An Integrative Literature Review of Self-Directed Learning in Higher Education

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Abstract

As a prerequisite for all adult learners in life-long learning, self-directed learning has been constantly discussed since the early 1960s. However, in what manner research operationalizes the concepts and what similarities occur across the empirical studies and theoretical studies are still ambiguous. The purpose of this study is to employ an integrative literature review to investigate and disentangle various interpretations of self-directed learning by identifying how the topic is defined and what competencies and strategies are needed for a highly self-directed learner. This is a six-phase study, including: 1) problem formulation; 2) data collection; 3) problem re-formulation; 4) data evaluation; 5) data collection; and 6) presentation of the findings. This study provided a comprehensive perspective of self-directed learning in a dynamically expanding process to include multifaceted interpretations of the topic and advanced research in self-directed learning in an updated, enriched learning environment. Specifically, the researcher updated the evidence for self-directed learning to date, identified all of the potential dimensions of self-directed learning that distinguish a highly-directed self-directed learner and the related instructional strategies, and made suggestions for the future direction of research on the topic.

Keywords: integrative literature review, self-directed learning, higher education

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General Audience Abstract

This study is the first comprehensive investigation of the topic of self-directed learning by use of an integrative literature review. The researcher strove to disentangle various interpretations of self-directed learning and identify competences and strategies needed for a highly self-directed learner. This study advanced research in self-directed learning in an updated enriching learning environment. Specifically, the researcher updated the evidence for self-directed learning to date, identified all the potential dimensions of self-directed learning that distinguish a highly self-directed learner, and made suggestions for the future direction for research of the topic. The findings demonstrated that self-directed learning is a highly dynamic and context-specific learning process in which the learner, as a proactive acting agent, interacts with his /her learning environment to accomplish his/her learning goals in a given learning context. In this dynamic and interactive process, the self-directed learner is motivated to control his/her learning, take advantage of his/her personal experience, set his/her realistic goals, believe in his/her ability to implement the plan and persist in accomplishing achievements by using cognitive skills such as metacognition and self-learning strategies such as seeking assistance, resources, and support when needed.

Dedication

This dissertation is dedicated

To my mom and dad, with whose love I persist in chasing my dreams and

from whom I learned unconditional love;

To my son, my little sweet guy, without whom I would have finished writing sooner

but would not have had as much fun;

To my caring husband, with whom I learned to mature.

To my grandpa, who inspired me

to explore the world.

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from her, which definitely taught me to reflect on my role as an instructor while pursuing a doctoral degree in instructional design and technology.

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Chapter 1. Introduction

The purpose of higher education is to prepare students for future careers, providing them with essential lifelong learning skills that help prepare students for post-college life, which will allow them to step into an authentic work environment (Taylor, Hunter, Melton, & Goodwin, 2011). For roughly 60 years, self-directed learning has been identified as one of the critical characteristics of lifelong learners (Brockett & Donaghy, 2011). This practice has recently gained increasing attention, especially with the introduction of a technology-enhanced learning environment and steadily more complex learning contexts (Boyer, Edmondson, Artis, & Fleming, 2014; Hartley & Bendixen, 2001; Song & Hill, 2007). The importance of enhancing self-directed learning, even though it is sometimes entangled with the term self-regulated learning, is implied in the literature. However, with varied interpretations of self-directed learning, there is no consistent theory defining that constitutes self-directed learning either in face-to-face classroom settings or in online learning environments. The researcher intends to disentangle the confusion surrounding the elements of self-directed learning, investigate operational definitions of the term in varied contexts, and identify characteristics that make a successful self-directed learner. Therefore, an investigation is required regarding the definition of self-directed learning, its evolution, related constructs, and its relationships to various constructs such as learning and performance. A comprehensive enquiry of the topic is indispensable in putting the segmented puzzle pieces together and creating a new framework of self-directed learning across disciplines. In addition, with all the questions in mind, the researcher intended to inquire whether self-directed learning in the online learning environment is indeed putting old wine into a new bottle.

Need for the Study

Self-directed learning is an essential component of adult maturity and a prerequisite of life-long learning (Knowles, 1975). The topic has "relevance to life or to real behavior" (Patterson, 1986, p. xx.), which explains the motivation for scholars' continued research efforts: as a goal of adult education (Candy, 1991; Garrison, 1997; Merriam, 2001) and as a process that determines successful learning (Merriam, 2001), self-directed learning needs to be explored.

As an aspect of adult education, self-directed learning is considered a prerequisite for all adult learners engaged in life-long learning. The topic has been constantly discussed since the early 1960s (Knowles, 1973, 1975b; Tough, 1971) within the dominant context of face-to-face classroom settings. Between roughly 1966 and 1991, according Long & Redding (1991), research accumulated into a body of 173 dissertations on the topic of self-directed learning. Most researchers of that time established their studies based on definitions proposed by Knowles (1975) and Tough (1971) with a focus on classroom settings within the fields of adult and continuing education and nursing and health education. In the last two decades, the topic of self-directed learning has continued to mature with attention shifting to the online context (Candy, 2004a; Garrison, 2003; Moore & Kearsley, 2011; Song & Hill, 2007). Numerous empirical studies have examined different dimensions of self-directed learning in the online learning environment across differing disciplines. New models have appeared since the early 1990s with updated dimensions such as psychological processes and affective aspects (Garrison, 1997; Pilling-Cormick, 1996; Song & Hill, 2007). However, the manner in which research operationalizes the concepts and what similarities occur across the empirical studies and theoretical studies are still ambiguous. Thus, it is necessary to examine how differing models resonate with each other and how self-directed learning has been defined across multiple fields of study.

The considerations of anchoring this study to the topic of self-directed learning are akin to the stated reasons of an integrative literature review by Jones, Torres, & Arminio (2006). Over the past three decades, self-directed learning has been interpreted differently with foci on varied dimensions. There is no theoretical consensus regarding the definition, its constituents, and its measurement. In the technology-enhanced, online-learning environment, a consistent guiding theory is also lacking (Song & Hill, 2007). Moreover, very few literature reviews or meta-analyses have been conducted to contribute to a summary of the extant literature, which is probably a result of the inconsistent definition of the term, its constituents, and, accordingly, the related constructs. This leaves many still unanswered questions or misconceptions: What are the necessary skills or attributes of a successful self-directed learner in various learning environments? In order to answer this question, further exploration on the following questions is entailed. For example, how is self-directed learning defined within technologically enhanced learning environments? What constitutes self-directed learning? How is self-directed learning related to various constructs, such as perceived learning or learning outcomes, both in face-to-face classroom settings and in online instructional settings? All these unsettled questions and ambiguous understandings in the area of self-directed learning have made the researcher ponder the evolving history of the concept and its studies in both theory and practice. Taken together, these questions have truly intrigued me and sufficiently raised her interest to contemplate and inquire more on the subject. The researcher's intrinsic motivation is triggered by her sufficiently compelling interest in exploring self-directed learning in the new context of learning with increasingly proliferated technologies as media of learning. The researcher is curious to know how self-directed learning originated and developed in the seventies and eighties and how it has flourished in the context of learning and instruction.

Purpose Statement

The purpose of this integrative literature review is twofold: The first is to disentangle various interpretations of self-directed learning and identify what makes a successful self-directed learner. This process requires research to explore how self-directed learning has evolved, identify its definition and related constructs, and investigate how they are related to various constructs, such as perceived learning and performance. The second goal is to provide suggestions of instructional design in the updated learning environments, and directions for further exploration of the topic in a specific context. It is anticipated that researchers will engage in further discussion of self-directed learning across disciplines in higher education and that instructors and instructional designers will be further informed as to the application of self-directed learning design into curriculum and course designs. Hopefully, learners will also benefit from the self-directed learning strategies that have been demonstrated and summarized from the integrative review of the extant literature.

Research Questions

To address the identified problem in the context of higher education, an integrative literature review was conducted to answer the following questions.

1. How is self-directed learning defined in literature, and what common characteristics constitute self-directed learning?
2. What types of competencies/attributes are needed to make a highly self-directed learner?
3. What strategies or methods can help cultivate and develop self-directed learning?

Significance of the Study

The significance of an integrative literature review is to bring "value-added contribution to the new thinking in the field" (Torraco, 2005, p. 358). The findings of this integrative

literature review will contribute to the existing body of literature on the topic of self-directed learning and advance research in self-directed learning in an updated enriching learning environment such as in online instructional settings. Specifically, the researcher will update the evidence for self-directed learning to date, identify all the potential dimensions of self-directed learning that make a successful self-directed learner, and make suggestions for the future direction of the topic. Furthermore, instructors and instructional designers will benefit from using the integrative literature review to guide their instruction which may potentially promote quality instruction and learning practices. Lastly, adult learners will be able to refer to and reflect upon the characteristics or skills of self-directed learning in the previous practice and explore strategies or methods that can foster or improve their own self-directed learning in various learning environments.

Organization of the Study

The dissertation is composed of six chapters. Chapter 1 provides a brief introduction to the topic of the study and includes the need for the study, the research purpose, research problem and questions of inquiry, and the significance of the study. In Chapter 2, there is a brief review of the evolving topic of self-directed learning, including mainly the synthesis of previous theoretical studies of the topic. Main voices of self-directed learning and major milestones are identified and presented as an icebreaker to introduce a more extensive exploration of the extant literature in earnest later (Chapter 4). Chapter 2 ends with a discussion on potential self-directed learning skills in online context. Chapter 3 is a narrative description of the methodological approach used in this study, including the purpose of the study, the study design, scope and rationale, and the procedures of the study with explanations of rigor and the strategies used to conduct an integrative literature review. Chapter 4 presents the findings from the integrative

literature review, and discusses the implications of the findings, the future research agenda. Chapter 5 presents conclusions from the integrative literature review.

Chapter 2. Review of Literature

Compared to the usual approach of the literature review process, the integrative literature review is privileged with a start of a conceptual definition search, which means no operational definitions are needed other than a search with a concept followed by a procedure of evaluating "the conceptual relevance of different operations" (Cooper, 1984, p. 20)
as they appear in the results of the literature search. The researcher may encounter "unanticipated samplings" in the stage of data collection (p.20), which might help to modify the research questions.

By applying Cooper's approach of conducting the literature review, the purpose of this chapter is to briefly review self-directed learning in the field of adult learning, including a synthesis of the previous theoretical articles regarding major milestones of the development of self-directed learning, the definitions, and constituting dimensions. There is no intention to conduct a traditional "state of the art" or "critical review" in order to avoid forming conclusions and potential bias before the study begins in earnest. Rather, the literature review here is a prelude and catalyst to an extensive literature search that follows in the phase of data collection. Specifically, the review covered an existing body of theoretical studies on self-directed learning, anchored emerging themes for further inquiry, and proposed the preliminary research questions.

Major Milestones in Self-Directed Learning

Among the expansive literature of self-directed learning, definitions are various, and conclusions are surprisingly inconsistent. For example, some studies find that self-directed learning has demonstrated its effectiveness as an instructional pedagogy to teach adult learners, while some studies find that self-directed learning is not an effective approach to improve learning outcomes. Moreover, different studies since early 1980s discuss its relationships with

various related constructs, such as achievement, cognitive abilities, locus of control, motivation, performance, satisfaction, personal attributes, and so on. Self-directed learning is a well-explored area of study, but it still needs to be trimmed and disentangled by defining parameters in various contexts and clarifying related constructs within the respective contexts. Inconsistency of the research on self-directed learning is a driving motivation to explore how this term has evolved and in which direction future studies will develop.

Tough and His Contributions in the 1960s and 1970s. A review of the theoretical history and development of self-directed learning revealed major milestones. The first landmark was established by Tough (1967), who optimistically believed that all adults are motivated to learn because of the need for interpersonal communication. However, he has been criticized since he overlooked individual differences in the level of motivation. Having taken into consideration the criticism of his work, Tough (1971) continued to persevere in his exploration of self-directed learning and later proposed an operationalized definition of self-directed learning – a learning project, which is composed of "a series of related episodes, adding up to at least seven hours. In each episode, more than half of the person's total motivation is to gain and retain certain, fairly clear, knowledge and skills, or to produce some other lasting change in himself" (Tough, 1971, p. 7). His learning project specified the concept of self-directed learning and was utilized as a practical model in many teaching and learning practices. His later works shifted his thinking from merely external activities to internal processes such as learner motivation, which has established a solid foundation for the research with a focus on motivation in the 1990s.

Knowles and His Contributions in the 1970s and 1980s. Knowles proposed his widely used definition in 1970, modified it in 1972, and more precisely defined it in 1975. It has been widely used since then. Knowles (1975) believes that there are three reasons to teach self-

directed learning. Firstly, imbued with meaningful purpose and great motivation, proactive learners take the initiative to learn, thus learn more and better than reactive learners (p.14). Secondly, self-directed learning is an essential component of maturing. Aligned with psychological development, as one matures, he/she increasingly takes the responsibility to be independent and self-directing. Thirdly, considering new learning environments, such as non-traditional programs and universities-without-walls, learners need to take the initiative and control of their own learning. He also points out the importance of being equipped with the ability to acquire new knowledge and skills after leaving school, so one can learn on one's own and better survive in the increasingly changing world.

Knowles' justification of the reasons to teach self-directed learning was widely accepted for over two decades. His definition, therefore, was seen in numerous studies. Specifically, dissertations written between 1970s and 1990s have confirmed his exceptional influences on popular academic thought. Furthermore, his *Self-Directed Learning: A Guide for Learners and Teachers* has impacted teaching and learning practices in the 1970s and 1980s. In this momentous book, Knowles introduced self-directed learning as an andragogy, an adult instructional pedagogy, preparing learners to negotiate their learning experience with the facilitators. He defined self-directed learning as:

> a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (Knowles, 1975, p.18)

Knowles' definition of self-directed learning coincidently resonates with Moore's (1972, 1993) learner autonomy, which entails the learner's identification of the problem and preparation

of his/her solution plan, finding the solutions to the problem and executing the plan, and judging his/her solutions and execution of the plan. Although the latter is in the field of distance education and the former is in the field of adult education, both Knowles and Moore find the same importance of learner initiative and responsibility to accomplish learning tasks. It would also be interesting to inquire whether self-directed learning has a parallel research trend in distance education. Even though he described learners' internal incentives to participate in learning, Knowles still influences his disciples upon their dissertations with emphasis on the external instructional environments and activities and learner traits, rather than the learner's internal cognitive process. His emphasis on learning contracts has a focus on the learning environment design, including activities that engage and motivate learners to negotiate and pursue their own learning experiences; however, his model lacks acknowledgement of the learner's cognitive and psychological processes in their learning experience.

