huang, 2004; Layne, Boston, & Ice, 2013).

The researcher suggested that this study and the resulting taxonomy serve as a foundation from which future research into online learner types and functions within online instructional environments in higher education will be built. As there is a notable deficit of works and theoretical constructs specifically addressing the identification and differentiation of online learner types engaged within the higher education sphere, this study served as an essential step towards developing awareness and fostering the continued evolution and relevancy of online learning.

Research Method

The study employed a meta-analysis-based grounded theory qualitative study to identify the fundamental differentiating factors of the online learner types. Additionally, this research strategy provided insight into the development of the proposed TOLT model for higher

education through an extensive review of previous research and theoretical models within the educational and digital game spheres.

Though the existing body of literature has served as the foundation for significant research primarily using quantitative research strategies, this approach has tended to "seek causal determination, prediction, and generalization of findings" (Hoepfl, 1997, p. 48), rather than fostering a deeper insight, understanding, and contextual relevance available through qualitative methods. As such, the outcomes of one approach generated "a different types of knowledge" (p. 48) from the other. Additionally, as Bytheway (2015) observed, "qualitative research revealing participants' perspectives can add insight into how people learn in realistic, complex learning contexts with multiple and incongruent contributing factors" (p. 509). Furthermore, as there is little to no work directly associated with defining and articulating differentiating online learner types, and the existing models within educational and game-based research do not adequately address the topic, grounded theory provided the ideal process for deriving the needed theoretical outcomes from the research. It offered the ideal approach to analyze the topic and develop a new theoretical construct. As Chen (2005) stated, "[g]round theory methodology can be used to identify themes and develop theories" (p. 12).

Definition of Key Terms

Online Learning

The purpose of this study was not to address the itemization and subsequent specification of online learning environments nor was it to demonstrate correlations between online gaming and learning environments. However, it was necessary to establish a qualifying baseline for identifying and defining the differentiating categories and types.

While it was beyond the scope of this study to provide a comprehensive analysis of

terminology and definitions associated with online learning, a basic working definition of online learning was required. For the purposes of this study, the concept of online learning is defined as an instructional engagement that is separate and distinct from traditional face-to-face learning (Al Ghamdi et al., 2016; Berenson et al., 2008). It is accessed through and delivered by a digitally-based wide-area network (i.e., the Internet), and managed and facilitated by a technology-enhanced learning environment (e.g., learning management system) that is of a constructive, experiential nature (Kauffman, 2015; Russell, 2002) and demonstrates versatility and unrestrictive didactic adaptability (Goodyear & Retalis, 2010). Furthermore, it is experienced by the online learner through digital technology-based asynchronous and/or synchronous interactions, communications, and learning activities specifically designed and engineered to provide a unique opportunity for instruction, learning, and assessment within an online medium, and capable of eliciting distinctive learner behaviors, strategies, (Berenson et al., 2008), and academic outcomes based on the inherent differences (i.e., motivations, temperaments, personality, etc.) as distinct online learner types.

Effectance Motivation

The concept of effectance motivation was referred to by White (1959) as "the desire for effective interaction with the environment" (p. 317). This also encompasses, as noted by Sabir (2014), "the tendency to investigate matters of concern, to master techniques or skills, or to engage fully in the environment in general" (p. 17). While White's (1959) considered effectance motivation as serving as a central root for specialized motivators, Sabir (2014) postulated that it was a natural byproduct of an affirming environment. This does not completely align with Elliot and Reis's (2003) position, which stated that "effectance motivation is what competence motivation looks like in its purest and most fundamental form" (p. 318). Within the context of

this study, effectance motivation functions as one possible causal perspective on the origins and source of manifestation for other motivational dynamics. The notion of an association with competence was considered to be the closest relative functional understanding of the concept.

Delimitations and Limitations

To establish a qualifying baseline for identifying and defining the differentiating categories and types of online learners, it was necessary to provide a perspective of the core context through which the online learner is perceived and functions. Therefore, the concept of online learning was given an operational definition so that the purpose, methods, and outcomes of the study will be effectively conveyed and provided relevant placement in terms of expected applications and future research. A key challenge to this basic need was that there was no clear agreement on the conceptual terms and definitions associated with the area of online learning (Moore et al., 2011a). Even when considering what this educational concept was called, there were various terms that had possible correlation to it (e.g., distance learning and e-learning) (Moore et al., 2011a), all deriving from a problematic lack of continuity and agreement among researchers (Stone, 2017).

Delimitations

Given the nature of this study, the questions on application and validation of the model are left for future research. This provides key opportunities for continuations and further contributions. Likewise, this study did not address the itemization and subsequent specification of online learning environments nor did it demonstrate correlations between online gaming and learning environments. However, in order to establish a qualifying baseline for identifying and defining the differentiating categories and types, it was necessary to provide a perspective of the core context through which the online learner is perceived and functions. Therefore, the concept

of online learning was given an operational definition so that the purpose, methods, and outcomes of the study were effectively conveyed and provided relevant placement in terms of expected applications and future research. A key challenge to this basic need is that there is no clear agreement on the conceptual terms and definitions associated with the area of online learning (Moore et al., 2011a). Even when considering what this educational concept is called, there are various terms that can be said to have correlation to it (e.g., distance learning and e-learning (Moore & Kearsley, 2011b)), all deriving from a problematic lack of continuity and agreement among researchers (Stone, 2017).

Limitations

Understanding the inquiry strategy employed in this study, and as is the case with other studies that are based on the analysis of existing literature (Tlili et al., 2016), there were limitations to the findings of this study. The intention stated is the development of a new taxonomy of online learner types for higher education. However, the ultimate validity and application of the proposed taxonomy is deferred to future research where the model can be assessed beyond a theoretical context.

Additionally, this study was not intended to assess other aspects of online learning, such as the most effective delivery model or modality of online instruction but was solely concerned with creating a model that offers a classification and definition of the different types of learners engaged in online learning within the higher education setting. Other questions, including comparisons of blended vs. total online delivery, supplemental usage vs. primary utilization, and synchronous vs. asynchronous interaction are not addressed as points of inquiry or primary factors to be evaluated. Likewise, this study did not address the itemization and subsequent

specification of online learning environments nor did it demonstrate correlations between online gaming and learning environments.

The author did not challenge or deny the aforementioned areas as potential impact factors within the overarching learning process or academic performance of the individual learner. However, when considering the differentiating factors that contribute to the categorizing and defining the unique learner types, these were not considered relevant as parts of the learner's individuality within the online learning environment. Therefore, these topics of research were out of the scope and intention of this study.

Despite the apparent limitations, this study was a significant step in the evolution of online instruction in higher education in that it established a means of knowing the learner more holistically as a unique individual and provided a key foundation from which future research related to teaching and learning within higher education online learning environments can be developed. In turn it served to enhance the learning experience of students, provide more meaningful engagements and interactions for instructors, and generate more effective and relevant online courses and learning outcomes from instructional designers by facilitating a more complete understanding of the learner as a unique system within the online learning environment.

Summary

This chapter introduced the background of online learning, presented the statement of the problem that the study addressed, and expressed the purpose of the study. Additionally, the primary and secondary topics of inquiry were listed, along with the stated significance of the study, the research method used, and definitions of key terms. Finally, the perceived

delimitations and limitations of the study were addressed to provide appropriate expectations of the scope of the study, as well as anticipated next steps.

Chapter 2 presents the past research relative to online learning and the online learner. Additionally, it reviews key game player research expected to contribute to the understanding of differentiating online learner types and the factors that distinguish them. A meta-analysis based on a grounded theory qualitative research approach was applied.

CHAPTER 2

REVIEW OF LITERATURE

Humans are complex with many variables and factors that influence their behaviors and perceptions. To consider them in absolute terms of predictability is problematic at best. Rather than understanding individuals as formulaic, it was considered that it is the very nature of their individuality that, as Bandura stated, "contribute to, rather than merely predict, their actions" (as cited in Johnson, 2017, p. 10). As such, the online learner was perceived as an interactive system within the context of online instruction rather than as a variable. Direct research that comprehensively examines and articulates online learner types in higher education is very limited, with most works only emphasizing performance correlations to specific traits, practices, or instructional dynamics. For this literature review, a critical spectrum of research areas representing the diverse contributing dimensions relevant to the contextualizing, defining, and articulating online learner types were analyzed, as shown in Table 1.

Table 1

Key Aspects Investigated for Online Learning and Significant Research Trends

Topical Area	Keys Aspects Investigated
Online Learning	<ul style="list-style-type: none">• The online learning paradigm• The online learning environment• The online learner
Significant Research Trends	<ul style="list-style-type: none">• Performance and success• Comparison studies• Motivation

In addition to these topical areas, the spectrum of works evaluated incorporated a review of specific key concepts, theories, models, and other influencers from educational research, as well as other relative behavioral disciplines. These areas of conceptual, theoretical, and structural

influence are presented in Table 2.

Table 2

Concepts, Theories, and Constructs of Influence into Online Learner Types

Concepts	Theories and Constructs
<ul style="list-style-type: none"> • Behaviors • Constructivism • Contextual learning • Experiential learning • Learning styles and preferences • Engagement • Locus of Control • Learning motivation • Self-Directed learning • Self-Regulated learning 	<ul style="list-style-type: none"> • Bloom's taxonomic and ontological model • Myers-Brigg's Personality Types • Five-Factor Personality Types • Personality Theory • Personas • Gardener's Multiple Intelligence Theory • Dimensions of learning • Self-Determination Theory • Burge and Huang Model

Additionally, two other areas of inquiry were included in the review. This included an analysis of work addressing the existing perceptions of online learner types as a unique segmentation and the gamer taxonomy construct. This later topic explains the rationale for leveraging game player theoretical constructs as the basis for developing the TOLT.

Each of these areas examined specific dynamics and conceptual details that provide a meaningful assessment of these topical areas and foster a deeper perspective of the contribution and relevance of the works being reviewed within the context of the subject of study.

Additionally, the aspects considered within each of these topics had a direct bearing on the eventual form and function of the taxonomy being developed.

Online Learning

Online learning has played a role in instruction for more than 20 years. Over this time, there have been enumerable changes in educational technology and instructional methodologies that, while not necessarily negating, do call into question the validity and relevance of early

studies (Cavanaugh, 2001; Machtmes & Asher, 2000). It is clear that online learning is no longer a new or novel concept, but has become, as Kentnor (2015) observed, “mainstream” (p. 22). It has emerged as a key strategic consideration within higher education (Layne et al., 2013) and a critical instructional paradigm that continues to grow and develop (Allen & Seaman, 2011; Allen & Seaman, 2013; Allen, Seaman, Poulin, & Straut, 2016b; Lederman, 2018; León-Urrutia et al., 2018; Online Learning Consortium, 2016; Shah, 2018; United States Department of Education, 2013), offering students unprecedented access to education (Al Ghamdi et al., 2016). To appreciate the relevancy and impact of online learning, it was necessary to consider the various aspects of which it is comprised.

While in previous works, convenience has often been cited as one of the primary reasons for students to select online learning (Dabbagh, 2007; Jenkins & Downs, 2003; Yukselturk & Top, 2013), this is no longer necessarily the case. More often, other considerations are emerging as primary determinants for choosing online learning in higher education. Admittedly, there are some fairly straight-forward explanations to account for this trend, such as an increasing prevalence of required online learning activities, materials, or courses. This conjecture could potentially suggest support for studies that concentrate on correlating individual psychological factors, such as personality, learning styles, temperament, or motivation, with success in online learning (Fomunyan & Mnisi, 2017; Golladay, Prybutok, & Huff, 2000; Pintrich & De Groot, 1990; Yukselturk & Top, 2013). More likely, the characteristics of the learner may serve as a far more extensive and prominent component to account for within a comprehensive perception of the purpose, design, function, and effectiveness of the online learning environment itself.

The Online Learning Paradigm

A decade ago, online learning was considered by many in higher education as a necessary

move, however the adoption of the methods and practices associated with it were not completely understood or embraced (Lautenbach, 2008). Given its unique dynamics and capacities, online learning has emerged as a key strategic arena and relevant instructional paradigm that continues to grow and develop (Allen & Seaman, 2011; Allen & Seaman, 2013; Allen et al., 2016b; Lederman, 2018; León-Urrutia et al., 2018; Online Learning Consortium, 2016; Shah, 2018; United States Department of Education, 2013), offering students unprecedented access to education (Al Ghamdi et al., 2016). However, despite the numerous works dedicated to the subject (Layne et al., 2013), there is still no consensus on the varied aspects or functional methods of this academic paradigm. Though the notion of online learning is still considered by some to be new and revolutionary, its prevalence and complexity, as well as the body of work that has been dedicated to it (Layne et al., 2013) has fostered its evolution into a relevant academic medium across the full spectrum of education (Allen & Seaman, 2016a).

Though the initial draw of online learning tended to focus on the convenience factor (Dabbagh, 2007), its nature permits learners with diverse needs and characteristics to engage in instruction and academic programs. As such, online learning is an evolutionary step within the broader philosophy of distance education, which, “since its inception in the 1700s, was about making knowledge accessible to more than just a privileged few” (Kentnor, 2015, p. 30). When examining the evolution of distance education over the last 300 years, the milestone demarcations noted have typically corresponded to key innovations in technology and communication. From the parcel post (Emmerson, 2005; Verduin & Clark, 1991), to radio (Buckland & Dye, 1991), to television (Kentnor, 2015), each milestone has been considered as groundbreaking and revolutionary. As some innovations have represented significant changes in instruction and content, there have been predictions of the demise of traditional educational

models, such as in the case of Thomas Edison, who went so far as to state that “books will be obsolete in the public schools. Scholars will be instructed through the eye. It is possible to teach every branch of human knowledge with motion picture. Our school system will be completely changed inside of ten years” (Smith, 1913, p. 24). The introduction of online learning as a key distance education milestone, likewise drew concerns. As Garrison, Anderson, and Archer (2003) noted, “for educational institutions built around face-to-face classroom instruction, the advent of online learning presents a crisis situation, in the classic sense of being both an opportunity and a threat” (p. 123). Though technology has been considered the lens through which distance learning has developed, at the core it is about the learner. As online learning in higher education has been recognized as a major academic factor and continues to play an increasingly prominent role in education (Allen & Seaman, 2010), the need of a taxonomy to understand those engaged in learning within this environment should be considered of essential importance.

The Online Learning Environment

There are assumptions made regarding which factors are essential to examining and understanding the environment and paradigm which influence the context and relevance of the outcomes. Research covers a range of emphasis, including the applied technologies of the environment relative to access, management, and delivery of courses (Anderson, 2016; Siemens, 2014), the instructional interaction and engagement dynamics (Ma, Han, Yang, & Cheng, 2015; Roffe, 2002), and instructional design concerns and practices (Crawford-Ferre & Wiest, 2012; Moore & Kearsley, 2011b). Likewise, the investigative targets of these works will typically address the effectiveness of applied systems, technologies, or methodologies in facilitating instruction, or the determinations of criteria for measuring the design quality and effectiveness.

In terms of the learner, studies tend to seek to correlate factors which can be attributed to performance outcomes, such as success, satisfaction, or retention (Angelino, Williams, & Natvig, 2007; Chen & Jang, 2010a; Hu, Lo, & Shih, 2014). These factors may be related to a technology, design strategy, engagement method, or other environment-specific element, or be oriented towards the individual within the context of a theoretical or predictive trait.

The opportunities for engaging in higher education learning within online environments continue to expand, with the models of implementation diversifying, ranging from access to supportive materials for face-to-face classes all the way to complete degree programs delivered using totally asynchronous instruction (Stone, 2017). Online learning environments are constructive in nature. They can foster social learning through the development of communities of practice dependent on those engaged in the instructional process (Russell, 2002). When considering the learning environment, the emphasis may be placed on the technologies used. One of the primary conceptual dynamics that distinguishes online learning is the foundational aspect of the instructional discourse being facilitated through a digital medium (Roffe, 2002). With online education having been in use for almost 20 years, it is highly improbable that technology factors would be perceived as a dominant consideration when evaluating student success. This is to say that as a personal trait, an understanding and familiarity with the technologies associated with online learning have become common place and are therefore no longer competencies that are typically in question. The only relevance that technology may still have in terms of the success of a student would most likely be based on the reliability of the access point, learning management system, or functionality of the course design. The learning management system (LMS) is typically understood in terms of its function as means for managing and facilitating online instruction. It provides the mechanisms for administering, organizing, and accessing the

online instruction. While this fundamental function of the LMS is generally accurate, its role should be perceived beyond that of its technological or organization function. These are the core constructs of the online learning environment. They do not in and of themselves determine the learning environment but are the starting point for generating a unique virtualized learning experience for the online learner. This perspective is better understood for game environments (Gee, 2008), and should likewise be considered for the online learning environment. These are all outside of the control of the student and should no longer be factored in when determining individual success potential. Ally (2004) noted that a primary consideration and factor for effectiveness has been the technology and means of delivery used in online learning. However, he indicated that there should be a shift from focusing on these factors to an emphasis on the learner and the importance of “the students’ interaction” (Ally, 2004, p. 16). One of the fundamental defining aspects of online learning is that it is learner-centric (Ali, Ramay, & Shahzad, 2011).

One of the unique dynamics of online learning is the duality of its delivery and engagement functionality, facilitating both synchronous and asynchronous instruction (Broadbent, 2017). In turn, online courses are just as likely to employ real-time communications and interactions using relative constructs and deadlines, as learning strategies that are free from time and presence dependencies (Means, Toyama, Murphy, Bakia, & Jones, 2009).

As Broadbent (2017) observed, blended learning environments are distinct from those that are delivered completely online and those within the traditional face-to-face method. However, this study was not intended to assess the most effective delivery model or modality of online instruction but was solely concerned with creating a model that offers a classification and definition of the different types of learners engaged in online learning within the higher

education setting. As such, the questions of blended vs. total online delivery, supplemental usage vs. primary utilization, and synchronous vs. asynchronous interaction were not addressed as points of inquiry or primary factors to be evaluated. The extent to which these may have some relevance is in their use in expressing the preferences, characteristics, and dynamics that articulate the personas of the defined types. A critical point of awareness is that “online courses differ from traditional courses in many ways” (Kauffman, 2015, p. 2), and, as such, it is imperative to perceive and treat them distinctly.

The Online Learner

Studies by Caspi, Chajut, and Saporta (2008), Godwin, Thorpe, and Richardson (2008), Hrastinski (2009), and Rovai and Baker (2005) indicate “that online learners having various properties could behave differently while participating in online courses” (as cited in Yukselturk & Top, 2013, p. 719). In turn, this suggests a justification for differentiating the dynamics and function of a given learner between their experiences in a traditional face-to-face instructional environment and one that is delivered through an online medium (Yukselturk & Top, 2013). The focus is not on online learning as a bridge but the learner within the online learning environment (Yukselturk & Top, 2013). Dabbagh (2007), while indicating that learning styles were not validated as “a significant predictor of success” (p. 218), inferred that such preferences could still impact the level of engagement, focus, and motivation for the online learner. Even with this acknowledgement, Dabbagh (2007) continued to put forth the emphasis of correlating traits of the online learner with successful performance, noting “that intrinsically motivated learners possessing a high internal locus of control, coupled with a positive attitude toward the instructor and a high expectation for grades and degree completion were more likely to succeed in a

distance education course” (p. 218). From her research, Dabbagh (2007, p. 220) provided seven key attributes and dynamics considered central to successful online learners:

- Having a strong academic self-concept
- Exhibiting fluency in the use of online learning technologies
- Possessing interpersonal and communication skills
- Understanding and valuing interaction and collaborative learning
- Possessing an internal locus of control
- Exhibiting self-directed learning skills
- Exhibiting a need for affiliation

Another perspective was provided by Joksimović et al. (2015), who suggested a more concise definition for online learners. Unlike the seven dynamics proposed by Dabbagh (2007), Joksimović et al. (2015, p. 120) offered four key characteristics

- Intrinsic motivation
- Self-efficacy and self-directness
- Responsibility for their learning
- High digital literacy

However, within Joksimović et al.'s (2015) contextual framework of the "educational experience in online learning settings" (p. 120), the online learner functions as one of seven significant factors that contribute to the overall online learning experience, with the others being instructors, instructional strategies, content, media, course design, and institutional adoption (Joksimović et al., 2015). While the dynamics presented have similarities to those listed by Dabbagh (2007), they are limited, if not restricted by design due to the larger conceptual considerations of the other factors. When assessing these characteristics, there are some that stand out as being more

applicable than others in contributing to a broad, holistic definition and understanding of unique online learner types.

Additionally, some may find stronger association with specific types than others. However, the intention of these characteristics is to personify the make-up of a successful online learner as opposed to providing context and definition to any specific type of online learner. It should be considered that certain attributes might be better expressed as assumptions or general prerequisites. For instance, some of the listed competencies, such as technological fluency, often are cited as a common factor for consideration when identifying and defining online learner types. However, given the predominance of self-selection of the student for pursuing instruction within an online environment, it is more likely that natural attrition will generate a population predisposed to and exhibiting the required competencies for functioning within an online learning environment. While understanding the personalities and dynamics of the learners before they enter the online learning environment may have some degree of practicality and benefit (Dabbagh, 2007; Yukselturk & Bulut, 2009), it is understanding who they are and what they do within the online learning environment that ultimately is most valuable. The challenge to using entry behaviors and attributes is that once an individual acclimates to a new environment, or after an affective situation or circumstance has passed, those initial understandings may or may not continue to be valid and applicable. Conversely, having a strong understanding of individual online learners based on their persistent distinctive type within an online learning environment affords a higher probability of consistency and continuity in how they respond and perform.

This understanding was derived from the student-centric approach to learning and effective engagements that personifies online learning and Constructivist methods, which “enables learners to exhibit their knowledge through demonstration” (Keengwe, Onchwari, &

Agamba, 2014, p. 888-889). As the students are central to online learning, a comprehensive understanding of them was necessary to enable a stronger representation of constructivist methods and concepts. Within the constructivist learning environment, as Ruey (2010) noted, “students are encouraged to actively engage in learning: to discuss, argue, negotiate ideas, and to collaboratively solve problems” (p. 707). This was a fundamental catalyst for understanding and future application beyond the parameters of the immediate course. Of these learning environments, Ruey (2010) further noted that they are uniquely suited to “fit various learning needs of adult learners and to distinguish tasks and roles played by the parties involved in the learning process” (p. 718). This adaptability correlates to the conceptual basis for defined online learner types. While a purely constructivist course design would not be expected to fit all types, it may offer the types of structural foundation that facilitates the dynamics of other learner types.

Significant Research Trends

Despite the longevity of online learning as an accepted means of delivering instruction within academia, and while the various aspects and elements of implementing online instruction have been examined (Rogers, Graham, Rasmussen, Campbell, & Ure, 2003), there remain areas of study that have not been thoroughly addressed (Romero-Hall & Vicentini, 2017). Within the realm of learning, there are numerous ways in which differences are considered and investigated. While some studies have centered on the notion of learning styles (Kolb, 1984; Manochehri & Young, 2006; Richmond & Cummings, 2005), others have examined personality types (Bolliger & Erichsen, 2013; Judge & Ilies, 2002; Kim, Lee, & Ryu, 2013), motivation (Huang, 2011; Kizilcec & Schneider, 2015; Malone, 1981; Schunk, 1995), and other areas. These are the works that speak to the learners, though this is often within the context of identifying the traits and practices needed for success within the online environment. Often, the intention is to provide a

means of predicting performance (Golladay et al., 2000; Kauffman, 2015; Yukselturk & Bulut, 2007).

In terms of online learning, while some studies attribute the rise of online learning as a relevant and mainstream instructional channel to the nontraditional student, traditional student populations continue to have a significant representation (Layne et al., 2013). Though an understanding of online learners may ultimately prove to be beneficial in terms of student retention (Layne et al., 2013), it was not considered a core developmental motive or dynamic of the proposed taxonomy.

Performance and Success

Kizilcec and Schneide (2015) indicated that research into online learning and the understanding of success within these instructional environments have tended to be instructor-centric. Motivation is an essential influencer in learning (Chen et al., 2010a; Lim, 2004). While this has been understood for traditional instructional situations, Lim (2004) noted that “identifying certain learning motivation types that are effective for online learning environment has been an important research issue for online learning researchers” (p. 863) and, as Chen et al. (2010a) stressed, “should be taken seriously” (p. 741).

The objective in researching the differences in online learners should not be solely to predict performance within a specific method of instructional design or applied theory. This emphasis considers the learner only in terms of observable behaviors and performance in response to designated external frameworks and situations. As a result, outcomes will be more aligned with understanding the design and delivery of instruction from a perspective that prioritizes the applied technologies, design strategies, or capabilities of the instructor. There are few studies that truly seek to fully understand who the learner is and give priority to the

considerations and consequences of their unique differences. There are several factors that are at play and interact within individual learners which determine how, why, and when they learn (Broadbent & Poon, 2015; Heeter, 2009).

Previous research into online learning has often sought to gain insights into expected performance based on investigations into differences in the environments (Xu & Jaggars, 2013). Not surprisingly, the outcomes of these studies were inconsistent, yielding mixed results (Bernard et al., 2004; Zhao, Lei, Yan, Lai, & Tan, 2005; Sitzmann et al., 2006; Jahng, Krug, & Zhang, 2007).

There are several studies dedicated to identifying predictors of online learner success (Berenson et al., 2008; Broadbent, 2017; Fariba, 2013; Golladay et al., 2000; Greene, Oswald, & Pomerantz, 2015; Hu et al., 2014; Kauffman, 2015; Richardson et al., 2012; Yukselturk & Bulut, 2007). These explore a wide range of factors as probable indicators correlating to performance within the online learning environment, including personality traits (Fariba, 2013; Judge & Ilies, 2002; Kim et al., 2013; Lucas, 2007), learning styles and preferences (Abdullah et al., 2015; Bueno, 2005; Shahabadi & Uplane, 2015), engagement (Hamane, 2014; Johnson-Smith, 2014), learning behaviors (Nakayama et al., 2014), motivation (Pintrich & De Groot, 1990; Schunk, 1995), emotional intelligences (Berenson et al., 2008), self-regulated learning strategies (Broadbent, 2017; Pintrich & De Groot, 1990), temperament (Fomunyan & Mnisi, 2017), and participation (Yukselturk & Top, 2013).

Comparison Studies

A continuing trend in online learning research is the comparison of the distance education paradigm to traditional instructional situations (Angelino & Natvig, 2009; Bernard et al., 2004; Crawford-Ferre & Wiest, 2012). This continuance of comparing environments when determining

success factors detracts from the degree of accuracy and relevance when constructing a clear understanding of any of the particular components of the online learning environment. This is especially the case when evaluating and qualifying the learner. While deriving an understanding of the unique nuances of online learning is valuable and can be of benefit to key stakeholders, including instructional designers and instructors, comparative studies that juxtapose these separate approaches often is undertaken with the intention of identifying the advantages or shortcomings of one over the other. Though some may perceive online learning simply as an "alternative to face-to-face classroom instruction" (Crawford-Ferre & Wiest, 2012, p. 11), it should be understood instead, as a strategic instructional environment possessing distinct capabilities and serving a unique function within education.

There have been concerted efforts to compare the online and face-to-face learning environments (Allen, Bourhis, Burrell, & Mabry, 2002; Bernard et al., 2004; Harrington & Loffredo, 2010; Johnson-Smith, 2014; Paechter & Maier, 2010; Reeves & Osho, 2010; Sitzmann et al., 2006). Though the intentions have been varied, the predominant perception is that the learner is a constant. There is no distinction given to who the learners are, or how they react and respond, or behave in terms of the context of the learning environment. While the concept of there being factors correlating to success in online learning is commonly adopted, this assumption is that the individual as a learner does not differ from one context to the next. It is essential to understand and recognize that online learning environments are separate and distinct from traditional face-to-face learning environments. As such, they provide unique opportunities for instruction, require instructional designs specifically engineered for the technical capabilities and potential of the medium, and generate distinctive experiences, strategies, and responses with the learners engaged in instruction.

Motivation

While Kizilcec and Schneide (2015) maintained an understanding of motivation as being "a lens of understanding learner behavior" (p. 2), their assertion of there being a significant correlation existing between an online learners' choices and their motivation to engage in the instructional space may equate to actions being a manifestation of internal intention. This may infer that there is no difference between implicit and explicit actions, which deals with the originating drivers. If it is understood that implicit actions fall within the realm of automatic responses and reactions that are not initiated or governed through conscious awareness or precognition, and explicit actions are those that are directed through clear forethought, planning and controlled awareness (Bartle, 1996; Tondello, Wehbe, Orji, Ribeiro, & Nacke, 2017), then the choices of a learner cannot be considered the "expressions of learner's own motivations for engaging in the environment" (Kizilcec & Schneide, 2015, p. 2). While DeBoer, Ho, Stump, and Breslow (2014) suggested that the correlation does exist, it is perhaps more appropriate to state that the mechanism and nature of choice is a viable aspect of expressing individuality.

Previous studies have indicated that demographic differences may have influence on the strategies, motivation, behaviors, and performance of learners (Biner et al., 1996; Kizilcec & Schneide, 2015; Layne et al., 2013; Stokes, 2003). Likewise, there is an anticipated performance and motivation difference between online learners based on three (3) key demographic variables - age, education level, and professional experience. Additionally, there could be degrees of correlation between these variables in that the learners' age may relate to their level of education and/or the amount of professional experience they possess. Where this interrelation may not apply is in situations where the learners are pursuing a degree (be it at the undergraduate or graduate level) that is unrelated to their existing area of expertise due to a shift in career or

interest, or a decision to pursue a degree for the first time as a nontraditional adult learner. In such a scenario, the age of the learner would not necessarily correlate to their education level or the extent of their prior knowledge and experience in the area of study. Regardless of these factors, there is the potential for a learner's age to show some measure of correlation to type determinants such as motivation. Whether this is to a significant level remains to be seen. However, it was the expectation of this study that while age differences may have been exhibited within certain online learner categories and types, the prevalence was negligible and therefore was not qualified as a distinguishing characteristic or dynamic in and of itself. The intentions of the online learner were not considered to be a factor of investigation in this study despite some research having speculated that these intentions are indicative of an initiating motivation that could serve as a predictor of an individual's learning behaviors within the online instructional environment (Kizilcec & Schneide, 2015). A central takeaway was that learner motivations are a useful lens for understanding learners.

Other Considerations

While success performance is a recurring theme in online research, Keller et al. (2013) noted that performance was not the only topic being investigated. While not necessarily evaluating the online learner holistically, the examination of identifying elements, such as personality, on the behaviors and attitudes of the learner within the environment does represent a growing understanding of the need to have a deeper understanding of the learner. There studies offer investigation into other situational and outcome dynamics. As with efforts to find predictive correlations between various factors and success, these studies seek to establish predictive connections to address other relevant academic concerns including student retention (Greene et al., 2015; Kemp, 2002; Park & Choi, 2009; Parker, 1999), satisfaction (Ali et al., 2011; Allen et

al., 2002; Bolliger & Erichsen, 2013; Ilgaz & Gülbahar, 2015; Reeves & Osho, 2010), engagement (Fredricks & McColskey, 2012; Wu, 2016), and participation (Vonderwell & Zachariah, 2005; Wu, 2016; Yukselturk & Top, 2013). Of interest were efforts to focus on the actions and choices of the individual in association with game player types and learning styles (Konert, Göbel, & Steinmetz, 2013), which offered a relative perspective to the proposed taxonomy. While moving towards a greater emphasis on the psychological dynamics, such as personality, is a positive step towards understanding player or learner types on an individual basis, the use of such factors as predictors does not offer an approach to deeper comprehension of the unique person but functions instead as taking a different attempt at the same functional goals of previous predictive models. While these studies address the online learner to a degree, none of these fully endeavor to provide a comprehensive perspective of the types of learners that are engaged in online learning. Within the context of higher education, this deficit is particularly noticeable.

Identifying student characteristics in terms of contributors to failure in online learning does not necessarily translate to enhancing student success. This assumption approaches effective online learning in terms of behaviorism. This approach of investigating students' traits based on outcomes, is equally problematic when dealing with successful students. The issue is that there is an assumption that the experience of students within online learning can be condensed into a series of variables and learner outcomes are a matter of the right formula. The human factor is a highly complex one that cannot be simplified to a standardized expression with predictable results.

When reviewing the literature, a host of study purposes, emphases, methods, and outcomes were observed. What was even more evident than the diverse nature of the studies was

the notable inconsistency in the conceptual perceptions being examined and the differing assumptions made regarding online learning. Even key terminology, including what is considered online learning, reflected a lack of continuity and agreement, with there being a perception of various conceptual terms (e.g., e-learning, Internet learning, distributed learning, online collaborative learning, virtual learning, web-based learning, and technology-mediated learning) (Ali et al., 2011; Ally, 2004) being interchanged and used synonymously. Considering the degree of deviation from a common understanding of the design, function, and attributes of online learning environments, as well as inconsistent perceptions on what constitutes quality, effective courses and methods of delivering instruction, the question of the learner as an individual within the online environment, and not in terms of only successful online learners, provided a unique and critical avenue for investigation and understanding with high potential for generating an essential and relevant contribution to the body of knowledge in teaching and learning that has not been sufficiently explored.