Various Voices in the 1990s. Influenced by Tough and Knowles, numerous scholars have created frameworks or models. Several influential models were established by various researchers as demonstrated in Table 1, which lists the major models and the dimensions included within the models (Garrison, 1997; Garrison & Archer, 2000; Pilling-Cormick, 1996). As can be seen from the table, cognitive process and psychological process have emerged and bloomed across all the models, which is different than the previous interpretations of self-directed learning which focused merely on personal traits and external instructional activities. Another difference is that critical awareness has been identified as an additional dimension, which characterizes learners and their roles as acting agents in learning.

Table 1.

Self-Directed Learning Models in the 1990s

	Descriptions
Hammond & Collins (1991)	Proposed critical self-directed learning; Believed personal experience is important, and thus reflection is a distinct step in critical self-directed learning process.
Garrison (1997)	Shifted to psychological dimensions, including cognitive and meta-cognitive processes, and motivational dimension.
Garrison (1997) and Pilling-Cormick (1996)	Considered self-directed learning to be a process rather than an inherent learner trait Pointed out that instructional activities and cognitive responsibility are both important dimensions and interaction between leaner and instructor is significant.
Garrison and Archer (2000)	Claimed that learning environment and instructional activities are both necessary dimensions and added the cognitive dimension.

The late 1980s and early 1990s witnessed a transition from a focus on the learning environment and instructional activities to additional foci on motivation and cognition. One dissertation published in 1989 is the only study the researcher located that discusses motivation as a theme that is related to self-directed learning, however, the target population of the study is older adults aged 50 and above (Sears, 1989). Another dissertation of that era touches upon the

cognitive process with an investigation of the relationship between self-directed learning preferences and cognitive styles, but still self-directed learning is examined only in the context of personal traits, rather than internal monitoring processes (Bitterman, 1988). In the early 1990s, influenced by Paulo Freire, two Canadian scholars named Hammond and Collins (1991) proposed the critical practice of self-directed learning and distinguished their theory from others by using "critical self-directed learning" (p. 13). They believe that it is indispensable to raise the learner's self-consciousness and critical awareness when participating actively in the learning experience, and that the learner is something an emancipatory social actor "with power to influence events positively – to make their own history" with one immediate goal—to take control of learning—and one ultimate goal—to improve work and life conditions (Hammond & Collins, 1991a, p. 15). Later, in the world of self-directed learning, critical tone seems to increase in reaction to the numerous frameworks and models focusing on different dimensions of self-directed learning.

Measurements

Gerstner (1987) reviewed literature published between 1920 and 1986 and found that there were substantial conundrums and contradictions in the literature on self-directed learning and that the term self-directed learning was still functionally ambiguous. Thus, she advocated for the use of the term self-directedness instead of self-directed learning. Her proposed learning theory of learner self-directedness actually implicitly advocated for learner attributes as a component in self-directed learning. However, measurements of self-directed learning did not seem to vary to accommodate this emphasis. Two outstanding and widely used measurements with a focus on considering self-directed learning as learner attributes include Guglielmnino's Self-Directed Learning Readiness Scale and the Oddi Continuous Learning Inventory (OCLI)

(Guglielmino, 1977; Oddi, 1986). Oddi (1986) developed OCLI to measure self-directed learning as a personality construct, while Guglielmino's Self-Directed Learning Readiness Scale (SDLRS) measures whether an individual possesses the skills for self-direction in learning. In fact, a study demonstrates that both instruments are similar in the way they measure self-directed learning and that SDLRS is more reliable as a measurement tool than OCLI (Landers, 1989).

Guglielmino's Self-Directed Learning Readiness Scale (SDLRS) is deemed "primarily as a predictive or diagnostic instrument for those who are preparing to begin self-directed study in an academic area at a high school, college, or graduate level" (1978, p.77). It is a 58-item self-report instrument with each item scored on a 5-point Likert scale and with a reliability coefficient of .87 (Guglielmino, 1978). The final score reflects the learner's current level of self-directed readiness. In the self-report survey, the learner is asked to judge his/her learning preferences and attitudes towards learning based on a range from "almost never true of me; I hardly ever feel this way" (1 point) to "almost always true of me; there are very few times when I don't feel this way" (5 points) (Guglielmino, 1978, p. 90). One example from the items is that "If there is something I want to learn, I can figure out a way to learn it" (Guglielmino, 1978, p. 90).

Oddi (1986) developed the Oddi Continuous Learning Inventory (OCLI) to measure self-directed learning as a personality construct. The tool has a reliability coefficient of .606. The OCLI has 24 7-point Likert-scale items and measures self-directed continuing learning based on three dimensions – proactive drive versus reactive drive; cognitive openness versus defensiveness; commitment to learning versus apathy or aversion to learning (Oddi, 1986). The learner is required to select a score from one to seven to demonstrate to what degree he/she

agrees with the statement. One example of the items is "I seek involvement with others in school or work projects," included in the dimension of cognitive openness versus defensiveness.

Basically, both of the two tools measure learner attributes in a similar way. It is interesting to see from Figure 1, as follows, that the meaning of self-directed learning has been enriched with respective paradigms shifted, but there has been no subsequent measurement developed to address the changing learning environment.

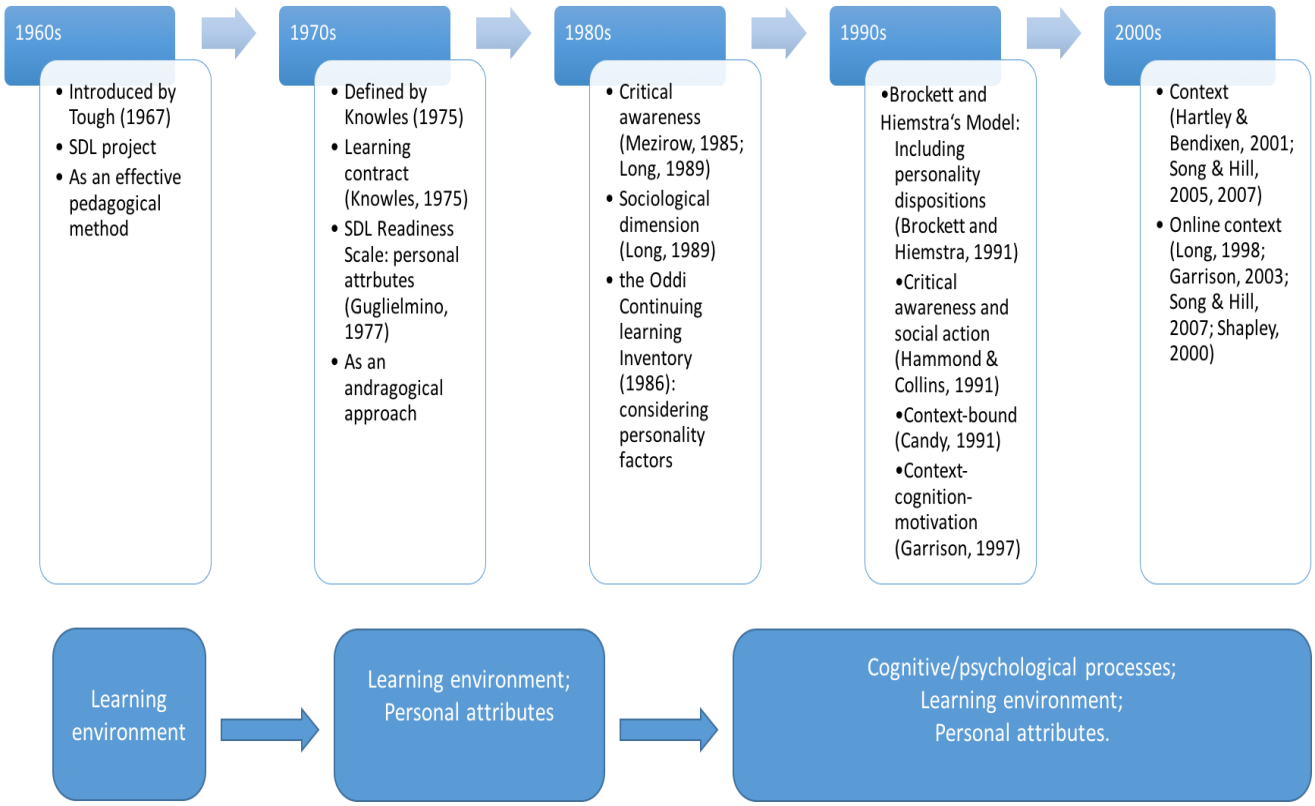

Figure 1. History of elaboration of self-directed learning and concomitant paradigm shifts.

Summary of Literature Review

Self-directed learning, as one of the most frequently discussed topics in adult education, has experienced its pinnacle and researchers assumed they had already mastered sufficient knowledge in this area; however, Brockett, one of the current active advocates for self-directed learning, reflected upon its past research agenda in an article and called for an update of the area

of study. With an affirmative, resounding tone, he informed the researchers that it is time to "move on" and encouraged the researchers to take on the study of self-direction and bring it to "a new level" (Brockett, 2000, p. 1).

Just as Brockett (2000) predicted, the enriching learning context ever since the new millennium attracts researchers' increasing attention, and thus, self-directed learning has been endorsed with additional denotations according to the variation of the learning context. Some researchers with great contributions to the scholarship in this area are also cognizant of the use of self-directed learning in an updated context (Candy, 1991), such as in distance education settings (Candy, 2004b; Long, Marchetti, & Fasse, 2011; H. B. Long, 1998), and they point out that the uniqueness of the physical separation between learners and instructors provides more possibilities in researching the critical role of self-directed learning (Long, 1998). Recent studies demonstrate that students with a high level of self-direction tend to succeed in online learning environments (Hartley & Bendixen, 2001; Song & Hill, 2007). It appears that the importance of the online learning context has been recognized and is promising in the area of self-directed learning; however, there is still scarcity in research and practice regarding just how the competencies or attributes of a self-directed learner contribute to learning in online learning environments. Therefore, it would be worthwhile to perform research on self-directed learning within the online context, particularly as, according to the 2015 Online Learning Consortium report, distance education enrollments continue to increase (Allen, Seaman, Poulin, & Straut, 2016). In this study, a review of theory and practices of self-directed learning in general will be conducted as well as a review of theory and teaching practices of self-directed learning in the online context.

Chapter 3. Research Methodology

The purpose of this chapter is to provide an introduction of the methodological approach, present the scope and rationale of the study, and demonstrate how the study was conducted with a highlight on the rigor of the study. The ultimate goal of this study is to update the understanding of self-directed learning practiced in higher education, particularly with aims to disentangle various interpretations of self-directed learning, identify what attributes, competencies, strategies, and methods make a successful self-directed learner. Furthermore, the researcher will address and examine unsettled research questions.

Introduction to Study Design

In this study, the researcher employed an integrative literature review, a type of research that "reviews, critiques, and synthesizes" a body of literature on a specific topic in an "integrated" manner, resulting in newly generated knowledge and comprehensive perspectives on the topic (Torraco, 2005, p. 360). Callahan (2010) agreed with the definition given by Torraco (2005) but further claimed that an integrative literature review has "the concentrated focus on a topical area and the presence of a methodology" (p.301). The approach of an integrative literature review, he stated, explores "the depth of a major topic within a field" and "systematically traces" the selected literature on a topic "back to its roots" (Callahan, 2010, p.301).

There are two types of integrative literature reviews, based on the maturity of the review topic: well-developed topics and emerging topics (Torraco, 2005). This study is mainly concerned with the well-developed topic of self-directed learning with a mission to address the need to review, critique, and re-conceptualize the topic as it continues to develop (Torraco, 2005). To yield an enriched and elaborated understanding of the topic of self-directed learning, the researcher employed both deductive and inductive approaches in this integrative literature review. The deductive approach enables the researcher to utilize Knowles' definition and core features of

self-directed learning to guide the exploration of the existing body of literature, while the inductive approach allows the researcher to generate personal theories by formulating themes that emerge from the extant literature and categorizing them into a meaningful framework of the topic reviewed.

Specifically, the researcher followed six phases as illustrated in Table 2. The study phases were modified by integrating the widely used five stages of integrative literature review (Whittemore & Knafl, 2005) and the procedures for integrative literature review (Soares et al., 2014). The researcher added one phase to reformulate the research problem by modifying the research questions, assuming that it is indispensable to reevaluate the concept and relevance of the operationalized definitions in the search results, which further requires re-evaluation of the research questions and modification of them accordingly (Cooper, 1984, p. 20). Furthermore, themes emerge from various bodies of literature search in a bottom-up (inductive) manner, and it was likely that additional themes would emerge to contribute to the topic but may not have been covered in the original research questions. With the research questions modified, the investigation of the topic was comprehensively conducted. Therefore, it was necessary to modify them after literature search and data extraction for analysis. In sum, the modified six-phase process was likely to enhance the replicability of the review, thus yielding a vigorous study.

Table 2.

Overview of Study Phases

Phases	Actions in Each Phase
1	Define the research questions.
2	Search literature and extract the data set.
3	Modify research questions.

4	Evaluate data for analysis.
5	Analyze data.
6	Present and discuss findings.

Scope and Rationale of the Study

An integrative literature review allows for a combination of various research methodologies and differing forms of synthesis to reach the goal of new knowledge generation (Torraco, 2005; Whittemore & Knafl, 2005). In this study, the researcher incorporated the approach of a mixed-method study into an integrative literature review. Employment of mixed methods provides a comprehensive understanding of a complicated phenomenon where qualitative research and quantitative research are both applied to explore different perspectives of the phenomenon and minimize the limitations that either individual methodology might cause (Creswell & Plano Clark, 2011).

In this integrative literature review, the researcher followed the procedures of an exploratory sequential study, in which the qualitative inquiry was given priority and the qualitative data set were analyzed by an iterative comparison of similarities and differences across the studies reviewed (Creswell & Plano-Clark, 2011). Informed by the qualitative findings, additional statistical, calculative analyses were conducted to justify the status quo, define the trend, and indicate the future direction for research. Specifically, this integrative literature review covered both qualitative inquiry and quantitative examination on the topic of self-directed learning. Meta-inferences from both quantitative and qualitative findings complementarily leveraged the strengths of both quantitative and qualitative analysis as well as offset the weaknesses of either quantitative or qualitative findings. The synergistic use of meta-inferences

provides a robust and holistic worldview on a complex phenomenon (Creswell & Plano-Clark, 2011).

The advantages of utilizing a mixed-method study in this integrative literature review are multifaceted. The first advantage is that the mixed methods design allows for multiple legitimate methods to be applied to social inquiry, which helps solve a practical problem in a pragmatic manner with multiple sources (Greene, 2008). The second advantage is that triangulation increases trustworthiness due to the nature of differing data sources (Creswell & Plano-Clark, 2011). Words and numbers act as supplementary sources to help solve the research problem as a whole (Caracelli & Greene, 1997; Greene, 2008). The third advantage is that mixed-methods research engages the researcher with dialectical interaction among numerous ways to see, hear, think, and interpret the social world (Greene & Caracelli, 1997). By thinking deeply and comprehensively, the researcher was able to expand her perceptions of the world. The fourth advantage is that the researcher can practice various ways of thinking and researching, which bestows her with a better preparation for her future profession.

Integrative Literature Review Process

To apply the approach of an integrative literature review, the researcher designed a six-phase process to perform this study, as illustrated in Figure 2. Following the figure, a complementary narration of each phase is explicitly presented.

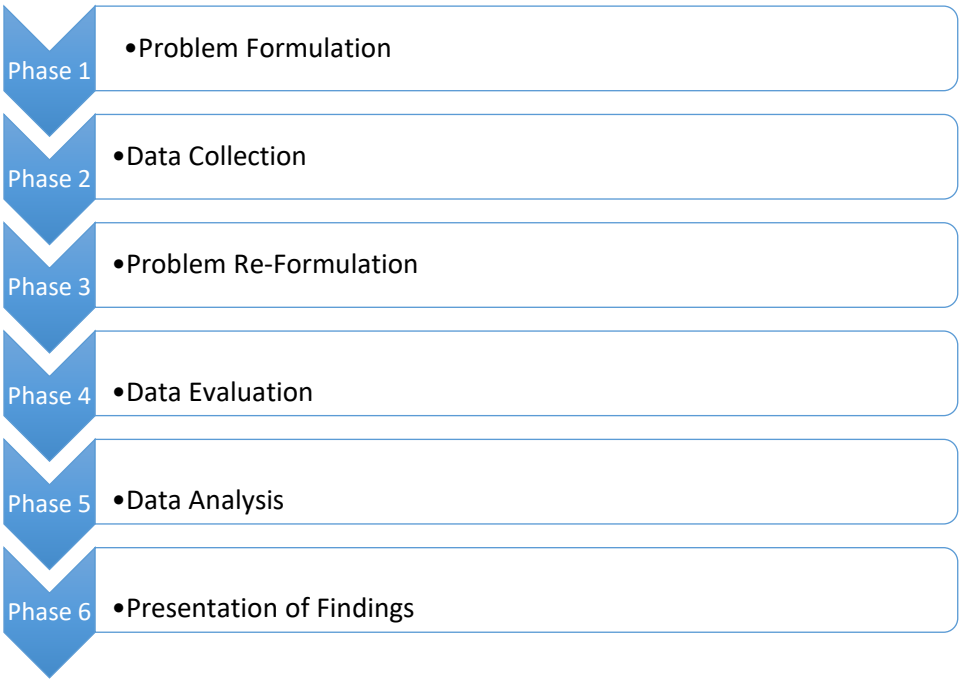

Figure 2. Process of the research methodology.

Phase 1: Problem formulation. Originated from researcher's interests across adult education and distance education, the research problem was formulated when the researcher explored the topic of self-directed learning as established in life-long learning and its learning and instructional strategies across disciplines. In the phase of problem formulation, the researcher acknowledged her own interest in the topic of self-directed learning in the process of investigating online learning strategies. Having been confused by the interchangeable use of the two terms "self-directed learning" and "self-regulated learning," the researcher explored the denotations of the two seemingly similar terms across various research contexts and found the term "self-directed learning" mainly employed by researchers and educators in the field of adult learning while the term "self-regulated learning" was applied by scholars in the field of educational psychology. With this initial discovery, the researcher anticipated further exploration of the common and distinct connotations of the two similar terms.

With a compelling research interest in adult education, the researcher was determined to focus her research on the term "self-directed learning" as mainly applied by adult education researchers. Through further examination of the self-directed learning literature, the researcher found that self-directed learning has been discussed since the early 1960s from different perspectives. For instance, self-directed learning has been perceived as a goal of adult education, a process that defines successful learning, and as one of the learner attributes that determine learner autonomy (Candy, 1991; Garrison, 1997; Merriam, 2001). As stated in the Introduction, the decision to ultimately anchor this study in the topic of self-directed learning was a result of the primary findings of the review of the literature on the topic. The initial literature review indicated that no theoretical consensus has been reached in terms of the definition, its constituents, and its measurements. Additionally, the researcher found that there was a gap in the literature regarding a comprehensive, updated summary of the extant literature (Brockett, 2000; Brockett & Hiemstra, 1991): Brockett (2009), suggested that "although we have made important inroads toward understanding the phenomenon of self-directed learning, many important questions remain" (p. 37). In roughly five decades, the scholarship in self-directed learning has prompted researchers to pay attention to and pursue updated knowledge in a "systematic and sustained way" among the researchers and practitioners across disciplines (Conner, Carter, Dieffenderfer, & Brockett, 2009, p. 70). The researcher of this study firmly believed that in order to move forward in the area, it was necessary to organize and interpret what the previous research tells us. With many important questions unanswered and many issues unsettled, it is crucial to generate an update of the knowledge base and continue the line of scholarship in a sustainable manner.

Additionally, it is significant to examine how factors such as learning contexts influences self-directed learning, which in turn demands a review of various learning contexts within which learners foster self-direction either intrinsically or are facilitated by extrinsic motivators (Candy, 2004a; Song & Hill, 2007). The learning contexts include, but are not limited to face-to-face classroom instruction, online learning environments, and both formal and informal educational contexts. Among the various contexts, researchers indicated that there is a gap in research on self-directed learning regarding higher education in a formal educational context (Merriam, Caffarella, & Baumgartner, 2012) as well as in the online settings (Song & Hill, 2007). Therefore, an integrative literature review was needed, with one of the aims being to examine how a learner fosters his/her own self-directed learning in the context of higher education and in the online learning environments.

With all the unsettled questions, issues, and ambiguity of our understanding in the area of self-directed learning, the researcher was compelled to examine how the term self-directed learning has been defined across disciplines and in different learning environments regarding its evolving history, especially as the learning environments have steadily changed and proliferating technologies tend to become part of teaching and learning. Furthermore, the researcher intended to examine what attributes or competencies of self-directed learning have been identified in successful self-directed learners and, accordingly, what strategies and methods have been determined to foster self-directed learning.

Phase 2: Data collection. To enhance the rigor of the integrative literature review, the data collection phase requires the use of "well-defined literature search strategies" to enhance the rigor of the integrative literature review (Whittemore & Knafl, 2005, p. 548). Failure to use the strategic literature search strategies can lead to insufficient or biased search results, which can

ultimately affect the accuracy of the sources to be included in the data set (Cooper, 1998; Whittemore & Knafl, 2005).

In this phase, the researcher composed an explicit description of the search criteria and the search procedures to counterbalance the threats to the rigor of the study, such as a biased selection of the search results and inadequate search results. The search criteria, strategies, and search findings were established as follows.

The strategies used in the literature search process are the complementary approaches recommended by Whittemore & Knafl (2005) to ensure the most extensive body of literature that is relevant to self-directed learning. In this study, two main approaches were used to enhance the rigor of the study. One approach is to conduct a computerized data search among the major electronic databases. According to Klassen and his colleagues (1998), computerized databases are efficient and effective to use in literature review. Researchers can rely on their efficiency and effectiveness, but they should also be cautious when applying the indexing search terms and choosing the eligible sources to be included in the final data set. The complementary approach is the "ancestry approach," which means that a manual screening is conducted through the references and bibliographies of the sources that have been identified and reviewed (Cooper, 1984, p. 41; Mullen, 2013, p. 32).

Following the initial step of the literature search, the researcher identified the term of "self-directed learning," a broad concept related to the topic of the study, as suggested by Cooper (1984). He stated that a broader search will generate "greater operational detail" for later use when the researcher determines whether or not to exclude the irrelevant studies (p. 26). The process of literature search in this study started with a computerized data search method using the key search term "self-directed learning" in the commonly used electronic databases in

education, including ERIC from CSA, Education Research Complete, Academic Search Complete from EBSCOhost databases, JSTOR, PsycINFO from the APA PsyncNET database, Dissertation and Theses Global from ProQuest, and Google Scholar. Other terms deemed equivalent to "self-directed learning" were also used in the search, including "self-planned learning," "inquiry method," "independent learning," "self-education," "self-instruction," "self-teaching," "self-study," and "autonomous learning" (Knowles, 1975a, p. 18). The initial search yielded more than 23,000 sources. After the terms were delimited to adult education and scholarly (peer-reviewed) articles published in English, the relevant articles were reduced to less than 500 articles, among which the repeated articles were extracted. By means of a brief review of the titles and keywords, the researcher discovered that 336 articles addressed the topic of online learning or distance education.

Following "the ancestry approach" (Cooper, 1984, p. 41), the manual examination of the reference lists of the sources that were located generated 39 studies of interest. Moreover, to guarantee that all relevant studies in self-directed learning were included, all issues of a prestigious journal that focused on self-directed learning (the *International Journal of Self-Directed Learning*) were manually screened to ensure that no articles in that journal were overlooked in the search process; all potentially eligible articles were included in the data set.

In the following step, all the titles, keys words, and abstracts of the primarily identified articles were examined for necessary, sufficient information relevant to the review. Articles without a setting in higher education were excluded since the review has a focus on the topic of self-directed learning in higher education, as mentioned in the introduction and research questions. This manual screening further cleaned the data set for the researcher to use in the next step – modifying research questions in the phase of problem re-formulation.

Phase 3: Problem re-formulation. The research questions were accordingly modified based on the suggestions proposed by the committee members in the prospectus exam. Additionally, the researcher re-evaluated the concept of self-directed learning and relevance of the operationalized definitions in the search results. When examining the abstracts of the primarily identified articles, the researcher was aware that self-directed learning as an attribute and competence were frequently discussed. Therefore, an investigation of the necessary attribute(s)/competency in a successful self-directed learner was added to the research questions. Accordingly, strategies or methods to help foster or improve self-directed learning need to be investigated as well. Another discovery was that almost all the studies developed their research based on the definitions or models of scholars such as Cyril Houle, Allen Tough, Malcolm Knowles, Lucy Guglielmino, Stephen Brookfield, Huey Long, Philip Candy, Ralph Brockett, Donn Randy Garrison and Roger Hiemstra, who were identified by the researcher in the initial literature review stage as the major contributors in the scholarship of self-directed learning.

Having modified the research questions, the researcher decided to group the primary search results into two categories – theoretical articles and empirical studies. The theoretical articles were determined to mainly answer questions regarding definitions of self-directed learning and common characteristics of self-directed learning. To guarantee the rigor of the integrative literature review, the use of empirical evidence helps to justify the theoretical hypothesis and avoid excessively spectacular theoretical claims (Baumeister & Leary, 1997). In this integrative literature review, the empirical studies were used as justifiable evidence to recognize the types of competence/attributes of a successful self-directed learner and the relevant strategies/methods to foster or improve self-directed learning. Table 3 outlines the relationship between the modified research questions and the research methods.

Table 3.

Relationship Between Research Questions and Research Methods

Research questions	Collected data	Types of analysis
1. How is self-directed learning defined in the literature and what common characteristics constitute self-directed learning?	Mainly from theoretical articles and open to empirical studies.	An iterative comparison of patterns and distinctions among all the studies.
2. What types of competence/attributes are needed to make a highly self-directed learner?	Empirical studies	An iterative comparison of patterns and distinctions among all the studies.
3. What strategies or methods can help cultivate and develop self-directed learning?	Empirical studies	Statistical, calculative analyses of the patterns to justify qualitative results and make indications.

Phase 4: Data evaluation. In the data evaluation phase, all the articles need to meet two criteria to be included. Firstly, an extensive search was conducted for peer-reviewed studies published in English in the past 50 years (from January 1966 to date). Secondly, the articles need

to be relevant to the topic of self-directed learning. Specifically, the articles need either to address the definition, the characteristics of self-directed learning, or the competencies/attributes and strategies/methods of a successful self-directed learner.

The primary search results were categorized into two sets of raw data: theoretical articles and empirical studies. In this phase of the study, each abstract of the selected articles was read for the information needed to discern the features of the articles. When ambiguity or confusion emerged, the researcher read the entire article to seek additional valuable information for clarification and justification. Housed in Microsoft Excel sheets, the two sets of data included (a) the publication date, (b) the author(s), (c) disciplines, (d) setting of the studies (e.g. face-to-face instruction or distance learning), (e) abstract, (f) keywords, (g) methodology and research populations (only for empirical studies), and (h) specific findings and conclusions pertaining to the research questions of this study.

Phase 5: Data analysis. The goal of the data analysis is to generate a "thorough" and "unbiased" synthesis of the primary sources for an updated knowledge base (Whittemore & Knafl, 2005, p. 550). One of the strategies to achieve the goal is to borrow the research methods of analysis from mixed-method design, which allows the researcher to qualitatively analyze the data by iteratively comparing across the primary sources and quantitatively analyzing the patterns or trends, in order to justify the qualitative analysis and make implications for future research (Miles, Huberman, & Saldana, 2013; Patton, 2002; Tashakkori & Teddlie, 1998). There are four steps in data analysis using the approach of an iterative comparison. They are 1) data reduction, 2) data display, 3) data comparison, and 4) drawing conclusions and verification (Whittemore & Knafl, 2005). Each of the steps is described as follows.