Though some of the studies on online learning have been focused on generating methods of predicting performance and success based on course design elements, demographic traits, performance variables, and personality types, or learning styles (Hu et al., 2014; Hwang, Shadiev, Wang, & Huang, 2012; Kotsiantis, Pierrakeas, & Pintelas, 2003; Macfadyen & Dawson, 2010), few studies have examined online learning specifically within the context of identifying and understanding the distinctive differentiators of the unique types of learners engaged in learning in these environments. This is even more so when considered in terms of online learning in higher education. A key difference between the emphasis of the proposed taxonomy and retention-based studies deals with those elements that deviate from a student-centric perception. An example of this is seen in Berge and Huang's (2004) work addressing

retention which incorporated institutional and circumstantial variables, in addition to those addressing the state and influencers of the learner (Layne et al., 2013; Tyler-Smith, 2006).

Influential Concepts and Constructs

From a theoretical perspective, it is necessary to understand if the dynamics and stipulations of learning theory maintain full compatibility with the dominant theoretical influences demonstrated in effective online learning environments and by the online learner. With consideration for constructive experiential learning as a primary means through which instruction is designed and executed, there is a need for theoretical cohesion to ensure that the expectations are consistent with the learner, and that the overall experience of the engagement is contiguous. In situations where there is no consistency, either within an online course from module to module, or between the offered courses of a given program, the experience and reaction to the online learning environment has the potential to significantly differ. This fluctuation would not be indicative of the distinctions between types of online learners, but rather an artifact of instructional design challenges. An examination of previous efforts into the modeling of personality for online learners (Campos, Alvarez-Gonzalez, & Livingston, 2012, as cited in Tlili et al., 2016; Romera & Ventura, 2016; Halawa, Shehab, Hamed, & Essam, 2015, as cited in Tlili et al., 2016), while incomplete, does provide an insight into the function of the different dynamics as experiential influencers for learners within an online instructional environment. Yet, according to Ertmer and Newby (1993) behaviorist, cognitivist and constructivist schools of thought overlap and these three theories can form a taxonomy for learning. Proposing the importance of addressing the “what”, “how”, and “why” in online class environments, Ally (2004) suggested that

behaviorists' strategies can be used to teach the “what” (facts), cognitive strategies can be used to teach the “how” (processes and principles), and constructivist strategies can be

used to teach the “why” (higher level thinking that promotes personal meaning and situated and contextual learning). (p. 19)

Ultimately, when assessing the various theories and models associated with the critical and relevant aspects of online learning, it is necessary to perceive their potential value and meaning within the context of holistically articulating the online learner and their capability to be effective contributors within a broader interactive construct. Models that offered relevance in terms of one dynamic of the study, could be deemed as inconsequential due to key limitations in their application elements or adaptability.

There is risk in attempting to over generalized models and findings. When the outcomes are provided in this manner, they begin to lose their ability to function with high definition and strong resilience. This is part of the rationale for developing the proposed taxonomy relative to the context of the higher education sphere. "One of the central goals of scientific taxonomies is the definition of overarching domains within which large numbers of specific instances can be understood in a simplified way" (John & Srivastava, 1999, p. 102). Within the arena of educational research, there are few models specifically oriented towards the contextualization of online learners.

Behaviors

Learning behaviors can be either intrinsically or extrinsically motivated (Deci & Ryan, 1985), where activity engagement can occur because it has evoked a personal appeal or interest, or perhaps because the learner perceives the engagement outcomes as being beneficial and/or of strategic significance (Garris, Ahlers, & Driskell, 2002).

The Learner Model proposed by Tmimi et al. (2017), is the only learner-centric construct identified during the review of literature that has any relevant similarity to the taxonomy being presented in this study. However, it represents and describes the information about a learner

solely to explain the behavior of the learner in terms of the learning process within the context of hypermedia. While the adaptive hypermedia and online learning environments may be considered as in close proximity to their technologies and interactive dynamics, they are not synonymous. Additionally, the six facets that the model is based on are specifically associated with the phase of learning and adaptation within adaptive hypermedia. Though these six are stated as the essential dynamics by Tmimi et al. (2017), their ability to comprehensively represent the learner's distinctive type within an online learning environment is questionable. When evaluating these facets, their functional capacity can be better understood. The personal information facet is intended to reflect demographic aspects, such as age, gender, etc., which are relatively static in nature. With the knowledge and skills facet, only the learner's competencies are considered. While this can factor in prior experiences and preexisting knowledge, the application suggested would indicate a purely cognitive role and influence with the learner and not directly correlate to insights or broader understanding of concepts or topics. The historic facet is presented as being most closely aligned with a computer log and, in turn, functioning in the same capacity. It literally is an account of all actions carried out by the learner within the adaptive hypermedia environment noting the type and sequence of the activity.

While there is a degree of usefulness of this kind of data when performing trend analysis, it only addresses the matter of what activity is performed, and the order and timing of its execution. There is no sense of the context and motivation. Given the connotations associated with the concept of a psychological profile, it was expected that this facet would be intended to provide a richer perspective of individual factors characterizing the learner. However, Tmimi et al. (2017) chose to utilize the Felder-Silverman Learning Style Model (FSLSM) to derive this facet. Though the learning preferences of an individuals can afford a degree of indication as to

their unique approach to the learning process (Zywno, 2003), Learning styles, as a theoretical construct, are not universally recognized as a valid based on the research related to them, and they do not provide the full range of individual dynamics needed to gain a productive insight into the learner holistically. The next facet, cognitive ability, did not provide any meaningful compensation to the shortcomings of the psychological profile. Instead, it suggests a functional matrix of required cognitive processes. Despite offering three levels of functionality within each cognitive dynamic, it still does not convey perceptual distinctions for the learner. Finally, the emotional state facet is presented as a means of accounting for key aspects of the learner's individuality associated with their responses and behaviors. However, the entirety of this facet places emotions as a means of assessing the learner's behaviors and learning condition based on quantified variables within three primary tiers of response - learning state, emotional recognition, and control. Tmimi et al.'s, (2017) model does not provide a comprehensive understanding of learners in terms of how they differentiate within the context of online learning environments. It lacks a means of assessing the qualitative aspects of the online learner.

Bloom's Taxonomic and Ontological Model

Gaitanaru (2016) noted that Bloom's educational taxonomy was conceived and created specifically within the context of traditional instructional situations, as the face-to-face dynamic was the standard of the period in which it was developed. Observing the continued evolution and implementation of Bloom's taxonomic and ontological model, Gaitanaru (2016) conjectured that any model of eLearning should be based on an ontology-centered framework. Within this approach, the learner functions as one of the participating elements of a relational branch of the overall model. Considering this perspective, it would not be feasible to use this concept to

describe and address the online learner to the degree that is needed to fully express the differences between the individual types engaged in instruction.

While there are several positive moves made in revising Bloom's taxonomy, one of question is the choice to rename Knowledge to Remember. The presented rationale is based on terminology being used by teachers. This, in principle, seems to be sound, but when examining the functionality of these two concepts, the notion of knowledge would have a stronger relevance, within the context of teaching and learning, over remembering. The later conjures a perception of purely cognitive actions that lack purpose and meaningful intent. This may be common in how teachers describe their work, but the question of its appropriateness should be addressed as it raises concern about the perceived quality and purpose of the learning process. Granted, this is the cognitive process dimension. However, conceptually speaking, transference might be a more effective and constructive term to represent the category. Of importance is the shift towards understanding as the identifying connotation as opposed to Comprehension. This suggests a transition of information into relevant insight. This in turn permits a broader conceptual application.

The intent for taxonomies, such as Bloom's, is to help facilitate a framework for developing more effective objectives and processes. Within the context of instructional design, this remains an essential function. Krathwohl (2002) suggested that the framework of the revised taxonomy provides valuable and insightful enhancements that better facilitate deeper learning. Providing a two-dimensional approach to address the knowledge and cognitive processes aligns with constructive learning. While an understanding of Bloom's Revised Taxonomy is of importance for academic relevance, this does not apply to all aspects of the proposed model. It

does, however, provide a meaningful context when considering how the online learner taxonomy can impact instructional design and curriculum development (Krathwohl, 2002).

Constructivism

Constructivist strategies emphasize the importance of the learners' own interpretation and knowledge construction where the learner facilitates the learning process through cognitive structures (Chakraborty, 2017). Shavelson (1972) defined Cognitive Structure as "a hypothetical construct referring to the organization (relationships) of concepts in memory" (p. 226-227). However, Taber (2008) offered a conflicting assessment of the concept, noting that "the term cognitive structure is well established ... although there does not seem to be a single well-accepted meaning" (p. 1030). Chakraborty's (2017) perspective aligned with the earlier precepts of Blees and Rittberger, (2009) who noted "[f]rom a constructivist perspective, learning is a constructive, active, emotional, self-organized, social, situational process" (p. 3). The nature and dynamics of this theoretical approach to online learning fosters active, highly engaged learning that is significantly more effective than passive learning environments and course designs (Murphy, Mahoney, Chen, Mendoza-Diaz, & Yang, 2005).

Contextual Learning

The concept of contextual learning is derived from the awareness of the complexity of learning and the assertion that "learning occurs only when students (learners) process new information or knowledge in such a way that it makes sense to them in their own frames of reference" (Lucas, 2007, p. 12). While this is an important factor within such concepts as Self-Directed Learning, the broader associations with and inferred validation of Learning Styles (Ally, 2004; Lucas, 2007; Wright & Stokes, 2015) represent a non sequitur. Rather, contextual learning should be understood as an active attribute of constructive learning. Therefore, in terms

of online learner types, this concept, while having theoretical merit, does not function either as a differentiating factor or construct for presentation.

Experiential Learning

“While experiential learning is not a new concept, it is a relevant theme within modern learning, especially within the realm of online instruction” (Darby, 2017, p. 32). The modern manifestation of experiential learning theory (ELT) has a lineage rooted in the work of significant thought leaders, such as Dewey, Lewin, Piaget, James, and Rogers to name a few, and has emerged as a holistic approach to learning that has broad applications in various instructional spheres (Kolb & Kolb, 2009). This theoretical approach factors in the unique life experiences as a core contributor to the learning process. While perhaps more applicable to non-traditional or graduate students, this concept has direct relevance to any learner within the higher education sphere due to the self-selected nature of an individual’s academic career, and the constructive effect of established degree plans where prior knowledge is required and applied to provide scaffolding for future learning.

Kolb (1984) states that within experiential learning, learning is "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (as cited in Kolb & Kolb, 2009, p. 44). The ELT model expressed these across “two dialectically related modes of grasping experience – Concrete Experience (CE) and Abstract Conceptualization (AC) – and two dialectically related modes of transforming experience – Reflective Observation (RO) and Active Experimentation (AE)” (Kolb & Kolb, 2009, p. 44). Of interest are these axes, which correlate to the concept of knowledge creation vs. knowledge acquisition proposed as a dialectical differentiation axis for the TOLT. The ELT model captures the dynamics relative to meaningful online learning.

Affirming the ELT's effectiveness at depicting the nature and flow of learning, Akella (2010) added that "the ELT model is highly useful in understanding the learning processes of students and types of students" (p. 103).

One key limitation of the ELT models is its intended integration with emphasis on Kolb's learning styles as a functional companion component. This issue was raised by Fielding (1994), who stated that "[l]earning styles are flexible structures, not immutable personality traits" (as cited in Akella, 2010, p. 111). This aligns with the understanding of the complexity of personality and the challenges associated with implementing learning styles within education. Still, while there is a capacity to directly tie into efforts to holistically conceptualize distinct learner types, as a single construct, it is not enough to assess the different factors and distinctive dynamics of online learners; the model does provide a baseline of understanding of constructive attributes of learning that can vary from one learner to the next at a high level.

Personality Theory

The genesis of type theory is based on Jung's efforts "to define his premise that human behavior is not random but predictable and classifiable" (Lucas, 2007, p. 12). This initial examination of behaviors was framed only in terms of personal attitudes and functions (Lucas, 2007). However, this approach did not provide an adequate understanding of the complexity of personality differences. As Lucas (2007) pointed out, "Jung noted after ten years of continued research that these two types did not provide a complete picture" (p. 13). From this start, there have been numerous efforts made to better understand, refine, and apply this concept, especially within education. The challenge in understanding the differentiation of individuals has prompted the development of numerous theories and models to address the complexities of individuality. The unique aspects of the person are what remain of central consideration. The relevance of this

was supported by Konert et al. (2013), who made the observation that “even though several theories and related, empirically validated, models exist to categorize player behavior into player types and learning behavior into learning styles, they all have a natural common aspect: they focus on decisions and behavior of the person to model” (p. 239).

Some studies focused on the actions and choices of the individual (Konert et al., 2013). While moving towards a greater emphasis on the psychological dynamics, such as personality, is a positive step towards understanding player or learner types on an individual basis, the use of such factors as predictors does not offer an approach to deeper comprehension of the unique person but functions instead as taking a different attempt at the same functional goals of previous predictive models. The inconsistencies of the outcomes of the various studies that have examined the relationship between personality and performance in online learning (Keller, 2013) demonstrate the challenge in attempting to leverage a single dynamic as a predictor. Additionally, a focus on performance maintains an emphasis on observing contextual reactions and responses. Still, the importance of the individual learner, or player, and the factors that distinguish them cannot be understated.

Other research has inferred personality type as a motivator for learning (Tlili et al., 2016). An examination of previous efforts into the modeling of personality for online learners (Campos et al., 2012, as cited in Tlili et al., 2016; Romera et al., 2016; Halawa et al., 2015, as cited in Tlili et al., 2016; Halawa, Hamed, & Shehab, 2015), while incomplete, does provide an insight into the function of the different dynamics as experiential influencers for learners within an online instructional environment.

As other studies indicated (Bolliger & Erichsen, 2013; Kim et al., 2013; Nakayama et al., 2014) the dynamics of personality are relevant elements of the online learner, but they should be

applied within a meaningful context. While there is no consensus on the influence of personality on learners within online instructional environments, there is evidence to suggest that personality is a differentiating factor (Bolliger & Erichsen, 2013; Kim et al., 2013; Nakayama et al., 2014)).

Myers-Brigg's Personality Types

Jung's early work on personality types serves as the foundation of the Briggs-Myers & Briggs work on personality types (1985, as cited in Boyle, 1995), and subsequent development of the Myers-Briggs Type Indicator (MBTI) (Boyle, 1995; Moller & Soles, 2001), which extended the type classifications (Lucas, 2007). This extension has afforded a model where "[f]our dichotomous dimensions classify individuals" (Boyle, 1995, p. 71). These pairings articulate personality types as differentiation preferences where people

- Preferred focus of attention and source of energy (Extroversion vs Introversion (E-I))
- Preferred method of receiving or gathering information (Sensing vs iNtuition (S-N))
- Preferred method of making decisions (Thinking vs Feeling (T-F))
- Preferred method of managing the outer world, using received information and decisions from that information (Judging vs Perceiving (J-P)) (Lucas, 2007, p. 14)

Based on these four dimensions, 16 personality types emerge (Pittenger, 1993) providing a correlation to each individual. Though this represents a strong basis for understanding individuals, its application into online learning has not been fully established or understood, with some research suggesting that introverts are better suited for the paradigm and environment than individuals with an extravert disposition (Moller & Soles, 2001). This perception reflects a limited understanding of the emerging dynamics of the online learning environment, and makes presumptions of learner function, motivation, and behaviors based on the notion that individual learners are constant regardless of the instructional environment.

Does this indicate that the MBTI is not applicable or relevant for evaluating online learners? Not necessarily. Harrington and Loffredo (2010) supported the adaptability of the model, stating “that the MBTI has been used to assess characteristics of learners including learning styles, teacher/learner interactions, and their academic aptitude and achievement across elementary, secondary, and higher education settings including those with computer-assisted instruction” (p. 90).

However, even with supportive studies, there are still questions concerning the model’s viability. One such point was made by Boyle (1995) who stated that the “psychometric limitations of the MBTI raise concerns about the validity of the instrument” (p. 74). Likewise, Pittenger (1993) argued that the model imposes restrictive boundaries and suggests “that MBTI attempts to force the complexities of human personality into an artificial and limiting classification scheme” (p. 52). Both bring up conceptual aspects that should be considered in using the MBTI but are not shared by all researchers. Additionally, as there is often not an intention of using personality types as the sole means of evaluating and differentiating learners, as is the case with the proposed taxonomy, the limitations presented by Boyle (1995) and Pittenger (1993) fail to merit elimination of personality types and the MBTI altogether.

Five-Factors Personality Model

The MBTI personality inventory has been widely used and validated (Tlini et al., 2016), providing credence to the Myers-Briggs personality types. McCrae and Costa (1989) demonstrated that the MBTI axes should be viewed more in terms of measures, which rather than defining the individual dynamics rigidly, offers more potential for transition and personification. However, there are other personality models that exist and have been applied in research. One such model is the Big Five Factors model developed by McCrae and John (1992). The Big Five

Factors (BFF), also known as the Five-Factors Model (FFM) and Big Five Personality Traits, is one such approach to understanding personality differences that, though building from MBTI, is based on trait theory. This model examines five dimensions which "do not represent a particular theoretical perspective but were derived from analyses of the natural language terms people use to describe themselves and others" (John & Srivastava, 1999, p. 103). These dimensions include Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN). In their review of 19 non-experimental studies focused on the role of personality in online learning, Tlini et al. (2016) showed that 14 (74 percent) employed the MBTI personality model, while only four (4) (21 percent) used the Big Five Factors model (Tlini et al., 2016). In terms of the impact of personality with the learner, Tlini et al., (2016) indicated that there were two primary means of influence; through the learner's feeling and behaviors. The effect of these factors translates to other dynamics which can be associated within the unique learner types.

Keller (2013) inferred that there are benefits in using the FFM as a predictor for performance in online learning, primary due to its "broad, important dimensions of personality" (p. 2494). While some studies have indicated validity for the FFM, others have claimed to counter such confirmations (McCrae & John, 1992). However, as MBTI has been shown to be a viable and valid approach in numerous studies, it continues to remain a dominant method for articulating personality types. The FFM, while not a theory of personality, does have a relative connection to personality based on McCrae and John's (1992) the point that it "is essentially correct in its representation of the structure of traits" (p. 176). This therefore suggests that as it "implicitly adopts the basic tenants of trait theory" (McCrae et al., 1999, p. 160), FFM may facilitate a bridge between disciplines in terms of how the dimension of personality is contextualized as an application framework (McCrae & John, 1992).

Research into academic and the FFM model was undertaken by Poropat (2009). As previous works indicated, there have been numerous studies carried out to correlate the personality and characteristics of learners with their academic outcomes. In assessing previous research, Poropat (2009) noted that “early research was beset by inconsistent research findings and methodological problems” (p. 3), and that “the relationship between personality and academic performance have generally presented equivocal conclusions, largely due to the use of variable research methodologies and theoretical bases” (Poropat, 2009, p. 4).

As to the question of why the inclusion of the FFM is deemed as relevant or necessary for this study when MBTI has had its validity verified in previous research, while MBTI is a valid means of assessing personality, "the value of the FFM is that it encompasses most of the variance in personality description in a simple set of dimensions" (Poropat, 2009, p. 4). This does not detract from the use the MBTI, which still provides a foundational perception of personality, but instead offers an additional context through which the traits and characteristics of the online learner types can be articulated and classified in conjunction with game player types.

When considering the application of personality theory, and the outcomes of past research related to personality, it is essential to remember that there is no definitive accord on its role. As Ackerman and Heggestad (1997) noted, "the literature is rife with isolated personality measures of varying levels of breadth, often with no linkage to any personality theory" (p. 222). One reason for the lack of congruency may lie in the conflicting perceptions of how personality should be contextualized, with some focused on a broad inclusive approach for deriving a more holistic understanding of the dynamics as a construct, while others emphasizing the need for identifying a theoretical definition, and in turn excluding some aspects of personality (Ackerman et al., 1997).

Judge and Ilies' (2002) confident assertion that "if a consensual structure of traits is ever to emerge, the five-factor model is probably it" (p. 798) is not shared among all educational researchers. With the validity of Myers-Briggs having been demonstrated in numerous studies "that produced results that were nearly identical to the four-factor model hypothesized by the MBTI assessment" (Lucas, 2007, p. 80), the justification for adopting a new model would require a specific need.

Personas

Lloyd et al., (2017) provided a stronger effort to understand those engaged in learning online. The emphasis of their study pertains specifically to learning networks within social media, however in providing personas to give substance to the individual learners, they present a kindred philosophical construct as the current study. The concept of individuals adopting personas within online environments is not new. This has been demonstrated within other online channels, including chat rooms, games, and virtual worlds. Therefore, the notion of online learners taking on personas within the context of the online learning environment is to be considered more of a probability expectation than exception. The degree to which the persona differs from the individual's real-world self within a traditional face-to-face learning environment may not be too overt but could be significant depending on the overall impact of the change in environment.

One drawback of the personas offered by Lloyd et al. (2017) is the stated context and application of network learning within social media. Though there are clear similarities between social media and online learning environments, these frameworks are not parallel. Though the validity of the assertion that personas "emphasize [sic] the 'social' in social media and mediate our relationship with others and how we fit within the networks we join" (Lloyd et al., 2017, p.

155) is not being called into question, it does represent a limited understanding of the concept's function. These issues aside, the study does represent one of the few constructs that attempts to give a measure of definition to online learners. While other studies have addressed the development of online associated personas (Cover, 2012; White, 2001), the framing of them within the context of learning has not been the typical motive or orientation.

Where Lloyd et al.'s (2017) study differed was in its stated purpose "to develop a greater understanding of the personas adopted by those who use social media to further their own personal learning" (p. 158). As a launch point, an evaluation of Gladwell's (2002) Connectors, Mavens, and Salesmen roles, derived from "The Law of the Few" (p. 13), was undertaken. The critical nature of these fundamental personas was stressed by Gladwell (2002), who asserted that "the success of any kind of social epidemic is heavily dependent on the involvement of people with a particular and rare set of social gifts" (p. 54). Gladwell (2002) defined Connectors as being "people with a special gift for bringing the world together" (p. 16). Lloyd et al. (2017), in revisiting this persona, offered a modified understanding of it as being "someone who knows people in a range of positions and with differing expertise" (pp. 161-162). At its core, Gladwell (2002) understood the Mavens role as being "one who accumulates knowledge" (p. 65) and conceptually as "information brokers, sharing and trading what they know" (p. 69). To provide clarity, Lloyd et al. (2017) associated the function of the Mavens more as mentors. As for the Salesmen, Gladwell (2002) envisioned these as those individuals "with the skills to persuade us when we are unconvinced of what we are hearing" (p. 70). Likewise, Lloyd et al. (2017) presented the Salesmen as being "someone who has the ability to persuade others, when they are unconvinced, to participate in an idea or movement" (p. 165). So, within the context of social epidemics, these three personas function as the core pillars required for success. "Mavens are

data banks. They provide the message. Connectors are social glue: they spread it” (Gladwell, 2002, p. 70). The Salesmen are “critical to the tipping of word of mouth epidemics” (Gladwell, 2002, p. 70). The roles of Connectors, Mavens, and Salesmen functioned as initial personas for Lloyd et al. (2017), as they illustrated the characteristics and expectations of certain learners. However, to account for the broader learning requirements, Lloyd et al. (2017) expanded the defined personas to include Lurkers, Challengers, Facilitators, Irritants, and Leeches based on the responses of study participants which indicated significant crossover of the three primary personas. Lloyd et al. (2017) characterized these extended personas in the following terms:

- Lurkers are passive observers that learn without engagement. They have a positive function.
- Challengers challenge the thinking of others through their oppositional responses, fostering deeper reflection.
- Facilitators “keep the conversation going, maintain cohesion and ensure that others are heard” (p. 175).
- Irritants represent a negative persona. They “make others in the network feel angry or annoyed or discourage participation” (p. 177).
- Leeches are presented as the most negatively inclined persona. These are seen as users in that the Leech “takes without contributing” (p. 178).

While the additional personas that emerged enhance the potential application to the broader online learner type construct, the social emphasis negates the model as a viable solution in differentiating and holistically understanding online learner types within the higher education context. As such, the model does not fulfill the requirements and expectations of a taxonomy of online learner types for the higher education sphere. Rather, as the types define show indications of the use of similar psychological factors for articulating the roles, a comparison should be undertaken to assess compatibilities and discrepancies. This would be valuable in terms of a future study with intent of extending definition of online learning environments in higher

education. Though there are some aspects that could be considered relevant, the overarching focus deviates from the providing clarification of online learner types as unique and separate participants within the online instructional environment. The limitations of the suggested categorizations do not afford enough granularity to adequately define and express distinctive learner types in a manner that extends beyond generalizations and ambiguity.

Learning Styles and Preferences

Though personality and learning preferences may be considered as unique dynamics of a learner's individuality, research does not demonstrate correlation or support these as valid predictors of success. As Conti and McNeil (2011) concluded, "no significant relationship was found between overall personality type and learning strategy preference; that is, personality type is not a predictor for discriminating among learning strategy preference groups" (p. 6).

Therefore, personality and learning strategy preference alone cannot be used to holistically explain the online user. Instead, these may be considered potential factors that help us articulate the persona of a particular online learner type but cannot be predictive measures in and of themselves (Aragon et al., 2002).

Addressing learning styles, Kinshuk, Liu and Graf (2009) noted that "[t]he area of learning styles is complex, and many questions are still open, including a clear definition of learning styles, a comprehensive model which describes the most important learning style preferences, and the question about the stability of learning styles" (p. 740). The matter of stability stands out. Despite continued interest in the potential application of learning styles in education, there is no definitive validation of the principle as a predictor of performance or otherwise. Robotham (1999) argues that "[r]esearch into the relative stability of learning style... remains both confusing and confused" (para. 9). However, the concept of individuals having

preferred approaches to learning does offer some degree of insight into the nuances of the online learner as a distinctive individual. As Kinshuk et al. (2009) indicated “researchers and theorists generally agree that students learn in different ways” (p. 740), therefore the idea of individuals having preferences should be supported.

Built upon the experiential learning theory, Kolb’s Learning Styles suggests “that learning preferences can be described by using two continuums: active-reflective and abstract-concrete” (Shahabadi, et al., 2015, p. 131). While such conclusions drawn regarding learning styles are not universally accepted or supported within education. The presence of conflicting outcomes and conclusions across multiple studies would suggest that this dynamic should not be utilized as a primary factor in evaluating the performance and behaviors of learners. Within the context of online learners as examined by the current study, learning styles are considered in terms of preferences. No direct correlation is offered or suggested in this regard, but these differences are seen to function within the process of differentiating online learner types.

Gardner's Multiple Intelligence Theory

The theory of multiple intelligences (MI) is founded on Gardner and Hatch’s (1989) argument “that human beings have evolved to be able to carry out at least seven separate forms of analysis” (p. 2006). It asserts two key assumptions – first, that all types of intelligences are within all people, and second, that the manner in which the varying degrees of intelligences will be manifested with an individual is distinctive (Gardner, 2004; 2008). As Gardner (2004) explained, “just as we all look different and have different personalities and temperaments, we also exhibit different profiles of intelligences” (p. 5). These profiles initially comprised seven intelligence types identified by Gardner and Hatch (1989) as

1. Linguistic intelligence (as it a poet);

2. Logical-mathematical intelligence (as in a scientist);
3. Musical intelligence (as in a composer);
4. Spatial intelligence (as in a sculpture or airplane pilot);
5. Bodily kinesthetic intelligence (as in an athlete or dancer);
6. Interpersonal intelligence (as in a salesman or teacher);
7. Intrapersonal intelligence (exhibited by individuals with accurate views of themselves) (p. 2006).

Gardner later would identify and add an eighth one – natural intelligence - which “allows individuals to identify and distinguish among products of the natural world” (Davis, Christodoulou, Seider, & Gardner, 2011, p. 6). While there may be studies that lend a degree of support around MI, such as those by Kornhaber, Fierros, and Veenema (2003) (as cited in Gardner, 2004), no definitive validation for the concept has been established. The purpose in reviewing MI is neither to support or challenge its validity, but rather to examine it within the lens of how online learners may differentiate from one another. While some efforts would seem to indicate potential in academics, Flood's (2004) understanding of learning offers a perspective that is relative and supportive of this study. It is the individual student's experiences and reactions that determine and shape the nature, relevance, depth, and effectiveness of their learning. The ability constructs identified by Carroll (1993, cited in Ackerman et al., 1997), provides a different perspective on intelligence which also considers this dynamic to be the product of the interaction and operations of various psycho-systems engaging within the individual. This precept provides a clearer context for distinctive online learner types than it does for MI as an approach to define and explain the learner.

Dimensions of Learning

The learning model dimensions specified by Tmimi, Benslimane, Berrada, and Ouazzani

(2016) as useful for developing a learner model for adaptive media provide broad considerations for the individual learner's psychological make up, offering a general profile that also incorporates experience. Additionally, while demographic factors and the emotional state are evaluated, most aspects do not contribute to a deeper understanding of primary dynamics of individuality, like motivation or behavior. Tmimi et al. (2017) expressed these dimensions as six facets, and include:

1. Personal information – personal data points and demographic elements.
2. Competency and knowledge – performance abilities and experience.
3. Historic – the learner’s track record within the environment.
4. Psychological profile – considered the individual’s learning styles.
5. Cognitive capacity – consisting of “the cognitive abilities required” (p. 16010).
6. Emotional state – influencers on “motivation, self-regulation and academic achievement” (p. 16012).

While the personal information facet represents a primarily objective factor, the relevancy of the other dimensions should be assessed in terms of apparent bias. The personal information factors do not contribute to the question of who the learners are or why they behave the way they do within the online learning environment. Competency, as represented by the required skills sets and knowledge bases for a course and the basic technical literacy needed to operate within an online learning environment, could be considered a potential indicator of performance capability. This second facet places emphasis on aspects of the learner that are functional and not representative of the dynamics of the psychological self-perception. The historic facet is purely analytical in nature. While offering an account of activities, it cannot provide insights into the context and motivation of such actions. The psychological profile demonstrates the most apparent bias in this model. Tmimi et al. (2017) rationalized that they

“chose the Felder-Silverman Learning Style Model (FSLSM), which combines the majority of style models and describes the learning style in many details” (p. 16010). By limiting the inspection of the unique psychological profile of the learner to their learning styles, Tmimi et al. (2017) ignored the diversity and complexity of the learner. In turn, this approach fails to allow “insight into how people learn in realistic, complex learning contexts with multiple and incongruent contributing factors” (Bytheway, 2015, p. 509). As for the potential of the facets dealing with cognitive capacity and emotional states. Cognitive capacity offers little in the way of explaining motivation and primarily will function, in part, as a performance predictor. However, some degree of assumption must be made in terms of the learning environment and whether this facet is considered consistent across instructional situations. Likewise, while an individual’s emotional state will influence performance and attitude, this factor is highly transient in nature and would not be viable as a consistent identifier of differentiating learner types.

Engagement

Angelino and Natvig (2009) recognized the significance of online learning in education, but in developing their model of engagement, miss the broader understanding of the learner. As with other studies, significant consideration is given to student attrition during a course and in terms of continued participations in online learning, but with regard to the online learner, the study of online success factors is identified as the primary need to address. As such, the Model of Engagement is not so much a means of understanding the learner as much as it is a theoretical process of connecting with and supporting student participation in online learning which “provides a graphical representation of opportunities where engagement with students taking courses online can occur” (Angelino & Natvig, 2009, p. 3).

Locus of Control (LOC)

The concept of locus of control (LOC) originated from Rotter's (1954; 1966) research on the observed discrepancy of some individuals to respond to reinforcements as expected. This notion refers to idea that "people attribute the cause or control of events either to themselves or the external environment" (Spector, 1982, p. 482). Individuals that consider themselves to be the governing dynamics of things fall into the internal category, while those perceiving outside forces as being the determinant governors fall within the external category (Spector, 1982). In evaluating this principle's potential as a key factor for identifying and differentiating online learner types, it was necessary to compare it against other psychological dynamics in order to assess if it functioned as a unique systemic variable, a symptomatic indicator of another system, or as a contributing element of another system. As LOC deals with individual perceptions and reactions, there are some obvious dynamics that can be seen as being correlated. Motivation, at its basic level, is understood in terms as being either intrinsic or extrinsic in nature (Beluce & Oliveira, 2016; Huang, 2011; Kizilcec & Schneide, 2015), which indicates an apparent association with LOC. However, as SDT suggests (Deci & Ryan, 2008) and previously addressed, these two concepts can be further articulated with a higher degree of definition. However, SDT also indicates that "all behavior is intentional and may be guided" (Beluce & Olivera, 2016, p. 597). This guidance will be either be motivated through autonomy or control (Rufini, Bzuneck, & de Oliveira, 2011; Beluce & Olivera, 2016). So, in terms of the bilateral function of motivation within the guidance of behavior, there appears to be a strong kinship with LOC. As such, LOC is expected to function in parallel to behavior guidance and is then considered a complimentary dynamic that may be taken into consideration only in terms of confirming the perceived guiding emphasis of the learner.