Data reduction. The first step is to organize the data in a meaningful and manageable manner (Whittemore & Knafl, 2005). The researcher chronologically organized the primary data into two categories – theoretical articles and empirical studies. Each article was simplified and abstracted into a manageable unit of study with similar features hosted in a table on the Excel sheets for future coding.

Data display. The second step is to display the extracted data in the form of "matrices, graphs, charts or networks." When it is prepared this way, it is conducive for the iterative comparison across studies (Whittemore & Knafl, 2005, p. 551). The researcher of this study created a table to embed all the abstracted information for subsequent iterative comparison and statistical analysis.

Data comparison. The goal of data comparison is to recognize patterns, themes, or relationships among the data displays (Whittemore & Knafl, 2005). An iterative comparison was conducted across the selected articles. This process allows the researcher to convert the abstracted information into meaningful clusters, where patterns, themes, differences, and relationships emerge. To identify an updated definition of self-directed learning, the researcher constantly compared each of the definitions across all the selected theoretical studies and generated three categories: (a) self-directed learning as a goal of life-long learning, (b) self-directed learning as a learning process, and (c) self-directed learning as a learner attribute. In the process of exploring answers to the research questions regarding competencies/attributes and strategies/methods, the researcher firstly coded the abstracted information of each article. Next, the primary codes were constantly compared across all the articles/studies and were followed by a systematic classification of 11 emerging categories. After a further process of comparing and

abstracting among the 11 categories, five categories were eventually determined. They are (a) drive to achieve, (b) independence; (c) persistence, (d) self-efficacy, and (e) motivation.

Conclusion drawing and verification. In this step, all identified themes are used to classify the extant research into a method of synthesis or summary (Torraco, 2005). To verify the synthesis or summary, each of the articles in the data was reviewed repeatedly to ensure that there was no misinterpretation and that each article was congruent with the initially selected sources (Whittemore & Knafl, 2005).

Phase 6: Presentation of findings. The final phase of the study is the presentation of findings, in which a synthesis of the exhaustive literature is developed and presented in the form of a model or a framework to "comprehensively portray the process of integration" with supportive evidence (Whittemore & Knafl, 2005, p. 549). The researcher presents the findings in a comprehensive framework that embraces all the addressed perspectives in the literature in the area of self-directed learning in higher education. The framework has captured the "depth and breadth" of the area of self-directed learning and has contributed to an updated knowledge base, thus establishing direction for future research agenda and implications for teaching and learning (Whittemore & Knafl, 2005, p. 547).

Rigor of This Study

A robust and systematic review of the literature is essential to establish an extensive knowledge base about a topic (Broome, 2000). To guarantee the rigor of this study, the researcher utilized two strategies. One strategy was designing a six-phase review process to execute robust, transparent procedures; the other strategy was ensuring a high level of validity through the efforts to meet the criteria of validity of integrative reviews created by Oxman & Guyatt (1991) and modified by Klassen, Jadad, and Moher (1998).

The rigor demonstrated in the six phases of the design was explained as follows. In Phase 1, the research problem was clearly identified with explicit research questions. The clear description of research questions guided the literature search in Phase 2, where the search terms were identified as well as the range of databases, publication years, references manager, the search strategies, and the inclusion/exclusion criteria of the studies for the review. The characteristics of the reviewed articles were defined and outlined to ensure that the selection strategies were vigorous and could counterbalance the limitation of the only researcher, when searching and collecting data. Transparency of the procedures in Phase 2 renders a robust data collection for this review. Having transitioned into Phase 3, data analysis, the researcher recognized the frequently discussed concepts that were not addressed in the original research questions, and modified the questions accordingly, per the suggestions from the dissertation committee members. Three out of five original research questions were removed and two questions were added. In total, three research questions were determined, and these focused on the definition of self-directed learning, competencies/attribute(s) of a highly self-directed learner, and strategies/methods to augment self-directed learning. The modified questions enabled the researcher to understand the spectrum of self-directed learning. In this phase, the literature plays the role of data per se, and requires an in-depth and systematic review in the data analysis phase. By systematically analyzing literature as data, this study encapsulated a comprehensive understanding of the topic under study (Broome, 2000).

In Phase 4, the researcher evaluated the primary data sources by reading the titles, keywords, and abstracts and, based on the research questions, boiled the raw data down for review in its entirety. The extracted data was composed of both theoretical articles and empirical studies. The research questions guided the selection of the articles for the review. Next, the data

was extracted for review after several rounds of screening, including evaluation of the title, abstract, key words, purpose of the study, methodology, and conclusions. In Phase 5, data was determined for this integrative review. In the data analysis stage, the researcher cautiously reviewed each article in a proximally objective and unbiased manner with a critical tone, coded for themes, and generated concept categorization. Coding was used to analyze the diverse sources of data. A concept matrix was used to generate the themes and further categorize the themes. In this phase, an iterative comparison of the data sources was conducted. Reliability of the study was established mainly by consistency of coding, which was guaranteed by the only researcher's consistent coding and detailed documentation of the analysis decisions, thoughts, and elaboration of the codes (Miles et al., 2013). In Phase 6, when presenting the findings, a systematic synthesis of the data was presented in a framework, comprehensively explaining the perspectives of self-directed learning and supporting the framework with the congruent evidence from the data sources. Overall, the transparency of this study lies in an explicit narration of procedural details. Therefore, this study is likely to be robust and replicable.

To ensure the rigor of the search results, three factors were considered: the level of a researcher's open-mindedness and expertise in the given area (Davidson, 1977, as cited in Cooper, 1984, p.25); "the way the research is documented in the retrieval system" (Resnick, 1961, as cited in Cooper, 1984, p.p. 25-26), and the amount of time spent determining relevance of the search results (Cuadra & Katter, 1967, as cited in Cooper, 1984, p.26). The researcher was able to follow the three factors to ensure rigor of the study. She believed that she was open to explore the topic of the study across disciplines and had accumulated sufficient expertise in the area of self-directed learning. The researcher documented the process of conducting this study and spent more than enough time to determine relevance of the search results. In line with the

guidance of Davidson (1977), and Cuadra & Katter (1967), she believed that she secured the rigor of the study.

For the purpose of further augmenting the rigor of this study, the researcher utilized the following strategy to achieve a high level of validity. Efforts were made to meet the criteria of validity of integrative reviews created by Oxman & Guyatt (1991) and modified by Klassen, Jadad, and Moher (1998). One factor that influences the rigor of the study is its validity. The researcher reviewed different tools to validate integrative literature reviews, and determined the criteria of validity of integrative reviews created by Oxman & Guyatt (1991) and modified by Klassen, Jadad, and Moher (1998) to apply. The criteria included a checklist of six questions. A robust literature review with a high level of validity is able to meet most of the criteria with only minor omissions (Klassen et al., 1998). The researcher reflected on the process of conducting this study and answered the questions in the checklist as follows.

1. *Did the systematic review address a focused, clinical question?*

Yes, all the answers to the research questions were relevant to the research problem and are explicitly stated in Chapter 1 Introduction. Then, the research questions were modified based on the suggestions of the committee members from both the prospectus exam and the primary literature search results.

2. *Were the criteria used to select articles for inclusion appropriate?*

Yes, the inclusion criteria were appropriately stated and related to the research questions. In Chapter 3 Methodology, the researcher was focused on an explicit description of the inclusion criteria when discussing the literature search strategies.

3. *Is it likely that important, relevant studies were missed?*

Yes. The search strategy for this study included a computerized search of the major electronic databases from 1960 to 2016, a manual screening of the International Journal of Self-Directed Learning from 2004 to 2016, and a review of reference lists of the identified studies. The researcher made reasonable efforts to obtain an exhaustive data set, despite the fact that some important studies were not included because of the access limitation when the study was in process. The issue of the access limitation was also documented and presented in the section of limitations of the study.

4. *Was the quality of included studies assessed?*

Yes. The researcher evaluated the quality of the primary studies by following the quality criteria in the phase of data evaluation. The inclusion and exclusion criteria was closely related to the research questions and presented clearly in Chapter 3 Methodology.

5. *Were the assessments of studies reproducible?*

Yes. All the inclusion and exclusion criteria were created by the researcher and reviewed by her advisor. The exhaustive description of the inclusion/exclusion was documented and presented in detail to the audience, so it is assumed that the other interested researchers would be able to reproduce the study by referring to and modifying the criteria for their own studies. However, it would be more rigorous if there were an expert review on the inclusion/exclusion criteria, which the researcher also addressed in Chapter 6 Reflection.

6. *Were the study results similar across studies?*

No. There are no similar studies in the literature regarding an integrative review of self-directed learning in higher education. The researcher found a literature review with the purpose of theorizing self-directed learning in the workplace from the perspective of human resource development; yet, the review was not deemed relevant to the current study because, firstly, the

review of self-directed learning in workplace has a different targeted population of the workers in the setting of industry. In addition, the study does not include any empirical studies, which is likely to lack vital evidence to support the review. Thus, the results of the review could not be used to compare with the findings of the researcher's review. Despite lack similarities across these two studies, motivation was addressed in both reviews regarding its significance in self-directed learning.

Overall, the current study is able to meet most of the criteria of assessing validity of systematic reviews with only minor omissions (Klassen et al., 1998; Oxman & Guyatt, 1991). It can be concluded that the validity of the study tends to be strong, and it is a rigorous study.

Chapter 4 Findings and Discussion

This chapter is a presentation of the findings of the integrative literature review after iterative comparisons of patterns and distinctions among all the selected studies. Findings from this study identify and classify definitions and common characteristics of self-directed learning. Moreover, the findings demonstrate the identification of the competencies/skills that a self-directed learner needs and the strategies to help cultivate or improve self-directed learning. Answers to each of the questions are as follows.

Findings of Research Question 1

Research Question 1:

How is self-directed learning defined in the literature and what are the common characteristics of self-directed learning?

To answer Research Question 1, twenty-three major definitions were selected among various interpretations of self-directed learning from as early as 1960 to the most recent proposed in 2000. Most studies in the 2000s were found to borrow the definition from the selected 23 definitions. Therefore, no new names were identified. The selected definitions have the common features: firstly, they were frequently addressed in most studies in the extant literature of self-directed learning; secondly, they have an explicit description of the definition; lastly, they were all empirically grounded. All the selected authors are listed in the following table in chronological order.

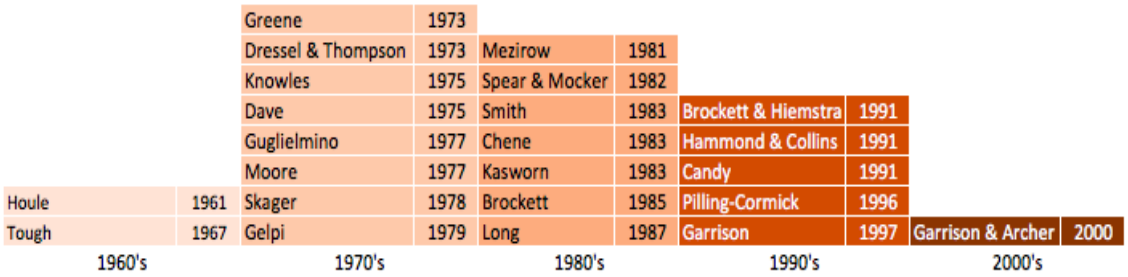

Figure 3. Distribution of definitions according to the year with authors.

As demonstrated in Figure 3, the definition was first introduced by Houle and also by Tough in the 1960s, when the study of self-directed learning was in its infancy. Then, in the 1970s, the area of study mushroomed and arrived at its pinnacle. In the sample of this study, 68.2% of the studies cited the definition proposed by Knowles and 25.3% of them cited Tough's definition. It was also in the 1970s when Guglielmino's Self-Directed Learning Readiness Scale, the first quantitative measurement of self-directed learning was developed and implemented into empirical studies. The enthusiasm in the defining self-directed learning continued in the 1980s; however, in the 1990s the popularity of expanding the definition decreased. Since 2000, one new definition (Garrison & Archer, 2000) has been identified.

By iteratively comparing the 23 definitions and bringing them back to the context where they were proposed, the research found four significant results. The first finding is that the conceptualization of self-directed learning has experienced an expanding process. The second finding is that the definitions share commonalities regarding the purpose of self-directed learning but are distinct from each other regarding the dimensions on which they focus. The third finding is that nine out of 23 definitions demonstrated agreement that self-directed learning is a

planning-executing-evaluating process. The fourth, and the most interesting finding is that all of the definitions, as a whole, despite having distinctive stressed dimensions, have coincidently composed three modes of mental functioning. Each of the findings is further explained as follows.

Finding 1 Discussion. The first finding is that the definition of self-directed learning has experienced a dynamic expansion process, which can be characterized by three stages. In the first stage, represented by Houle, Tough, and Guglielmino, self-directed learning is viewed a personal attribute which forms the basic dimension in the definition. The desire to know/learn, as a learning attribute, is pinpointed. All the three scholars, via their empirical studies, identified that the desire to learn is the purpose to learn. The desire is a genetic and innate nature. They believed that self-directed learners are adult learners so they have definite goals that "they wished to achieve" (Houle, 1961, p. 25). The learners are motivated to participate in the learning activities because they "enjoy participation", or they "[want] to learn" (Tough, 1967, p. 3), or they feel that learning is "desirable" (Guglielmino, 1978b, pp. 1, 73).

The second stage of the dynamically expanded process manifests itself in the added dimension of the learning environment, and the focus of research switched from an inherent nature of the self-directed learner to the learning climate outside the self-directed learner. The major definers are Knowles, Dave, Mezirow, Brookfield, Long, Candy, and Garrison. All these scholars pointed out the significance of the learning environment as one dimension of self-directed learning. For example, learning resources, learning support, and learning context were recognized as comprising a major dimension in defining self-directed learning. Knowles (1975) and Dave (1975) claimed that a self-directed learner can identify resources and learning support through resource people such as facilitators or peers to help them accomplish their learning needs.

Mezirow (1981), Mezirow and Brookfield (1985), and Long (1991) included in their definitions the importance of the relationship between the self-directed learner and what resources his/her institution can provide regarding information and other resources the self-directed learner needs for learning. According to Brockett and Hiemstra (1991) Candy (1991), context is classified as one indispensable dimension of self-directed learning. Candy (1997) noted that the learning context could influence self-directed learning in the way that the learner tends to be more self-directed if he/she is familiar with the context. She further explained that a Spanish-speaking learner is likely to be more self-directed when she learns Italian because both of the languages are Romance languages and share common or similar words. Similarly, Brockett and Hiemstra (1991) included in their definition the role of social context and its influence upon the learners. By social context, they meant physical locations where learning occurs, such as classrooms in the universities, public libraries, museums, and so on.

The third stage of the dynamically expanding process is slightly complicated. The cognitive process is another contributing dimension that was discussed in defining self-directed learning. The definers perceived the cognitive process as a dimension at different levels, although the majority of the definers acknowledged that self-directed learning is a type of individual cognitive process in which the self-directed learner takes responsibility to plan, execute, and evaluate the his/her own learning process. Early definers in the 1960s and 1970s merely identified the learner as the acting agent who had the responsibility in controlling his/her self-directed learning, rather than applying theories of educational psychology. Without a theoretical foundation, most of the definitions of that age are bland. One example is as follows: A self-directed learner retains "the major responsibility for planning, supervising, and controlling his learning and can simultaneously obtain advice, encouragement, and other assistance briefly

from several other individuals" (Tough, 1967, p. 30). Tough's (1967) definition aligns with the core idea of his advisor and mentor Houle's (1961) explanation of three levels of self-directed learners. Both scholars contributed to the area of the study by introducing self-directed learning as an aspect of adult education and initiated that research thrust among other scholars. However, the drawback of both pioneers is that they put more weight on self-directed learning as a hereditary attribute of adult learners rather than a learned process with identifiable strategies. One of Houle's (1961) findings from the case study demonstrates that the traits of the learning-oriented learners are inherited and are rarely related to the "environmental factors" (Houle, 1961, p. 64). His protégé continued this belief by concluding his case study with the statement that the goal of self-directed learning is desired by and the purpose of learning originates from the natural self of the learner.

The complexity of the third stage of the dynamically expanding process is also reflected in the work of later definers, beginning in the mid-1980s. The definers in the mid-1980s include either explicitly or implicitly in their elaborated definitions recognition that self-directed learning is a cognitive process. Kasworn (1983) points out clearly that self-directed learning is an internal process of the self-directed learner. He also suggests that research in self-directed learning should be grounded in a framework of both cognitive psychology and human development psychology. Oddi (1986) borrowed the idea from Maslow and other psychologists to define a self-directed learner as an "autonomous, self-actualizing individual who seeks opportunities to grow and fulfill potentials" (Oddi, 1986, p. 98). Oddi's framework includes three dimensions and is reflected in his Continuing Learning Inventory, a scale that measures the learner's personality characteristics as the *outcome* of self-directed learning. One of the three dimensions is openness, by which he means that the self-directed learner is open to alternatives and change,

is tolerant of ambiguity and confusion, is not fearful when faced with difficulties or failures. His implementation of human development psychology refreshed the previous definition of self-directed learning and increased researchers' interest in carrying out empirical studies by using his measurement tool. However, his perception of the cognitive process is somewhat superficial, because he still pursued self-directed learning as a personality characteristic.

Compounding the complexity, scholars in the1990s and later began to introduce more terms from both educational and human development psychologies to consolidate their beliefs of self-directed learning as a cognitive process. The representative ideas are learner control or learner autonomy, self-efficacy, motivation, metacognition, and so on. Among all the selected definitions, learner control was included in 11 definitions. Eight definitions included motivation as a dimension. Two definitions included metacognition as an essential dimension (Garrison, 1997; Guglielmino, 1978b). Self-efficacy and critical thinking were included at least once among the selected definitions (Brookfield, 1986; Guglielmino, 1978b; Hammond & Collins, 1991b; Mezirow, 1985). It is an interesting phenomenon that the development of adult learning theories started to go hand in hand with the development of learning theories in educational psychology. There seems to be more space in the marriage of the two branches of theories for the future study of self-directed learning. However, if the researcher's postulation were true, it bears asking why the era of 2000s lacked new definers or updated definitions. One possible reason would be that it usually takes time for the new theory to form, mature, and replace the long-established and widely accepted theories.

To sum up, three stages of the process of the dynamically expanding definition of self-directed learning constitute an evolutionary process by which three major dimensions of self-directed learning are identified. They are self-directed learning as a learner personality

characteristic, learning environment, and self-directed learning as a cognitive process. Figure 4 is a visual demonstration of the three dimensions to consider when defining self-directed learning.

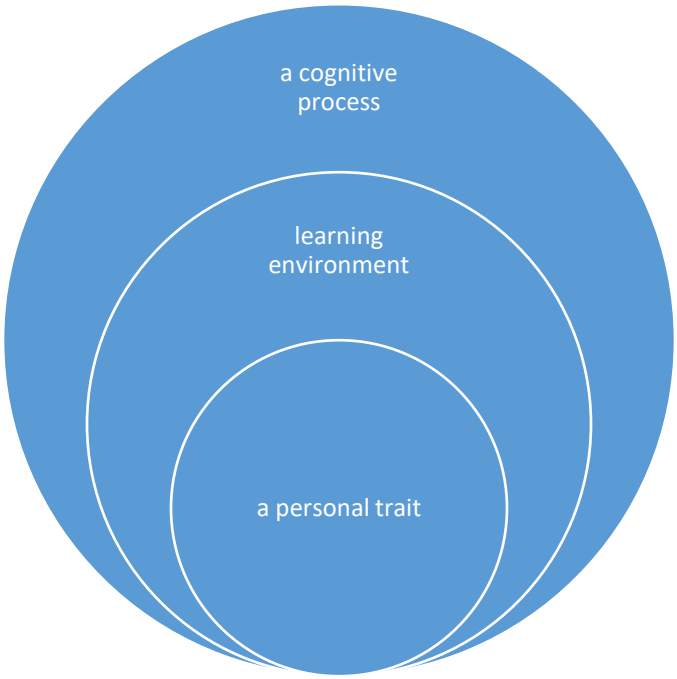

Figure 4. The three dimensions to consider defining self-directed learning.

Finding 2 Discussion. The second finding is that a majority of the selected studies share commonalities regarding the purpose of self-directed learning but diverge from each other with their focused dimensions, as mentioned in the first finding under the three stages of the defining self-directed learning. The common characteristics of self-directed learning are 1) the learner has intentional goals and can make reasonable plans; 2) they have the ability to execute a self-directed learning project; 3) they persevere in the learning process. All the commonalities are focused on the learner from the internal perspective.

First, the majority of the selected studies demonstrated that self-directed learning is intentional, and learners can make reasonable plans (Brockett & Donaghy, 2011; Candy, 2004; Dave, 1975; Guglielmino, 1978; Houle, 1961; Knowles, 1975; Moore, 1989; Skager, 2014; Song

& Hill, 2007; Spear & Mocker, 1984). Self-directed learners have specific goals they choose based on their learning needs before stepping into a self-directed learning project. Their learning goals are closely related to their life-cycles, according to Moore (1986). In each stage of their life-cycles, they have different learning needs, which motivates them to pursue the solutions to satisfy the needs. An example would be that a senior college student who majored in Spanish intended to learn some trending instructional technology because he/she is passionate about the most recent technologies and plans to land a job using technologies to teach digital natives. With the intentional goal anchored, his/her subsequent behavior would be to start planning with the oriented goal. In the process of planning, the self-directed learner takes primary responsibility as an acting agent (Brockett & Hiemstra, 1991b).

Among all interpretations of planning, an elaborated explanation was proposed by Skager in 1978 and then was revised in 2014. Though it is not cited as often as definitions by other prestigious scholars of self-directed learning, it provides an explicit starting point. The researcher of this study found that Skager's emphasis on planning is explicitly stated and has provided implications for teaching and learning. According to Skager (2014), the self-directed learner needs to be planful, which he further named planfulness. By planfulness, he meant that "planful learners are able to diagnose their own learning needs, set appropriate goals in the light of those needs, and devise effective strategies for accomplishing the learning goals" (Skager, 2014, p. 24). The three aspects of planning – diagnosing goal-oriented needs, setting appropriate goals, devising effective strategies for achieving goals– provides the self-directed learner with guidelines to follow when he/she plans his/her own learning project.

The second common characteristic is that self-directed learners have the ability to execute a self-directed learning project (Ralph G. Brockett & Donaghy, 2011; Chene, 1983; Dave, 1975;

Dressel & Thompson, 1973; Gelpi, 1979; Guglielmino, 1978b; Knowles, 1975a; H. B. Long & Redding, 1991; M. Moore, 1986; Pilling-Cormick, 1996; Skager, 2014; Tough, 1967). A plethora of the extant literature shows that it is important for the learner to master the ability to execute a self-directed learning project. Tough (1967) established this area by presenting the executing process in a specific manner, and it is worthwhile for both researchers and practitioners to consider. According to Tough (1967, 1971/1979), a self-directed learner plays the role of self-teacher and performs teaching tasks either entirely on his/her own or with the assistance or support from others or resources. The learner is able to choose goals based on his/her needs, decide appropriate approaches and activities to achieve the goals, estimate the level of the knowledge and progress toward the goal, and deal with difficulties or frustrations. Similarly, Knowles (1975) stated that self-directed learners need to ask questions, collect, and analyze data before finding the answers to the questions. In this process, formulating questions is of priority. Learners need to identify their learning needs in a realistic manner with help from teachers or peers, transform their learning needs into learning objectives, and make them feasible to accomplish and evaluate. Consistent with Tough (1967), Knowles (1975) believes that self-directed learners are able to utilize the resource people such as facilitators or peers when they see the need and identify resources to help them accomplish the learning needs. Furthermore, they are able to take the initiative to select their support or assistance, and possess the effective strategies and skills to satisfy their learning needs. They are able to determine whether they need to seek help from others, when and where to seek help, and how to locate the help and use it for their own learning. Rather than an isolated, solitary learning process as stated by Knowles (1975, p. 18), self-directed learning is a reciprocal process involving two-way communication, or negotiation between the learner and the human and non-human resources. The most important of

all, self-directed learners are able to validate their performance on achieving the learning objectives. To validate performance entails the capability to conduct both summative and formative evaluation.

The last common characteristic of self-directed learning in literature is perseverance, an important feature requiring both affective and cognitive efforts in the self-directed learning process. Tough (1967), Gugliemino (1978), Skager (2014), and Knowles (1975) concurred that self-directed learners demonstrate tolerance of ambiguities and confusion in their learning projects and can flexibly adjust learning activities or approaches to continue toward the ultimate goals. Skager (2014) pointed out that self-directed learners have "a willingness to change goals or learning mode and to use exploratory, trial-and-error approaches to problems" (Skager, 2014, p. 25). With the adaptive attitude and the following behaviors, self-directed learners tend to persist in their learning projects instead of withdrawing when they encounter fear, frustrations, or failures.

As illustrated above, three internal characteristics of the self-directed learner have been identified as commonalities among all major definitions in the literature. The learning environment, learner behavior, and personality interplay with each other and the interactive relationships "determine the life process of individuals" (Spear, 1988, p. 220). It is necessary to consider the learning environment as well when filling out the definition of self-directed learning, although the learning environment has not been widely discussed among the current definitions in the literature.

One implication from the finding is that it is essential to define self-directed learning in a useful way especially regarding what pedagogies can foster a learning climate where learners are taught the art of "fishing" rather than directly offered "fish". Questions as follow might be

considered when designing the learning environment for self-directed learning. For example, it is essential in trying to support self-directed learning to ask how to prepare students to make reasonable plans; how to make a learner aware of whether he/she executes the self-directed learning project appropriately in light of his/her own decisions on the needs; how to prepare a learner with competence to persist in a self-directed project; and how to make him/her cognizant of the need to individualize his/her own strategies to persevere.

Finding 3 Discussion. The third finding is that nine out of the 23 definitions demonstrated a consensus that self-directed learning is a planning-executing-evaluating process, as demonstrated in the following figure.

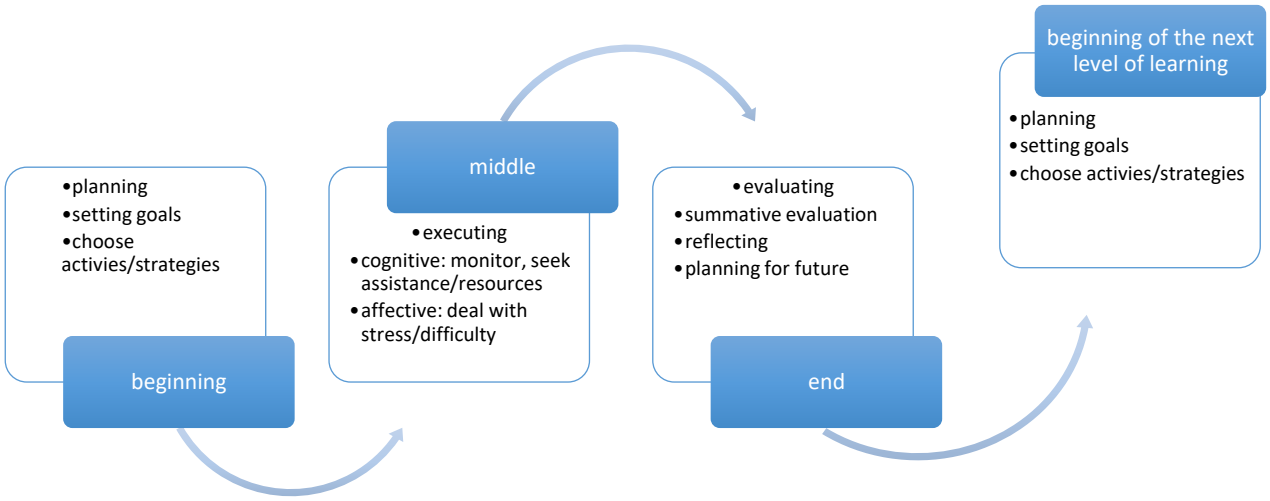

Figure 5. Self-directed learning as a planning-executing-evaluating process.