Learning Motivation

Though the intentions of the online learner are not considered to be a factor of investigation in this study, some research has speculated that these intentions are indicative of an initiating motivation that could serve as a predictor of an individual's learning behaviors within the online instructional environment (Kizilcec & Schneide, 2015). With there being so many theoretical models on motivation with differing emphasis (Garris et al., 2002), a conclusive consensus on direct correlations with learners does not exist. However, what does appear to be generally understood is that "behavior can be intrinsically or extrinsically motivated" (Garris et al., 2002, p. 444). While a majority of the developed constructs have focused on intrinsic motivation (Garris et al., 2002) and have framed it in terms of activity-related tasks (Malone, 1981; Malone & Lepper, 1987), other research has taken the position of motivation being primarily extrinsic in nature and a product of the learning activity itself (Vallerand, Fortier, & Guay, 1997). Though both approaches to explaining the motivation of the individual hold a degree of relevance within the study and understanding of online learners, they are both limited in the ability to fully articulate the complete range of learner types. For this reason, the concepts presented by Deci and Ryan (2008) in Self-Determination Theory offered a stronger and more effective foundation for generating a holistic view of motivation within the context of online learners as unique individuals. A central takeaway is that learner motivations are a useful lens for understanding learners.

Self-Determination Theory (SDT)

An additional area where game research closely mirrors the emerging research into online learner types is in the use of SDT as a framework for understanding motivation. According to Deci and Ryan (2000), SDT takes the position that intrinsically motivated behaviors “are those

that are freely engaged out of interest without the necessity of separable consequences, and, to be maintained, they require satisfaction of the needs for autonomy and competence” (p. 233), or “pursued for their own sake or their inherent satisfaction” (Przybylski, Rigby, & Ryan, 2010, p. 155). On the other hand, those behaviors considered as being extrinsically motivated are “controlled by specific external contingencies. People behave to attain a desired consequence such as tangible rewards or to avoid a threatened punishment” (Deci & Ryan, 2000, p. 236) – behaviors that are “pursued to access desired end states or avoid aversive ones” (Przybylski et al., 2010, p. 155). Some key predictors for player engagement have included competence, autonomy, and relatedness (Chen et al., 2010a; Deci & Ryan, 2008; Przybylski et al., 2010). These factors have direct relevance for online learning.

SDT postulates multiple levels of extrinsic motivation – external, introjected, identified, and integrated, each representing a progression towards and emergence into an intrinsic state (Deci & Ryan, 2008; Rufini et al., 2011). For the purposes of this study, only the first three levels - External, Introjected, and Identified - were used as Integrated motivation is heavily autonomous in nature (Beluce & Olivera, 2016; Rufini et al., 2011) and could be considered more of a transitional state rather than a true extrinsic motivation. However, the contribution of SDT goes beyond its extension of how extrinsic motivation is perceived. When considering what Deci and Ryan (2008) called SDT’s “most central distinction” (p. 182) of autonomous and controlled motivation, a core diametrical motivational inclination can be understood with the potential to influence the online learner on a more latent level as a separate and unique factor of the individual type.

While the SDT model for online learner motivation proposed by Chen et al. (2010a) stands as one of the few efforts to specifically assess the viability of SDT within the context of

the online learning environment, it does not sufficiently articulate and describe the range of online learners as it only correlates motivation as the determinant of learning outcomes. Though motivation is considered a key differentiating factor involved in establishing and expressing online learner types, it is only one dimension in understanding the individual. Additionally, while SDT is considered a relative theoretical contributor in evaluating and understanding motivation, especially in terms of its deeper expression of extrinsic motivation into four key regulation types – external, introjected, identified, and integrated (Chen et al., 2010a; Chen, Jang, & Branch, 2010b; Deci & Ryan, 2008; Gagné & Deci, 2005; Raes & Schellens, 2015; Vanslambrouck, Zhu, Lombaerts, Philipsen, & Tondeur, 2018) - within online learning environments, it is not the sole contributor, though SDT likely can contribute directly into the development of the online learner taxonomy as it correlates to the required dynamics of learning within an online learning environment.

A strong case for leveraging SDT in developing the TOLT can be made based on its previous success within other educational contexts (Chen et al., 2010b). While SDT's application within traditional learning situations has been examined, research specific to the online learning environment is still limited (Chen et al., 2010b). As such, motivation-related qualifiers may be derived from elements of theory based on the symmetric dynamics of the defined intrinsic and extrinsic levels, which offer strong correlation to the differentiators of the TOLT, and the support demonstrated by previous works (Rufini et al., 2011).

Berge and Huang Model

Though the personal variables included in Berge and Huang's (2004) model accounted for some degree of psychological dynamics, such as motivation, the primary contributors were demographic elements and other measures (Berge & Huang, 2004; Kemper, 1995; Layne et al.,

2013; Parker, 1999; Rotter, 1999) not considered as fully relevant to articulating the learner as a distinctive individual within the instructional environment. A primary emphasis of Berge and Huang's (2004) work addressed retention which incorporated institutional and circumstantial variables, in addition to those addressing the learner (Layne et al., 2013). This focus did not offer deep insights into broader understanding of the online learner.

Self-Directed Learning (SDL)

Researchers, including Candy (1991) recognized that a key point of relevance for SDL lies in learning context (as cited in Song & Hill, 2007). It is the awareness and recognition that “learners may exhibit different levels of self-direction in different learning situations” (Song & Hill, 2007, p. 27) that provides a strong motive for developing the TOLT as it supports the premise that individuals as learners are not necessarily consistent and mirrored between learning environments. Though there are a number of models that claim association with SDL, not all demonstrate a meaningful correlation (Song & Hill, 2007). However, of those that Song and Hill (2007) reviewed, three were noted as being “comprehensive representations of SDL” (p. 28). These include Candy’s Four-Dimensional Model (1991), Brockett and Hiemstra’s Personal Responsibility Orientation Model (1991), and Garrison’s Three-Dimensional Model (1997) (as cited in Song & Hill, 2007).

While these models offered key dynamics of SDL, including personal autonomy, learner control, motivation, and self-management (Song & Hill, 2007), the SDL framework as a whole does not provide a sufficient level of definition to articulate the core dynamics and functions of unique learner types. Where SDL does contribute is in its emphasis of the influence of contextualization in learning. This concept is fundamental to developing and evaluating any taxonomy that addresses the online learner holistically.

Self-Regulated Learning

Barnard-Brak, Paton, and Lan (2010) defined self-regulated learning as “those active and volitional behaviors on the part of individuals to achieve in their learning” (p. 62). Studies by Bandura, Schunk, and Zimmerman (as cited in Barnard-Brak et al., 2010) suggested that the cyclically developed skills and strategies employed in self-regulated learning may function as differentiators among online learner types due to the “bidirectional interaction of personal, behavioral, and environmental factors, which takes the form of triadic reciprocal causation” (p. 62). Though Zimmerman (1998) argued that the concept of self-regulated learning was a contextual process that was “dependent on several key psychological dimensions of functioning” (p. 74), the overarching purpose was understood to have a strong impact of performance. This emphasis is also evident in the model he suggested dealing with three phases – forethought, performance control, and self-reflection (Zimmerman, 1998). Although the effects associated with the motivation of the learner are relevant, performance is not necessarily meaningful as a qualifier of the type.

Various studies have been undertaken with the intent of generating quantifying measures that could serve as a generalizable means of predicting success and performance (Broadbent, 2017). These endeavors usually emphasized specific cognitive traits or behavioral patterns as indicators and elements for measure. The current study being undertaken, while building on the existing body of research, seeks to perceive the learner holistically within the context of multiple dimensions of identity in order to fully comprehend who they are within the environment. This approach to understanding the individual serves as a comprehensive construct for instructional engagement from a qualitative perspective with anticipated implications for all areas associated with online instruction within the higher education sphere.

Shea and Bidjerano (2010) suggested the Community of Inquiry (CoI) framework (Garrison, Anderson, & Archer, 1999; 2001) as a viable model for online learning when functioning in conjunction with learning presence. It was thought that this conceptual pairing would build on the CoI framework's capacity to foster epistemic engagements while addressing the dynamics of self-regulated learning (i.e., motivation and behavior traits) inherent to learners in online instructional environments (Shea & Bidjerano, 2009). Though this extended relationship model is offered as a productive step towards "the development of a comprehensive explanatory model for understanding the potential benefits of online instruction" (Shea & Bidjerano, 2010, p. 1722), and does address some aspects of the learner, it is still oriented towards success performance and continues to encompass a broader examination of the participants and dynamics of CoI. This emphasis minimizes the effectiveness and relevancy of the model as a means of evaluating online learners comprehensively.

Online Learner Types

The unique aspects of the individual learner coalesce into a distinct state of individuality and it is within the dimensions of this state that learning is experienced. These distinctions should be of paramount interest to researchers in order to understand the learner and not simply rely on "past achievement and cognitive capacity" (Richardson et al., 2012, p. 2). The prevalence of online learning merits a stronger awareness and understanding of the different types of learners that are engaged within the environment (Lucas, 2007). Learners' identities can be described in many ways. Salmon (2000) suggested that learners within the online environment would reflect one of four learning styles where individuals are:

1. Activists who enjoy new problems and experiences to keep engaged and bounce ideas off others with extraverted interactions

2. Pragmatists who need to see obvious links and immediate applications to their work environment and tend to be comfortable with immediate extraverted interactions
3. Theorists who want to explore in depth and create links between ideas and situations and tend to prefer introversion.
4. Reflectors who use their introversion to engage with the learning task and prefer time to consider their responses, (as cited in Russell, 2002, p. 29).

A generalization of online learners is equally as problematic as that of face-to-face traditional learners. Therefore, they should be addressed in terms of their distinctive differentiating dynamics rather than commonalities in order to truly understand. Dabbagh (2007) presented a study which directly evaluated the online learner. Addressing the status of previous works, it stated that “research to date has not converged on an archetypal profile of the online learner” (p. 217). In contrast to most research, Dabbagh (2007) showed a clear appreciation and awareness of the online learner as part of online learning, stating that “what seems to be more prevalent is the changing or emerging nature of the online learner” (p. 217). This understanding supports the notion of the online learner as a functional interactive system rather than as a variable. As the student population has changed (Richardson et al., 2012), so has the need for understanding the learner on a holistic level. Therefore, understanding the behaviors, motives, and attitudes of different learner types is critical. Ultimately, this understanding holds potential for improving the structural and theoretical strategies and methods employed in online instructional design, and in terms of the activities and materials which are to be integrated (Stone, 2017).

Gamer Taxonomy Construct

There are significant parallels between online gaming and instructional environments. Both are digital learning systems operating within a virtualized environment where participants interact and engage in experiential activities with the purpose of developing the needed skills and

knowledge required to successfully carry out and accomplish tasks associated with the targeted outcome goals. Addressing the function of gaming as a relevant learning system with direct applications within the academic arena, Squire (2008) suggested that “[f]or educators interested in learning with digital technologies, [digital games] are an excellent place to examine what interactions are possible with the medium” (p. 2).

The correlations between the dynamics associated with a game and those connected with engaging, experiential online learning provide a bridge for cross-disciplinary theoretical contribution. The similarities provide a relevant justification for applying research into game player types into the arena of online learning (Tondello et al., 2017). The inclusion of game research represents a highly valuable perspective and key insights into the potential and execution of online learning constructs. Some of the research that has dealt with using studies in player types to better understand learning differences addresses the relevance of player types only within the context of educational games (Heeter, 2009).

Individuality transfers into all aspects of life. Whether it is observed in the differences in the way individuals play games or in their approach to learning, differences are a reality (Heeter, 2009). Within the realm of learning, there are numerous ways in which differences are considered and investigated. Those studies that address the learner often remain within the context of identifying the traits and practices needed for success within the online environment. Typically, the intention is to provide a means of predicting performance rather than to provide an holistic perception. This is not the case with works dealing with game player types.

As with the parallels between the online gaming and instructional environments, there are meaningful similarities existing with the individuals engaged within these mediums. Individual participants in game play exists as distinctive game player types, just as different online learners

engage in learning as unique learner types (Heeter, 2009). Within the sphere of game-related research, numerous studies have addressed the differentiating dynamics and attributes of the game player (Bartle, 1996; Bateman, Lowenhaupt, & Nacke, 2011; Busch et al., 2016; Ferro, Walz, & Greuter, 2013; Tondello et al., 2017; You et al., 2007). Given the gap existing in educational research to provide comprehensive constructs that define and articulate the distinctive types of online learners engaged in instruction, leveraging the existing research and taxonomic experience associate with game player types offers a viable and relevant framework to base the online learner type construct upon.

Summary

Within educational research, the area of online learning has been examined and explained from several perspectives and through various lenses of consideration. However, comprehensive works related to the online learner as a distinctive system relative to the unique attributes and effective dynamics of the online instructional environment are noticeably lacking.

In this chapter, a meta-analysis of online learning, significant research trends of relative works, influential concepts and constructs impacting online learning, and existing perceptions of online learner types were presented, and the rationale for leveraging game player taxonomy constructs as a basis for developing the proposed TOLT model were provided. This review provided an assessment of these key areas to gain a clearer perspective of the current state of understanding and practice within education, to identify any inconsistencies and discrepancies that may exist with the potential to affect the learning experience or the learner, and to ascertain the gaps and deficits evident within the body of literature.

Each of these areas contributed to the construction of an awareness of how the online learner is perceived and factored into the online instructional environment within academia, and

what factors are associated with classifying and defining the differentiating learner types engaged in learning at the higher education level. Given the complexity of this endeavor, it was necessary to gain a broad understanding. As such, online learning was evaluated at a conceptual systemic level, addressing it within the context of a paradigm, environment, and in terms of the learner. The inclusion of the online learner was needed as it should be expected that the differences encountered between learning environments would reveal differences in the characteristics, strategies, behaviors, attitudes, and motives of the learners themselves (Xu & Jaggars, 2013). The assumption that a learner in a traditional face-to-face environment would react and function in an identical manner within an online learning environment is inherently as problematic as perceiving the two learning environments to be parallel and synonymous.

The review of the key research trends afforded an understanding of the history, evolution, and current state and execution of instruction within the online environment. Additionally, the examination of these trends revealed the prevalent strategies being employed as well as the predominant expectations of future development and application direction of online instructions being postulated within education. These dynamics and beliefs provided a strong context for the role and function of the learner within this instructional situation. Likewise, the analysis of the various concepts and constructs associated with learning and online learner types enabled the development of a baseline of the current approaches and traits through which learners within the online instructional environment are portrayed and functionally positioned.

As stated, there is reasonable justification to look to game player research to provide a relevant construct for the proposed taxonomy. Though there are numerous models associated with education, online learning, and various aspect of the learner, there is not an adequate model existing to holistically differentiate and define learners engaged in online instruction and gamer-

related theoretical constructs will provide valuable insights into the needed approach for categorizing and defining the unique learner types. Based on the review of literature, there is enough reason and need to justify the development of a model of online learner types within the higher education space. In chapter 3, the methodology employed for this study will be explained.

CHAPTER 3

METHODOLOGY

Introduction

The goal of this study was to develop a holistic understanding and taxonomic categorization of the distinct online learner types engaged in instruction in higher education using research-based publications and theoretical constructs. Both educational and game-related research were reviewed to generate a knowledge base of data with the required comprehensive range and complexity for identifying and defining the differentiating factors associated with individuality within the online environment. Each work and/or construct evaluated functioned as a case study from which patterns, trends, and distinguishing elements were derived. As such, the evaluated articles, chapters, models, papers, and theories provided a rationale and evidence for the factors specified for use in evaluating individual learners, and the categories and types identified and articulated for differentiation. As the existing literature indicated that a taxonomy directly addressing the primary topic of the study did not exist, and that there was a clear deficit of works specific to addressing online learners as distinctive types, it was necessary to adopt a research strategy that would facilitate the development of a new theoretical explanation based on the evaluated data (Corbin & Strauss, 1990).

Inquiry Strategy

Previous studies addressed the various aspects of online learning using quantitative methods. Some have emphasized the criteria of effective online learning environments (Anderson, 2008; Lorenzo & Moore, 2002; March & Lee, 2016; Mashaw, 2012; McGahan et al., 2015; Outlaw & Rice, 2015; Puzziferro & Shelton, 2014; You et al., 2015), often exhibiting as Beaudoin et al. (2009) stated, a “focus on ‘how to’ teach online and how to optimally utilize the

various features available in most instructional platforms” (p. 276). Others have dealt more with the various factors affecting the performance and success of learners (i.e., motivation, self-efficacy, personality, etc.) (Bolliger & Erichsen, 2013; Bouvier, Lavoué, & Sehaba, 2014a; Johnson, 2017; Judge & Ilies, 2002; Lucas, 2007; Poropat, 2009; Richardson et al., 2012). While some of these studies have served as foundational works for investigating and explaining online learning, their intent typically has been to "seek causal determination, prediction, and generalization of findings" (Hoepfl, 1997, p. 48), rather than to foster deeper insight, understanding, and contextual relevance as can be obtained through qualitative methods. As such, the outcomes of one approach will generate "a different type of knowledge" (Hoepfl, 1997, p. 48) from the other. By striving to truly understand and define the distinctions of individual online learner types, a qualitative approach that comprehends them in terms of this unique environment was required. As Bytheway (2015) observed, "descriptive qualitative research revealing participants’ perspectives can add insight into how people learn in realistic, complex learning contexts with multiple and incongruent contributing factors" (p. 509).

Parry, Mumford, Bower, and Watts (2013) observed that there is "the tendency for psychological research to be wedded to experimental designs, a style of research that does not connect well to qualitative research. Non-experimental research tends to be undertaken when an experimental design is not feasible" (p. 135). Tlini et al. (2016) indicated that several online learning studies have used a non-experimental research method; however, these studies focused on the role of personality rather than on holistic perception of the learner. In order to accomplish the goal of this study, it was necessary to formulate a new construct of understanding. Therefore, grounded theory represented the most appropriate strategy to adopt. Grounded theory “is a qualitative research method that uses a systematic set of procedures to develop an inductively

derived grounded theory about a phenomenon" (Strauss & Corbin, 1990, p. 24). It provides a dynamic where, as Strauss and Corbin (1998) stated, "data collection, analysis, and eventual theory stand in close relationship to one another" (as cited in Chen, 2005, p. 38). The proposed TOLT for higher education is based on the trends and connections which emerged from the meta-analysis of previous research and theoretical models and stands as a unique effort to understand the learner within a distinct instructional environment.

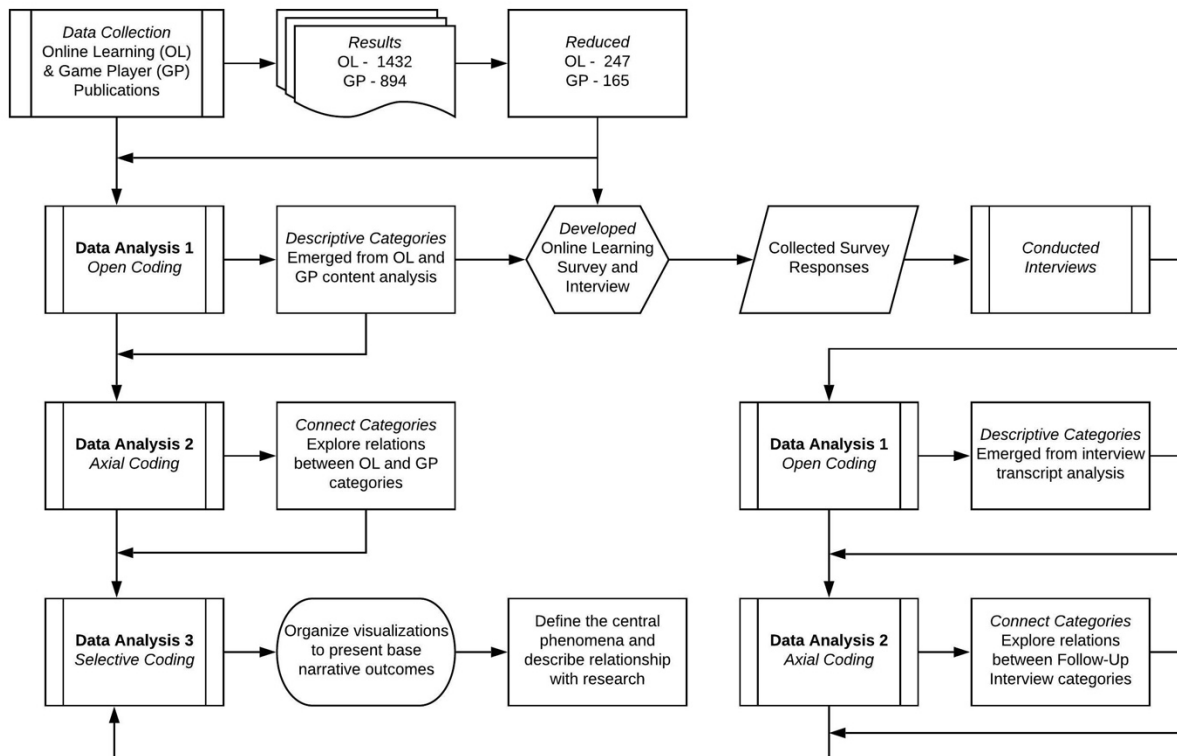


Figure 1. Data collection and analysis process derived from grounded theory.

The data collection and analysis process used is illustrated in Figure 1. By utilizing a meta-analytic approach based in grounded theory (Strauss & Corbin, 1998), it was possible to derive insight, understanding, and definition to the different online learner types, and in turn, meet the key objective of this study; the development of a holistic model to classify and define online learners within the higher education setting. This research provided a meaningful context

for understanding online learners and offered a unique conceptual lens through which we can better understand their perceived roles and actions in online instructional environments.

Procedure

To fully assess the broad spectrum of literature related to the subject of inquiry, it was necessary to adopt a procedure that took a comprehensive evaluation of the body of works and was able to further manage the examination of data derived from relative supportive interviews.

Meta-analysis of literature

Given the broad range of studies associated with online learning and the intended inclusion of both educational and game-related research, an exploratory meta-analysis of literature from both disciplines was undertaken.

The grounded theory process in a qualitative meta-analysis that focuses on building categorical relationships in a cumulative fashion. Similar phenomena are grouped in categories and are re-analyzed to identify relationships. These categories become components in the conceptual framework. (Symeonides & Childs, 2015, p. 413)

This approach, therefore, served as an ideal basis for identifying and/or developing the critical factors for use in establishing the distinct online learner types of the taxonomy of online learner types (TOLT), and for differentiating the individual learners. Additionally, this allowed the production of a set of proposed relevant taxonomic categories as a means of classifying online learner for testing in the future.

Data Collection

Data collection was guided by the conceptual methodologies associated with grounded theory. As the objective of the study is the development of a new taxonomy supported by the emerging trends and outcomes of the meta-analysis, the approach to collecting and assessing

the works for inclusion was deemed to be open enough to accommodate a broader spectrum for review within the conceptual framework requirements of grounded theory.

To provide a dataset with the comprehensive range needed to fully assess the breadth of works associated with online learning, game player theory, and other relevant areas, data were collected from multiple sources. This was meant to ensure that the requirements for the study were met and that all pertinent areas for consideration in developing the proposed taxonomy were addressed. As the degree of coverage extended beyond the context of educational research into online learning, the range of works considered for evaluation was not limited to a specific publication timeframe. Search terms related to online learners, taxonomies, models, or theories, game player types, models, and typologies, online learning, games and learning, and others in various combinations were included to foster the desired returns upon execution. The following represents the digital tools utilized in the search process. It should be noted that it was necessary to use multiple sources to locate some of the required source materials.

- Google and Bing searches – To locate PDF files that could not be otherwise located, Boolean searches were employed to identify online access locations. This approach was also used to determine the nature of publications that were mislabeled.
- Google Scholar – Using this data mining tool provided queries based on keywords that yielded a listing of all articles, conference proceedings, books, chapters, dissertations, white papers, and reference citations with their corresponding authors, titles, and publication names. This tool also included citation counts and links to the specific works.
- University library databases – EBSCO, JSTOR, ERIC, and other databases were used to locate and acquire PDFs for those articles of interest identified for review.
- Research Gate – Some PDFs related to online learning were available by their authors for download. While most were freely available, some required submission of a request to gain access.
- Publisher web sites – To access some articles, it was necessary to go directly to the publisher's site. While several articles required purchase, some were available at no cost.

- Organization web sites – To gather relevant proceedings, reports, studies, whitepapers, and other content deemed meaningful. Where access was provided only to abstracts and not full papers, the item was not included in the analysis.
- Amazon and Google Books—Where there was a need to purchase an original book or e-book (i.e., Kindle) for review, these services were used.

Although grounded theory is not a new strategy, the options for synthesizing relative works within the context of the unique intentionality of the study are still limited (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005). However, a suitable approach was identified that provided a sound approach to the analysis.

Data Analysis

To synthesize the collected data, the variation of Onwuegbuzie and Teddlie's (as cited in Warren, Sauser, & Nowicki, 2019) recommended approach to multi-strategy data-analysis presented by Warren et al. (2019) was used. While the process followed the steps below, the order was subject to change as this method utilized a comparative cycle to assess and reassess the data.

1. Data transformation and reduction – This stage brings the transformation and reduction processes together. Publication PDFs, or hard copy versions of texts, were analyzed to determine if online learning, game player, or other key areas of interest were addressed or figured in research to a degree that suggested potential relevancy. Within the transformation part of the process, qualitative data collected from content reviews were quantitized with a binary score of 1 to indicate a meaningful reference to or occurrence of research connected with target topics, and if nothing was found, or if the work was deemed to not be truly associated, a 0 was indicated. Any works found to not be relevant were subsequently eliminated.
2. Data integration – Data from Research Gate, publisher sites, and other sources were assimilated into the database.
3. Data comparison and correlation – As per Warren et al.'s (2019) approach, data from the different sources was concurrently confirmed by means of comparison and correlation. This provided indication that the same outcomes and revisions were generated, and in turn adhered to the primary source.

4. Data consolidation – Finally, all identified data were consolidated and the primary source texts were subsequently organized according to their subject area within a digital folder.
5. Data display – An analysis of the outcomes of the organized database set was carried out in Excel utilizing the Quick Analysis function. This allowed a relatively simple production of the elements (i.e., charts, graphs, etc.) to provide a visualization of the data.

The data visualization steps provided a sense of depth the scope of the meta-analysis and offered insights into the source origins of the educational and game player research materials that were assessed and utilized.

Survey Instrument

As part of the study's employment of a grounded theory qualitative approach, survey methods were included. This element supported the identification of relevant interview participants that would contribute to an increased depth and clarity of the differentiating factors involved. The online learning factors survey (OLFS) (see Appendix A) is an instrument derived from elements and associated research from the Myers-Briggs Personality Type Indicator (Briggs & Myers, 1998; Myers, McCaulley, Quenk, & Hammer, 1998), the Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990), the Intrinsic Motivation Inventory (Inventory, 1994; Ryan, 2006), the Scale for Teaching Strategies, Learning, and Motivation for Learning in Virtual Educational Environments (Beluce & Olivera, 2016), the Index of Learning Styles (Felder & Spurlin, 2005; Solomon & Felder, 1999), the Learning Style Survey (Cohen, Oxford, & Chi, 2002; 2009), the Gamification User Types Hexad Scale (Tondello et al., 2016), the Bartle Test of Gamer Psychology (Barr, 2017; Bartle, 1996), and the BrainHex gamer personality questionnaire (Bateman, 2009; International Hobo, 2010; Nacke, Bateman, & Mandryk, 2014). The OLFS was developed to identify and examine key factors associated with measuring the perceived influences of existing online instructional experiences with potential

undergraduate and graduate learners.

The OFLS delivered provided an emphasis on evaluating differentiating factors as explored through three (3) key sections –Motivation, Learning Preferences, and Player Types (see Appendix A). In addition to prompts correlating to the sections, relevant demographic information was collected to ensure that participants fell within the targeted segmentation for the study. This information also provided context to the responses of selected interview candidates and facilitated meaningful attributions for quoted response materials.

To address the motivation emphasis, participants were asked to self-report their perceptions and preferences within three (3) areas: the essential aspects of online courses, the dynamics of online learning they enjoy, and the best practices they most often apply while taking an online course. With respect to the essential aspects, ten (10) traits were presented, for enjoyable dynamics, fourteen (14), and for best practices, six (6) were offered to elicit participant response (see Appendix A). Each of these areas includes a series of Likert-type response prompts (see Appendix A) with a scale of seven indicators – Strongly agree, Agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Disagree, and Strongly disagree. While the prompts are associated with motivation, they also provide additional insight into other factors of the learner’s individuality, including personality, engagement behavior, learning strategies, and temperament. These nuances provided relative support in identifying and articulating the distinctive online learner types. Additionally, to investigate best practices applied – six (6) prompts were used (see Appendix A). These practices reflected more abstract concepts rather than concrete learned skills. As such, they offered a deeper perspective of the individual’s approach to the learning process as well as the way they conceive their role within the learning environment.

To assess the individual's learning preferences, eight (8) Likert-type response prompts with a scale of seven (7) indicators – *strongly agree, agree, somewhat agree, neither agree nor disagree, somewhat disagree, disagree, and strongly disagree* – were used (see Appendix A). While a few of the situations presented related to online learning, they were intentionally designed to provide an understanding of the individual's preferences within the learning environments (e.g., types of engagement, materials, interactions, etc.). The intention was to determine the range of differentiation based on perceptions related to specific dynamics and activities indicative to online learner distinctions.

The final section of questions used represented another key part of this study and in developing the online learner type taxonomy. The inclusion of game-related research, especially game player typology, provided a relative formative model for online learner types. Therefore, this section attempted to investigate those factors that correlated to unique typologies within a learning context. To accomplish this, fifteen (15) Likert-type response prompts with a scale of seven indicators – *strongly agree, agree, somewhat agree, neither agree nor disagree, somewhat disagree, disagree, and strongly disagree* – were used (see Appendix A). Though influenced and inspired by a number of game player typologies (Bartle, 1996; Bateman, 2009; Hamari & Tuunanen, 2014; Tondello et al., 2017), the verbiage used provided an intentional framing that allowed transference to the educational sphere while still retaining the core conceptual elements related to game player types. This connection was of critical interest considering the commonalities of the online game and learning environments.

Participants

The study involved four groups (undergraduate students, graduate students, traditional students, and nontraditional students) with a total number of approximately 92 individuals

participating in the demonstration of the survey over the extent of the study's 7-week window of availability. The four groups represented were not mutually exclusive, and the participants were expected to represent an even mixture of the four. From the demonstration participant responses collected, select individuals were contacted to participate in interviews for more in-depth information. The number of required participants for the interviews was set to be between 5-15 individuals, and 9 interviewees ended up participating.

The four population segments utilized in the study were based on the potential higher education student groups they represent - Undergraduate Student, Graduate Student, Traditional Student, and Nontraditional Student. Participants fell within one or more of these groups. While some demographic dynamics, such as age range, employment status, or education level had the potential to impact the perspective of the groups involved in the study, the demographic make-up of the participants varied and did not reflect a representative sampling of any particular population but emerged as a convenience sample based on willingness to be interviewed. The primary considerations were their psychographic dynamics and experiential perspectives based on their unique engagements, interactions, and outcomes as a student within the online learning environment.

As the study focused on online learners within the context of higher education, the subjects were derived from two different channels of recruitment based on the context of their involvement in online learning (Internal and External). The Internal channel targeted active undergraduate or graduate students currently taking an online course at an accredited university. The External channel targeted individuals based on experiences with online learning in higher education regardless of their status as a student through recommendations as well as through a snowball method via other participants.

Risks and Benefits

The demonstration survey represented no risks to the participants and no direct benefit exists for them.

Setting

During this phase of the study, the OLFS demonstration was distributed by email. In addition to the survey, a follow-up interview consisting of seven (7) open-ended questions (see Appendix B) was conducted with specific individuals based on their willingness to serve in this capacity, and their responses. The interviews were conducted through a digital channel (e.g. GoToMeeting, Skype, Adobe Connect, Zoom) with all conversations digitally recorded for qualitative coding and analysis. The follow-up interviews were conducted at the completion of the survey period.

The duration of the study was approximately seven (7) weeks. This time allotment accommodated the expected required time frames for the initial testing and revision of the instrument, and for collection of the targeted response sample from the delivered demonstration survey. Given the strategy for subject recruitment, and the channels for delivery, this was considered adequate for achieving the targeted participation goals.

Data Analysis

The analysis methodology that was utilized for this study was based on grounded theory. As such, it permitted the researcher to “inductively derive a theory” (Symeonides & Childs, 2015, p. 413) from the data analyzed and assessed by means of a coding process that fostered interpretation (Strauss & Corbin, 1990). The coding followed three processes: open coding, axial coding, and selective coding (Corbin and Strauss, 2008). While open coding is sometime referred to as initial coding and selective as theoretical (Saldaña, 2015), these are conceptually

synonymous and was referred to using their initial designations. These coding processes represent progressive “steps in coding data and in developing a visual model of the theory” (Creswell, Hanson, Clark Plano, & Morales, 2007, p. 249) through which the researcher identifies, refines, and transfers relevant factors and categories from their initial state of observed trends to applicable elements. The initial phase was the open coding where the primary categories and factors are derived from emerging trends and patterns in the analyzed data. This was followed by axial coding where the conceptual connections between one or more of the identify primary elements are identified and reevaluated. Finally, selective coding was employed to facilitate the finalization and integration of the developed categories and factors into the theoretical construct (Corbin & Strauss, 2008; Creswell et al., 2007; Saldaña, 2015; Strauss & Corbin, 1990).

Confidentiality

The confidentiality of the individual participant’s information will be maintained in any publications or presentations regarding this study. The names of participants were stripped and any publications that result will have pseudonyms of all participants. Pseudonyms were randomly assigned to each participant. Records are being maintained in a secure location for a period of three years and then will be destroyed at the end of the study.

Confidentiality is maintained to the degree possible given the technology and practices used by the online survey company. Participation in this online survey involved risks to confidentiality, similar to a person’s everyday use of the Internet. While the security and confidentiality of information collected from the email survey cannot be guaranteed, it is being maintained to the extent permitted by the technology being used. Information collected via email

can be interrupted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. Email addresses were discarded once participation was discontinued.

Summary

The goal of this study was to develop a holistic understanding and taxonomic categorization of the distinct online learner types engaged in instruction in higher education using research-based publications and theoretical constructs. This study focused on the distinct types of online learners in higher education as defined by identified and defined differentiating factors. Using a meta-analysis approach based on a grounded theory qualitative research method, data were acquired and assessed from existing literature from multiple disciplines, as well as through the use of a survey instrument and select follow-up interviews with participants. An exploratory analysis of the data was performed to assess the distinctions between learners and to develop the key differentiating factors for use in constructing the proposed taxonomy. In the next chapter, the results of the survey and interviews, analysis, and identified factors are presented. Additionally, the proposed taxonomy is shown with the identified factors and their definitions.

CHAPTER 4

FINDINGS

While the study of online learning is far from new, the investigation into the holistic nature and make-up of the learner as a distinctive individual has rarely been considered beyond the context of performance and success factors. The following chapter provides the outcomes of this study. The goal of the study was the development of a new taxonomy to express the diversity and uniqueness of online learners in higher education. Given the gap identified in literature in Chapter 2, the study offers insights and a key outcome from which future research can take place.

Overview

This study endeavored to classify and articulate the distinctive types of learners engaged in instruction within an online learning environment in the higher education context based on their differentiating characteristics and dynamics. Through the execution of a meta-analysis-based grounded theory study, it has investigated the key dynamics, characteristics, and influencers of student learning engagements within the context of online instructional environments in a higher education setting. Additionally, it provided an infusion of game player typology development research focused on existing models as part of the study. This was meant to provide a stronger alignment with the commonalities of the environments and leverage the efforts taken within the game research sector to articulate participating individuals in a comprehensive manner.

Topics of Inquiry

Though the primary objective of the study was the development of the taxonomy, the following secondary points we also assessed:

- How can we better understand who the online learners are and how they learn within an online instructional environment in higher education?
- What are the factors that differentiate online learners from one-another as distinctive learner types?
- How can distinctive online learner types be categorized and what are the unique types that should be defined within each of these categories?

Meta-Analysis of Research

Though the existing body of literature does not fully cover conceptual aspects of online being addressed in this study, it was essential to provide a comprehensive assessment of existing works to adequately gauge which aspects of online learning have been examined, what research offered relative insights and input into the study, and the degree to which the goals of the study would contribute to the broader body of knowledge.

Results

The products of the analysis offered a sense of the collective emergence of research into online learning and game player types. As shown in Figure 2, the body of literature analyzed followed a similar growth path as online learning in general.

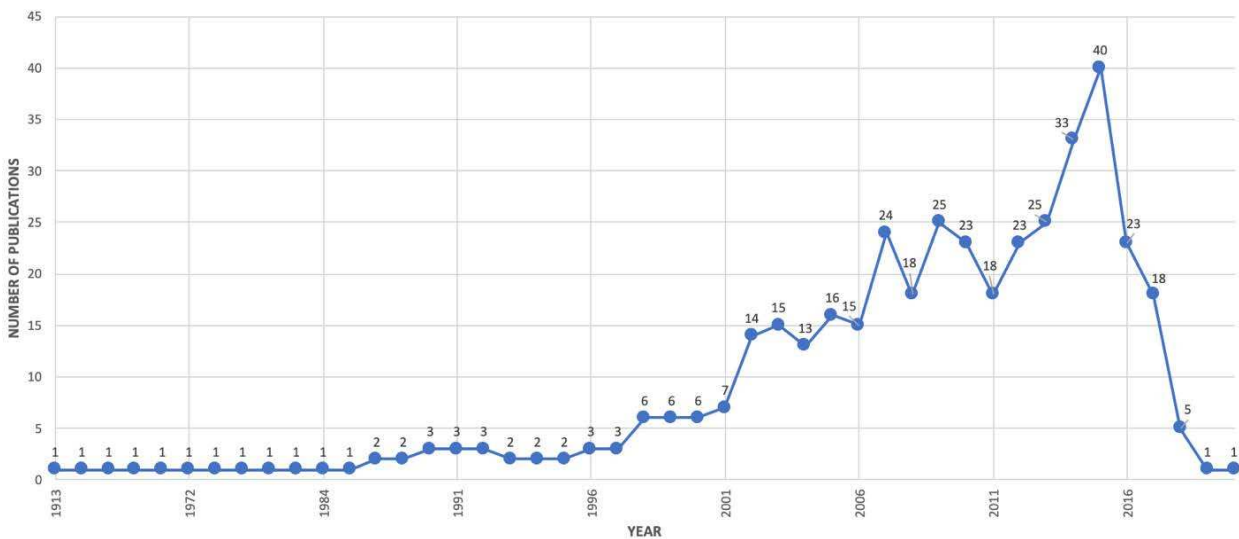


Figure 2. Publication trends for works including online learning and game players (1913-2019).

There was a noticeable initial growth starting in the mid-1980's and accelerated research productivity has provided a sharp increase into the present. This trend is likely to continue as the introduction of gamification into education provides a broadening common ground and mutual interest for strategic applications and methods within both arenas.

In terms of the origins of the works reviewed, at 72%, the primary source was overwhelmingly published articles as shown in Figure 3. While this was expected in terms of the existing body of literature from educational research into online learning and related areas, the potential for the emergence of other publication and information resources that could be construed as unconventional may be a factor in future research where game-related concepts and theories figure in with a more pronounced and prominent role.

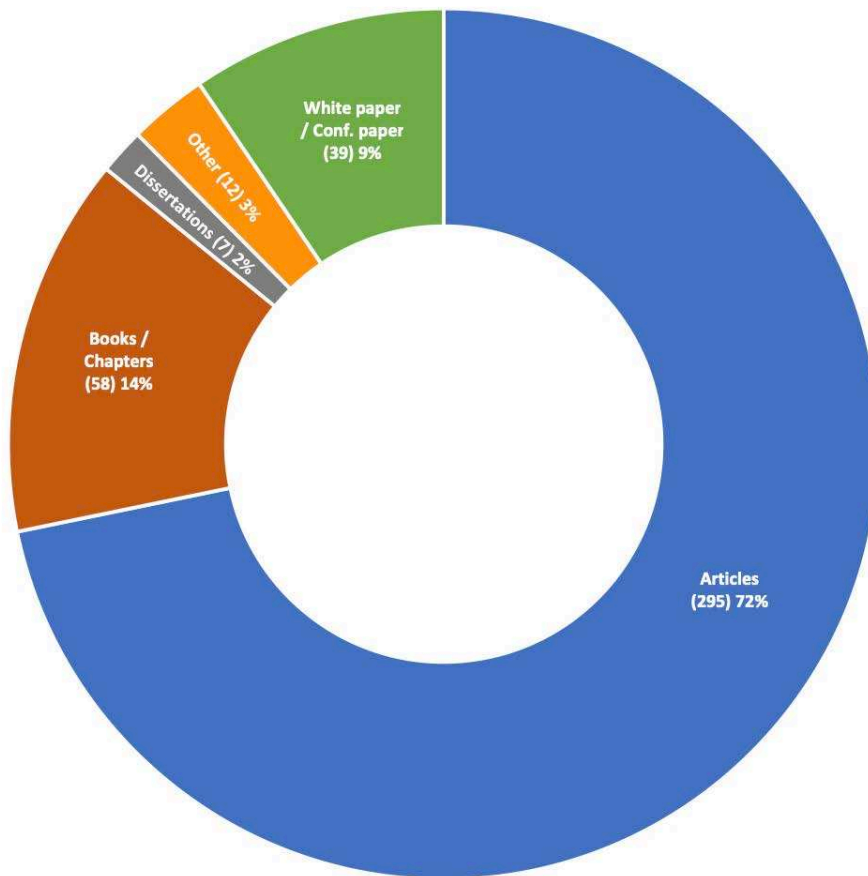


Figure 3. Publication outlet source frequency (n= 412).

The meta-analysis also resulted in the identification of key topical area categories supported by contributing aspects. There included:

- Online learning, which encompasses the paradigm, environment, and learner
- Significant research trends, which show the historical and current emphases
- Influential concepts and constructs, which are derived from educational research
- Online learner types, which addresses existing perceptions of segmentation
- Gamer taxonomy construct, which explains the rationale for leveraging game player theoretical constructs as the basis for developing a taxonomy of online learner types

While this analysis was critical to the development of a relevant construct and meaningful factors within the taxonomy, the supportive data for verifying these were collected by means of survey and interview responses.

Demonstration Survey and Interview Employment

The intention of the demonstration online learning factors survey (OLFS) was to garner relative interview candidates in order to have an additional perspective on the factors of the taxonomy being developed. It was anticipated that the survey would be further developed and explored as a contributor in future follow-up research to assess this dynamic in relation to and in dealing with the application side of the taxonomy of online learner types (TOLT). As for the interviews, from the final sample size of 92 respondents, nine (9) individuals were identified and agreed to participate. This offered an opportunity to fully code and assess the emergent indicators to determine if the factors and constructs suggested by the meta-analysis and game player research reflected a viable direction and function.

The interview dataset comprised of a mix of participants representative of the four pertinent population segments within the higher education context. Participants were approximately balanced in terms of gender and were aged between 18 and 55 years of age. They

also represented different stages in their academic careers and different degrees of professional and online experience. Additionally, the selected participants represented multiple higher education institutions which offered a valuable differentiation of instructional experience. Participation was voluntary and confidential. Table 3 provides a mapping of participant pseudonyms and their key identifiers.

Table 3

Participant Pseudonyms and Associated Key Identifiers

Participant Pseudonyms	Age Range	Highest Degree Earned	Online Courses Taken	Professional Experience	Currently Enrolled?
Amelia	26-30	Bachelors	12	8-9	Yes
Clara	22-25	Bachelors	5	0-1	No
Craig	36-40	Masters	4	2-3	No
Donna	31-35	High School Diploma	9	6-7	Yes
Martha	31-35	Masters	16+	10+	No
Mickey	51-55	Masters	16+	10+	Yes
Rory	22-25	High School Diploma	4	6-7	Yes
Rose	18-21	High School Diploma	6	2-3	Yes
Wilfred	51-55	Masters	10	10+	Yes

Interview Data Analysis

For the data collected by the Assessing Distinguishing Learning Factors interviews, an inductive qualitative coding and analysis process was applied that followed the methods recommended by Saldaña (2015). The methodology utilized for the study was based on grounded theory, which permitted the researcher to “inductively derive a theory” (Symeonides & Childs, 2015, p. 413) from the data analyzed and assessed by means of a coding process that fosters interpretation (Strauss & Corbin, 1990). The coding followed three processes: open coding, axial coding, and selective coding (Corbin & Strauss, 2008). While open coding is sometime referred

to as initial coding and selective as theoretical (Saldaña, 2015), these are conceptually synonymous and are therefore referred to using their initial designations. The employed coding process represents the progressive “steps in coding data and in developing a visual model of the theory” (Creswell, Hanson, Clark Plano, & Morales, 2007, p. 249) through which the researcher identified, refined, and transferred relevant factors and categories from their initial state of observed trends to applicable elements. The initial phase was the open coding where the primary categories and factors were derived from emerging trends and patterns in the analyzed data. The opening coding stage of the interview data analysis went through the following steps:

1. Transcribing the interview sessions.
2. Consolidating the transcription text into documents representing each of the interview questions with the responses ordered according to the assigned identity codes.
3. Performing a multi-iterative line-by-line analysis of the text at both a manifest and latent level.
4. Chunking the text based on identified patterns, key terms, words, ideas, or phases.
5. Generating 290 initial code segments based on the finalized chunked text.

This initial coding was followed by the axial coding where the conceptual connections between one or more of the identified primary elements were identified and reevaluated. Each of the 290 codes was reviewed multiple times in order to determine the type of meaningful relations and connectivity needed to create relevant categories. The approach used in this stage followed the grounded theory methodologies described by Corbin and Strauss (2008) and incorporated both digital and manual elements. The latter came in the form of the use of color-coded notes to aid in pattern recognition of sorted and organize codes.

Based on the multiple assessment cycles performed on the codes which emerged from the opening coding phase, there were eleven (11) categories derived and labeled in relation to the

perceived correlating relationships. The categories resulting from the axial coding stage, as shown in Table 4, represent the key strategic areas of consideration from the research and provide a convergence of the initial codes.

Table 4

Categories Derived from the Axial Coding of Interview Data

Category Name	Incorporated Codes
Learner Characteristics	44
Extrinsic Motivators	38
Online Learner Classifications	37
Perceptions of Online Learning	36
Intrinsic Motivators	24
Anticipations with Online Experience	20
Dynamics of Online Learning	18
Learning Preferences	18
Engagement Behaviors	17
Personal Influencers	12
Theoretical Components	9

Finally, selective coding was employed to facilitate the finalization and integrating of the developed categories and factors into the theoretical construct (Corbin & Strauss, 2008; Creswell et al., 2007; Saldaña, 2015; Strauss & Corbin, 1990). This stage of the coding involved closer analysis of the categories identified and labeled as a result of the axial coding stage, and evaluating the key attributes associated with the contributing coded elements for each which emerged from the initial coding phase contributing to them revealed that there were distinct themes intersecting.

The process of developing the thematic relationships from the axial coding categories revealed that the connections between some categories were noticeably stronger than others in

some instances. The observed dominance of certain correlations allowed for the convergence into relevant themes. As a result of the final selective coding outcome, the initial eleven (11) categories identified were reduced to four (4) primary themes, as shown in Table 5.

Table 5

Themes Derived from the Selective Coding of Interview Data

EmergEd Themes	Contributing Categories
Online Learner Classifications	Online Learner Classifications
Learning Motivation	Intrinsic Motivators
	Extrinsic Motivators
Online Learning Conceptualized	Perceptions of Online Learning
	Dynamics of Online Learning
	Anticipations with Online Learning
Descriptive Factors of Online Learners	Engagement Behaviors
	Learner Characteristics
	Learning Preferences
	Personal Influencers

As the theoretical components category represented extraneous codes that were not able to be reconciled within the overarching direction and context of the other codes and categories, it was dropped. What was of particular interest was the association and correspondence of the outcomes of the coding with the topical outcomes and aspects of the meta-analysis, as well as the anticipated constructs within the proposed taxonomy. While the sample coded was not representative of the entire population, it did provide interesting indicators and tacit support.

In relation to the proposed taxonomy, the survey coding outcomes provided some meaningful indicators of alignment with the theoretical and structural trends observed in the game-related research as well as from the online learning research patterns. The coded elements not only addressed key factors such as distinctions between intrinsic and extrinsic motivation

among online learners, but also within the dimensions represented within the online learning conceptualization and descriptive factors of online learners themes' categories. The contributing categories in these areas demonstrate the complexity of the online learners as well as the diversity of their makeup and nature. With regard to the perceptions of online learning, there are clear indicators of a lack of agreement with learners as research participant Sue expressed that she "learns better in an actual face-to-face class," while a Jane insisted that people taking online courses "work better in that kind of environment."

The diversity of perceptions and perspectives provides an indicator of the potential usefulness and credibility of this new taxonomy. While the individuals had no awareness or information of the specifics of the TOLT, their responses to what type of online learner types they had encounter demonstrated an innate intuition regarding the concept and meaning even without direction or prompting. Among the types named and described by participants some paralleled those shown in the TOLT and other typologies, such as the overachiever and competitor. These concepts, while more established and accepted within game research, were not present in educational research.

Game-Related Research

There is no clear understanding of the definition or clear roles for games within educational theory (Warren, Jones, Dolliver, & Stein, 2012). Despite the numerous studies associated with games as learning constructs (Aldrich, 2003; 2007, as cited in Warren et al., 2012; 2009; Ang & Rao, 2008; Dickey, 2007; Gee, 2003; 2007; 2008; Squire, 2006; 2011; Walker & Shelton, 2008, as cited in Warren et al., 2012), the lack of a common understanding of the concepts and terms limits discerning the full potential of this discipline within the academic context. There are likely various reasons why game-related works and their outcomes are not

more broadly adopted in educational research and theory discourses. This ranges from subjective bias to a lack of consistency regarding game-related terms and definitions (Warren et al., 2012). Some differences may stem from the limited correlations between environmental or engagement dynamics, such for the concept of identifying with one's character or avatar as a player within a game. There is low probability that such a dynamic would exist for learners within an online course, but it is not an impossibility. For example, this concept directly applies when dealing with immersive learning environments and situations like simulations, game-based learning, and virtual world activities. However, beyond this direct association, there is the potential for applying this concept within the online learning environment.

Digital games, while often created specifically for the purpose of entertainment, still function as learning systems (Aldrich, 2009). Their designs must engage the participant within a constructed, digitally-based environment (e.g., a video game, simulations, virtual world, etc.), which is accessed via the gameplay interface through a digital delivery channel - whether that be within a standalone-, local area network (LAN)-, or Internet-based, and proceed to instruct the player on the use of the interface, and the key gameplay principles needed to perform required tasks for engaging within the environment and achieving intended outcomes. These systems, when designed appropriately, will strike the right balance between eliciting the player's existing skills and knowledge, and providing sufficient challenge to produce the type of engaging experience that draws and maintains attention, produces critical thinking and creative problem solving, and fosters constructive learning to achieve a new level of skill, knowledge, and/or reward. These attributes align with the tenants of constructive experiential learning within online learning environments, be they within basic learning management systems (LMS), or within the context of immersive or gamified learning environments.

Some of the research dealt with using studies in player types to better understand learning differences addressed the relevance of player types only within the context of educational games (Heeter, 2009). One reason that game player type research shows high potential for application into understanding online learner types is that the study of player types encompasses a holistic spectrum of influencing factors. Unlike play styles, which emphasize behaviors presented during play, types combine these aspects with other dimensions such as motivation and reasoning for play. This difference therefore can be used for describing the unique player instead of just providing an expression of their transient contextual behaviors (Heeter, 2009). As is the case in trying to understand online learners, personality is a consideration in evaluating players. Here there is a clear alignment in perception in that personality traits should be considered a viable factor of individuality, but they are not the only aspects for evaluation (Tondello et al., 2017).

There are meaningful correlations between game player types and online learner types. The similarities provide a relevant justification for apply research into game player types into the arena of online learning (Tondello et al., 2017). Beyond this, there is reason to evaluate and incorporate theories and structures from both disciplines based on the technical, communication, and engagement dynamics and functionality of online learning and gaming environments. Taking this broader view helps align learning management systems and virtualized instructional situations with online digital games as functional learning systems afford a high degree of commonality and shared conceptual interests. Gee (2008) provided a strong parallel between game players and online learners in stating that

[g]amers often organize themselves into communities of practice that create social identities with distinctive ways of talking, interacting, interpreting experiences, and applying values, knowledge, and skill to achieve goals and solve problems. (p. 24)

These attributes are typically associated within the context of online learning.

Heeter's (2009) perception of educational games reflected the opinion that learning games are inherently weaker in their design and function, noting that they lack "social dimensions" (p. 5). This perception is perhaps one reason why game research was neglected or implemented as part of education-specific works. This perceived separation, while understandable if solely addressing traditional face-to-face instructional environments, is misplaced in terms of online learning. Online instructional environments, like digital game environments, exist as spaces designed for engagement in learning (Gee, 2007). Whether the outcome manifested as new knowledge or a new skill, the online learning environment, like the digital game, facilitates experiences that enable an individual to develop, apply, test, and understand by building upon previous experiences in order to progress and grow (Squire, 2008; 2011). Considering that there has been a close and old association described between play and learning (Vygotsky, 1967), an examination of digital gaming environments for understanding the differences in individuality is a nature step. As stated by Squire (2008), "video games are the medium of the computer representing the most polished, powerful, and thoroughly digital learning experiences known" (p. 3).

Game Concepts and Constructs

As Altarriba (2014) noted, "most of the theories related to games and fun have a psychology-related basis" (p. 16). While modern learning theories have their origins in philosophy, going back to ancient Greece (Austin, Orcutt, & Rosso, 2001), their evolutionary path is strongly associated with and influenced by the discipline of psychology as well, with notable theorists including William James, Edward Thorndike, Lev Vygotsky, Jean Piaget, and B. F. Skinner contributing conceptual milestones to address the distinct dynamics of learning (Austin et al., 2001). Therefore, it should be the expectation that from a theoretical perspective,

games and learning should share some phenomenological commonalities and similarities. This is especially true concerning online learning.

Keirsey Temperaments

Just as the Bartle model provides a foundation for understanding and exploring different player types, the Keirsey's temperaments (Keirsey, 1998), which are based on the Myers-Briggs types (Becker, 2005), offer a viable starting point in defining temperament as an applicable psychological factor influencing the individual. The four temperament types are identified as:

1. Artisans value freedom and spontaneity. They tend to be impulsive, playful and creative.
2. Guardians value belonging to a group or community. They tend to be traditional, responsible and conservative.
3. Idealists value personal growth, authenticity, and integrity. They are inclined to foster these same qualities in others. This group includes people they define as "teachers".
4. Rationals value competence and intelligence. They strive for knowledge, predictability, and control (Becker, 2005, p.2).

When evaluating Keirsey's basic types, there are notable correlations to the game player types of Bartle and others. However, the broad nature of Keirsey's temperament types does not provide an adequate degree of granularity to effectively differentiate and define the proposed online learner types being presented in the proposed taxonomy in and of themselves.

Demographic Game Design Models

Bateman and Boon (2005) provided a significant step by incorporating the MBTI in the demographic game design (DGD1) model. However, the four (4) proposed player styles - conqueror, manager, wanderer, and participant - lacked the breadth of differentiation suggested for online learners. While the DGD1 model presents potentially applicable concepts towards the

TOLT, the subsequent DGD2 model's direct correlation to game play modes (i.e., single vs. multiplayer) (Bateman et al., 2011) eliminate it as a meaningful contributor for this study.

Framework of Player Preferences

While the framework presented by Tondello et al. (2017) offered some pertinent factors, such playing styles and the impact of certain demographics factors, there is a clear emphasis on design and game categorization. This shift away from the individual suggests only limited application.

Online Gaming Motivations

The emphasis on motivation provided by Yee, Ducheneaut, & Nelson (2012), while representing a move towards better understanding player types, should be perceived within its intended context - games. Though his identified components - Achievement, Social, and Immersion - offer some attributes that parallel with those of online learning, there are distinctions that are likely to be irreconcilable.

Situated Learning Matrix

The dynamics and aspects that create effective gaming experiences can be understood as having a strong and relevant correlation to those which constitute effective online learning experiences. When viewing games as learning systems (Law & Sun, 2012), the goals of the game designer can be seen to closely parallel those of the instructional designer of online courses. Both seek to create environments that facilitate meaningful engagements and experiences for participants that facilitate the development and understanding of key required skills and knowledge needed to reach targeted outcomes. Therefore, the convergence of game and learning research and principles, both in terms of applied structural and theoretical strategies, is a natural

evolutionary step in generating more meaningful and effective instruction, especially within the context of non-traditional learning environments. Gee's (2008) Situated Learning Matrix (SLM) suggests an expression of this evolution as it suggests a bridge between the strengths of the gaming experience with the dynamics of instruction. This concept stresses contextual relevance and a means of using the environment as a more significant and relevant space for the learner to actively connect the subject matter and content to the targeted learning outcomes (Gee, 2008).

While the SLM is a positive move towards bridging gaming and learning, it cannot be considered a complete take on converging these areas and their dynamics. As such, any assessment of the SLM provides some insight into the environment in which the online learner functions. However, the SLM does not associate directly to efforts to identify or differentiate online learner types. Still, having a clearer conceptual understanding of the engagement environment is critical in comprehending the context of instruction. This provides key clues as to potential environmental influencers that will generate modifications in an individual's psychological response. To better understand the psychological factors that may drive differentiating behaviors, attitudes, or motivation, it is necessary to examine the unique types of game players, and their distinguishing traits.

One area where games have an advantage is in their capacity to generate emotions and in the areas of performing tasks and acquiring new skills (Gee, 2008). Considering the correlation between emotion and thinking and learning, this dynamic is a critical factor within any instructional environment. In terms of the online learning environment, a deeper review into game-related design and theoretical research should be considered a priority. However, it is no more appropriate to do a direct transfer from entertainment-based games to online learning than it is to do a direct transfer of a course engineered for a face-to-face environment to online

delivery. While this study did not focus on course design per se, identifying the unique influencing factors associated with skills development, knowledge acquisition, and engagement effectiveness are relative to the classification and definition of online learner types. Chen, Davis, Hauff and Houben (2016) observed that one area not given adequate coverage is within massive open online courses (MOOCs). As with other incarnations of online learning, the differences between the online environment compared to traditional face-to-face instructional situations suggests a complexity and distinction that represent a wholly unique paradigm of learning. While the differences between the two environments were noted, Chen et al. (2016) explained that, "similar to the classroom setting, personality impacts learner engagement, behavior [sic] and learner success" (p. 6). Though when considering personality as a psychological factor within the broader sphere of individuality, its impact is expected, the correlation to performance outcomes is not the only consideration worth presenting. When considering the application of personality theory, and the outcomes of past research related to personality, it is important to remember that there is no definitive accord regarding its role. As Ackerman (1997) noted, "the literature is rife with isolated personality measures of varying levels of breadth, often with no linkage to any personality theory" (p. 222). One reason for the lack of congruency may lie in the conflicting perceptions of how personality should be contextualized, with some focused on a broad inclusive approach for deriving a more holistic understanding of the dynamics as a construct, while others emphasizing the need for identifying a theoretical definition, and in turn excluding some aspects of personality (Ackerman, 1997).

Play and Playful Behavior

While learning can and often does emerge through play, it is important to provide a clear understanding of how the concepts of a learning process and play activity differentiate. In

examining the definition of play as presented by Caillouis (2001), six essential activity-oriented elements are identified

1. Free: in which playing is not obligatory; if it were, it would at once lose its attractive and joyous quality as diversion;
2. Separate: circumscribed within limits of space and time, defined and fixed in advance;
3. Uncertain: the course of which cannot be determined, nor the result attained beforehand, and some latitude for innovations being left to the player's initiative;
4. Unproductive: creating neither goods, nor wealth, nor new elements of any kind; and, except for the exchange of property among the players, ending in a situation identical to that prevailing at the beginning of the game;
5. Governed by rules: under conventions that suspend ordinary laws, and for the moment establish new legislation, which alone counts;
6. Make-believe: accompanied by a special awareness of a second reality or of a free unreality, as against real life (pp. 9-10).

While some of these elements are applicable within the context of traditional learning models, some are potentially incompatible, particular in relation to higher education.

Some aspects, however, were deemed viable within the learning process according to some learning theorists (Songer & Miyata, 2014). Of these six, the fifth, Governed by Rules, seems to have the most natural alignment to most learning models. The idea of a guiding construct for learning seems to be a foundational truth and requirement for instructional design, curriculum development, and the fostering of learning scaffolding. However, the argument can be made that when factoring in dynamics including motivation, learning preferences, personality, and engagement behaviors, a broader range of Caillouis' elements might be considered as strategies for extending the learning environment, fostering new opportunities for instruction, and creating more meaningful and relevant modes of experiencing learning. Though not direct parallels with the dynamics of learning models, these aspects do still represent preferences and

distinctions that are indicative of individuality. As such, there are some aspects that may demonstrate levels of relevance with the evaluation of online learner types.

Play Styles and Learning Palette

In order to provide a stronger learning emphasis and context within the definition of game player types, Heeter (2009) introduced the play styles and learning palette (PSLP) which integrates the 52 elements encountered during her review of prior works.

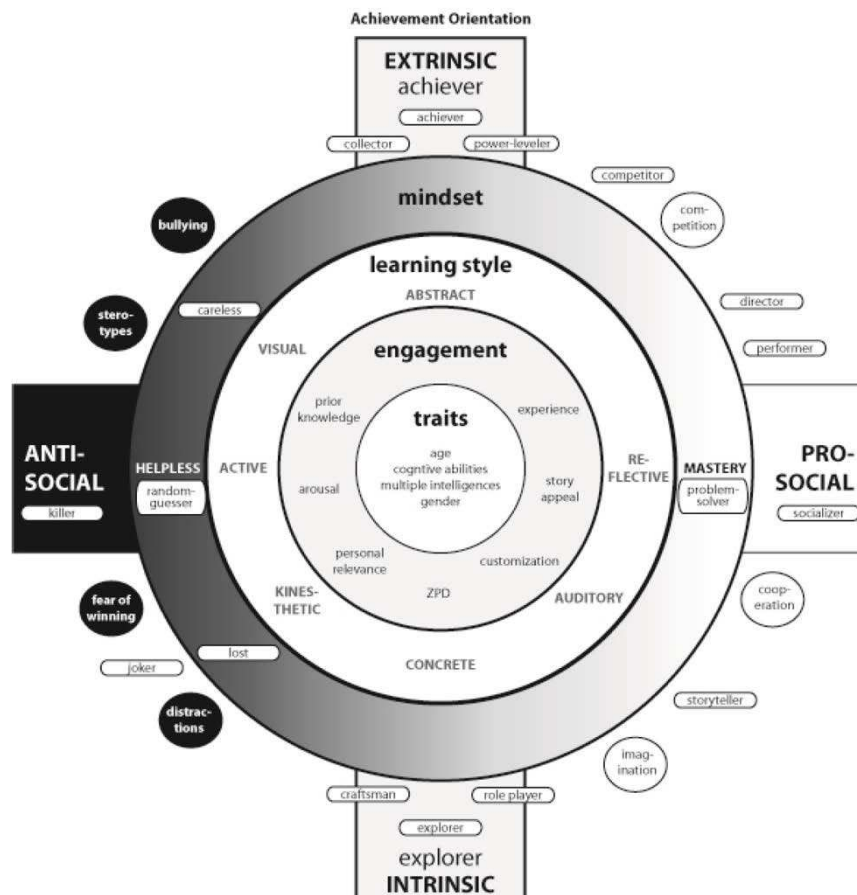


Figure 4. Play styles and learning palette (Heeter, 2009, p. 841).

A central dynamic of the PSLP are the two motivation-oriented axes – achievement and social – which “underlie player types and learning styles” (Heeter, 2009, p. 838). Within the context of this palette, the individual’s degree of motivation is expressed “along any combination of intrinsic and/or extrinsic achievement orientation and pro-social or anti-social people

orientations” (Heeter, 2009. p. 838). Though the PSLP, as shown in Figure 4, can be considered a bridge step in the application of game research into the sphere of learning, it cannot be considered an effective model for gaining a comprehensive insight in online learners in higher education. This limitation was supported by Heeter's (2009) clarification of the model only being "intended for game designers and teachers who want to teach with games" (p. 16).

The PSLP utilizes different elements to assess different dimensions of play and learning. While addressing motivation, it only does so at the base level, providing only axes of orientation - *achievement* and *social* (Heeter, 2009). However, given that this model integrates 52 elements, there seems to be a lack of balance which over emphasizes a direct alignment with Klug and Schell's (2006) player types, and Kolb's (1984) Learning Styles. There is also a lack of representation with other factors that provide differentiation within individuality, including personality and engagement behavior. There are interesting aspects observed in the PSLP that demonstrate some of the considerations addressed in the proposed online learner type taxonomy.

However, a primary limitation of the PSLP is its design intention. Given its intended use by game designers and educators specifically focused on game-based learning solutions (Heeter, 2009), the emphasis is not well aligned with the broader considerations of higher education online learners as a group. As such, the intention of only addressing games classified as educational hampers its ability to thoroughly examine and understand the learner. Still, there is value and applicable insight to be gained in the overall perception offered by Heeter (2009) who explains “player types are archetypes” (p. 838).

Radoff's Player Motivation Model

One illustration of the organic evolution of the player typology model is Radoff's player motivation model (Radoff, 2011) which demonstrates an evident orthogonal correlation of

motivations to Bartle's player types (Bartle, 2012). Rather than functioning to fully usurp the player types, Radoff's model offers a modified progression in the emphasis and intent. While a comparison of the two indicates no blatant conflict (Bartle, 2012), there does seem to be some question as to how the alignment is to be interpreted. For instance, if these two models are to be considered as possessing a direct one-to-one correlation of their elements, then the fundamental definition and/or characteristics of Bartle's types would need to be reassessed. The connotation of Bartle's Socializer correlates to Radoff's Achievement motivation, while the Achiever types correlates to the Cooperation motivation, see Figure 5.