As demonstrated in Figure 5, at the beginning of a self-directed learning project, the learner needs to take his/her responsibility for making his/her own plans, such as setting realistic

goals and choosing appropriate activities and strategies for achieving goals (Brockett & Hiemstra, 1991; Chene, 1983; Dave, 1975; Guglielmino, 1978; Kasworm, 1983; Knowles, 1975; Long & Redding, 1991; M. Moore, 1986; Tough, 1967). Tough (1967) and Knowles (1975) both added the roles of planning for using resources and seeking assistance and support, which to that such resources, assistance, and support are helpful if provided to the learner at the beginning of a learning project, and if appropriate to the learner's needs. The weakness of all the definitions when addressing planning is a lack of time and money management at the beginning of the learning process. Knowles (1975) touched on time management in the executing stage, stating learners need to allocate time in a realistic manner. However, he did not include time-management in the planning stage. If learners are given opportunity to be aware of their own responsibility to allocate time at the beginning of the project, it is likely that they will have a conscious perception of time management and monitor their allocation of the time used in different activities for achieving learning goals when they execute the plan. Another important factor to contemplate, but that has also been neglected, is budget planning at the beginning of a learning project. Tough (1967) stated that learners need to manage money to obtain resources. However, he included it in the executing stage rather the planning stage. The reason is similar to including time management in the planning stage: The earlier the learner is exposed to time/money management, the more aware the learner becomes of its importance and may incorporate time and money factors into the entire planning.

To execute the plan is the next stage of the entire process, which involves both a cognitive process and an affective process. Cognitively, the self-directed learner supervises his/her own learning activities including monitoring progress, seeking help or assistance for achieving the goal (Kasworm, 1983; Knowles, 1975a; Tough, 1967). Affectively, the learner

deals with emotional feelings such as dislike of a certain activity, stress, frustration, fear, or failure (Oddi, 1986; Skager, 2014; Tough, 1967).

The third stage is to evaluate the learning outcomes. All nine definers agreed that evaluating learning is important in the end. However, they did not further specify how to evaluate learning or what type of learning needs to be evaluated. The researcher of this study was contemplating upon the question of to what "evaluating their learning" specifically refers. It would be helpful to clarify whether self-directed learning or the content knowledge is supposed to be evaluated. The researcher also doubted whether evaluating should be included merely at the end of a project. If monitoring is important in the course of learning, then evaluating is useful to assist monitoring. The researcher would suggest forms of formative evaluation in the process of the learning and summative evaluation at the end of the learning process.

In the stage of evaluation, reflection was also mentioned as a summative evaluation and can be used to plan for the future learning projects (Knowles, 1975a). As demonstrated in Figure 3, the third stage of the learning process is not only an end of the learning project, but is also a stage that prepares the learner to plan for the next level of learning. It is an iterative process rather than a linear one, aligned with Bruner's (1966) belief that learning is a spiral development of knowledge.

Finding 4 Discussion. The fourth and the most interesting finding is that all the definitions as a whole, with their distinctive stressed dimensions, have coincidently composed three modes of mental functioning, as demonstrated in the following figure.

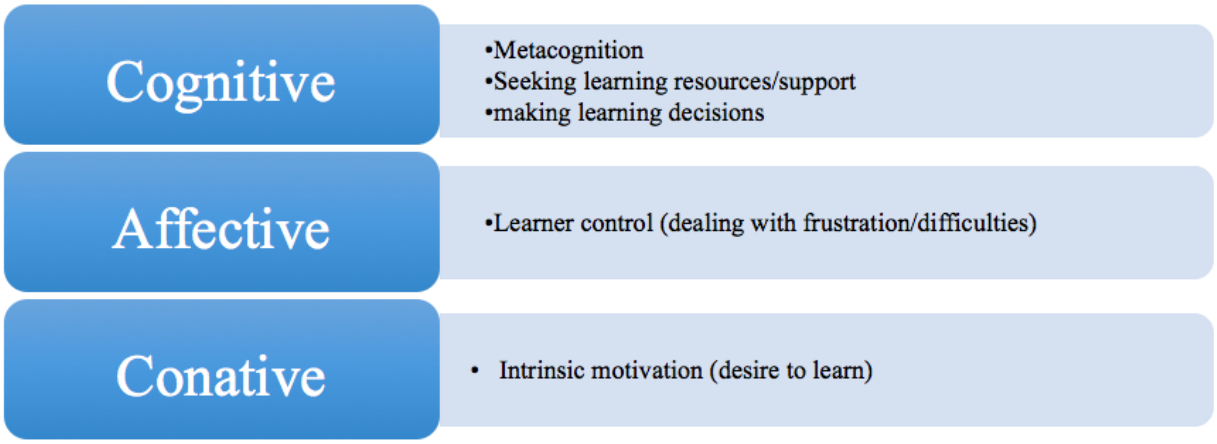

Figure 6. Self-directed learning as three modes of mental functioning.

Three Modes of Mental Functioning. According to Snow, Corno, & Jackson (1996) the three modes of mental functioning are cognition, affection, and conation. The cognitive construct refers to the declarative and procedural knowledge, or the act of retaining and applying knowledge. The cognitive construct is similar to Gagne's (1977)categorization of cognition including learned abilities. The cognitive construct includes, but is not limited to, intellectual skills and cognitive strategies. The affective construct refers to temperament and emotion including feeling, emotion, mood, temperament and so on so forth. The former is a long-lasting personality characteristic that cannot easily be changed as the situation changes, such as temperament; while the latter is closely related to a situation and can change in varied situations, such as feeling, emotion, or mood. The conative construct mainly deals with desire, volition, and motivation.

Cognitive. The cognitive aspect of self-directed learning manifests itself in the cognitive process where learners seek, retain, and apply knowledge or skills. This process includes the learner's metacognitive process or learning support (Garrison, 1997; Guglielmino, 1978b), seeking learning resources (Brockett & Hiemstra, 1991b; Dave, 1975; Hartley & Bendixen, 2001; Knowles, 1975a; Shapley, 2000; Tough, 1967, 1971), and making decisions to achieve the

learning objectives (Candy, 1991, 2004a; Tough, 1971). Long's (1991) elaborated skills in the cognitive process including basic information processing skills and deep processing skills. According to Long, basic processing skills such as observing, reading, listening, translating, sensory, and memory are primary skills in a self-directed learner. For example, by translating, he means the ability to "graphically reproduce visual information and relate it to existing information schemes" (p.2). The ability to read refers to the capability to "read, translate, and comprehend written material" (p.2). By listening, he means "receive and process aural information and relate it to existing information schemes" (p.2). He includes in deep processing skills the following: problem posing and solving skills, executive skills such as task monitoring, strategically gathering and using information, metacognition such as being self-aware of prior knowledge, associating personal experience with the learning content, personal cognitive processes and autonomy of the cognitive processes, reflecting, "deriving enjoyment from the activity," (p.3) "search(ing) for meaning in the information," (p.3) relating parts to the whole, evidence to the conclusions, new input to previous knowledge, and "develop[ing] theories," "form[ing] hypotheses," (p.3) etc.

Affective. The affective aspect of self-directed learning lies in a learner's control of his/her emotion, mood, or temperament when encountering dislike of the learning activities, frustrations, fears, difficulties, lost interest, or failures (Oddi, 1986; Skager, 2014; Tough, 1967). Skager (2014) points out that "tolerance of ambiguity" and "preference for complexity," and openness to "trial-and-error approaches to problems" are good characteristics and effective strategies to apply in self-directed learning (pp. 24–26).

Conative. The conative aspect of self-directed learning has been discussed most among the early contributors such as Houle and Tough, and other scholars as well, including Oddi, when

he wrote “proactive drive” (Oddi, 1986, p. 98) into his Continuing Learning Inventory (CLI). He found that intrinsic motivation drives the self-directed learner to commit him-/herself to learning and flexibly adjust the learning process to achieve the intentional goals. It is evident that Oddi’s (1986) identification of the dimension of proactive drive was inspired by his pioneers such as Tough (1967), Knowles (1975), and Guglielmino (1978), and all of them stressed that the purpose of self-directed learning is merely the desire to learn, an inherited personality trait recognized by all these scholars (Houle, 1961; Oddi, 1986; Tough, 1967). Therefore, there is no doubt that, in their empirical studies, personality traits of self-directed learning are measured, instead of the cognitive process or affective aspects. This can also explain the arguments surrounding the validity of their scales (Brockett & Donaghy, 2011).

According to Snow, et al. (1996), the three modes of cognition, affection, and conation interplay with each other as a system that determines human intelligence and personality. Therefore, this raises the question of whether there is a similarly interactive relationship among the cognitive aspect of self-directed learning; the affective aspect represented by learner control, particularly regarding learner’s control of emotions when dealing with difficulties, frustrations, or failures; and the cognitive aspect of being driven by a desire to learn.

The complexity of the conceptualization of self-directed learning has a long-, and still-evolving history. The findings indicate that it is necessary to define self-directed learning in a comprehensive manner. All the following factors need to be considered: 1) self-directed learning as a learner personality trait, as a cognitive process, along with the relevant learning climate; 2) self-directed learning as a capability to make reasonable plans, execute a self-directed learning project and persevere in the learning process; and 3) the affective, cognitive, and conative aspects of self-directed learning.

The first research question was mainly proposed to investigate the conceptualization of the topic of self-directed learning in the long established area of study. The concept of self-directed learning originated from adult education in the 1960s, entered its infancy in the 1970s, grew into its mature development in the 1980s, and reached its peak in the 1990s and the beginning of the 2000s. The conceptualization experienced its evolution from self-directed learning as a learner trait, for example, the hereditary desire to learn (Houle, 1961; Tough, 1967) to self-directed learning as a learning process involving the learner's cognitive and affective factors as influences.

Findings and Discussion of Research Question 2

Research Question 2:

What types of competencies/attributes are needed for a successful self-directed learner?

To answer question 2, the researcher summarized the findings from the selected empirical studies and theoretical articles. Four themes were identified regarding the competencies of a highly self-directed learner: 1) learner autonomy (with a focus on internal locus of control); 2) self-efficacy; 3) metacognition; and 4) self-motivation. Learners possessing a high level of each of the five mentioned aspects are likely to master self-directed learning. As demonstrated in the findings and discussion of Research Question 1, the conceptualization of self-directed is multi-faceted and complicated. Interpretations of the concept are varied at different levels. Self-directed learning has a planning-executing-evaluating process; it is a concept involving an inherent personality trait, a dynamic cognitive, affective, and conative process. Therefore, it is difficult to find much consensus in defining a successful self-directed learner that embraces all dimensions of self-directed learning.

Four measuring tools were found to measure self-directed learning among empirical studies (Guglielmino, 1978b; Oddi, 1986; Stockdale & Brockett, 2011; Tough, 1967), which conveyed some scholars' interpretation of the necessary characteristics of a successful self-directed learner. Among others, Gugliemino (1978) and Oddi (1986) believed that self-directedness as a learner personality trait is important to predict self-directed learning. The Self-Directed Learning Readiness Scale (Guglielmino, 1978b) and the Oddi Continuing Learning Inventory (OCLI) (1988) have been widely used to measure learner preparedness of self-directed learning. However, some scholars still argue against the validity of these two measuring tools (Hoban, Lawson, Mazmanian, Best, & Seibel, 2005). The weakness of both these measuring tools lies in that neither of them measures self-directed learning as a cognitive, affective, conative process but merely "the personality characteristics of self-directed learner" (Oddi, 1986, p. 97). There is no validity issue in Tough's questionnaire, based on three qualitative questions regarding the self-teaching tasks the learner performed, his/her difficulties with those tasks, and the people that assisted him/her (Tough, 1967). However, the credibility of the answers to the questionnaire and interview questions is of concern. In Tough's study, the questionnaire and interview take place at the end of the self-directed learning project. All the questions in the questionnaire and interview are used to elicit a learner's descriptive recall of certain aspects of his/her behavior. Accuracy, and thus credibility, of the participant's answers determines whether the results are reliable. There is chance that the learner did not document his/her behavior, causing a discrepancy between what was reported in the questionnaire/interview and his/her actual behaviors in learning.

Within the most recent measuring tool Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS), learning behaviors in the process of self-directed

learning and personality characteristics of the self-directed learner were perceived as measurable variables (Stockdale & Brockett, 2011). On a 5-point Likert-type scale, learners reported the degree of agreement or disagreement with regard to their perceptions of behaviors and beliefs in self-directed learning projects. This 25-item self-report measuring tool yielded a reliability coefficient of .91 (Stockdale & Brockett, 2011). One example from the 25 items is "I frequently do extra work in a class just because I am interested". The Personal Responsibility Orientation to Self-Direction in Learning Scale (PRO-SDLS) seems to be the most comprehensive scale among the four because this scale measures self-directed learning as both a personality characteristic and as learning behaviors in the self-directed learning process, and competencies of self-directed learning were suggested. Nevertheless, this scale is still in its infancy and needs time and effort to be empirically confirmed.

Four competencies of a highly self-directed learner were identified and categorized as follows: 1) learner autonomy (with a focus on internal locus of control); 2) self-efficacy; 3) metacognition; 4) self-motivation. Learners possessing a high level of each of the four mentioned aspects are likely to master self-directed learning. Each competency is explained in detail with evidence as follows.

Learner autonomy. A highly self-directed learner is an autonomous learner, (Chene, 1983; Dressel & Thompson, 1973; Knowles, 1975; Oddi, 1986; Skager, 2014; Spear & Mocker, 1984; Stockdale & Brockett, 2011; Tough, 1967), who believes his/her own efforts can cause his/her behavioral changes, similar to the learner with a high level of internal locus of control (Boyer et al., 2014). According to Rotter (1954, 1966), the learner with a high level of internal locus of control believes that he/she has control over the external events which can affect his/her learning behavior. A highly self-directed learner "exhibits initiative, independence, and

persistence in learning", "accepts responsibility for his/her own learning", "is capable of self-discipline", and "open to learning opportunities" (Guglielmino, 1978, p. 73-74). He/she has the ability to choose "what has value", to make choices in harmony with "self-realization" (Chene, 1983, p. 39). While undertaking a self-directed learning project, the self-directed learner "assumes primary responsibility for planning, implementing, and evaluating the learning process," perceives the institutional agent such as teachers, or resources such as textbooks and libraries, as "a facilitating role in the process" (Brockett & Hiemstra, 1991, p.24). He/she is able to take the responsibility to plan effective strategies and skills for accomplishing goals based on his/her own needs. When implementing his/her plans, the self-directed leaner has "the ability to relate to teachers as facilitators," "select and use many learning strategies," "collects and validates evidence of learning" (Brockett & Hiemstra, 1991, p.24).