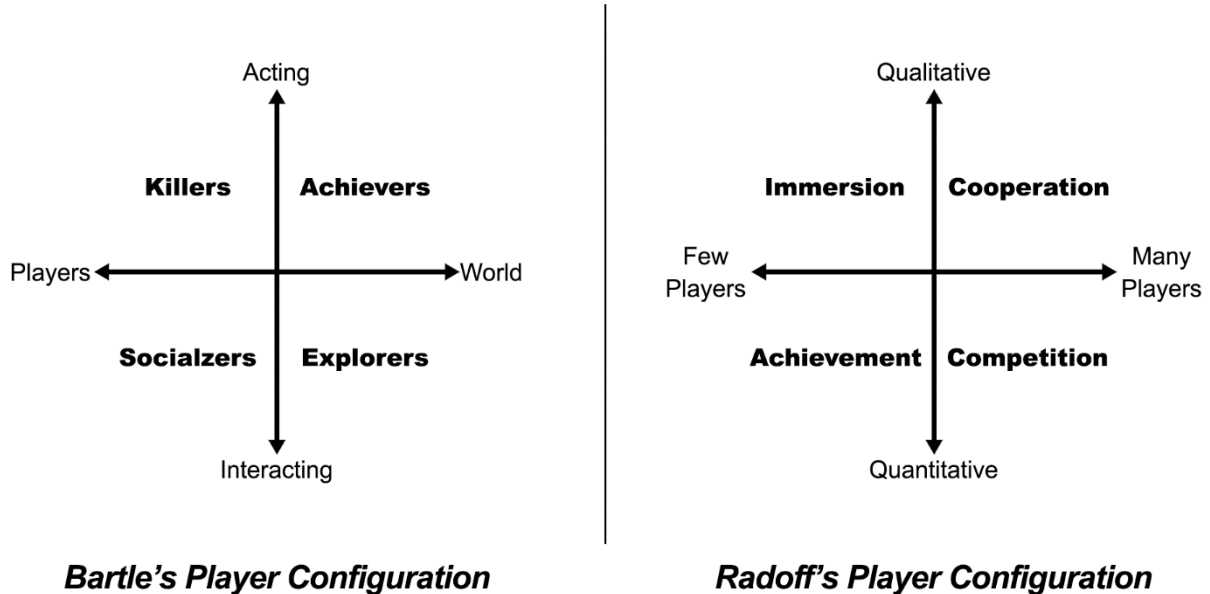


Figure 5. A comparison of Bartle's and Radoff's player motivations.

As this same quadrant swap exists for the other types and motivations as well, the discrepancy would suggest that any convergence of these models would require a degree of conceptual realignment before any practical application could be considered. It should also be noted that while both are based on observation, there is no theory necessarily connected to

address why they work. Still, both of these provide an effective starting point for formulating the differentiating categories and unique types of the online learner taxonomy.

While Bartle is a foundational point of investigation, this study derives insights and understanding from various studies, theories, and models (Hamari & Tuunanen, 2014; Yee, 2006a; 2006b; Yee et al., 2012). This is considered essential in terms of assessing relevant concepts from game-based research. Additionally, it is critical to gain a clear awareness of the current academic models and theories associated with online learners in higher education. While not every theory or model is applicable to all situations (Bartle, 2012), and there is definite risk in interpreting a theoretical model outside of its intended purpose; there are opportunities to draw upon the key strengths and attributes of various works to derive a new manifestation that is effective within a particular context. To this end, a comprehensive review of the literature was executed for the study and for the purpose of generating an effective taxonomy of online learners in higher education.

Game Player Types

A key rationale for looking at work into game player types and motivators lies with the perspective that digital games themselves represents a strong contextual benchmark for virtual learning environments such as learning management systems that comprise much of today's technological delivery of online courses. As such, the correlation between the two provides valuable insights into the behaviors, characteristics, motives, and practices that can be expected from and demonstrated by learners engaged in instruction within an online environment. Individuality transfers into different aspects of life. Whether observed in the differences in the way individuals play games or in their approach to learning, differences are a reality (Heeter, 2009).

Hamari and Tuunanen's Five Dimensions

Based on their review of game player typologies, Hamari and Tuunanen (2014) concluded that "the field of study in player types is perhaps surprisingly uniform" (p. 46). Additionally, they deduced that from the models reviewed, five primary player-associated dimensions emerged - Achievement, Exploration, Sociability, Domination, and Immersion (Hamari & Tuunanen, 2014).

Bartle's Player Types

Bartle's theory of game player types evolved from players' descriptions of what they enjoyed about playing MUDs and what they thought others enjoyed. These commonalities coalesced into the basic types he described - achievers, explorers, socializers, and killers. He envisioned these as a graph segmented into four quadrants, which provided a means of understanding the degree to which an individual exhibited aspects of the types. This model been applied successfully to MMO's for 15 years and is considered the standard by many.

Though widely recognized and having served as a launch point in developing subsequent theories and models (Nacke et al., 2014), it must be remembered that, as Hamari and Tuunanen (2014) noted, Bartle's player types, on which a number of subsequent models are founded, was never intended for application beyond the context of multi-user dungeons (MUDs). As such, the use of Bartle's types may or may not generate relevant outcomes (Bartle, 2012). This limitation resulted in models that lack in the needed depth or complexity for direct correlation to an adequate taxonomy of online learners. However, these models, as well as the original work of Bartle, offer key insights that may be applied and expounded upon (Tondello et al., 2017; Hamari & Tuunanen, 2014).

There were attempts to apply Bartle's player types into other areas. Kim (2000) applied the four types into website design around 2000 with noticeable positive results. She noted that certain player types responded favorably to specific design intentions and applications of gamification strategies and elements. (Kim, 2012). Also, there were efforts to apply Bartle's model into more abstract areas, such as near linguistic programming; however, this is likely beyond what Bartle would consider to be a relative application (Bartle, 2012). Such considered uses for these player types suggests that they may represent an inherently fundamental dynamic of human engagement that is based on neurological distinctions as well as from a cognitive, behavioral, and psychological perspective. In this regard, using such research and models requires a better understanding of the differences in performance individuals have within online environments, as well as what design and engagement factors are most effective based on those differentiations.

While the inclusion of player types into other spheres of purpose may indicate potential benefits, it is important to remember that the only intention of the Bartle Player Types model was within the context of MMOs. As Bartle stated, "the theory only explains why people play MMOs for fun" (Bartle, 2012). So, the taxonomy was never intended to be used to explain why people play other games or for reasons other than fun. As such, there can be no certainty or guarantees inferred regarding the effectiveness of the player types beyond the environment or situation for which they were derived and developed to explain. Though not discounting the abstract application of his model, Bartle clearly emphasizes that player types should be considered within the context of a theory rather than in terms of statistical analysis.

This finding is relevant for the task of its application as a structural element of the online learner taxonomy as it does link to other identity and cognition theories based in psychology.

Though there have been attempts to do so, Bartle (2012) noted that despite efforts to do so, the player types do not map onto Myers-Briggs. While this might appear to negate a key conceptual dynamic of the proposed taxonomy, it does not. The context which Bartle was addressing involved a direct correlation between MBTI and the four player types. This is not the intent or expectation in the case of the development of this online learner type taxonomy. While personality and player type are considered relative factors of influence in determining and defining the distinct online learner types, they are not mapped in direct correlation to each other. Rather, they are part of a collection of characterizing dynamics and attributes that serve to holistically manifest the representative personas and profiles of the specific types of the taxonomy.

The categorization of Bartle's player types in terms of the represented dimensions provides an interesting consideration. When observed through this lens, players exist and function in terms of their interactions in terms of the environment, others, and in later iterations of the model, their awareness. These dynamics of these dimensions reflect diametrical forms of engagements; the first of which is one-directional, and the second which infers a two-way exchange. This may be observed with the first two dimensions of Bartle's Taxonomy. For example, Achievers act on the world while Explorers interact with the world; Killers act on other players while Socializers interact with other players. However, in the case of the third dimension, this duality becomes more conceptual and abstract. Explicit actions involve directed awareness where things are intentional and pre-considered, whereas implicit actions originate at a more latent, subconscious level and typically manifest as automatic reactions or responses, or unconscious behaviors.

A risk with using the player types as determinant of development and assessment is that

positive outcomes may actually be the results of biasing towards the four specific types (Bartle, 2012). This study acknowledges this issue as a limitation and addresses it through the examination and integration of multiple theories into the formation of the proposed model. Despite the clear disclaimer regarding applying the Bartle types beyond their original context (Bartle, 2012), these dimensions suggest potentially relevant dynamic ranges that could contribute to the overarching construction of the defining categories and types of the proposed taxonomy. The degree of application of the three (3) dimensions proposed by Bartle's player types may be further investigated through the definitions and function of the subtypes that emerge from each (Tondello et al., 2017). So, rather than taking a direct adoption approach, the intention should be to generate an extended model that addresses the deficits indicated by Bartle on a holistic level. The required expansion of the types and their definitions was a point speculated when Bartle stated, “maybe there are another six types that you didn’t know anything about” (Bartle, 2012). While this study is not focused on game players, it may be asserted that online learning environments have commonalities with online (i.e., virtual) game environments that enable various theoretical, dynamic, design, and experiential aspects to translate and have significant application. The understanding of the extensive potential Bartle acknowledges supports the rationale behind the theoretical and structural development approach being undertaken to create the online player taxonomy.

BrainHex Gamer Typology

In part, the BrainHex player types listed below can be applied as an analogy for explaining online learners, but there are limits. If you stay within the limits it will work. The danger is when applying it towards definition. This concern is valid for some areas of generalization and application of the theory, however, in the case of online learners, there are

relevant conceptual commonalities. As this theory is designed for designers, the question as to whether or not it is applicable for the current student must be considered. In understanding that an intention for creating the TOLT was to understand the individual – in this case the learner rather than the player - for the purpose of improving the overall quality, effectiveness, and meaningfulness of the learning experience, then the application of the TOLT in terms of instructional design for online courses can be considered a correlating function. Addressing the intended function of the BrainHex model, Nacke et al. (2014) highlighted a significant aspect of the model, noting that

Each category within BrainHex should be understood not as a psychometric type, per se, but as an archetype intended to typify a particular player experience, which can thus be understood as a qualitative presentation of an underlying implicit trait framework. (p. 58)

This dynamic enables BrainHex to present types that can be seen to have a relative parallel within online learning. While not all components may be fully applicable, there is just cause for investigation of the model in reference to the online learner taxonomy. This justification is further strengthened by a key basis of the BrainHex model – neurobiology, which offers a deeper functional explanation for differences. These differences, while associated with game player types, are significant in that they provide direct correlations to the individual's cognitive and psychological processes and distinctions. These same distinctions are factors that influence and impact an individual engaged in learning within an online instructional environment.

There are seven archetypes defined for the BrainHex model. By design, these correlate with specific “neurological mechanisms” (Nacke et al., 2014, p. 58) and are:

1. Seekers, who are “curious about the game world and enjoy moments of wonder” (Nacke et al., 2014, p. 58)
2. Survivors, who prefer arousal from adverse situations, like horror

3. Daredevils, who are centered around thrill seeking behaviors
4. Masterminds, who gravitate towards strategy and problem-solving
5. Conquerors, who “enjoy defeating impossibly difficult foes, struggling until they achieve victory, and beating other players” (Nacke et al., 2014, p. 59)
6. Socializers, who are the quintessential people lovers
7. Achievers, who are “more explicitly goal-oriented” (Nacke et al., 2014, p. 59)

In the model, there are intentional connections with the Bartle types, as in the case with the mastermind, socializer, and achiever archetypes (Nacke et al., 2014). However, these do not represent direct one-to-one parallels. In considering these types, associating the Survivor game player type with an online learner type may be impractical, but there is potential relevance depending on the subject matter and topic. The focus on such a reconciliation was, however, outside the scope of this study. The intention of this research was to develop a taxonomy of online learner types within the context of higher education; therefore, the dynamics, strategies, motivations, etc. explored should apply to defining a specific learner type and generating a persona and profile that is exemplary for the associated type. Granted, survivor may have direct relevance when characterizing the effective elements that generate meaningful learning within simulations, or other immersive learning environments, and in fact it could be applied to the defining aspects of certain personality types (i.e., thrill seekers, risk takers, etc.), there are no clear parallels within the context of online learning in higher education. Still, as demonstrated by Busch et al. (2016), further validation of the BrainHex model is needed to determine its potential reliability.

Gamification User Types Hexad Framework

The Hexad framework provides an insightful approach for exploring online distinctions. Recognizing that motivation can be expressed with more depth than at the basic conceptual

intrinsic and extrinsic precepts, Marczewski (2015) proposed the Hexad model with specified six unique user types based on individual motivational levels as defined in SDT as relatedness, competence, autonomy, and purpose (Deci & Ryan, 2008). These are

1. Socializers, who seek interactions and connectiveness, and “are motivated by relatedness” (Marczewski, 2015, p. 67)
2. Free Spirits, who seek creativity and discovery, and “are motivated by autonomy and self-expression” (Marczewski, 2015, p. 67)
3. Achievers, who seek opportunities for personal growth and learning, and “are motivated by mastery” (Marczewski, 2015, p. 67)
4. Philanthropists, who seek the unselfish edification of others, and “are motivated by purpose and meaning” (Marczewski, 2015, p. 67)
5. Players, who seek selfish gain in their situation, and “are motivated by rewards” (Marczewski, 2015, p. 68)
6. Disrupters, who seek to shake things up in their surrounds via their own efforts or through others, and “are motivated by change” (Marczewski, 2015, p. 68)

The Hexad user type does indicate degrees of association, though not a direct correlation with the online learner types that were developed through this study, as well as insights and a measure of alignment to the strategic learning activities and engagement preferences of online learners.

Klug and Schell's Nine Player Types

In assessing game player type theories and models, there were a number of different considerations to base a review upon. Some typologies are based on specific types of games while others emphasize the particular purpose of a game (Kahn et al., 2015). For the purposes of this study, a more generalized perspective of player types was used to evaluate player types. Klug and Schell's (2006) nine player types offer a higher level of granularity and differentiation to player types in their categorizations. The types suggested were intended to provide a deeper sense of motive and purpose that the early Bartle types, and can be seen as a continuation of the

momentum expressed in other models (Yee, 2006a). The nine types identified by Klug and Schell (2006) are:

1. Competitor (be better than the other players)
2. Explorer (experience boundaries of the play world)
3. Collector (acquire the most stuff)
4. Achiever (championship over time, not just this round)
5. Joker (fun and social)
6. Director (thrill of being in charge)
7. Storyteller (create or live in alternative worlds, build narrative)
8. Performer (puts on a show)
9. Craftsman (build, solve puzzles, engineer constructions) (p. 829-830)

In reviewing the various existing player type classifications and models, a number of similarities could be observed. Bartle's player types have served as foundation for many in assessing the distinctions of unique games players, despite it never being intended to be applied beyond its original context of massive multiplayer online games (MMOs) (Bartle, 2012). This continuing reference has served as a genesis from which various player types have continued to evolve. In evaluating the models with their defined types, common contributing themes have emerged. While these characteristics of the differing players types did not demonstrate a clear accord and agreements of game player designations and descriptions, the key value they provided was in offering a diverse exploration into the motivations, actions, and differentiating dynamics of individuals within the online environment. This offered a unique perspective and insight that was not readily available through other research channels.

Differentiating Factors

While player type models provided excellent theoretical constructs to base the

classification and articulation of online learner types on, these models were still primarily associated with online games. The insights gained into the aspects of the individual that were pertinent to evaluate were clearly valuable, but it was necessary to assess differentiation in terms of the educational context. To this end, it was critical to understand the traits and factors of the individual learner.

Learner Differences

Vygotsky (1978) considered the human capacity to converge communication and activities to be "the most significant moment in the course of intellectual development" and suggested that it ignited "the purely human forms of practical and abstract intelligence" (p. 24). This connective dynamic of the human experience is, what Vygotsky (1978) referred to as "a dynamic system of behavior" (p. 31). This concept illustrates the complexity of individuality in that the interactions between a person's cognitive and psychological systems generates their perceptions and experiences within an environment and situation that while completely specific to them at the most granular levels, can also be considered unique to those with common perceptive and experiential factors for a given environment and/or situation. As with other disciplines, the differentiation of individuals provides an essential element for investigation and understanding in theoretical development (Hamari & Tuunanen, 2014)

Individuality

The notion of the individuality of the learner impacting their learning is not a new concept. As de Paz, d'Angles, Negrodo, and Perez-Vidal (2012) suggested, "there is a direct relation between individual differences and learning. Among those variables are cognitive styles, motivation, anxiety, self-concept, and self-esteem" (p. 29). Identity as a social construct presents interesting considerations. As noted by Lloyd et al. (2017), it is "dependent on context and

reciprocal interactions with others." (p. 155) However, beyond this, there are other factors that may be considered influential in defining identity. Still, the point that identity determines response is valid. While the question of what factors associated with the individual learner are critical and most relevant, there is still an understanding that the online learner is complex and that multiple factors contribute to who they are and how they respond to the online learning environment. Though de Paz et al., (2012) suggested that the most critical factor associated with learning and performance is achievement motivation, Wong and Csikszentmihalyi (1991) reflected this view and noted that there was "[a] positive relationship between scholastic performance and achievement motivation" (p. 542). This perception, though widely held, has been called into question by suggestions that there may be limitations dependent on the situational context of the learner (Reeve et al., 2004). Individuality is manifested through various psychologically-related channels. As individuality is an inherent part of the human condition, a learner will have unique characteristics within any given environment (Essalmi, Ayed, Jemni, Kinshuk, & Graf, 2010, 2015; Graf, Liu, Chen, & Yang, 2009, as cited in Tlili et al., 2016).

Demographics

Previous studies have indicated that demographic differences may have influence on the strategies, motivation, behaviors, and performance of learners (Kizilcec & Schneide, 2015). This suggests that there are relevant demographic factors that have the potential to explain some of the attitudes, behaviors, and preferences of the learner (Layne et al., 2013). Those focused on performance or satisfaction indicated no significance from demographics (Biner et al., 1996; Osborn, 2001; Wang & Newlin, 2002; Willging & Johnson, 2009). However, studies that investigated the likelihood of course completion suggested a correlation (Didia & Hasnat, 1998, as cited by Xu & Jaggars, 2013; Willis, 1992; Wojciechowski & Palmer, 2005). Those early

studies related to the demographic factor of age as an influencer in online learning provided differing outcomes based on the research emphases of the studies. Age, as a factor, may have some degree of meaning when understood as an influencer of experience and motivation. This is not guaranteed, but previous studies indicated it may be a factor in online learning (Wojciechowski & Palmer, 2005). The study did not include factors such as those addressed in Berge and Huang's (2004) circumstantial variables due to their transient nature. Circumstantial or situational factors were considered to not influence learning within the online environment despite the fact that some research suggests they actually may be likely to have an impact (Braxton, Shaw, Sullivan, & John, 1997, as cited in Layne et al., 2013). However, these factors did not represent consistent traits, behaviors, or dynamics contributing to the learner's persistent individuality state, so they cannot be considered a relevant or appropriate part of how a distinct online learner type is categorized, defined, or expressed.

As a factor, age may have some degree of meaning in terms of being associated with a learner's degree of experience and motivation. This is not guaranteed, but previous studies have shown it to be a factor in online learning (Wojciechowski & Palmer, 2005). There are multiple dimensions that shape differences in online learners and are key to helping to categorize and define them. The source of differentiation is the individual learner given that they, as Russell (2002) noted, "will have different personalities, and different personalities will want different things from the program" (p. 28). Individuality is manifested through various psychologically-related channels. As individuality is an inherent part of the human condition, a learner will have unique characteristics within any given environment (Essalmi et al., 2010, 2015; Graf et al., 2009, as cited in Tili et al., 2016). Personality is one such channel through which individuality manifests and is considered to function as a factor of individual distinction (Irani et al., 2003).

Competencies

Lightner et al.'s (2010) arguments regarding required capabilities of online learners cannot be considered as universal or persistent for multiple reasons. First, the online learning environment does not maintain a static state in terms of the capacities of the medium or the complexities and capabilities of the integrated learning technologies. Second, the applied online instructional design structural and theoretical methods continue to improve the quality and effectiveness of instruction as new insights are gained from research and experience. Third, the depth, nature, and function of instructional materials, content, and learning activities is in a constant state of expansion and improvement as online learners gain access to an ever-expanding range of resources, tools, services, and platforms. Finally, given the observed differences in learners within traditional face-to-face instructional environments, the same range of differences should be anticipated for online learners.

While similar to the dynamics of the online learner, Dabbagh (2007) suggested that there were critical competencies that were needed for success within the online instructional environment, stating that the learner must

1. Be skilled in the use of online learning technologies, particularly communication and collaborative technologies.
2. Have a strong academic self-concept and good interpersonal and communication skills.
3. Have a basic understanding and appreciation of collaborative learning and develop competencies in related skills.
4. Acquire self-directed learning skills through the deployment of time management and cognitive learning strategies (p. 221).

This presumption is not necessarily accurate as success is dependent on multiple factors and cannot not be generalized to this degree.

Technical and non-technical (i.e., interpersonal communications skills) competencies are factors for consideration when identifying and defining online learner types (Dabbagh & Bannan-Ritland, 2005). However, given the predominance of self-selection of the student for pursuing instruction within an online environment, it is more likely that natural attrition will generate a population predisposed to and exhibiting the required technical competencies for functioning within an online learning environment. Additionally, as online learning in higher education has become more prevalent and a majority of the engaged learners are likely acquainted with the nuances of online services, tools, and networks, if not online instruction, then the notion of difficulties concerning the required technical literacy to function in an online learning environment is no longer founded. As online learning has been in place over 20 years, it is no longer a novelty or foreign concept for most students, and their ability to comprehend and effectively function within these environments will only become more of the rule than the exception as this channel of education continues.

Disposition

Personality types are influenced by other dynamics, and directed by, as Jung (2016) explained, “perception and cognition which represents the receiving subjective disposition to the sense stimulus” (p. 31). At the core of each person lies what Jung (2016) referred to as “the two general types” (p. 2) – the introvert and extravert. Given the latent nature and base-level function of these types, there probably is reason to consider them as objective dispositions. Previous studies attempted to align personality differences with online learning to assess various correlations and predictive alignments. These previous findings ranged from associating general performance and preferences based on tendencies between introversion or extroversion (Harrington & Loffredo, 2010), or with specific learning activities or tasks (Da Cunha &

Greathead, 2007). According to Chen and Caropreso (2004), the learner's disposition - introvert vs. extrovert - can correlate to performance in online collaborative learning, and in terms of asynchronous engagement situations, introverts may function more effectively.

While Danesh and Mortazavi (2010, as cited in Tlili et al., 2016) addressed the role of personality within the context of online learning, their conclusion regarding the difficulty of extroverts within the online environment is based on a simplification of the factors impacting the learner. A disposition towards extroversion does not ensure that there will be difficulties functioning without a face-to-face instructional scenario. Extroverts display certain characteristics that translate to interpersonal preferences, but these dynamics are not necessarily limited to the physicality of the context of their interactions. A lack of observed differences between extrovert and introvert learners in terms of the adaptive nature of a learning environment (Al-Dujaily, Kim, & Ryu, 2013) is not an indication of differences between these dispositions within online learning environments as a whole. The inconsistent nature of studies into the performance of introverts and extroverts within online learning (Bishop-Clark, Dietz-Uhler, & Fisher, 2007; Al-Dujaily et al., 2013), suggests that the application of this disposition in personality is not being factored into understanding online learners in a manner that contributes in a relevant manner.

Attention

Attention as a factor in learning has been an ongoing subject of research. Historically, the topic has addressed the matter within the context of a traditional instructional environment and in general has provided similar outcomes. In a study, McLaughlin et al., (2014) reported "a growing body of literature consistently points to the need to rethink what is taking place in the classroom. Research shows that students' attention declines substantially and steadily after the first 10

minutes of class” (p. 236). This is consistent with other studies going back almost 40 years showing similar drop offs in attention at around 10-18 minutes (Johnstone & Percival, 1976). While there is not full consensus, outcomes from studies performed in the last few decades indicated that attention span within a learning setting typically ranges on average from 10-20 minutes before a drop-off in learning and attention occur and beneficial cognitive outcomes are significantly diminished. Strategies such as activity shifts and scheduled breaks to provide mental refresh have been employed with limited success (Binder, Haughton, & Van Eyk, 1990), but the barrier to sustained attention fostering deep contiguous learning has seemed to be a matter of mental capacity limitation with cognitive loads overwhelming the individual’s ability to sustain effective ongoing processing. The endurance issue is considered by some to be an impasse and matter of design restriction for human learning as it “can interfere with students’ motivation to learn” (Kim & Frick, 2011, p. 3). The only solutions therefore considered are to find strategic coping skills to minimize the impact on instruction methodologies and curriculum design. Some concepts included incorporating intervals for cognitive recovery, while others have proposed activity shifts to enable engagement in different areas or methods to allow for the break while still being able to utilize the available time (Binder et al., 1990). It may be possible to engage a single topic of inquiry and maintain a degree of focus by approaching a topic through different lenses of engagement to deal with a subject but from different perspectives. However, this still falls within the constraints of cognitive load and attention span limitations. For most researchers, the central issue tied to attention is student cognitive load and mental fatigue. Block, Hancock, and Zakay (2010) put cognitive load in terms of “the amount of information-processing (especially attentional or working-memory) demands during a specified time period; that is, the amount of mental effort demanded by a primary task” (p. 331). However, the behavior

and impact of cognitive loads is not necessarily constant. When looking at multitasking within action game environments compared to multimedia tasking, there are distinctive performance differences. For example, the conditions and context of the processing are determinant factors that gauge as to what bearing a given demand has on the individual's ability to continue or experience drop off due to mental fatigue (Nordin et al., 2013). The perception that a differentiation exists in regard to processing of multiple tasks within action games is not necessarily agreed upon, as other studies suggest that the format of games is responsible for the emergence of a reduction in the attention span in students (Annetta, Minogue, Holmes, & Cheng, 2009). Despite concerns over the risks of cognitive overload from gaming multitasking, "other evidence shows enhanced performance from these formats" (Courage, Bakhtiar, Fitzpatrick, Kenny, & Brandeau, 2015, p. 19). Additionally, there are indicators of other benefits with different games including improved attention spans (Courage et al., 2015). The issue of attention is key when considering flow state. It is the allocation of attentional resources that ultimately determines the impact of the experience on time perception. This is accomplished through reaching a level of complete absorption into the associated tasks of the game play so that nothing merits attention (Curran, 2013). Within this degree of immersion, it is possible to achieve a flow state, but all conditions must be met to reach the point where the activity becomes the sole focus and interest (Cairns, Cox, & Nordin, 2014). At this point, if conditions are right, all sense of time and external things is lost to a complete absorption.

Learner Distinctions

"People approach online learning in different ways" Russell, 2002, p. 26). There is growing evidence to support the argument that it is the characteristics of the learners themselves that may function as a principal determinant (Stone, 2017). This finding could support studies

that concentrate on correlating individual psychological factors, such as personality, learning styles, temperament, or motivation, with success in online learning (Fomunyam & Mnisi, 2017; Yukselturk & Top, 2013; Golladay et al., 2000; Pintrich & De Groot, 1990). Then again, the characteristics of the learner may serve as a more extensive and prominent component to account for within a comprehensive perception of the purpose, design, function, and effectiveness of the online learning environment itself. To that end, it is essential to fully understand the learner as an independent dimension of learning within the online environment, and not in terms of a behavior engine. An individual is defined by the specific factors associated with them, but in terms of the interaction of them holistically as a system. This can be understood when perceiving individuals as a functional collection of psychological, cognitive, and behavioral dynamics. The unique configuration of these dynamics and the influence they have when interacting within environments and situations, as well as with other systems presents them on a systemic level rather than solely as single variables. In turn, this systemic function enables “interpretations about self and world” (Blandin, 2013, p. 133).

The unique aspects of the individual learner coalesce into a distinct state of individuality and it is within the dimensions of this state that learning is experienced. These distinctions should be of paramount interest to researchers in order to understand the learner and not simply rely on “past achievement and cognitive capacity” (Richardson et al., 2012, p. 2). As the student population has changed (Richardson et al., 2012), so has the need for understanding the learner on a holistic level. How these distinctions are understood is not agreed upon. Younie's (2001) understanding follows the concept of cognitively flexible literacy is not entirely clear. It is uncertain if the intention is to infer that online learners should develop along multiple approaches of learning, or if the emphasis is more on the manner in which information is processed within

the learning environment by the individual.

Personality

What is personality? According to Berecz (as cited in Ferro et al., 2013) personality is “a stable core of emotions, dispositions, attitudes, and behaviors [sic] that uniquely characterize a person at a specific point in time and shape development across the lifespan” (p. 7). Personality is a key aspect of many of the attributes and determinants that define individuality. While not the only one, it is an essential component in articulating the differences in learner types. There are multiple dimensions that shape differences in online learners and are key to helping to categorize and define them. The use of any single dimension of an individual learner as a predictor offers limited reliability in determining their behavior within the online environment. As is the case with game players (Birk, Toker, Mandryk, & Conati, 2015), it is necessary to consider all aspects to adequately understand the learner on a holistic level.

Within different studies there have been indicators that the function of learners within online instructional environments is governed by multiple factors (Kizilcec & Schneide, 2015; Kalyuga, Ayres, Chandler, & Sweller, 2003; Mayer & Massa, 2003).

When considering the use of personality factors in developing a typology, it is necessary to include psychological types into the process (Bateman, 2012). However, caution should be taken with this presumption as “psychological types have been understood as rigid categories of personality” (Bateman, 2012, p. 55), and a degree of flexibility would yield better outcomes in differentiating and defining specific types. While Bateman (2012) specifically addressed game player types, the principles presented could be considered as being equally valid and applicable to online learner types given the similarities of the online gaming and learning environments, as well as in terms of the functional purpose of both online games and online instructional

environments as learning systems. One potential reasoning for this correlation lies within the nature of nuances of the engagement and experience channel. Personality, as defined in the MBTI, supposes individuals in terms of how they rate within four axes of bimodal psychological types. While historically these have been considered discrete types, a greater degree of flexibility may be more appropriate. Personality is one such channel through which individuality is manifested and considered to function as a fundamental factor of individual distinction (Irani et al., 2003).

While there is no clear consensus regarding how personality is to be defined, there exists a diverse range of interpretations (Tlili et al., 2016). In examining the online learner in higher education, the perception of personality as a contextual internalized system that is dependent upon the experience being encountered (Zafar & Meenakshi, 2012) most closely aligns with potential differentiation between the learner within online learning environments and traditional, face-to-face instruction. Though there may be good reason to take personality into consideration when trying to define and understand online learner types, such as utilizing specific personality types as a primary means for determining online instructional design, delivery, and success prediction (Moller & Soles, 2001), this would result in outcomes that are problematic, inconsistent, ineffective for a number of individuals unless combined in with additional factors represented the full spectrum of the individuality of the learner. Avoiding the use of personality traits and dispositions as a primary means of defining learners is strongly advocated; it is acknowledged that there are relevant differences arising from the various aspects of personality (Irani et al., 2003; Tlili et al., 2016).

Personality is a key channel through which individuality is manifested and considered to function as a fundamental factor of individual distinction (Irani et al., 2003). In terms of the

impact of personality with the learner, Tlini et al. (2016) indicated that there were two primary means of influence on: 1. a learner's feeling and 2. their behaviors. The effect of these factors translates to other dynamics which can be associated within the unique learner types. Tlili et al. (2016) went on to suggest that personality is "responsible for how a learner learns, communicates with others, recalls information, solves problems, takes notes, etc." (p. 812). While the notion of personality as a key influencer of many facets of the make-up of the online learner does have support, its role as such a foundational and holistic determining force is not fully founded. This stance may be dependent upon how the concept of personality is to be defined and understood. As one of a number of distinguishing factors, it is not central to defining a specific learner type. However, if the intention is to define personality as a broader concept that emerges from the convergence and interaction of the various dimensions that constitute the individual within the context of online learning, then there could be argument for Tlili et al.'s (2016) assertion. This is not, however, what their study suggests. Their recognition of key internal variables within the individual does align with the supposition manifested in proposed taxonomy. Personality factors should be understood within the correct context in order for them to be effectively applied, whether they be correlated with the MBTI, Big Five, or other personality models.

Engagement Behavior

Various studies sought to develop a generalizable means of predicting success and performance (Lomas, Patel, Forlizzi, & Koedinger, 2013; Bonafini, Chae, Park, & Jablonsky, 2017; Cole et al., 2017). As with this study, those endeavors often focused on specific cognitive traits or behavioral patterns as indicators and elements for measure. The current study being undertaken, while building on the existing body of research, seeks to perceive the learner holistically within the context of multiple identity dimensions to fully comprehend who they are

within the environment. Engagement behavior “relates to participation and involvement in activities” (Wang, 2017, p.80) within the learning environment. Understanding the role of this dynamic with the individual serves as a potential comprehensive construct for instructional engagement from a qualitative perspective with anticipated implications for all areas associated with online instruction within the higher education sphere. There are different ways in which engagement can be understood. Brown and Cairns (2004) examined engagement within the context of game play, position engagement as the first of the three levels of involvement, and as the entry point into immersion which “must occur before any other level” (p. 1298). The unique engagement behaviors of the individual serves as an essential dimension of differentiation for online learners (Bouvier et al., 2014b). As Bouvier et al. (2014b) observed, "several works highlight the significance of the user's engagement in different scientific fields" (p. 2) that utilize virtualized environments and online medium. Although engagement behaviors can be understood as being associated with motivation, they also function as a separate and unique factor within the context of differentiating online learner types as their effects can be experienced beyond the parameters of the instructional activities and interactions (Bouvier et al., 2014a). Furthermore, Bouvier et al. (2014a) suggested that there is a clear distinction between experiencing engagement and flow - or presence. While there are times within experiential learning activities where the learner can achieve flow/presence, there is no certainty or necessity of this. However, within the online learning environment, learners should be exhibiting engaged-behaviors during learning activities.