When facing difficulties, a highly self-directed learner has a high level of "tolerance of ambiguity" (Guglielmino, 1978, p. 112) and can control "one or more aspects of a learning situation" to "achieve greater self-direction in learning" (Chene, 1983, p. 39). Similarly, researchers empirically confirmed that an individual learner's perception of control over his/her own learning not only affect his/her academic performance, but also has a tendency to change his/her learning-related emotions, such as feeling of failure (Perry, Hladkyj, Pekrun, Clifton, & Chipperfield, 2005).

To sum up, a highly self-directed learner has the ability and/or willingness to "take control of their own learning that determines their potential for self-direction" (Brockett & Hiemstra, 1991b, p. 26). He/she has a tendency to achieve a positive learning outcome when he/she is bestowed with control over learning materials, approaches, strategies, evaluation of learning outcomes, as well as the learning environment.

Self-efficacy. A highly self-directed learner believes he/she has the ability implement his/her own plan and persist to accomplish the achievement (Knowles, 1975; Skager, 2014; Stockdale & Brockett, 2011; Tough, 1971). According to Bandura (1977), self-efficacy is a learner's belief in his/her capability to succeed in a specific situation or achieving a designated performance goal. Perceived self-efficacy can predict learner's performance accomplishments both "directly and indirectly through its influence on self-set goals"(Zimmerman, Bandura, & Martinez-Pons, 1992, p. 664). A highly self-directed learner can set realistic goals, is able to apply strategies and skills to follow his/her plans in the entire self-directed learning process, "views problems as challenges, not obstacles," is "self-confident" when faced with difficult situations, and persists in working to achieve his/her goals (Guglielmino, 1978, p. 73)

Five constructs were identified by Bandura (1977a) as related to one's self-efficacy. They are performance accomplishments, vicarious experience, vocal persuasion, physiological states, and motivation. A self-directed learner perceives performance accomplishments as a drive to persist. He/she is aware of using vicarious experience such as non-human resources, experts in his/her field, his/her teachers, or family members who can assist him/her solve problems when needed. Vocal persuasion as an external drive can enable the learner to be confident with his/her learning process; however, a self-directed learner still perseveres in executing his/her own self-directed learning even though there is no vocal persuasion from others such as positive feedback, or encouragement. Although, in the literature, physiological states have not been revealed to be associated with self-directed learning, numerous studies of self-directed learning remark that self-directed learners know when to learn and perceive difficulties as challenges rather than obstacles (Guglielmino, 1978b; Oddi, 1986; Tough, 1967, 1971). The implication would be that a self-directed learner knows when he/she is physically ready to learn and can adjust plans and

persist in carrying them out when dealing with physical uneasiness or nervousness, to name a few.

Metacognition. A successful self-directed learner tends to be self-aware of his/her own learning processes, strengths and weaknesses (Knowles, 1975a; Long & Redding, 1991). The ability to think about one's own thinking is a feature of metacognition. According to (Salomon & Perkins, 1989, as cited in Winne & Azevedo, 2014), metacognition can occur "before the cognitive event," "simultaneous with the event," and/or "after the event" (p.63). When metacognition occurs before a cognitive event, the learner predicts "whether knowledge and skills are available to successfully engage in a cognitive task" (p.63); when it occurs while a cognitive event takes place, the learner monitors his/her progress and consider whether he/she needs to adjust or replace the current strategies to improve learning progress; when it occurs after a learning event, the learner "retrospectively" thinks on the event, evaluate the effectiveness of the event, and make decisions for the future learning plans(Winne & Azevedo, 2014, p.63).

A self-directed learner is "able to use basic study skills, organize his or her time and set an appropriate pace for learning, and develop a plan for completing work" (Guglielmino, 1978b, p. 73). He/she is able to foresee himself/herself in a learning event by setting realistic goals in his/her planning and has "a realistic perception of [his/her] ability to achieve [his/her] learning goal" (Long, 1991, p.4). He/she can refer to peers to seek and offer help in a collaborative manner when he/she plans his/her own learning (Knowles, 1975a). He/she judges when to reach out for additional resources and use appropriate strategies, based on his/her own ability (Ralph G. Brockett & Hiemstra, 1991b). He/she can relate a given learning activity to his/her own prior knowledge and personal experience (Caffarella, 1993; Knowles, 1975a). While implementing a self-directed learning project, the learner is self-aware of his/her progress and able to take

advantage of the learning environment. In this process, he/she is able to determine and evaluate the sources of information, meaning of information, and its reliability and validity. He/she can also apply constant reflection throughout the learning process and a summative reflection at the end of the self-directed learning project. In sum, a self-directed leaner is cognizant of "learning how to learn" (Guglielmino, 1978b, p. 2) and "how [he/she] learns" (Guglielmino, 1978, p. 113).

Self-motivation. A highly self-directed learner is self-motivated and has a desire to learn (Guglielmino, 1978b; Houle, 1961; Knowles, 1975a; Tough, 1967; Zimmerman et al., 1992). Since "self-initiative" predicts academic success in college (Perry et al., 2005, p. 535), a self-directed learner with a high level of self-motivation is likely to succeed in achieving his/her goals. A self-directed learner "has a high degree of curiosity" about learning, "a strong desire to change or learn," and, therefore, his/her learning activities have "a tendency to be goal-oriented" and "task-oriented" (Guglielmino, 1978b, p. 73). Owing to "a drive to achieve" (Guglielmino, 1978, p. 9), the self-directed learner has "persistence" and "positive orientation to the future" (Guglielmino, 1978, p. 113).

Findings and Discussion of Research Question 3

Research Question 3:

What strategies are used to cultivate and develop self-directed learning?

Deci and Ryan (2000) implied that the learner's motivation is influenced by the learning environment (e.g., teachers, peers, etc.), which ultimately affects his/her self-efficacy and autonomy. The levels of self-efficacy and learner autonomy are among the many factors that determine types of competencies of a highly self-directed learner, as mentioned in the discussion in Question 2. Therefore, it is essential to further explore the frequently used effective strategies to help cultivate and develop self-directed learning. Unfortunately, the literature has not

revealed much in introducing specific self-directed learning strategies. The strategies identified were from early literature in the 1960s and 1970s and were used as interventions in numerous empirical studies in the 1980s and 1990s, however; they are not as frequently used nowadays. The main strategies were categorized into three: using Tough's learning project (1971), using Knowles' learning contract (Knowles, 1975a) and designing a facilitator role in self-directed learning.

Tough's learning project (1971) and Knowles' learning contract (Knowles, 1975a) were identified as the two instructional strategies to help a learner foster his/her self-directed learning and become a highly self-directed learner. Instructors can introduce learners to use either a learning project or a learning contract to guide their own self-directed learning. Discussion of the two strategies follows.

Using a learning project. Built on the revolutionary establishment of three types of learners by his doctoral advisor, Tough's (1971) contribution to the topic of self-directed learning resides in his identification of the third type of learner as self-directed learners. He accomplished a study of self-directed learning in his dissertation, which later was adapted into a book *The Adults Learning Projects*. In his book, Tough (1971) identified a learning project as:

> a series of related episodes, adding up to at least seven hours. In each episode, more than half of the person's motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself. (Tough, 1971, p. 6)

In his definition, he stressed four characteristics: 1) a learning project is intentional; 2) the episodes are associated rather than randomly combined; 3) the project is at least seven hours in total duration; and 4) the outcome is new knowledge gained or change. These four characteristics are helpful for the self-directed learner to use as a checklist at the beginning stage

of setting a self-directed learning project. Besides the checklist, the self-directed learner can also follow Tough's (1971) "preparatory steps" (p.63), including: 1) planning, deciding, and arranging steps; 2) making decisions, tasks, and arrangements; 3) defining the steps in the learner's decision-making process; and 4) following the learner's program-planning steps (p.64). The preparatory steps to plan for a learning project are of the first priority in self-directed learning, as pointed out by Tough (1971), "deciding whether and what to learn is crucially important" in a learning project (Tough, 1971, p. 63). Well begun is half done.

"Thoughtful, appropriate decisions lead to successful projects; a poor decision may lead to failure or quitting" (Tough, 1971, p.63). Therefore, it is important for learners to be cautious about the detailed steps, such as to 1) set up goals; 2) estimate the benefits of learning 3) estimate the current or future needs or problems; 4) assess their own strengths and weaknesses; 5) estimate the effectiveness or suitability of his actions, define, modify, and execute goals.

There are 13 clusters of steps identified in a self-directed learning project, which explicitly point the learners toward self-directed learning strategies and implicitly prepare them with the learning strategies. The 13 clusters are categorized by the researcher into seven groups as follows: 1) making decisions; 2) setting goals; 3) estimating progresses, difficulties, and inefficiencies; 4) seeking help (e.g., resources); 5) creating the learning environment; 6) obtaining money and time; and 7) increasing motivation or dealing with "motivational blocks" (Tough, 1971).

Among all the steps, Tough (1971) provides specific suggestions for the help-seeking process. First, he recommends that learners apply the five steps developed by his colleague, Devlin (as cited in Tough, 1971), including 1) develop the awareness of seeking help; 2) know precisely what he needs; 3) select a specific resource with or without others' advice; and 4)

decide how to approach/obtain the resource; and 5) take action (p.98). Second, he recommends that learners select the helper that he/she expects to feel "comfortable and relaxed" with (p.p.98-99) and use Macdonald's (1968) list of 50 items as a guide to pick the appropriate helper when needed. With the transient learning environment, strategies need to be contextualized. As Tough predicted in the 1970s:

> during the next 20 or 30 years, some important changes will occur in what people learn, why they learn, and the total amount they learn. Changes in the help available for the adult learner will probably be even more significant. Human help with the major decisions about learning will be more available, effective, and individualized. Hardware and nonhuman resources will increasingly be tailored to the individual, or at least flexible enough to meet his needs. (Tough, 1971, p.115)

With the development of the internet and technology nowadays, learners are faced with amplifying information in front a computer or a mobile device with access to the internet. Tough's (1971) prediction suggests that today's leaners to seek customized resources to meet their needs for accomplishing their learning goals. Undoubtedly, exposure to a huge plethora of resources from various channels and an overloading of information can be overwhelming. Thus, today's learners need to learn how to select the precise information to meet their needs to avoid information overload.

Using a learning contract. Knowles (1975) designed a plan for learning – a learning contract, which is a self-initiated binding agreement a self-directed learner enters into with him-/herself, sometimes in the presence of a facilitator (pp. 34-38). In a learning contract, the self-directed learner specifies what to do, when to do it, and how to do it to achieve the goals.

When introducing a learning contract to the self-directed learner, the instructors or facilitators need to focus on seven elements, in which the facilitator's mediating role in a learner's self-directedness is clarified. The first element to consider is preparation of the learning environment. The facilitator of the course needs to consider how to build a mutually caring, supportive, and intellectually rigorous learning environment where learners are acquainted with each other, where they can act both as learners and resources to each other. Meanwhile, the facilitator helps the learners understand and practice the concept of self-directed learning and the required competencies. The second element is planning for the learning process. The course facilitator invites the learners to the decision-making procedures, allowing them to make modifications or veto. The third element is diagnosing needs for learning. The facilitator needs to consider how to negotiate the learning needs with the learners and make them feel they are in control of their own learning in a realistic and nonthreatening manner. The fourth element is setting goals. A facilitator considers how to help settle the learning needs and objectives so the self-directed learners have a purposeful, meaningful, and measurable learning experience with explicit goals. The fifth element is designing a learning plan. The facilitator proposes guidelines for the learners to design their own plans, exposing them to the optional resources and encouraged them to use those resources toward their goals. Also, the facilitator needs to consider ways to encourage the learners to mutually support each other by being each other's resources and consultants in the process of designing a plan. The sixth element is engaging in learning activities. A facilitator considers which activities can help his/her responsibilities to meet the instructional objectives in common to all of the learners, which can help with the individualized inquiry, and how to execute the specific roles of both consultant and resource person. The seventh element is evaluating learning outcomes. A facilitator considers his/her role when he/she

provides feedback in evaluating the learner's performance. He/she needs to provide evidence to the learners, negotiate the feedback, and make sure the judgment is justifiable and likely to augment the learners' self-concept and self-directedness in a non-denigrating approach. By using a learning contract, a self-directed learner can outline an overview of his/her self-learning project, and monitor the learning process. Most importantly, the process of using a learning project is the process of learning how to learn, a metacognitive process that the self-directed learner is aware of his/her own cognitive processes. Teaching learners how to learn is the ultimate goal, and learning how to learn is one of the essential identified competencies for a self-directed leaner, as addressed in Research Question 2.

Designing a facilitator role in self-directed learning. Costa and Kallick (2008) identified the teacher's role as a mediator who intervenes in three stages of self-directed learning including self-managing, self-monitoring, and self-modifying. In all the three stages, the mediator's role is mainly as an assistant, clarifying outcomes, designing a strategic plan, scaffolding decision-making, and facilitating self-evaluation with the learner. Different than Knowles (1975), Costa and Kallick (2008) do not discuss the mutually helping relationship among learners, but only examine the relationship between the learner and the mediator (e.g., teacher's role). The strength of their study is that they explicitly propose the concept of *metacognitive strategies* that learners use in the process of decision-making. Comparing the contributions of Costa and Kallick and Knowles to self-directed learning, it is apparent that the former have a focus on fostering the capacities of an individual learner in self-directed learning while the latter has a preference for the collaborating characteristic in self-directed learning and the interactive relationship with surroundings, such as the facilitator, the peers, the experts, or non-human resources, etc. The present researcher stands in support with both of their opinions

and tends to postulate that an appropriate integration of the two opinions would be comprehensive. Self-directed learning is not just an independent, solitary learning process but more of an interdependent learning process wherein a self-directed learner needs assistance from his/her facilitator, peers, or experts while he/she also relies on his/her experience to judge input from those people, negotiate meaning with them, and make his/her own decisions by reasonable use of all potential resources. The opportunities to act independently with minimal assistance from others during the learning process and the dependent processes are supplementary and intertwined in the learning experience. With the great changes in the learning environment, self-directed learners might encounter more unexpected learning assistance or support. They need to be able to seek out and determine appropriate strategies on their own to meet their needs for achieving their goals.

Summary. To sum up the findings, the researcher outlines a framework to represent newly generated knowledge from this integrative literature review (Whittemore & Knafl, 2005), as follows in Figure 7.

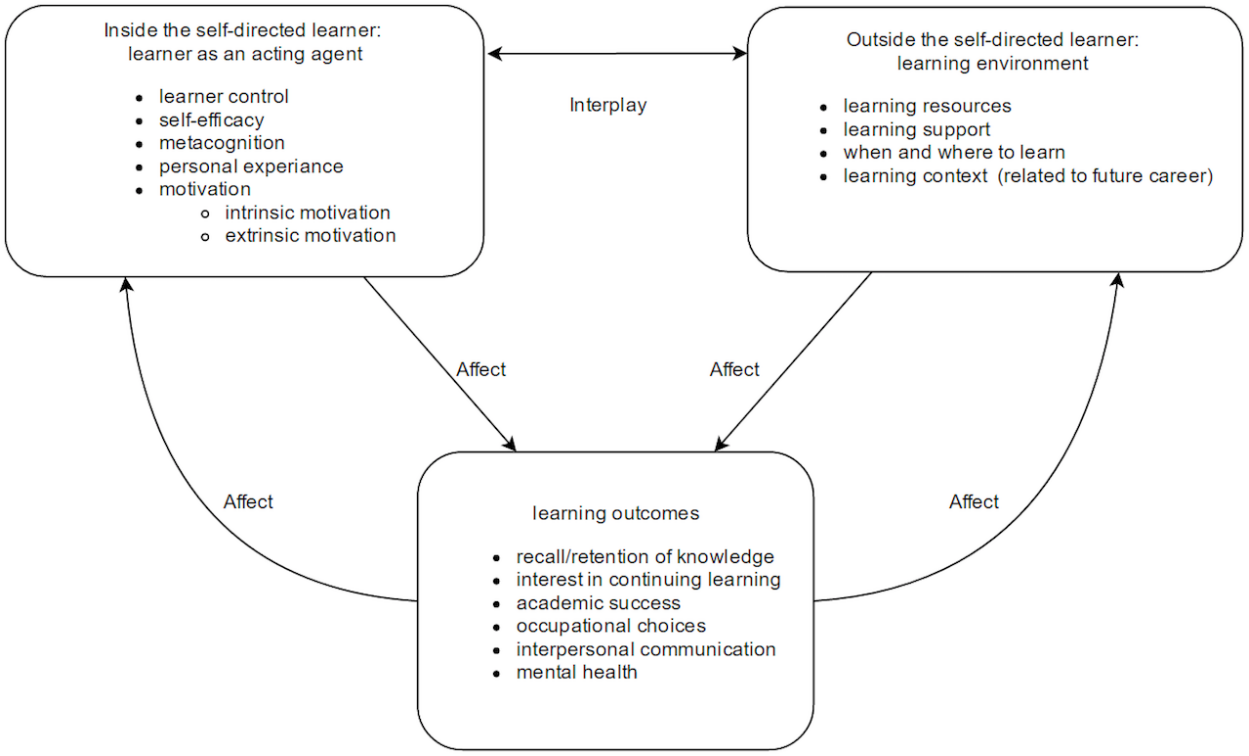

Figure 7. A framework of relationship in self-directed learning.

As demonstrated in Figure 7, self-directed learning is a complex concept. Both the learner and the learning environment, in concert, affect learning outcomes, such as recall/retention of knowledge, interest in continuing learning, academic success, occupational choices, interpersonal communication, and mental health. For example, in nursing education, researchers found that self-directed learning is likely to increase the learner's motivation, learner autonomy, interpersonal communication skills, and eventually may promote the learner's desire to become a life-long learner (Hewitt-Taylor, 2001; O'shea, 2003). The latter, conversely, affects the learner's behaviors as an acting agent, such as the levels of learner control, self-efficacy, metacognition, personal experience, and motivation. Simultaneously, learning outcomes influence the learning environment including, but not limited to, learning resources, learning support, where and when to learn, and the learning context related to future career planning. Concurrently, a self-directed learner as a proactive acting agent reciprocally interacts with the

learning environment. For example, research reveals that learners with a high level of self-efficacy tend to have more positive control of the environment and performance (Bandura, 1977; Pajares, 2003). The concept of self-directed learning, as demonstrated in Figure 5, has been found to have theoretical foundations in both adult learning theories and educational psychology. The future will likely see more integration of the two disciplines to come across and provide theoretical underpinnings for both learners and instructors.

Based on the previous definitions and the empirical studies, the researcher defines self-directed learning as a highly dynamic and context-specific learning process in which the learner, as a proactive acting agent, interacts with his /her learning environment to accomplish his/her learning goals in a given learning context. In this dynamic and interactive process, the self-directed learner is motivated to control his/her learning, take advantage of his/her personal experience, set his/her realistic goals, believe in his/her ability to implement the plan and persist in accomplishing achievements by using cognitive skills such as metacognition and self-learning strategies such as seeking assistance, resources, and support when needed.

The characteristics of self-directed learning are cognitive, affective, and conative. Self-directed learning is a cognitive process where learners learn and apply declarative and procedural knowledge and use intellectual skills and cognitive strategies. It is an affective process where a self-directed learner controls his/her temperament and emotion, specifically, dealing with stress, frustration, and difficulties as needed. It is a conative process, in which a self-directed learner demonstrates his/her desire, volition, or motivation to persist and learn.

The researcher believes that self-directed learning skills such as planning skills, time/money management skills, and learning strategies such as metacognitive strategies and other content-specific strategies (e.g. memorizing strategies in language learning) can be taught

and learned. Therefore, it is necessary to investigate further what specific learning strategies and skills are useful to help self-directed learning. Moreover, interested researchers might also want to explore to what extent the self-directed learner interacts with the learning environment and how self-directed learning affects learning outcomes.

Chapter 5. Conclusion

This study is the first comprehensive investigation of the topic of self-directed learning by use of an integrative literature review. The researcher strove to disentangle various interpretations of self-directed learning and identify competences and strategies needed for a highly self-directed learner. The utilization of an integrative literature review allowed the researcher to explore the manner in which the topic of self-directed learning has evolved by investigating various interpretations of the definition and its related constructs. The findings brought a "value-added contribution to the new thinking in the field" (Torraco, 2005, p. 358) by defining self-directed learning in a dynamically expanding process to include multifaceted interpretations of the concept. This study advanced research in self-directed learning in an updated enriching learning environment. Specifically, the researcher updated the evidence for self-directed learning to date, identified all the potential dimensions of self-directed learning that distinguish a highly self-directed learner, and made suggestions for the future direction for research of the topic.

Through an exhaustive search of the literature, the researcher found that there is a lack of high quality empirical studies discerning the learning and instructional strategies in self-directed learning. In the future, researchers need to conduct empirical studies on the strategies based on the most recent self-directed learning models, validate the models and generate new learning theories in self-directed learning (Stockdale & Brockett, 2011). Instructional designers may want to apply learning theories in educational psychology to design a friendly self-directed learning environment that encourages the learners to practice self-directed learning. For example, when designing online courses, it is necessary to take into consideration the learning resources and types of support that can be offered to the learners. The self-directed learner tends to persist with

support and assistance when confronted with difficulties. Time management skills can also be introduced at the beginning of an online course to help the learners with their planning and goal-setting. Since self-directed learning is not an independent, solitary learning process but more of a dependent learning process, a self-directed learner needs assistance from his/her learning environment, such as from his/her facilitator, peers, or experts, etc. Therefore, it is necessary for the instructional designers or instructors to design a mediator's role mainly as an assistant to clarify outcomes and help with a strategic plan, decision-making, and self-evaluation. For example, an avatar can be used to provide learners with statement of objectives, decision-making tips, and so on.

Another significant contribution of this this study is a call for high quality empirical studies that consider measuring self-directed learning in a valid approach, since most quantitative studies to date rely heavily on the use of Guglielmino's (1977) Self-Directed Learning Readiness Scale (SDLRS) or the Oddi Continuing Learning Inventory (OCLI) (1988), both of which have not been revised since they were developed to measure the self-directed learning as a learner personality trait. The paradox is that researchers have perceived self-directed learning as a cognitive process, but measurement tools have remained the same and evaluate only the learner personality traits or the static preparedness for self-directed learning instead of measuring the cognitive process.

As the definition evolves and the dimensions expand, self-directed learning as a learning process needs to be measured in addition to the learner personality trait. Therefore, it is time to call for a comprehensive measuring tool to evaluate the multifaceted dimensions of self-directed learning. For example, as suggested in Figure 5, interested researchers might want to consider measuring both the inside of the learner (i.e., learner as a proactive acting agent) and the outside

of learner (i.e., the learning environment). Measuring tools are also important for the instructional designers or instructors to consider when designing a course evaluation. A suggestion would be to modify and apply Tough's qualitative questionnaire and interview questions to evaluate the learner's cognitive process in self-directed learning. Specifically, rather than inviting the learners to recall and report what they have done in a self-directed learning project, it is reasonable to have learners document their own self-directed learning behaviors regarding the learning activities they have performed, the difficulties they have encountered, and the assistance/support they have sought, as well as how they have made each critical decision at the moment, which is similar to what the participants did in Tough's (1967) questionnaire and interview at the end of the learning project. The learners' documented journal can be used as a formative evaluation. Another option would be to use a learning contract to evaluate the learning process, which would also be a formative evaluation.

For the future, the researcher suggests integrating other disciplines into theorizing adult learning theory, especially theorizing self-directed learning. Educational psychology has been an area where learning theories were borrowed and applied in interpreting self-directed learning. Yet, there is space for improvement. More opportunities lie in theorization of the cognitive process of self-directed learning. Self-regulated learning is a similar but mature concept that has been discussed in the discipline of educational psychology and human development (Azevedo, et. al, 2012; Boekaerts, 1997; Loyens, Magda, & Rikers, 2008; Pilling-Cormick & Garrison, 2013; Zimmerman & Schunk, 2001). The indication is that research methodologies and theories could be borrowed to see how they fit in the study of self-directed learning in adult education settings. In practice, instructional designers and instructors may want to introduce self-regulated learning strategies to the learners and direct them to select the appropriate strategies to meet their own

learning needs. For example, metacognitive skills such as writing reflections may be considered as a learning activity or an evaluation tool in a course. Training the learners to observe and analyze their own thinking process can be one of the goals for course design. Self-managing, self-monitoring, and self-modifying strategies may also be introduced in general either at the beginning of a course, or threaded through the entire course.

The study covered a wide range of extant literature and systematically obtained a comprehensive picture of self-directed learning; however, there are still limitations. One of the challenges is that the review was conducted on a well-researched, but nonetheless, steadily-evolving topic. There is no consensus on a concise definition for the evolving topic of self-directed learning within an enormous extant body of literature. Within the ever-changing context of learning and instruction, it was difficult to include all the evolving characteristics of the topic. Another limitation lies in the single researcher's potential bias in data collection and analysis, especially when establishing the selection criteria of inclusion/exclusion and synthesizing the data. To some extent, it is feasible to be consistent all through the procedures of the integrative literature review. However, the drawback lies in that one single researcher tends to bring her prior experience and bias into the study. Although all the review procedures were reported to and cross-checked by the researcher's advisor, relying on only two perspectives is inherently limiting. The researcher admits that it is a biased study. Yet, the researcher's role is described in detail, which makes the bias visible and, by extension, makes this study transparent, offsetting the drawbacks and ultimately making the study a robust one.

Appendix

Personal Reflections

Writing this dissertation is indeed a self-directed learning process. I admit that this is a biased, subjective reflection with an overflow of my thoughts when looking back to what I have done. I have reflected upon my process of conducting the study, especially regarding the researcher role, the research purpose, and the vigor of the study. I, a strong believer in reflection, have acknowledged the significance of reflective thinking (Dewey & Dewey, 1962), through which I often see changes of thoughts as important at different stages when learning new knowledge. By comparison of the entry assumptions, the at-the-moment-of-learning thoughts, and the final thoughts, I enjoy seeing how amazing the human mind is developed.

I strove to be a self-directed learner in the process of writing this dissertation, which is considered a self-directed learning project. In this process, I acknowledged my role as the major investigator and took responsibility to control the entire learning process. As an acting agent, I believe that I had a high level of self-efficacy and learner control, and that I was intrinsically motivated to conduct the project. As shown in the literature, perceived self-efficacy directly affects behaviors and persistence (Bandura, 1977). I constantly compared my daily progress with my goals, and, for the most part, I felt confident in accomplishing my daily objectives except for the days when family commitments took priority over the study. Specifically, investigating the evolving history *per se* was an enjoyable experience, thus the stronger self-efficacy this created has affected my efforts to persist.

The project was an inspiring and worthwhile experience. I enjoyed participating in the entire process whether working on my own or working with my advisor in many rounds of discussions. One of the metacognitive strategies that proved useful was to be open-minded to the

adjustments and to document the critical decisions and continue to work toward the definite goals. There were moments when the data analysis slowed down, because I had difficulties in finding high quality empirical studies with a persuasive validity. I had to deal with frustrations. Fortunately, I sought the advisor's suggestions and support, and referred to examples in other online resources and made the decision to document and report all the results regardless of all the challenges. Another metacognitive strategy I used is to keep reflecting upon what has been accomplished periodically. Re-visiting and reflecting on the written texts led to constant revising of the draft, which took longer but is worthwhile. When reflecting upon all the challenges, I perceive the collection and synthesis of the data as the primary challenge. The selected topic is a mature and complex area of study. Seeking consensus among a plethora of literature is challenging, especially when there are differed interpretations of the same topic.

Looking back, the process of conducting this study was painful but rewarding. I have added to my exploration of self-directed learning by experiencing it. With my very own personal experience, I found the topic is worth investigating and enjoyable. Of course, I went through ups and downs and the road to experience self-directed learning was not as smooth as expected. There were bumps when I felt the pain and became frustrated, especially when family commitments grabbed my time for this study. I am fortunate to have had a resource person (my advisor) available to answer my questions and assist me with his expertise. As a resource person in the self-directed learning environment, he provided collegiality as well as his expertise, which enhanced my self-efficacy and thus led me to accomplish this dissertation.

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