While understanding the personalities and dynamics of the learners before they enter the online learning environment may have some degree of practicality, it is understanding who they are and what they do within the online learning environment that ultimately is most valuable.

The challenge to using entry behaviors and attributes is that once an individual acclimates to a new environment, or after an affective situation or circumstance has passed, those initial understandings may or may not continue to be valid and applicable. Conversely, having a strong understanding of an individual learner online based on their persistent distinctive type within an online learning environment affords a higher probability of consistency and continuity in how they respond and perform. Yukselturk and Top (2013) acknowledged that the characteristics of the individual learner impact their behaviors and activities within the environment, the assessment of the learner's characteristics in terms of course entry relates more to circumstantial or situational behavior and is likewise transient in nature. If there is to be an understanding in the differences between different types of online learners, then the examination must take place within the environment as a whole. To restrict the perceptions of online learner types strictly within the confines of a particular facet of the environment would ensure that any insights gained would be skewed and incomplete. Identity as a social construct presents interesting considerations. As noted by Lloyd et al. (2017), it is "dependent on context and reciprocal interactions with others." (p. 155) However, beyond this, there are other factors that may be considered influential in defining identity. Still, the point that identity determines response is valid.

Considering the nature of user engagement, Attfield, Kazai, Lalmas, and Piwowarski (2011) stated that "user engagement is the emotional, cognitive and behavioral [sic] connection that exists, at any point in time and possibly over time, between a user and a resource" (p. 10). Within the context of education, engagement can be seen as "the behavioral intensity and emotional quality of a person's active involvement during a task" (Reeve, Jang, Carrell, Jeon, & Barch, 2004, p. 147). Though there is no standard engagement precept, its characteristics are

closely associated with personal motivation, and is a construct “that encompasses ‘behavioral’ (participation, positive conduct, effort), ‘emotional’ (interest, positive emotions), and ‘cognitive’ (psychological involvement in learning, self-regulation) dimensions” (Bouvier et al., 2014a, p. 493). In the case of behaviors, it is necessary to assess the matter of individual motivation (Bouvier, 2014a).

Based on observations from existing research into user engagement which Bouvier et al. (2014b) noted fell across a range of disciplines, four (4) types of engaged-behaviors were identified:

- Environmental, in relation to the need for autonomy and directed towards the environment or frame that support the activity
- Social, in relation to the relatedness need and directed towards the social connections that may occur during the activity
- Self, in relation to the autonomy need and directed towards the character or role adopted during the activity
- Action, in relation to the competence and autonomy needs and directed towards the actions to perform during the activity (Bouvier et al., 2014b, p. 11)

Bouvier et al. (2014a) offered four (4) engagement behaviors as being supportive of and aligned with SDT. They place these within the context of "high-level engaged-behaviors [sic]" (p. 11) that are psychologically derived from the individual. Given the self-perceptive nature of these, there is the potential for applying this concept within the online learning environment. However, within the context of higher education online learning, additional types should be considered based on motivation and other determinant factors. Additionally, there can be a perceptual difference between one's self-perception as a learner within a traditional face-to-face environment and the online learning environment. As is seen in behaviors within social media and other online channels, a participant may and often does assume a persona to some extent. This may not be to the degree of a full-fledged alternate identity but may be to the degree where

their behaviors and attitudes would differ from a face-to-face situation. Some studies indicate that within online environments (i.e., chat rooms, social networks, etc.), individuals experience a perceived degree of anonymity and will act in a manner contrary to their typical real-world characteristic (Bell, Smith-Robbins, & Withnail, 2010; Bostan, 2009; Kowert, Vogelgesang, Festl, & Quandt, 2015). Within an online learning environment, there could be a heightened degree of critical response if the means of interaction is text-based and asynchronous. Also, some individuals exhibit alternate confidence levels than they would in the traditional situation. This could be manifested as an increase or reduction of participation or communication, depending on other factors, such as comfort level with the mediating channels technology, written communication skills, language familiarity, or interpersonal relational feelings, like shyness, anxiety, etc. So, a student could perceive their presence within the online learning space as being representative of who they are as a persona rather than as a true reflection of their real-life identity.

Aside from the direct correlations with immersive learning, this personalization may still take place. Rather than in terms of appearance, this could be manifested through more conceptual embellishments such as participation behaviors, demonstrated knowledge in responses, competitiveness with others, dominance of discourse, etc. From these, distinct type attributes can emerge.

Motivation

Some of the represented characteristics are defined in a loose and nebulous manner. The vague nature of these calls to question their validity and relevance within the current application of this study. Motivation is a key differentiating factor that is used to identify and describe unique online learners. Yee et al.'s (2012) examination into gamer motivation strongly parallels

the dimensions suggested by Humari et al. (2014). In connection with these five key dimensions of play motivation, there are some relevant correlations, but the overall emphasis and focus must be understood within the intended context of game players. When assessing the similarities between game players and online learners, the dimension of motivation is considered a common influencing factor with direct correlation to the meaningfulness and effectiveness of individual's experience within the environment. While the ultimate concern is not defining the "successful learner", there still is value in being able to exemplify the motivated learner. Motivated learners are "enthusiastic, focused, and engaged," stated Garris et al. (2002), and "their behavior is self-determined, driven by their own volition rather than external forces" (p. 444). This assertion suggests that these learners will be intrinsically motivated, and in turn, will exhibit autonomously-oriented behaviors (Bzuneck & Guimarães, 2010, as cited in Beluce & Olivera, 2016). While the supposition postulated by Garris et al. (2002) potentially could represent a valid conjecture for one type of motivated learner, it does not necessarily represent all types of motivated learners.

As a determining factor, motivation should be evaluated and considered in the differentiation and classification of online learner types as a unique, standalone dynamic rather than as a by-product of the interaction of other psychological systems. It stands, as Rufini et al. (2011) noted, as "a critical determinant of the level and quality of learning and performance" (p. 1). Each individual possesses a broad spectrum and traits and dynamics that work together and manifest their "response to environmental influences" (Blandin, 2013, p. 119). A key influential factor of learning is motivation (Lim, 2004). Though motivation is considered an important factor in a number of areas related to the structure and effectiveness of online environments (Vassileva, 2012), and attempts to recognize motivation as a significant factor of influence have

been made (Neves & Boruchovitch, 2007), it has not been adequately addressed in educational research (Chen et al., 2010a) or within the context and purpose being undertaken by this study.

Both in game play and online learning, motivation is often considered a critical factor and determinant of success. Motivation is an essential aspect of learning. Though often simplified into intrinsic and extrinsic modes, it represents a more complex and granular dynamic that is key to understanding the game player and learner alike. Malone's (1981) three categories of challenge, curiosity, and fantasy, while well suited for game development, may be of limited correlation to the learning sphere. Additionally, according to Ciampa (2014) challenge and curiosity function as relevant and active motivating factors in learning and this perception does have some support (Leung, Virwaney, Lin, Armstrong, & Dubbelboer, 2013; O'Brien & Toms, 2008). However, the concept of fantasy is not quite as direct. Where it does impact learning is within the context of such activities as role playing, simulations, and gamified learning solutions. These concepts are able to leverage fantasy to enhance the immersive quality of the experience and define the degree to which the learner is engaged. In turn, this can foster a stronger flow state through which more of the individual's cognitive resources are focused on the situations and problems at hand within the environment. While some studies have examined the relation of motivation to specific aspects of the individual, such as demographics (Kahn et al., 2015), there is no support for a definitive correlation.

White (1959) functionally envisioned effectance motivation as an all-encompassing conceptual root from which more specialized motivators, including "cognizance, construction, mastery, and achievement" (p. 323) emerged as the individual develops from childhood into their adult years. Later research (Malone, 1981; Yee, 2006a; Bzuneck et al., 2010, cited in Beluce & Olivera, 2016) extended these to express different intrinsic motivation, with Deci and Ryan's

(2008) Self-Determination Theory (SDT) offering a more holistic explanation of the differing functions of both intrinsic and extrinsic motivation types.

Those studies including motivation as a factor typically address its impact on learning within online instructional environments, centering on student success (Lim, 2004). Kizilcec and Schneide (2015) understood motivation as being "a lens of understanding learner behavior" (p. 2). However, their assertion of there being a significant correlation existing between an online learner's choices and their motivation to engage in the instructional space may be understood as equating to actions being a manifestation of internal intention. However, there may be no difference between implicit and explicit actions that deal with the originating drivers. If implicit actions fall within the realm of automatic responses and reactions that are not initiated or governed through conscious awareness or precognition, and explicit actions are those that are directed through clear forethought, planning and controlled awareness (Bartle, 1996; Tondello et al., 2017), then the choices of a learner cannot be consider the "expressions of learner's own motivations for engaging in the environment" (Kizilcec & Schneide, 2015, p. 2). Though some studies suggest that the correlation choice and motivation may exist (DeBoer et al., 2014), it is perhaps more appropriate to state that the mechanism and nature of choice is a viable aspect of expressing individuality.

Historically, motivation was understood to work along two paths, the intrinsic and the extrinsic (Beluce & Olivera, 2016). Though Stipek (1998) suggested that intention was conceptually conjoined with motivation as a source of causality, it should be considered "a highly complex object" (Maieski, de Oliveira, & Bzuneck, 2013) with the level of distinctive dynamics meriting a more in-depth definition to be properly perceived and applied for distinguishing different online learner types. While the traditional bilateral notion of motivation

is not as effective as the extended concepts provided by SDT, Rufini et al., (2011) suggested that it can foster understanding of the dominant influence that guides an individual's behavior. If extrinsic motivation is understood to be control-oriented, and intrinsic understood to be autonomous-oriented, then any given behavior by an individual can be seen as being guided by a motivation that is to one degree or another based more on control (extrinsic) or autonomy (intrinsic) (Beluce & Olivera, 2016; Rufini et al., 2011; Bzuneck et al., 2010; Deci & Ryan, 2000). This is not to say that an individual's motivation guided only at the extremes of extrinsic or intrinsic motivation, but more in terms of degrees with emphasis towards one or the other. This behavioral guidance, however, does not represent a measure that stands in the place of the motivation type of the individual, but would be a separate contributing dynamic.

Learning Strategies and Preferences

“There is no one preferred learning style that works for all students or even for any one particular ethnic or cultural group” (Mestre, 2006, p. 28). Kinshuk et al. (2009) stated that “the area of learning styles is complex and many questions are still open, including a clear definition of learning styles, a comprehensive model which describes the most important learning style preferences, and the question about the stability of learning styles” (p. 270). Though affirming the impact of a learner’s individuality, Al-Dujaily et al. (2013) emphasized the learner’s preferred learning styles as being the key indicator of learner distinction. It is within this context that personality types “may influence on how people were able to learn” (p. 22). Beyond the concept of learning styles, the online learner is complex. While a number of researchers have investigated the concept of learning styles (Abdullah et al., 2015; Becker, 2005; Chen, Jones, & Moreland, 2014; Fariba, 2013; Felder & Spurlin, 2005; Gülbahar & Alper, 2004; Mupinga, Nora, & Yaw, 2006; Pashler, McDaniel, Rohrer, & Bjork, 2009; Rakap, 2010; Shahabadi & Uplane,

2015), no definitive consensus or validation for this precept exists. As such, it is perhaps more appropriate to think in terms of the learning preferences of individual learners. The idea of personalized learning encompasses aspects of learning preferences, strategies, and behaviors (Mestre, 2006). The intention of several of the theories and models centering on the cognitive and learning styles of the learner have been used to evaluate the way in which individuals learn (Gülbahar & Alper, 2004).

This is not to say that learning preferences could not factor in success as the preferences of the individual learner could impact the level of engagement, focus, and motivation. While initially perceived, this, in fact, may not be the correct assumption. Within this higher education context, it is established that the strategies students employ to self-regulate their learning impact their academic performance (Richardson et al., 2012). Students differ in the strategies they employ to self-regulate their learning (Barnard-Brak et al., 2010), as well as the frequency with which they utilize these strategies (Dörrenbächer & Perels, 2016). These individual preferences likely reflect the strategies learners have been taught previously and/or found to be helpful; strategy utilization preferences may also reflect the constraints of one's learning environment (Broadbent, 2017, p. 24).

Temperament

Weber (2007) explained that “an individual’s personality is very complex as it includes the emotional and behavioral components that make up temperament” (p. 21). A common challenge in several areas of study relates to the lack of agreement or consistency regarding concepts, terms, and definitions. This lack of consensus exists as well concerning the idea of temperaments (Goldsmith et al., 1987). While there are some generalized points of agreement, such as the notion “that temperamental dimensions reflect behavioral tendencies rather than map

directly onto discrete behavioral acts" (Goldsmith et al., 1987, p. 507), the diverging aspects are quite specific in nature and represent areas of contention that are not easily reconciled (Goldsmith et al., 1987).

Some consider temperaments as being inherent traits that are present within the individual from an early age and are not associated with those dynamics of personality that are influenced by environment (Goldsmith et al., 1987). However, this understanding assumes that environmentally-related traits are transient in nature (Goldsmith et al., 1987) rather than considering that unique contextual temperaments may be a stable preexisting factor within the individual. Thomas and Chess (Goldsmith et al., 1987) offered a different perception of temperament, explaining that it contextualizes behavior, providing researchers with an understanding of the how, what, and why (Goldsmith et al., 1987). This role is more closely aligned with the conceptual understanding taken with this study. Therefore, it is within the first temperament boundary consideration offered by Goldsmith et al., (1987) that the conceptual definition used in this study is most effectively articulated where it is seen as "an independent psychological attribute" (p. 508), whose influence is understood through its interaction with other factors (Goldsmith et al., 1987). This concept is further defined within the third consideration as Goldsmith et al., (1987) remark that temperament functions as "a dynamic factor that mediates and shapes the influence of the environment on the individual's psychological structure" (p. 509). As such, it should be expected that "a similar stimulus may evoke different behavior in different individuals" (p. 509). However, rather than expecting different environments to generate similar responses (Goldsmith et al., 1987), there should be the expectation that unique environments would elicit different responses.

Temperament and personality are strongly associated. This point was highlighted by Blandin (2013), who observed that they “are thoroughly enmeshed in experience and expression and therefore the terms are often used interchangeably” (p. 119). While a connection between these two factors can be asserted, they should not be perceived as synonymous. Each possess distinct attributes and influences and originates from different contextual dynamics of the individual (Blandin, 2013).

Online Learner Categories and Types Contributing to the Proposed TOLT Model

The primary focus of this study was the development of a taxonomy intended to identify and articulate the distinctive types of learners engaged in online instruction within the higher education context. Based on the findings of the meta-analysis of existing educational research into online learning and online learners, and through the assessment and incorporation of game player research, the TOLT model emerged.

Table 6

The Online Learner Type Categories and Associated Types

Type Category	Macro Level Type	Meso Level Type	Micro Level Type
Creator	Theorist	Architect	Formulator
Explorer	Wanderer	Discoverer	Analyzer
Socializer	Networker	Collaborator	Encourager
Rival	Contender	Victor	Subduer
Doer	Completer	Accomplisher	Overachiever
Braggart	Boaster	Grandstander	Know-It-All

The online learner type categories and their affiliated type identifiers, as shown in Table 6, were considered a central factor in the TOLT model. These categories and their distinctive types provided a relevant structure through which the individuality of the online learner could be investigated and understood beyond the limitations of single objectives, such as performance

success, or attributes like learning styles. Rather this outcome offered an opportunity to affiliate the various dimensions of the complete person within the context of the online learning environment and be able to assess their function and purpose. As part of the initial development of the taxonomy, an evaluation of a number of models was made to see how the various players types aligned. While exact correlations do not exist between the generated online learner types and the evaluated game player type models, strong associations were noted and provide meaningful context for building effective definitions and articulations. Based on the comparisons made, shown in Table 7 on the following page, and the specific types identified for the taxonomy, relevant parallels were noted that merited utilizing the game theory research and constructs to model.

With distinct categories and associated types given to the online learners, this TOLT model takes into consideration the key defining traits and dynamics that differentiate one online learner from another, including motivational emphasis, motivational maintenance, online engagement behavior, and information and knowledge management. This taxonomy provides an explanation of the online learner that is not a binary conception but instead, it allows understanding at multiple levels and degrees. Furthermore, by addressing these deeper attributes, it enables a wider range of research and development to continue.

The Taxonomy of Online Learner Types Model

The graphical model that illustrates the TOLT incorporates a number of the primary determinant attributes that aid in differentiating the distinctive online learner types. These are likely apparent as the design intentionally seeks to provide intuitive visual cues and information placement. However, some aspects may convey more latent representations.

Table 7

Alignment Comparison of Online Learner Type Categories with Player Type Models

Darby's Online Learner Types	Bartle's Player Types	Demographic Game Design DGD1	Demographic Game Design DGD2	BrainHex Player Types	Klug & Schell Player Types	Trojan Player Typology	Marczewski's Hexad Types	Social Media Learning Personas
Rival	Killer	Conqueror	Tactical	Conqueror	Competitor	Competitors	Achievers	Challengers
Explorer	Explorer	Wanderer	Strategic	Seeker	Explorer	Story-Driven	Free Spirits	Mavens
Socializer	Socializer	Participant	Diplomatic	Socializer	Joker	Socializers	Socializers	Connectors
Doer	Achiever	Manager	Logistical	Achiever	Collector / Achiever	Completionists	Players	Lurkers
Creator				Mastermind	Craftsman	Smarty-Pants	Philanthropists	Facilitators
Braggart					Performer			Irritants
				Daredevil	Director	Escapists	Disruptors	Salemen
				Survivor	Storyteller			Leeches

The model is composed of a number of symbolic and text-based elements intended to convey the key dynamics and dimensions that are associated with the established online learner categories and types. The configuration, presented in Figure 6 on the following page, offers dynamic representation of core conceptual aspects being presented in the study.

Category Division and Placement

Aside from the noticeable separation and labeling of the six learner type categories – Socializer, Creator, Explorer, Rival, Braggart, and Doer, the placement of each of these is intentional and offers key corresponding contextual insights into the particular categories and their related types. While not specifically communicating hierarchy, there are functional reasons for the locations. First of all, those categories occupying the top half of the model (i.e., Socializer, Creator, and Explorer), are all considered to have a Knowledge Construction association, represented in blue, whereas the three in the lower half (i.e., Doer, Braggart, and Rival), are all within Knowledge Acquisition shown in gray. These two opposing sides specifically deal with Information and Knowledge Management (IKM) framework.

Next, the associated colors of the category sections themselves are correlate to the specific online engagement behavior of the learner types, but also are meant to convey a minor degree of expectation concerning the overarching nature of the represented type group. The colors also offer a sense movement around the model which helps reinforce the notion that individuals will likely experience degrees of types rather than complete absolutes.

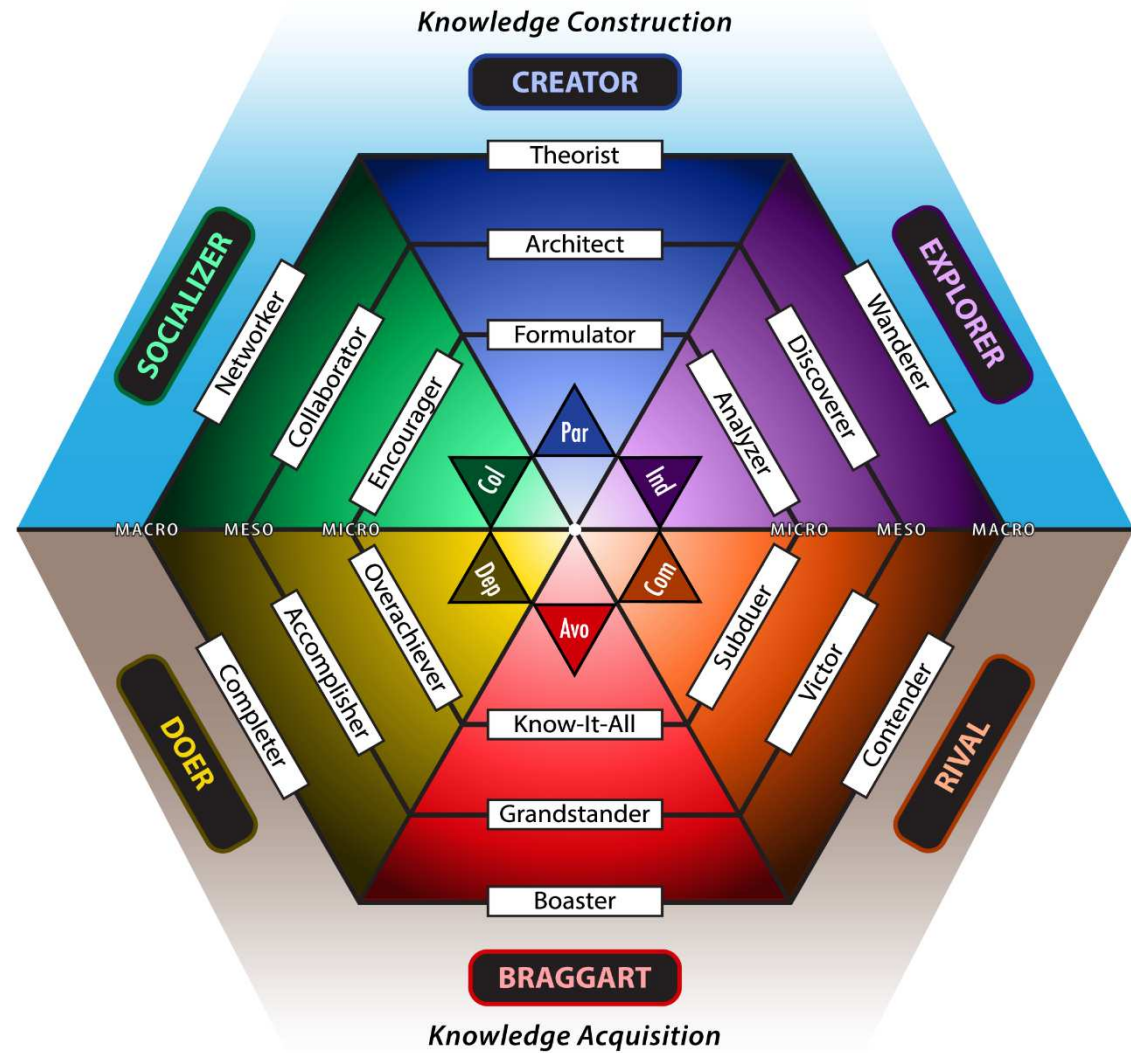
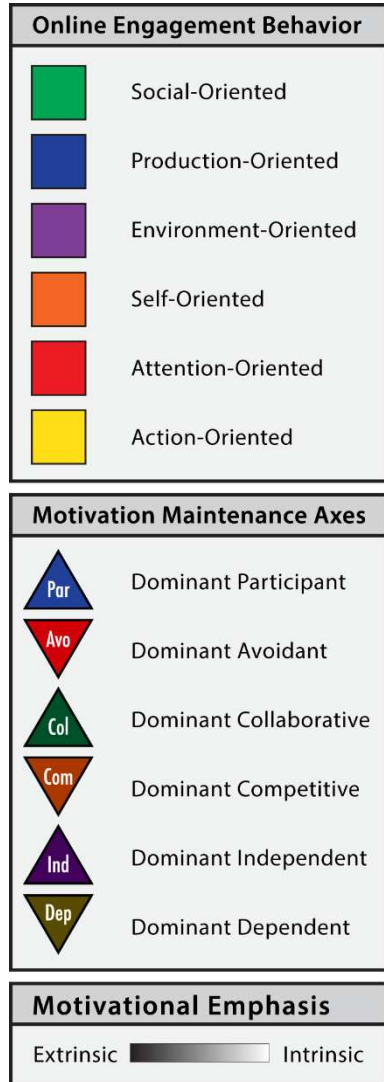


Figure 6. Taxonomy of online learner types.

It should be noted that while the color schemes of the design are intentional and meant to be representative of a dimension of differentiation, these are in no way founded in, supported by, or utilizing a theoretical perspective like color psychology (Valdez & Mehrabian, 1994). Finally, the placement of the categories corresponds to their relation across the three Motivational Maintenance axes which deal with how online learner maintains their learning motivation. Each category is considered a dominant to a particular dynamic axis and is counter to the dominant represented by the opposite category. In essence, in terms of the dynamics represented by these axes, each category is literally a polar opposite to the category that is adjacent to it.

Positioning of the Specific Types

Like the category groups, the locations of the specific online learner types have functional relevance. Within the model, there are three tiers - macro, meso, and micro. These correspond to the levels of behavioral function of the specific learner type in relation to the overarching conceptual makeup and nature of its parent category. The macro signifies a broad, high-level identity and behavioral activity dynamic. It is the most generalized perception of a particular online learner type and is predicted to correlate with the motivational emphasis that serves as the underlying means of governance for the individual learner's behaviors and actions. It then stands to reason that the meso level represents an intermediate level and the micro the narrowest and most focused level. This conceptual dynamic is represented by the applied gradient. The center of the model, where the color is lightest in all regards, is understood to be the zenith of intrinsic motivation whereas the outermost boundary represents the darkest shade, and consequently is representative of the greatest degree of extrinsic motivation at play. Each of the unique online learner types fall on either the macro, meso, or micro level and the naming of

the correlating type reflects a descriptive conceptual connection to the governing motivational emphasis.

Information and Knowledge Management (IKM)

The IKM measure addresses the fundamental way in which the online learner handles information and the main underlying perception of the use of knowledge in learning. This contributed to the creation of a key dynamic of the TOLT that facilitated the differentiation of the six learner type categories into two conceptual hemispheres – Knowledge Construction and Knowledge Acquisition. This dimension of the TOLT model not only generated a spatial division between the construction-oriented learner categories (i.e., Socializer, Creator, and Explorer) and the acquisition-oriented learner categories (i.e., Does, Braggart, and Rival), but it also afforded a more latent separation based on the inherent nature of the different categories. As shown in Table 8, the two sides of this diametrical axis indicate the individual learner's inclinations within the online learning environment as either emphasizing knowledge construction or acquisition. The aspects of their functional approaches and intended purposes communicate aspects of the learner types categories that are associated with each that reveal insights into learner drive and behavior.

Table 8

Information and Knowledge Management Emphasis

Handling Type	Functional Approach	Intended Purpose
Construction	Apply, test, review, and repeat.	Developing new knowledge.
Acquisition	Acquire and retain information.	Using existing perceived knowledge.

Motivational Maintenance (MM)

Another dimension integrated into the model was the motivational maintenance (MM). This area of consideration correlated to the dynamic associated with the primary vectors of influence along with online learner derive their motivation to sustain and continue to pursue learning within an online instructional environment. These vectors, represented in three axes, correspond to specific learner type categories with distinct diametric motivational factors. Each associated learner category represents one of the dominant types of motivation at either extreme of a respective axis, as shown in Table 9.

Table 9

The Motivation Maintenance Axes

Dominant Type	Motivation Maintenance Axes			Dominant Type
Explorer	Independent	–	Dependent	Doer
Creator	Participant	–	Avoidant	Braggart
Socializer	Collaborative	–	Competitive	Rival

The concept of motivational maintenance relates to the “processes that direct, energize, and sustain human behavior” (Grant et al., 2007, p. 54). As a differentiating factor, this can be perceived as three (3) diametrical axes which “describes the learner along the bipolar scale dimensions” (Aragon et al., 2002, p. 18). The defined online learner types demonstrated a degree of emphases on each of these, and each of the learner type categories functioned as a polar extreme to these axes, exhibiting a dominant representative of one of the six sides seen within the three axes. These dominants were situated at a position in conjunction with the corresponding and opposite polar dominant of the axes. As the dynamics of these three axes is considered a critical aspect of the behaviors of the learner type categories they correspond to, it was deemed essential to provide a meaningful and definitive approach to represented them within the context

of the TOLT model. To accomplish this, the decision was made to incorporate multiple cues as to the intended function and translation of the elements. These took the form of directional pointers that also included corresponding colors to suggest the appropriate relationship with the dominant types for each axis and the correlating category type section, as shown in Figure 7. Additionally, the direction of the pointers was meant to further convey the increasing degree of dominance of the individual types within the category along the projected axis moving from the micro to macro levels of motivational emphasis.

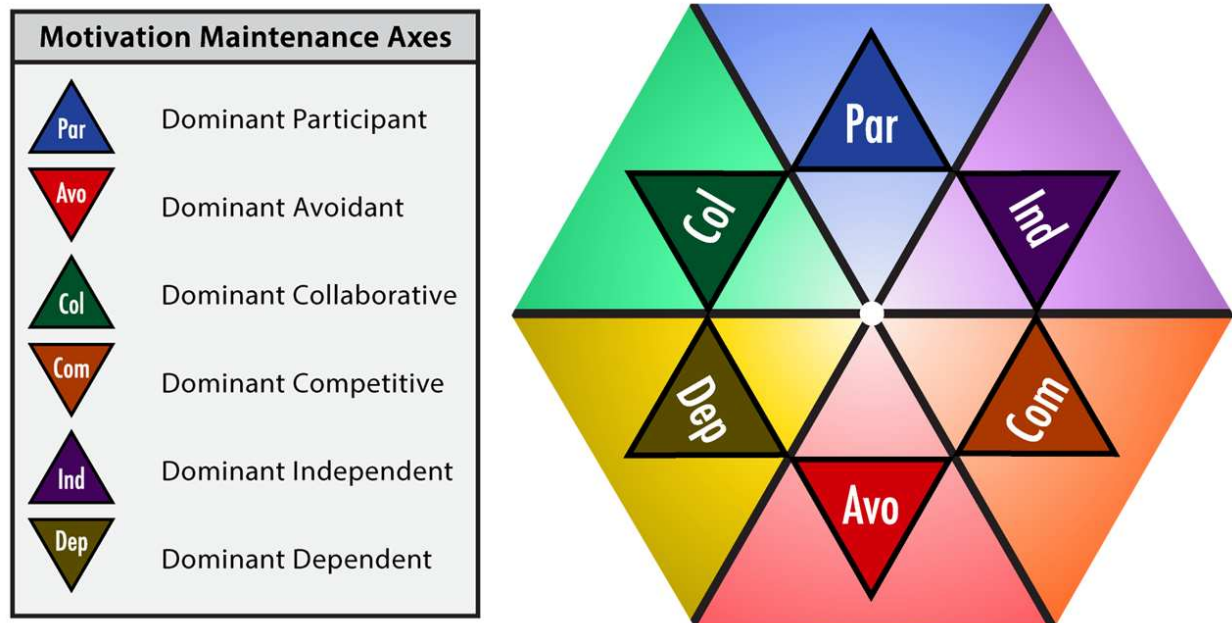


Figure 7. The motivation maintenance axes indicators.

Motivational Emphasis

The motivational emphasis in the model references the degree to which the factors associated with a given learning type are intrinsically or extrinsically influenced and are manifested. This emphasis corresponds to the level of behavioral function indicated in the macro, meso, and micro tiers of the model. To communicate the influence of the motivational emphasis within the TOLT model, a gradient is used that can be understood to represent the greatest

intrinsic emphasis at the center of the model and the greatest extrinsic emphasis along the parameter of the model's boundary.

Online Engagement Behavior (OEB)

The purpose of the OEB measure was to provide a context for the online learner's actions. The context these engagement behaviors provided were derived from activity theory and were associated with and determined by the emotions an individual is seeking within their framework of interaction (Bouvier et al., 2014b). Considering the core emotion motivators that provide context, each of the OEB's engagement behavior orientations has a primary emphasis with a specific type. These are understood as follows:

- Self-Oriented individuals are concerned with “distinguishing themselves” (Bouvier et al., 2014b, p. 13), which associates with the Rival;
- Action-Oriented individuals are concerned with “accomplishment” (Bouvier et al., 2014b, p. 13), which is associated with the Doer;
- Environment-Oriented individuals are concerned with discovery and “curiosity” (Bouvier et al., 2014b, p. 13), which is associated with the Explorer;
- Social-Oriented individuals are concerned with the idea of “relatedness” (Bouvier et al., 2014b, p. 13), which is associated with the Socializer;
- Production-Oriented individuals are concerned with the concept of conceptualization and creation, which is associated with the Creator; and
- Attention-Oriented individuals focus on posturing, which is associated with the Braggart.

To address those engagement behaviors exhibited by the Braggart and Creative online learner type categories, Bouvier et al.'s (2014a, 2014b) original model was extended from four to the six orientations indicated. The OEB associated with each of the learner type categories are represented within the taxonomy model as specific colors – green for social-oriented (Socializer), blue for production-oriented (Creator), purple for environment-oriented (Explorer),

orange for self-oriented (Rival), red for attention-oriented (Braggart), and yellow for action-oriented (Doer).

Online Learner Motivations (OLM)

The indicator of dominant motivation for the online learner types was derived from self-determination theory (Deci & Ryan, 2000) and the work of Rufini et al. (2011) and Tondello et al. (2016). At a high-level, these measures can be understood in terms of their original states of being extrinsic or intrinsic in nature. However, to afford the differentiation between learner types, a great degree of granulation was provided which, as was the case with the OEB measures, suggested dominance for each OLM with specific types. These six motivations follow a progression from most extrinsic to most intrinsic, and are

- External (Extrinsic), where “behavior is controlled by specific external contingencies” (Deci & Ryan, 2000, p. 236). This would be expected to be primarily exhibited by the Rival;
- Introjected (Extrinsic), where “contingent consequences are administered by the individuals to themselves” (Deci & Ryan, 2000, p. 236). This would be expected to be primarily exhibited by the Creator.
- Identified (Extrinsic), where “process through which people recognize and accept the underlying value of a behavior” (Deci & Ryan, 2000, p. 236). This would be expected to be primarily exhibited by the Explorer.
- Autonomy (Intrinsic), where “the more control of a situation a person feels, the more likely they are to succeed” (Tondello et al., 2016, p. 230). This would be expected to be primarily exhibited by the Braggart.
- Competency (Intrinsic), which is “the feeling of having the skills needed to accomplish the task at hand” (Tondello et al., 2016, p. 230). This would be expected to be primarily exhibited by the Doer.
- Relatedness (Intrinsic), which is “the feeling of involvement with others” (Tondello et al., 2016, p. 230). This would be expected to be primarily exhibited by the Socializer.

Descriptive Personas

Depending on the conditions and the individual, “people take on multiple online identities” (Lloyd et al., 2017, p. 155). This is a primary consideration that provides some of the rationale for creating the taxonomy of online learner types. While the main emphasis for the taxonomy is to provide a deeper and more holistic awareness and understanding for learners engaged in online instruction in higher education, the notion of deriving descriptive personas to illustrate and articulate the key dimensions and facets of the various online learner types is quite pertinent. Still, this application of learner personas must be appropriately contextualized and not placed within the same usage framework as personas developed specifically for the purpose of evaluating online instructional design (Wilson, 2015). For the purposes of this study, the created personas presented will functionally exhibit a mix of role-based and identity-based elements to provide a cleared descriptive articulation of the defined online learner types within each of the established categories.

The Creator

The Creator category relates to an individual who manifests something from their own thought or imagination. They are Knowledge Constructionists with regards to how they manage information and knowledge. The personality disposition of Creators will tend towards introvert but may have extravert traits as well. Learners within this category will typically contextualize their actions within the online learning environment based on a Production-Oriented online engagement behavior and are concerned with the practice of conceptualization and creation. As such, they perceive the purpose of information and knowledge as being for the development of new concepts, solutions, and knowledge, and approach this perception through the application, testing, and evaluation of their knowledge.

Those within the Creator type category reside on the participant-avoidant motivational maintenance axis and are generally inclined towards the dominant participant position. Because of this, they derive their motivational energies and drive for learning from their experiences as participants and a personal quest for expression. While not exhibiting the highest degree of extrinsic online learner motivation, Creators are high nevertheless and tend towards being Introjected (Extrinsic). Rather than being driven by competition, Creators strive to have a deep comprehension and command of a subject and seek full mastery of a concept for the sake of knowledge and understanding. Within the Creator category there are three defined types – Theorist, Architect, and Formulator.

Theorist

Theorists are learners who tend to form contemplative, speculative, or proposed conjectural explanations with their available information and knowledge to address a question, needs, or problem. The Theorist represents the macro level engagement behavior within the Creator category. As such, they are more inclined to demonstrate the highest level of extrinsic motivational emphasis of the Creator types and focus more on high-level concept development over focused application.

While Mickey's statement that there were "learners who go into the course with a pure desire to learn not solely for the sake of passing the course, but to enrich their own personal knowledge and base knowledge with a bigger picture" encompassed the Creator learner category in many ways and touched on one of the key behaviors of the Theorist; forming contemplative, speculative, or proposed conjectural explanations of things. Mickey also noted that Theorists possess "[a] desire to understand or even a passion for the subject matter." That "bigger picture" perspective was shared by Wilfred who stressed his interest and preference for "being able to see

things beyond the obvious and look for connections” which was an excellent way to surmise motivation of the Theorist quite effectively.

Architect

Merriam-Webster (“Architect,” 2018) defines an architect as “a person who designs and guides a plan or undertaking” (para. 2). As a learner type, Architects are learners who function as the devisers and planners of solutions and ways to apply the information they acquire and knowledge they develop during the learning experience. The Architect represents the meso level engagement behaviors within the Creator category and demonstrates a movement towards intrinsic motivation. While the Theorist offers the high-level conceptual element, it is the Architect that takes this concept and generates a plan of action to translate knowledge into application.

The feedback provided by Martha had the potential to be placed within the context of a Doer learner, however, when talking about how her “approach” differed from others, she pointed out that “the way I go about [learning]” was very much a matter of taking what she was acquiring during instruction and generating a plan of “attack.” That intentionality and desire to devise a strategic approach for expressing understanding represented a strong correlation to the Architect learner type as it placed an emphasis on using the knowledge and information garnered from the learning process to conceive a solution or application plan. This constructive process was also reflected in Amelia’s response when she explained that she liked “[k]nowing the purpose of each class and understanding how the classes contributed to the ultimate outcome and goal.” This idea of bringing the concepts being developed into a blueprint that offered a clearer direction towards the goal suggested the notion of a comprehension process within the learning environment. This same function was eluded to by Craig when he mentioned that he strived to

“have a better sense of being able to process better” in order to “have a better perspective for how to encounter things in general.” The practice and taking ideas and concepts and figuring out ways in which they might be applied is indicative of the Architect.

Formulator

At the micro level Creator category’s engagement behaviors resides the Formulator learner type. Functioning as the most intrinsically motivated of the Creator types, the Formulator is the learner who will execute an action plan for taking information and knowledge and devising or developing an applicable method, system, or solution to precisely express and concept or insight. This type is focused on the tangible manifestation of outcomes derived from information and knowledge gained in the learning process.

As a Formulator type, Craig used his personal experiences taking online courses to explain that this type of user takes a conceptual plan and gains an understanding of “the way things are structured in order to execute” a relevant application of what is being learned. He further described his personal connection to this type in stating that he wanted to create ways “to access and have an educational experience when I can in a way that’s often times closed off for me.” Craig’s example as a Formulator aligned with the core nature of this Creator learner type as it demonstrated an emphasis on the implementation of a devised conceptual solution as a means to contribute to knowledge and for the sake of deeper understanding. Though somewhat more direct and pragmatic, Rory’s statement that he preferred “taking what I learn and doing something with it” was nevertheless akin to Craig’s. Likewise, the thoughts shared by Amelia clearly exhibited a Formulator mindset when she pointed out that learning is meaningful “[i]f it’s relatable and can be used on a day-to-day basis.” Additionally, she echoed the primary sentiments of the Formulator learner type in noting a preference to have “[t]he ability to apply

[what she learns] directly into action.” These all reflected a common desire of this Creator learner type.

The Socializer

The Socializer category relates to a fairly universal concept among models of player types (Bartle, 1996; Bateman et al., 2005; 2011; Tondello et al., 2016; 2017; Kahn et al., 2015). Learners in this type category emphasize engaging with others as part of the learning process. As with Creators, Socializers are Knowledge Constructionists with regards to how they perceive the management of information and knowledge. Their personality disposition will tend towards extravert. Socializers demonstrate a Social-Oriented engagement behavior in their approach to online learning and are focused on the ideas of connectiveness and relationship. Given this, they are extremely sociable, diplomatic, and communally-oriented and actively seek to build and maintain relationships and consider communities of learning an essential part of the learning experience. They see information and knowledge as a bridge and catalyst for relation building, collaboration, and providing support.

Learners within the Socializer type category reside on the collaborative-competitive motivational maintenance axis and are inclined towards the dominant collaborative position. Because of this, they derive their motivational energies and desires for learning from the social and collaborative dynamic experienced through their learning interactions. Notably and unsurprisingly, Socializers are inclined towards Relatedness (Intrinsic) in their online learning motivation. They are driven by a sense of connection, and so motivated by relatedness and purpose, seeking to contribute and assist peers by sharing their knowledge. Within this learner category there are three defined types – Networker, Collaborator, and Encourager.

Networker

Networkers are learners who strive to meet and connect with individuals who possess expertise, skills, and knowledge bases within diverse areas, and hold various organizational positions and roles. The Networker represents the macro level engagement behavior within the Socializer category. As such, they demonstrate the highest level of extrinsic motivational emphasis of the Socializer types, practicing a more generalized and surface approach to relationship development. These learners will likely be the first to attempt to add an instructor or fellow student to their social media networks (e.g., LinkedIn, Facebook, Twitter).

While a number of individuals recognized aspects of the Networker type, few were able to identify themselves in relation to it. Such was the case with Martha. Her immediate take on the Networker demonstrated a clear association with aspects of the type as she stated that she always liked “[t]o connect with other people and learn from them” and be able to get a sense of who was in the class. This precept correlated to a Networker’s focus on making contacts that are more about assessments of others and fostering access to beneficial resources. Wilfred’s explanation of a learner type provided a direct description of the Networker when he reflected that “[s]ome people just like to meet the others in class and get their contact information right off the bat.” When considering the motivation for this action, he went on to conjecture that often it could be “a first step towards building a learning group” but then indicated that he had experienced situations where “it ends up resulting in a LinkedIn request.” Networkers do not approach creating connections from inappropriate motives necessarily, they often just see their actions as a responsible first proactive step in engaging in learning.

Collaborator

Collaborators thrive on learning activities and strategies that center around group

dynamics and incorporate class and/or peer interactions and engagements as a part of the instructional process. These learners prefer to work collectively rather than on their own and perceive learning opportunities that include group discussions, team projects, or similar approaches to be most effective and beneficial. The Collaborator represents the meso level engagement behaviors within the Socializer category and represents a shift towards a strong intrinsic motivation within the category. Unlike the Networker, Collaborators demonstrate a broader engagement with others that reflects some of the primary characteristics of the category through more meaningful interactions on a deeper social level.

More than a couple of individuals identified with the Collaborator learner type. Rose stated in no uncertain terms “[her] preference for learning with others” and emphasized that she would “much rather work with others than work alone.” This was a fairly clear indicator, however, she followed up by professing “[her] love for collaboration.” This passion for engaging with peers or the instructor in the learning process is a key characteristic of the Collaborator and a hallmark indicator of a persuasion of this Socializer learner type. While there were some individuals that clearly indicated a connection with this learner type, others were equally clear about their aversion to being Collaborators, or any other Socializer. Clara acknowledged that “others have more interactions with the professor than [her],” whereas Rory offered a more direct assessment of his interactions and the reason he was not very sociable as he admitted that “I just keep to myself.” However, Martha’s thoughts provide a solid reasoning and appeal to the Collaborator types when she related that “[t]alking and interaction with [other learners] allows me to learn about what they are doing and what things help them to succeed.” Collaborators are not about taking, but rather thrive on the give and take of a mutually beneficial learner relationship.

Encourager

Represented by the most intrinsically motivated of the Socializer learner types, the Encourager resides at the micro level of the category's engagement behaviors. This type of learner provides a clear example of the Socializer manifested in its most profound state. The Encourager is a type of learner who is interested in and driven to share their knowledge with the express purpose of edifying and supporting others. These individuals function as mentors to fellow students, affirming voices to help others build confidence in their academic efforts, and sources of moral fostering involvement and participation. The Encourager is able to utilize the strategies of the Networker and Collaborator at a meaningful functional level as a means to connect and assist others. These learners may struggle with appropriate boundaries within the learning environment as their focus is primarily on assisting and supporting others.

The Encourager demonstrates the most intimate relational connection of the Socializer learners. The drive for these learners is strongly intrinsic with some, like Rose, wanting to find ways to promote inclusion in the group – “I like bouncing ideas off of other people.” While for others, there was a clear perception that their desire to engage and include others was derived from a more nature and innate state, like Donna who stated that “[m]y personality helps me engage with others online” or Craig who explained “I’m very social and I like interacting with people.” For Craig, however, this aspect of his nature truly differentiated him “I find that I engage really easily socially online,” he shared, “even in communities that aren’t really close knit or have had a chance to foster a sense of connection.” At the heart of what Donna, Rose, and Craig expressed were the foundational identifiers for the Encourager; that is, connecting with, including, and edifying those around them. This whole concept was eloquently captured by Donna as she shared that “[she] always prioritize[s] others’ needs first.”

The Explorer

The Explorer category encompasses those individuals who are very innovative and curious, and typically explore the options around them. They are Knowledge Constructionists with regards to how they manage information and knowledge. The personality disposition of Explorers primarily will reflect that of an introvert. Learners within this category will typically contextualize their actions within the online learning environment based on an Environment-Oriented online engagement behavior and are concerned with active discovery. Individuals identified with the Explorer type category reside on the independent-dependent motivational maintenance axis and are inclined towards the dominant independent position. As such, they derive their motivational energies and drive for learning from a sense of self-determination. Explorers are driven by curiosity about all things and seek to understand the potential, limitations, and capabilities of all elements and functions of the learning environment within which they are engaged in instruction. They will investigate all elements (i.e., systems, tools, functions, etc.) to discover and comprehend the full nature of that which is known as well as those aspects that may be hidden or undocumented. Explorers possess an Identified (Extrinsic) online learner motivation and maintain an awareness of, and appreciation for the latent nature of behaviors. These learners enjoy discovering how things work and will go to the lengths necessary to satisfy their curiosity. Within the Explorer category there are three defined types – Wanderer, Discoverer, and Analyzer.

Wanderer

While curious in nature, Wanderers are only mildly inclined to assess and examine the instructional dynamics of their learning environment. They are likely to take more of a casual approach to identifying, understanding, and exploiting the potential options available to them.

The Wanderer represents the macro level engagement behavior within the Explorer category. As such, they demonstrate the highest level of extrinsic motivational emphasis of the Explorer types and focus more on discovering and utilizing the basic aspects of their environment over engaging in a deeper examination of its potential.

The root nature of the Wanderer was seen as curiosity. Wilfred's drive to explore likewise stemmed from "[his] natural curiosity and love for learning new things." This basic curiosity peaks the Wanderer's interest to the point of examining the online learning environment, but only to the extent that it satisfies a surface interest, but not to a deeper committed level. This surface exploration provides a sense of awareness that, as Craig pointed out, "online learning gives you the chance to have a structured way to help get everybody in one space so you can interact well that way." This base perception of the Wanderer provided a delineation for it in relation to the other Explorer types.

Discoverer

The Discoverer is a learner that engages in an excavation of the learning environment to reveal operations, functions, and features that are meaningful and relevant. As a learner type, Discoverers are learners who demonstrate a high degree of innovation and perception in how they go about understanding the learning environment. While they will engage in a deeper level of exploration, they are not as concerned with assessing the full utilization of what is revealed to them as a result of their efforts. The Discoverer represents the meso level engagement behaviors within the Explorer category and demonstrates a movement towards intrinsic motivation. While having a more comprehensive understanding of the learning environment than the Wanderer, the Discoverer does not engage in realizing the meaning of what they have found and understand.

Whereas the Wanderer provided only a surface degree of exploration and insight, the Discoverer facilitated a deeper excavation of understanding. This was shown in Clara's perceptions of learning as she noted "[g]etting to open new windows of understanding" or with Craig's exclamation "I love the idea that there is more out there for me to discover!" A differentiator between seeing learning in terms of curiosity and as a channel of understanding and discovery was significant to conceptually contextualizing these types. While Wilfred demonstrated an understanding of the distinctions and agreed that at the Discoverer level the learner had "[t]he chance to explore and investigate," Craig demonstrated a stronger conceptual awareness of learning as this type as he observed that "[a] lot of people who have taken an online class...are either better at or are prone to have an interactive investigative approach to these classes where they're asking a lot of questions, clarifying a lot, and digging into things that may not make sense at first pass." This sense of excavation and deeper engagement reflected by Rory to a degree when he commented that he liked "being able to experience things first-hand and discover things for myself" typifies a Discoverer.

Analyzer

Within the Explorer category, the Analyzer represents the most thorough and inquisitive learner type. Functioning with a micro level engagement behavior, these individuals manifest the traits and practices of researchers, employing various methods and processes to experiment with the structure and functionality of the learning environment, testing its boundaries and gaining a clear command of the benefits and limitations that exist, and developing a complete picture of how to leverage what is available. The Analyzer demonstrates the highest degree of intrinsic motivation of the Explorer types and while most driven by deriving a comprehensive awareness

and command of the learning environment, they garner additional satisfaction in being able to share the knowledge.

The Analyzer is the most inquisitive and meticulous of the Explorer learner types. While the Discoverer was determined to be innovative and skilled at divulging the capabilities or explanation for something, the Analyzer represents the deepest degree of investigation and functional awareness. As Rory noted about learners related to this state “[they] will look at every option of what can be done and are the ones to go to if you need technical support or help in with something in the class.” While learners like Craig shared their “affinity for technology,” this aspect alone did not suggest being identified as an Analyzer. However, interests and thoughts, such as Craig’s perception that the online learning environment facilitated “access to better tools that you can help kind of tailor the experience to your own needs” provided a meaningful context to the purpose and role of this type. Likewise, his other shared reflection on the value of an analytical level of exploration further demonstrated an appreciation for what being an Analyzer provided, as he stated that when within online learning “I get to look up a word or term I don’t understand while I’m also learning without [...] disruption. I can follow a link, go down a rabbit hole of other learning on another topic if I’m interested.”

The Doer

The Doer category relates to an individual who is highly structured, logistical, and highly task focused. They are Knowledge Acquisitionists with regards to how they manage information and knowledge. Learners within this category will typically contextualize their actions within the online learning environment based on an Action-Oriented online engagement behavior and in turn are focused on the completion of designated and required tasks and their application to the achievement of objectives (both long- and short-term). The personality disposition of the Doer

will typically lean towards introvert. They are driven by a sense of the necessity of required tasks with regards to the desired accomplishment.

Learners within the Doer type category reside on the independent-dependent motivational maintenance axis and are inclined towards the dominant dependent position. As such, they derive their motivational energies and drive for learning from their perception of the correlation of requirements to goals. They are characterized by a Competency (Intrinsic) learner motivation which exemplifies their desired to have the necessary capabilities to accomplish required action items. Doers strive to achieve outcomes and reach goals by acting on things and demonstrate a high degree of focus and tenacity towards this end. Within the Doer category there are three defined types – Completer, Accomplisher, and Overachiever.

Completer

Completers are learners who tend to address only the minimal tasks required to reach a point of completion with respect to the current situation. They represent the macro level engagement behavior within the Doer category, and so are more inclined to demonstrate the highest level of extrinsic motivational emphasis of the associated types. This translates to a focus on getting through the required task with less emphasis on the quality of the resulting outcomes.

The Completer “will only put forth the least possible effort to get through” observed Amelia. The concept of this learner type framed within the context of minimal effort was shared by others as well with a range of perceptions regarding the extent to which the Completer was represented in online learning. There was a mixed view in terms of the prevalence of the type, where Martha considered that “[s]ome only did minimal interactions” while Clara suggested that “most are minimalist.” However, in terms of the Completer being present, others also suggested it was a definite type. Craig suggested the idea of the motive being one of comfort and

preference, as noted in his statement that there were “people who enjoy finding the minimal amount they can engage to get credit or what they’re looking for” whereas Wilfred’s comment that “[s]ome don’t usually participate and seem to only do the minimal needed to get by” seemed to be related more to engagement. Finally, the opinion expressed by Donna that these learners were “slackers that do the bare minimal” conveyed more of a statement on the learner’s work ethic and character. As the primary defining aspect of the Completer was their intention to only do what was necessary to finish, these views were all considered relevant at some level. The Completer, then, was apparent in their objectives and motivation. With Clara having stated that her motive was to “[j]ust get it done” and that she was primarily interested in “getting the grade,” this learner type appeared to be directly represented and a primary potential identifier for her.

Accomplisher

At the meso level of engagement behavior for the Doer category is the Accomplisher. This learner type, like all Doers, strongly emphasizes addressing learning tasks. However, the Accomplisher is more focused on a basic outcome. Rather than addressing the minimal tasks required, the Accomplisher is driven towards completing all tasks and achieving a meaningful outcome. This underlying need for achievement is a distinguishing factor in their academic performance.

While the Completer was seen as being associated with minimal effort, the Accomplisher was understood in a different light. Mickey appeared to identify with this learner type when he shared his own personal connection as he reflected

I am in that environment, probably driven by the carrot. The carrot being the completion of the class, the completion of a degree, or just the assignment. At some level there's a need for achievement that probably motivates me more than any other single factor that I can think of.

Likewise, Rose acknowledged her focus on similar qualities of the Accomplisher in stating “I just want to do the best I can, get the best grades that I can, and get everything in on time.” However, with Donna there were mixed indicators when she commented that “[m]y main motivation is to finish the class, so I do whatever the class assignment is or project is, my motivation is to get a good grade and check that off the list.” This suggested that there were aspects of the Completer as well as the Accomplisher at work. These individuals conceptually aligned with the Accomplisher learner types in that the outcome is assigned a greater relevance and emphasis. These learners were not interested or satisfied solely with completing required tasks as a means to an end but felt that achieving a meaningful outcome held value and was part of the motive for learning.

Overachiever

The most intrinsically motivated of the Doers is the Overachiever. Residing at the micro level of engagement behavior, this learner is characterized by a noticeable compulsion to exceed the requirements of a given assignment. While possessing the task-oriented practices of the Completer and the emphasis on quality outcomes of the Accomplisher, the Overachiever will typically breach the scope and expectations of what is required to accomplish a goal. In doing so, the learner likely perceives a greater sense of overall accomplishment and affixes an elevated value to the outcome.

The Overachiever, like the Completer, was a learner type that appeared to be recognized by a number of individuals. Though some saw this type within themselves, like Amelia who noted that “I tend to overthink everything and feel I must perform at a high level,” others clearly perceived it in others, such as Donna who commented that “you can totally see your over achievers that answer every question with at least two paragraphs.” Often the Overachiever was

not considered in a positive light and evoked a similar reaction to that of Rory who said that he had “seen others that write up very involved things that go on and on.” Martha provided a slightly different take on these learner types stating that they “always go the extra mile with their work and put tons of extra things in. These go getters in turn put pressure on the rest of us to take it up a notch or risk looking bad.” This perception offered a sense of the impact and influence these learner types may have within a group. However, as Wilfred noted “I think there’s a difference between those that go the extra mile for show and those that do extra because they are truly interested in exploring the subject thoroughly.” This suggested that the motive for the Overachiever may not have been as apparent as some considered.

The Rival

Learners within the Rival category are most clearly characterized by an innate need to prove themselves and a desire for a challenge. Those within this type category are highly competitive and focus on outdoing others to one degree or another. Their emphasis is on winning and being perceived as the best. As with Doers, Rivals are Knowledge Acquisitionists with regards to how they perceive the management of information and knowledge. Their personality disposition is heavily towards the extravert. Rivals demonstrate a Self-Oriented engagement behavior in their approach to online learning and are focused on those learning behaviors and actions they perceive will contribute to their success over other individuals or the group. As such, they are extremely confident and bold with regards to the learning engagements and interactions with others and are often construed as confrontational. They see information and knowledge as a strategic asset and potential weapon for gaining an advantage over others.

Learners within the Rival type category reside on the collaborative-competitive motivational maintenance axis and are inclined towards the dominant competitive position. They

derive their motivational energies and desires for learning from extrinsic rewards and challenge dynamic experienced through their engagements and interactions with other learners. Rivals are distinctly External (Extrinsic) in their online learning motivation and seek out competitive situations at all levels. Within the Rival learner category there are three defined types – Contender, Victor, and Subduer.

Contender

Contenders are learners who are inclined to take a competitive position within groups, but only to the extent that they will seek to challenge the position of others or look for points of contention to highlight. Representing the macro level engagement behavior within the Rival category, Contenders gravitate towards the confrontational dynamic of the group, but are not as focus on the outcome of competition as on the competitive behavior itself. They demonstrate the highest level of extrinsic motivational emphasis of the Rival types, practicing a more adversarial role to other participants.

The Contender learner type was demonstrated by a broader range of individuals than expected. Though not seeming overtly competitive, Martha showed some latent tendencies when she claimed that her “time management stands out because most [learners] showed no sense of urgency and weren't as time conscious” and when she reflected that “When I was younger, I didn't like being online. However, I did my masters online in a year.” These both suggested a sense of comparison and positioning in relation to others, as well as an inclination towards challenge motivation. Likewise, Clara indicated her strength as “being a self-starter; having personal discipline.” Although these aspects manifested in a manner that was perceived as being self-image oriented, they were framed within a competitive context to the same degree as the Contender.

Victor

Where Contenders represent contention within the learning environment for its own sake, Victors represent learner types that consider a successful outcome to their efforts as an essential part of the process. They will channel their energy into performing at a level that puts them ahead of others – the competition. The Victor represents the meso level engagement behaviors within the Rival category and represents a heightened level of intrinsic motivation within the category. They see the learning process in terms of actions and outcomes within the context of being first and standing out.

The typical behavior of the Victor learner type was suggested by Wilfred who observed some people as “being overly competitive in terms of grades or having the right answer.” The rationale for this behavior was inferred by Mickey who reasoned that “online learners may not know each other really well and they want to establish themselves.” Given that Victors placed a strong emphasis on successful outcomes and stressed their position in relation to others, they sought out opportunities to go head-to-head with other learners with a challenge mindset. As Donna experienced “I’m more nervous and worried about if I’m going to have the wrong answer or are people going to judge me.” This showed the effect of the Victor’s engagement behaviors in relation to others.

Subduer

At the most intrinsically motivated end of the Rival category is the Subduer. Residing at the micro level of the category’s engagement behaviors, this type of learner exhibits extreme aspects of the Rival. Not being satisfied with winning a competition, the Subduer is a dominating type of learner who seeks to intimidate and suppress others. Through the use of constant negative feedback, challenges, and other forms of direct and indirect confrontation, the Subduer is driven

to impose their skills and knowledge with the express purpose of subjugating others and establishing their supremacy within the learning environment.

The Subduer learner type demonstrated the highest degree of competitiveness and desire to dominate of all Rival learners. Individuals associated with Subduers were, as Wilfred stated, “those who tend to dominate others through their questions or understanding of the topic.” Their excessive confrontation attitudes and behaviors often had significantly adverse effects on others, such as Donna who explained

I'm not good with confrontation at all. So those learners that are really competitive and confrontational can cause me to pull back and shut down to avoid their challenges and reaction responses to what I put out there. That's when I want to keep my answers as basic as possible to avoid attention.

This approach was typical for the Subduer type who perceived the learning environment and other learners in terms of conquest rather than community. Of all the Rival learners, the Subduer was, as Wilfred noted, “perhaps the most difficult to interact with.” This was an opinion shared by Rose who when reflecting on her own experiences stated of the situation that it was “kind of tough.”

The Braggart

Learners within the Braggart category are prone to demonstrate their existing knowledge and typically look to dominate discourse. While seemingly similar to the Rival, Braggart learner types are not interested in challenges or competition in general. Domination for them is more about drawing attention to what they know and appearing to always be knowledgeable. Those within this type category demonstrate behaviors that indicate that they hold “a high estimation of their ability” (Hendricson & Kleffner, 2002, p. 44). As with Doers and Rivals, Braggarts are Knowledge Acquisitionists with regards to how they perceive the management of information and knowledge. As such, their perspective on information and knowledge is that of being a

means to garner attention and make an impression. The Braggart's personality disposition would seem to be extravert in nature, however, it likely is strongly inclined towards being introvert. This can be understood in that these types of learners like the social aspects of learning environments only in so much as they enable the learner to receive attention. Braggarts demonstrate an Attention-Oriented engagement behavior in their approach to online learning and are focused on posturing to make an impression and gain the attention of the group. They are overly confident and beyond opinionated, which often results in them not being open to feedback or criticism (Albright, 2017). They see information and knowledge as an instrument of posturing within the environment.

Learners within the Braggart type category reside on the participate-avoidant motivational maintenance axis and are inclined towards the dominant avoidant position. They derive their motivational energies and desires for learning from generating attention and controlling the direction of discourse towards the same end. Braggarts are distinctly Autonomy (Intrinsic) in their online learning motivation and like to maintain control over situations for their own purposes. Within the Braggart learner category there are three defined types – Boaster, Grandstander, and Know-It-All.

Boaster

Boasters are learners who tend to present themselves with exaggeration and a great deal of pride and ego. They will often overstate their experience with or understanding of something during class discourse but be unwilling to substantiate their information or claims. Residing at the macro level engagement behavior within the Braggart category, Boasters will attempt to steer discussions and interactions towards perceived knowledge strongholds in order to maintain a sense of control and continuation of attention. However, when directly confronted, they can

disengage as a means to avoid challenges. Functioning at the highest level of extrinsic motivational emphasis of the Braggart types, the Boaster represents a relatively small degree of arrogant behavior within the learning environment relative to other learner types and is perceived as an outlying participant compared to other learners.

As with all Braggart learners, the Boaster showed an emphasis in attention seeking and surface levels of control. Within the group of individuals participating in the interviews, there were indicators of the Boaster. Mickey, in particular, demonstrated aspects of this type in that he would not always provide a direct response to questions but would instead counter with his own inquiry, as was the case when he was asked about what he found most interesting about learning. A primary part of his response was to redirect the subject by countering with “The root question of it all is how do we really learn?” Wilfred expressed an awareness of the Boaster learner in his observation that “there are some people that are overly confident and sure of what they know coming into the class.” The central idea of the Boaster was to impress others based on what they knew and was seen translating not only in terms of facts but in attempts to communicate intellect.

Grandstander

While a Boaster can be thought of as a minor form of name-dropper, the Grandstander represents a much more pronounced self-glorifying learner type. True to the nature of Braggarts, Grandstanders seek to present themselves in a manner that attracts attention and creates a targeted impression, however, the strategies taken to impress others are far from subtle and have a higher degree of intentionality about them. This may take the form of promoting a particular political, social, or theoretical stance, or leveraging a specific position related to the subject of study. Rather than being intended to facilitate productive discourse and reflection, the intention

of the Grandstander is to capture and dominate attention within the group and divert focus away from more relevant and appropriate situations or topics. The Grandstander represents the meso level engagement behaviors within the Braggart category functioning within a moderate degree of intrinsic motivation within the category.

The Grandstander demonstrated a higher degree of ego and posturing. One possible reflection of the motive of this position was reflected in a comment made by Mickey when he observed “there's a need among a number of students to really kind of make their presence known” and followed up in noting his differentiation to this disposition by stating “I feel no such compulsion to, for lack of a better word, bloviate for its own sake.” While this potentially could contribute to other learner types, it did show similar engagement behaviors to what was expected with the Grandstander. Additionally, Mickey stated that “I am likely a little bit less attentive online, I'm more prone to distraction just because I control the environment in an online situation” which suggested that the perception of control may have transferred to other areas. Rory made an observation that suggested an experience with a Braggart learner when he stated that “some will take off on discussion tangents that take over everything and get stuff stirred up and off track.” This represented the tendency not only to show off but to dominate the conversation. As Wilfred noted “[t]hey seem less interested in learning and more about posturing.”

Know-It-All

The Know-It-All represents the most ego-centric learner type within the Braggart category and functions at the most intrinsically motivated position. The distinction of a Know-It-All learner is that their actions and behaviors are those of absolute conviction and confidence in their knowledge and information. The effect of this is that the learner may become dismissive of

any feedback, response, comment, or insight that does not support or align with their own. This refusal to maintain an openness to even the possibility of a different position, alternative concept, or solution introduces negative effects to the learning environment with some learners being drawn into a state of frustration while others disengage from the learning process altogether. The Know-It-All resides at the micro level of the Braggart category's engagement behaviors and can be a source of disruption within the learning environment.

At the extreme of the Braggart types is the Know-It-All. This disruptive learner's behavior was expressed by Wilfred, when reflecting on their behavior and attitude in courses that he had taken. He noted that they may "come off as an authority on all things and at times will defy instruction or information if they don't agree with it." This aligned with Mickey's statement that "they want to establish themselves as, you know, with a sense of authority" and furthermore noted their "desire to be perceived as a critical part even a critical thought leader in the class." These stated attributes related to the Know-It-All's tendency to not be open to feedback or consideration of error. This behavior is suggested in Donna's experience where she recalled strength and resistance of any challenge to knowledge "If you say anything that doesn't align with what they say 100%, they want to question you back." With the Know-It-All, there was an extreme response of control and avoidance. This perhaps was demonstrated in Mickey's comment that "I'm less incline to contribute unless I'm supremely confident in how I feel about something."

Summary

In this chapter, the results from the data collection and analysis were presented. A grounded theory based meta-analysis of the body of literature was exhibited demonstrating the extent of evaluation undertaken as well as the outcome findings. Additionally, the coding of the

individual interviews was introduced and related in conjunction with the rest of the research findings. Finally, the subsequent taxonomy model addressing the identification and definition of distinct online learner types for higher education was presented and interpreted for the core dimensions being expressed and factored.

The outcomes presented here have addressed the primary objective of developing the TOLT as well as provided relative headway into the secondary inquiry topics by identifying factors through which online learners can be better understood, distinctively differentiated from other learner types, and categorized and grouped. Chapter 5 presents the final discussion concerning the outcomes of this study and provides a conclusion to the investigation as well as recommendations for future research.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to classify and articulate the distinctive types of learners engaged in instruction within an online learning environment in the higher education context based on the key dynamics, factors, and influencers of the individual student. Subsequently, it was to generate a new theoretical model to facilitate the classifications and associated individual learner types that were established. The model, the Taxonomy of Online Learner Types (TOLT) was created to provide deeper insights and understanding about those engaged in online learning in higher education in terms of their unique differences as individuals rather than in relation to specific targeted outcomes and factors of success, and to gain a more holistic perspective of learners on a systemic level. To accomplish this, a grounded theory-based meta-analysis was performed that focused on relevant existing works related to online learning and learners. Additionally, a demonstration survey related to key factors in online learning was developed and deployed to aid in identifying online learners for interview. These conversations were meant to support a determination of applicable instructional and measurement practices and dynamics to better assess the trends emerging from the meta-analysis for future research. This chapter addresses the findings of the undertaken research, identifies limitations to be considered, discusses future research recommendations, and provides a perspective on how the outcomes contributed to the body of knowledge.

Summary of Findings

Though the primary focus of this study was classifying and defining distinctive online learner types, and to manifest these within the framework of a new theoretical model, the research was also intended to generate additional relevant insights into the online channel and the

different learners engaged in instruction by leveraging game player research. Given the natural correlations between the dynamics associated with online games and those connected with engaging, experiential online learning (Bedwell et al., 2012), there was justification in the literature reported in Chapter 2 for exploring the theoretical and structural dynamics of games as a potential foundation for building the new taxonomy. An exploratory meta-analysis of a broad range of literature from the body of educational and game-related research, was used to reveal categorical relationships of like phenomena and dynamics (Syneonides et al., 2015), yielding several relevant categories. Based on the outcomes of the meta-analysis, it was possible to distill pertinent differentiators to help foster a better comprehensive understanding of online learners. Additionally, analysis of the findings from the survey data revealed several factors and differentiators that found some support when examined through the interview response data. This was valuable in that the interview respondents were representative of the higher education populations being assessed, accounting for both undergraduate and graduate learners, traditional and non-traditional populations, a broad range of age and experiences, and a balance of gender. Applying a grounded theory approach, the interview data were analyzed using open, axial, and selective coding. The initial open coding passes yielded 290 labeled transcript chunks which were ultimately reduced to eleven (11) categories during the axial coding stage. These included:

- Intrinsic motivators
- Extrinsic motivators
- Engagement behaviors
- Learner characteristics
- Perceptions of online learning
- Dynamics of online learning
- Learning preferences

- Anticipations with online experience
- Online learner classifications
- Personal influencers
- Theoretical components

These initial categories provided parallels and correlations with those identified during the meta-analysis component of the study. After applying the final selective coding, the final four themes were identified:

- Online learner classifications
- Learning motivation
- Online learning conceptualized
- Descriptive factors of online learners

These themes provided key correlating context for the online categories and types that were defined and articulated and provided direction regarding what dynamic dimensions might be most effective for inclusion in the taxonomy model.

All data and outcomes finding from the research were evaluated through the combined lenses of educational and game player research. This perspective enabled the final learner categories and associated types to be developed and fostered the comprehensive integration of the research outcomes into the taxonomy model. There were clear gaps within the body of educational works that did not provide for the theoretical and structured objectives of the study.

Ultimately, the research outcomes appear to relate to the following six proposed categories of online learners – Creators, Socializers, Explorers, Doers, Rivals, and Braggarts. Furthermore, based on the factors used to differentiate users (i.e., personality disposition, online engagement behavior, motivational maintenance, online learning motivation, information and knowledge management, etc.), it was possible to define three unique learner types within each of

these categories. Relating to three tiers of motivational emphasis (i.e., macro, meso, and micro), the following learner types were identified:

- Creators – Theorist, Architect, and Formulator
- Socializers – Networker, Collaborator, and Encourager
- Explorers – Wanderer, Discoverer, and Analyzer
- Doers – Completer, Accomplisher, and Overachiever
- Rivals – Contender, Victor, and Subduer
- Braggarts – Boaster, Grandstander, and Know-It-All

While not providing a direct one-for-one correlation with the game player models evaluated, the online learner categories and types showed relevant alignments that helped to provide meaningful context and direction in applying them to a model that graphically represents the concepts anticipated.

Concerning the TOLT model, the final outcome of this project sought to integrate and represent those differentiating online learner factors that provided meaningful distinctions among unique learners. While not all possible dimensions of differentiation were expressed through the graphical aspects of the model, those included were considered central to the effective conveyance of the model's functional dynamics. As such, the model characterized online learners across five (5) discernable descriptive dimensions:

- The approach to handling Information and Knowledge Management (i.e., Knowledge Construction vs. Knowledge Acquisition).
- The primary engagement behavior orientation associated with each of the online learner categories and types (i.e., Social, Production, Environment, Self, Attention, and Action).
- Indicated dominance across the Participant-Avoidant, Collaborative-Competitive, and Independent-Dependent motivational maintenance axes.
- The degree of motivational emphasis influencing the learner type factors.

- The level of behavioral function (i.e., macro, meso, and micro).

These dimensions were intended to be perceptively intuitive for those viewing the model, and direct enough to be conceptually understood. As such, the resulting TOLT model may be tested against real world practice for further evaluation of the value of its components and explanatory power. It may help provide a useful model for instructors and theorists, despite the innate complexity of the subject being addressed. From a conceptually functional standpoint, the outcomes of the research findings support, though do not prove, the idea that online learners function as unique and distinctive individual types within the learning environment, which was anticipated.

Limitations

While the study provided a comprehensive examination of the literature, there were notable limitations to the study. First, the study was intentionally general in nature as it sought to build an empirically supported model typology that could provide explanations into questions related to the types and nature of online learners. No highly defined explanations of learner choices or actions should be or can be derived from the TOLT model until significant work to test it in practice has been conducted in the future. This would include exploring questions concerning how or whether the taxonomy addresses self-regulated learning. However, as the theoretical model is tested, refined, and adapted, it should be expected that more specific articulation of the factors associated with the TOLT model will emerge. Also, those considerations related to different aspects of the study including the online learning paradigm and environment, human behavior and identity factors, and interrelations among education and game-related research outcomes were not exhaustively addressed.

Online Learning

As to the range of investigation into the online learning paradigm and environment, the study was not intended to assess other aspects of online learning, such as the most effective delivery model or modality of online instruction, or the individual influences of technology-enhanced learning environments. Rather, it was solely concerned with generating a new theoretical model that would offer classifications and definitions of the different types of learners engaged in online learning within the higher education setting. For this reason, it had to be assumed that all other questions, including comparisons of blended vs. total online delivery, supplemental usage vs. primary utilization, and synchronous vs. asynchronous interaction would not be addressed within the study. These are, however, all relevant points of inquiry and potential factors of influence that limit the impact of the study because the model has not been tested against real world learning processes or against academic performance of the individual learners. However, in terms of categorizing and defining the unique online learner types as a potentially valuable model, this typology will ultimately need to be tested against practice.

Online Learner Factors

As for the factors for differentiating online learners, not all aspects of human behavior could be included in an assessment. The process selected examined those considered to most likely have relevance, and a strong correlation to game-player differentiation. Given the diverse nature of human behavior and the extensive number of potential factors that could have been explored, accounting for all contingencies within the context of a single study was not possible. As such, not all aspects of individuality are fully explored. This limitation leaves open the possibility of other potential factors of differentiation based on a deeper assessment of personality or other psychographic dynamics. Additionally, some potential factors that were

touched on during the study were still not ultimately included in constructing the different learner types or taxonomy model. Other factors, such as the basis for learning based on Fink's principles of significant learning in the virtual environment (Dirckinck-Holmfeld, 2009) or dominant learning strategies (de Paz et al., 2012), were not incorporated. Likewise, this study did not address correlations between online gaming and online learning environments as it was outside the scope of the exploration. While a degree of correlation was suggested, the details of the correlation were not addressed. This limitation was not expected to be meaningful within the context of learner differentiation but could not be directly spoken to within the context of the study.

Survey Instrument

Another limitation of the study regarded the utilized demonstration survey. While the developed OLFS instrument (see Appendix A) was effective in identifying relevant candidates for the interviews that fit within the targeted participant groups, it focused primarily on evaluating three (3) key sections – Motivation, Learning Preferences, and Player Types. While these were significant measures, and although they incorporated prompts associated with other factors of the learner individuality, including personality, engagement behavior, learning strategies, and temperament, the survey, in its demonstration state, did not address personality types to a full extent. While the rationale for this related to emphasis on other factors as seen through the meta-analysis, the dimension had the potential to have a bearing on some aspects of individuality and so could merit deeper exploration.

The other limitation related to the survey dealt with the sample size and its overall application. As mentioned, this study was exploratory in nature. As such, and being a grounded theory based meta-analysis, a quantitative element was not necessarily required. However, in

terms of gaining a better understanding of the validity of the factors, an enhanced version of the survey and subsequent analysis on the data would have been enlightening and could have provided some relevant insights. Ideally, having a sample of 300 or more participants would provide the opportunity to run productive analysis (e.g., frequency, factor, cluster, etc.) on the data in the future. There are also limitations associated with the interviews. While the interview data generated acceptable outcomes in terms of the exploratory research and development of the TOLT model by providing tacit support for the learner categories and types, having additional data would have aided in assessing the differentiating learner categories and types and provided more confidence that the typology elements were present across a broader swath of learners. This will be addressed in future studies.

Validation and Application

Finally, there were two other significant limitations identified. The first in relation to validation and the second concerning application. Though the stated intention of developing a new model taxonomy of online learner types for higher education was accomplished, the ultimate validity and application of the established online learner categories and types, and the TOLT model was deferred to future research when the findings and model can be assessed beyond a theoretical context in actual classroom practice. Such validation exceeded the scope of the study because validation requires a deeper level of investigation, likely through a mixed-methods approach. Garnering a deeper understanding of the model's applicability requires a longer-term evaluation of effectiveness and relevance based on how the outcomes were applied in multiple instances of teaching practice.

These limitations represent viable issues to be subsequently addressed in future research, however, in terms of the exploratory theoretical nature of the study, these acknowledged

limitations were deemed to be acceptable for the intended purpose and resulting outcomes. This leaves questions of application and validation of the TOLT model and the influence of other factors for future research, while providing key opportunities for continuations and further contributions.

Contributions to Knowledge

This study built on the existing body of knowledge within online education and game player theory. It was essential to understand the full range of research into a channel of learning that has been around for decades, and in covering a wide spectrum of works, it was possible to glean meaningful insights from influential learning research dealing with indirect, but relevant, topics such as social learning and communities of practice (Russell, 2002) as well as research specifically dealing with the engagement functions and learning strategies of the online learning environment (Broadbent, 2017; Means et al., 2009).

Though not directly aligned with this study, the research of Fomunyan and Mnisi (2017), Golladay et al. (2000), Pintrich and De Groot (1990), and Yukselturk and Top (2013), provided meaningful fundamental examinations into the impact of psychological factors in relation to learner performance in the online learning environment. Though these studies did not attempt to comprehensively understand the online learner, they provided meaningful insights into the effect of key factors related to individuality. Similar contributions into learning outcomes were made by others, including Angelino et al. (2007), Chen et al. (2010a), and Hu et al. (2014), which further developed the body of literature on online learning. However, these works were still focused more on the performance of the online learner and the identification of predictive elements than on attempting to establish a comprehensive understanding of the learner. Still, these pieces provided levels of relevant direction. However, of particular interest were other

studies relevant to differentiating factors such as intrinsically or extrinsically motivated learning behaviors (Deci & Ryan, 1985), from which some key learning dynamics were derived, the influential aspects of SDT as an impacting factor for online learners as well as game player types were examined and explored (Chen et al., 2010a; Deci & Ryan, 2000; Przybylski et al., 2010), and the use of personas within social media learning (Lloyd et al., 2017). Though Lloyd et al.'s (2017) was originally applied only to social media learning, it offered meaningful examples into the application of learner type concepts within an online-based learning medium.

An intriguing area of study that has provided direction and a foundation to build upon was game-related research. When considering the relation of game research to educational research, the work of Heeter (2009) was found to be exceptionally relevant and useful. While not a complete bridge between worlds, Heeter's (2009) work, that pertained specifically to educational games, did provide valuable insights into the use of game player types within the educational context. As such, his work was nevertheless relevant as a useful source to extrapolate from and provide conceptual guidance. Other key referenced works related to game player theory that were leveraged included Bateman et al.'s (2005; 2011) DGD1 model, Bartle's (1996) Player Types, Heeter's (2009) Player Styles and Learning Palette, Hamari and Tuunanen's (2014) Five Dimensions, Nacke et al.'s (2014) BrainHex Player Typology, Marczewski's (2015) Gamification User Types Hexad Framework, and Klug and Schell's (2006) Nine Player Types. Additional influential research included Online Gaming Motivations (Yee et al., 2012), Keirsey Temperaments (Keirsey, 1998), Play and Playful Behavior (Caillois, 2001), and Radoff's Player Motivation Model (Radoff, 2011). As with works related to online learning, the research related to game play or game players did not provide an exact alignment or solution with regards to the

question of online learner types. However, a number of works did serve as points from which new insights were derived and built.

Based on the examination of literature, a discernable gap in educational research regarding understanding the online learner existed. The primary consideration of the body of existing works deals with various aspects of online education, including the characteristics and elements of the online learning environment (Blees & Rittberger, 2009; Chizmar et al., 1999; Moore, 2013; Moore & Kearsley, 2011b), generating successfully learning outcomes (Al Ghamdi et al., 2016; Aragon et al., 2002; Machtmes et al., 2000), and specific traits associated with successful online learners (Abdullah et al., 2015; Broadbent & Poon, 2015; Hamada et al., 2011; Moallem, 2007). However, efforts to holistically understand the online learner as a distinctive individual and as a systemic entity within the online learning environment have been scarce (Hrastinski, 2009; Ilgaz & Gülbahar, 2015; Lloyd et al., 2017; Tmimi et al., 2017; Chu & Tsai, 2009). The need for a definitive work that comprehensively looks at the online learner as a distinct, functional, dynamic within the environment remains. Evaluating the individual with regards to the unique environment and outside the focus of performance and single factor consideration provides a broader understanding of how learning takes place by identifying who is learning, how they approach learning, and what motivates and governs how they engage. This study and the TOLT model may provide insights into this area in the future as a means to address a deficit in the body of knowledge.

The gravity of this research is most clearly understood when considering the traditional perspective of the learner in relation to the online learning environment. In general, the pervasive understanding is that the individual learner responds, interacts, engages, and performs in an online learning environment in the same manner that they do in a traditional face-to-face

situation. This notion oversimplifies the complexity of individuality and underestimates the factors involved within the learner. This study supports the position that online learning exists as a separate and distinctive channel and mode for providing instruction (Broadbent, 2017; Yukselturk & Top, 2013). As such, the behaviors, motivations, and perceptions of the learner are not a constant from one environment or time period to the next and should not be seen as generalizable; rather, patterns should be discovered that tend to occur. With the continuing growth and strategic relevance of online learning in higher education (Kentnor, 2015; Layne et al., 2013, Poulin et al., 2016b; Lederman, 2018; León-Urrutia et al., 2018), having a holistic and comprehensive understanding of the online learner as distinct individuals and learner types is critical for ensuring the continuing relevance and effectiveness of online education as well as fostering its evolution. Therefore, this study, and in particular the establishment of the Taxonomy of Online Learner Types, represents the beginning of the creation of a useful typology of online learners and may be used to examine whether it applies in face-to-face settings as well.

Future Recommendations

The outcomes of the study provided a valuable potential model of who the online learner in higher education is. The distinctive classifications and defined types may offer instructors and theorists a way to think about their online students and their needs as participants in classes. The establishment model may also serve as a means of review and application. However, there are limitations to the study that should be addressed in future research.

To start, this study was exploratory in nature and the outcomes and model are part of an initial discovery process. The identified and defined learner type categories and types and the TOLT typology are a starting point for future research into online learning and the online learner to help guide the design of course activities to accommodate the identified types if future

research supports the model. It is expected that future research will address the validation of the segmentations articulated and the developed taxonomy structure, as well as their application.

Additional research and assessment are needed to refine the taxonomy and that will afford opportunities to deepen the perceptions of the online learner and understand the breadth of their functional dynamics within the online learning environment. Three potential areas where future studies should be executed are:

1. Evaluate the defined categories and types against a broader sample of higher education online learners to validate the identified segmentations.
2. Create and deploy a revised version of the Online Learning Factors survey used in this study to provide a deeper assessment of factors contributing to the differentiation of online learner types as a means of beginning to validate the model.
3. Study the application of the TOLT model into instructional design and delivery.

As indicated at the onset of this study, it was anticipated that the research outcomes and the resulting taxonomy produced by this work would serve as a foundation from which future research into online learner types and functions within online instructional environments in higher education would be built. While three possible follow-up research opportunities were expressed, the potential opportunities for building upon this foundation are numerous and diverse. Even within the area of instructional design and delivery, there are several directions that can be taken, including the development of learning activities, engagement, and alternative assessment aligned to the learner types in the model. There are also avenues related to existing and emerging learning technologies that have not been considered. The focus of this study centered on the online learner in higher education and their differentiating distinctions as individuals within a unique learning environment. As such, it serves as an essential step towards developing awareness and fostering the continued evolution and relevancy of online learning and future channels of instruction.

Conclusions

The study was an exploratory endeavor which demonstrated an articulation of online learners as distinctive individuals within the online learning environment and provided a typology model based on that research to be used for future investigation. The resulting outcomes provided tacit support for the TOLT model as a new approach to understanding and expressing these learners within differentiated categories and types, and the defined classifications and the taxonomy represent a significant next step in online education research. The study provided a meaningful contribution to the gap in the existing body of online education research literature. While it addressed an area that has not been adequately accounted for, it also functions as an important catalyst for building understanding regarding online learners and learning in general. As such, it will provide a foundation for future evaluations into the validity and application of the outcomes and serve as a starting point for additional related studies to build upon. Using a grounded theory approach, it was possible to ascertain the state of online learning research and gauge its strengths and deficits. This approach provided a clearer understanding of the direction that online learning is taking and the challenges to be addressed.

A key study outcome dealt with the perspective of what is understood as online learning and what the current and emerging role of games are in relation to it. While the notion of game-based learning and gamification were not targeted as part of the research or inquiry of the study, the concepts revealed themselves within the meta-analysis. Likewise, it should be remembered and stressed that game-related research played a pivotal role in the development of the TOLT. The body of work related to player types offers a significant wealth of experience and insight into engagement within an online medium, and while the commonalities with education are often not perceived, the realities of a kindred spirit exist. The shift to placing games in the context of

learning does not apply only to educational games or gamified learning because they originate in understanding human motivation as core drivers of activity and values. Past studies indicate that games may be viewed as learning systems (Warren & Jones, 2017). This provides a connection and framework through which the outcomes of this study may be viewed. The distinct online learner categories and types of the taxonomy, and the proposed theoretical model that conceptually express them share a common heritage with the efforts of both the educational researchers who have contributed to the development and understanding of online learning as well as game researchers who diligently worked to explain the unique attributes and function of online gaming environments and those engaged within them.

The TOLT is an evolutionary step towards building a model of how students prefer to engage in online learning activities. This construct may offer a new direction that is learner-centric and no longer confined within one discipline. Understanding the learner is a step towards taking online learning into new levels of significance and the TOLT offers a unique opportunity to move up into them. This new tool does not promise to deliver all answers, but it is a chance to lead change, to enhance learning, and to grow in new directions. The outcome of this study is not a point of completion but rather one of beginning; a beginning in generating a deeper understanding of online learning and a beginning into exploring the deeper potential benefits of game-related research in education. The concepts and models generated are the grounds on which the next studies will be able to assess what has been presented to determine if the theory suggested will be confirmed, is needing to be modified, or is unsubstantiated. Regardless of the outcome of the evaluations that follow, there will be answers and the matter of addressing the distinctions of the online learner will continue.

APPENDIX A
ONLINE LEARNING FACTORS SURVEY

[Start of Block: Informed Consent Notice]

University of North Texas Institutional Review Board

Informed Consent Notice

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Assessing Distinguishing Learning Factors for Defining Online Learners

Student Investigator: Doug Darby, University of North Texas (UNT) Department of Learning Technologies.

Supervising Investigator: Dr. Scott Warren, UNT Department of Learning Technologies.

Purpose of the Study: The purpose of this study is to assess the key dynamics, characteristics, and influencers of student learning engagements within the context of online instructional environments. It will examine the core factors impacting learning based on the reported perceptions and experiences of online learners within a higher education setting, and gather pertinent insights and responses on learning strategies and preferences, attitudes, personality, prior experience, competencies, practices, and motivation. Furthermore, the study will provide a differentiation between the types of online learners by identifying and defining fundamental classifications and personas related to each. The results of this study will be applied to the development of a general taxonomy and model of online learners in higher education for potential use with online instructional design and in future research into effective online learning.

Study Procedures: You will be asked to commit about 20-35 minutes to answer survey questions about your technical competencies and personal attitudes, preferences, practices, and perceptions as a learner in an online instructional environment. After the survey, you will have the opportunity to indicate your interest in participating in a follow-up interview. If selected based on your responses, we may ask you for a 20 to 30-minute phone or computer call interview to ask further questions about your responses. We will record and transcribe the interview, and the transcription will be analyzed along with other participant responses to determine potential factors that differentiate types of online learners.

Foreseeable Risks: There are no potential risks to you as a participant.

Benefits to the Subjects or Others: This study is not expected to be of any direct benefit to you, but we hope to learn more about the key factors that differentiate and define online learners engaged in the higher education arena now and in the future.

Compensation for Participants: No compensation is provided for participation in this study.

Procedures for Maintaining Confidentiality of Research Records: The confidentiality of your individual information will be maintained in any publications or presentations regarding this study. The names of participants will be stripped and any publications that result will have pseudonyms of all participants. Pseudonyms will be randomly assigned to each participant. Records will be maintained in a secure location at the university for a period of three years and then destroyed at the conclusion of the study.

Confidentiality will be maintained to the degree possible given the technology and practices used by the online survey company. Your participation in this online survey involves risks to confidentiality similar to a person's everyday use of the internet. The security and confidentiality of information collected from your email survey cannot be guaranteed. Confidentiality will be kept to the extent permitted by the technology being used. Information collected via email can be interrupted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. Your email address will be discarded once you have received compensation, or participation is discontinued.

You will be asked for names of potential other recruits and you have the right to decline to provide this information. The researcher will maintain confidentiality when subjects suggest other persons for inclusion in this researcher.

Questions about the Study: If you have any questions about the study, you may contact Doug Darby at douglasdarby@my.unt.edu.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-4643 with any questions regarding the rights of research subjects.

Research Participants' Rights: Your participation in the survey confirms that you have read all the above and that you agree to all of the following:

Doug Darby has explained the study to you and you have had an opportunity to contact him/her with any questions about the study.

- ☐ I agree (1)
- ☐ I do not agree (2)

You have been informed of the possible benefits and the potential risks of the study.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

You understand why the study is being conducted and how it will be performed.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

You understand your rights as a research participant and you voluntarily consent to participate in this study.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

You understand you may print a copy of this form for your records.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

You understand that your decision whether to participate or to withdraw from the study will have no effect on your grade or standing in a course.

- ☐ I agree (1)
 - ☐ I do not agree (2)
-

I have read through above notice, and

- ☐ I consent to participate (1)
- ☐ I do not consent to participate (2)

[End of Block: Informed Consent Notice]

[Start of Block: Demographics]

Gender

- ☐ Male (1)
 - ☐ Female (2)
 - ☐ Other (3)
 - ☐ Prefer not to say (4)
-

Age range

- ☐ <18 (1)
- ☐ 18-21 (2)
- ☐ 22-25 (3)

- ☐ 26-30 (4)
 - ☐ 31-35 (5)
 - ☐ 36-40 (6)
 - ☐ 41-45 (7)
 - ☐ 46-50 (8)
 - ☐ 51-55 (9)
 - ☐ 56-60 (10)
 - ☐ 61-65 (11)
 - ☐ 66-70 (12)
 - ☐ 71-75 (13)
 - ☐ 76-80 (14)
 - ☐ 80+ (15)
-

Type of area in which you live

- ☐ Urban (1)
 - ☐ Suburban (2)
 - ☐ Rural (3)
-

Highest degree held

- ☐ High School diploma or equivalent (1)
 - ☐ Vocational/Technical School Certificate (2)
 - ☐ Associates (3)
 - ☐ Bachelors (4)
 - ☐ Masters (5)
 - ☐ Doctoral (6)
 - ☐ Professional (e.g., MD, JD, etc.) (7)
 - ☐ Other (8) _____
-

Years of professional experience

- ☐ 0-1 (1)
 - ☐ 2-3 (2)
 - ☐ 4-5 (3)
 - ☐ 6-7 (4)
 - ☐ 8-9 (5)
 - ☐ 10+ (6)
-

Number of online courses taken

- ☐ 0 (1)
- ☐ 1 (2)
- ☐ 2 (3)
- ☐ 3 (4)
- ☐ 4 (5)
- ☐ 5 (6)
- ☐ 6 (7)
- ☐ 7 (8)
- ☐ 8 (9)
- ☐ 9 (10)
- ☐ 10 (11)

- 11 (12)
- 12 (13)
- 13 (14)
- 14 (15)
- 15 (16)
- 16+ (17)

Types of online courses taken (check all that apply)

- ☐ 100% online asynchronous (1)
- ☐ 100% online synchronous (2)
- ☐ 100% online, asynchronous/synchronous mix (3)
- ☐ Face-to-Face / Online hybrid (4)

Are you currently engaged in online learning towards a post-secondary higher education degree?

- Yes (1)
- No (2)

Display This Question:

If Are you currently engaged in online learning towards a post-secondary higher education degree? = Yes

What type of degree are you pursuing?

- Associates (1)
- Bachelors (2)
- Masters (3)
- Doctoral (4)
- Professional (e.g., MD, JD, etc.) (5)
- Other (6) _____

[End of Block: Demographics]

[Start of Block: Motivation]

The essential aspects of online courses to me include:

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Discovering unique or unconventional approaches to learning (1)	○	○	○	○	○	○	○
Becoming the top student in the course (2)	○	○	○	○	○	○	○
Dominating other students	○	○	○	○	○	○	○

in the course academically (3)							
Getting all possible extra credit points offered (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking time to apply and master new skills and knowledge (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming familiar with key researchers and thought leaders in the subject (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completing all possible assignments and projects in a course (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing at the highest academic level within the course (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having creative options for developing and delivering presentations (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engaging in challenging activities that may require multiple revisions (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The dynamics of online learning that I enjoy include:

	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
--	--------------------	-----------	--------------------	-------------------	-----------------------	--------------	-----------------------

	disagree (4)						
Learning within an engaging technology-enhanced environment (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fast-paced learning experiences with quick turnaround deadlines (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using a variety of interactive tools (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functioning as an agent to challenge established practices and knowledge (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Courses that incorporate long-term constructive learning strategies (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning activities that involve roleplaying or simulations (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative project work involving other students (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competing against other students (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning activities that require	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

careful decision-making (9)							
Learning activities that require extensive planning (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning activities that require quick responses and actions (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Head-to-head learning engagements against other students (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interacting with other students (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assisting other students (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The best practices that I most often apply when taking online courses include:

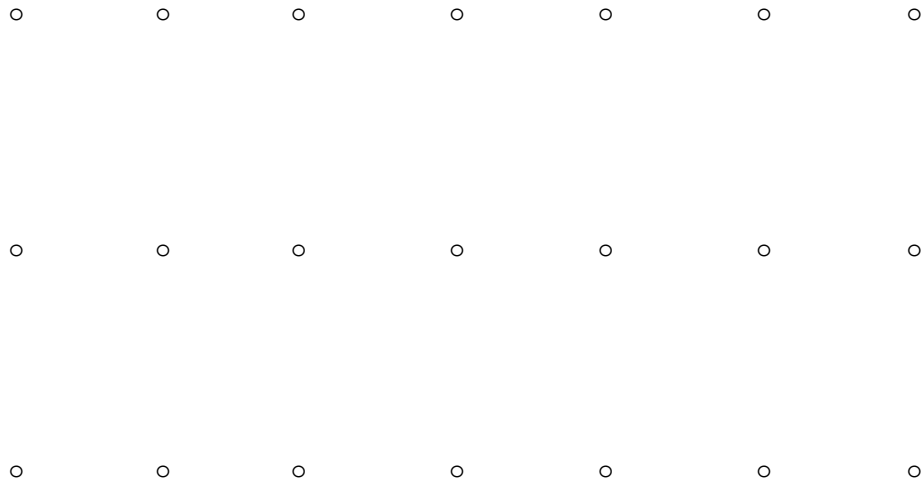
	Strongly agree (1)	Agree (2)	Somewhat agree (3)	Neither agree nor disagree (4)	Somewhat disagree (5)	Disagree (6)	Strongly disagree (7)
Exploring the learning management system for curiosity's sake (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improving my study skills by observing the practices of other students (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Primarily focusing on improving my	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

academic
standing
within the
course (3)

Putting a lot of
thought and
effort into
creating
projects and
assignments
(4)

Trying out the
different
learning
environment
functions to
see my
options (5)

Experimenting
with learning
tools to better
understand
what they can
do (6)



End of Block: Motivation

Start of Block: Learning Preferences

When engaged in learning, I prefer to work independently.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

Synchronous activities provide a more meaningful learning experience with online courses.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

Access to various resources and being given choices fosters better learning outcomes.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

A pragmatic, more logical approach to learning generates a deeper understanding of the subject.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

To effectively solve a problem, it is necessary to use creativity.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

Adequate time for thought and preparation are needed before engaging a topic with others.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

Learning is achieved through the examination and understanding of the specifics.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

Collaboration and assisting peers is critical to effective learning.

- ☐ Strongly agree (1)
- ☐ Agree (2)
- ☐ Somewhat agree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Somewhat disagree (5)
- ☐ Disagree (6)
- ☐ Strongly disagree (7)

[End of Block: Learning Preferences]

[Start of Block: Player Types]

I love exploring to see what there is to discover.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

I like to share my knowledge with others.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

I enjoy working out how to solve a challenging problem.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

It is important to me to always carry out my tasks to completion.

- ☐ Strongly agree (1)
- ☐ Agree (2)
- ☐ Somewhat agree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Somewhat disagree (5)
- ☐ Disagree (6)
- ☐ Strongly disagree (7)

Completing a difficult challenge after multiple tries is satisfying.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

Following my own path is important to me.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

It is essential to complete all assigned tasks.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

Help others succeed is meaningful to me.

- ☐ Strongly agree (1)
 - ☐ Agree (2)
 - ☐ Somewhat agree (3)
 - ☐ Neither agree nor disagree (4)
 - ☐ Somewhat disagree (5)
 - ☐ Disagree (6)
 - ☐ Strongly disagree (7)
-

Reward is an effective way to increase my effort.

- ☐ Strongly agree (1)
- ☐ Agree (2)
- ☐ Somewhat agree (3)
- ☐ Neither agree nor disagree (4)
- ☐ Somewhat disagree (5)
- ☐ Disagree (6)
- ☐ Strongly disagree (7)

Devising a relevant strategy is essential when deciding how to address a need.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

Getting to work in a group is stimulating and enjoyable.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

It is difficult for me to move past a problem until I have found a solution.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

I am energized by trying new things.

- Strongly agree (1)
 - Agree (2)
 - Somewhat agree (3)
 - Neither agree nor disagree (4)
 - Somewhat disagree (5)
 - Disagree (6)
 - Strongly disagree (7)
-

Being about to see a return on investment is important to me.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)

- Disagree (6)
 - Strongly disagree (7)
-

An key part of success is being able to work out what to do on your own.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

[End of Block: Player Types]

APPENDIX B

ASSESSING DISTINGUISHING LEARNING FACTORS: INTERVIEW QUESTIONS

Below are the questions to be addressed by selected participants of the study survey.

1. **Icebreaker:** What basic aspects of learning do you find most interesting?
2. How would you characterize who you are online compared to in a face-to-face setting?
3. What aspects of you as an individual most influence you as an online learner?
4. What would you say is the central guiding motivator that directs your actions and behaviors while learning online?
5. Think about your expectation when engaged in online learning and complete the following sentence:
 When I'm involved in online instruction, I want to _____.
6. How do you differ from other online learners would have encountered while taking online courses, and in which ways would you say you are similar?
7. What are the different types of learners you have experienced while taking an online course?

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