

DEVELOPMENT OF AN INSTRUMENT TO MEASURE TENDENCIES
TOWARD SELF-DIRECTEDNESS IN LEARNING
WITHIN A WORKPLACE SETTING

Except where reference is made to the work of others, the work described in this dissertation is my own or was done in collaboration with my advisory committee.
This dissertation does not include proprietary or classified information.

Kenneth Shannon Hogg

Certificate of Approval:

Maria Martinez Witte
Associate Professor
Educational Foundations,
Leadership and Technology

James E. Witte, Chair
Associate Professor
Educational Foundations,
Leadership and Technology

Anthony J. Guarino
Associate Professor
Educational Foundations,
Leadership and Technology

Joe F. Pittman
Interim Dean
Graduate School

DEVELOPMENT OF AN INSTRUMENT TO MEASURE TENDENCIES
TOWARD SELF-DIRECTEDNESS IN LEARNING
WITHIN A WORKPLACE SETTING

Kenneth Shannon Hogg

A Dissertation
Submitted to
the Graduate Faculty of
Auburn University
in Partial Fulfillment of the
Requirements for the
Degree of
Doctor of Education

Auburn, Alabama
May 10, 2008

DEVELOPMENT OF AN INSTRUMENT TO MEASURE TENDENCIES
TOWARD SELF-DIRECTEDNESS IN LEARNING
WITHIN A WORKPLACE SETTING

Kenneth Shannon Hogg

Permission is granted to Auburn University to make copies of this dissertation at its discretion, upon request of individuals or institutions and at their expense.
The author reserves all publication rights.

Signature of Author

Date of Graduation

VITA

Kenneth Shannon Hogg, son of Mary Jo Edmiston and stepson of Cecil Edmiston, was born October 26, 1952, in Ruston, Louisiana. He graduated from Louisiana Tech University with a Bachelor of Arts in General Studies, with emphasis in Mechanical Engineering. He worked in various industrial facilities in the fields of aerospace, automotive, optics, electronics, equipment fabrication, and Department of Defense related munitions. His work has involved research and development of new technologies, processes, and materials within each of these fields. He has been involved in the preparation and submission of over 17 patent applications, either as the principle author or as technical support. During the last 26 years of employment a significant portion of his work involved the process of educating employees in new technologies and processes at the facilities where he was employed. He received the Master of Science in Manufacturing Systems Engineering from Auburn University in 1995. He is married to Anita-Kaye Owens and they have a combined family of seven children, Karmen, Glen, David, Caleb, Jenny, Megan and Eamon.

DISSERTATION ABSTRACT
DEVELOPMENT OF AN INSTRUMENT TO MEASURE TENDENCIES
TOWARD SELF-DIRECTEDNESS IN LEARNING
WITHIN A WORKPLACE SETTING

Kenneth Shannon Hogg

Doctor of Education, May 10, 2008
(M.S., Auburn University, 1995)
(B.A., Louisiana Tech University, 1981)

121 typed pages

Directed by James E. Witte

The self-directed acquisition of knowledge and skills needed to develop or enhance an individual's ability to adapt and advance within society is a factor in the development of programs to promote independent study within business, industry, and formal education. Research to date in the development of instruments for the purpose of assessing information relative to an individual's self-directedness in learning have focused primarily on learning in terms of formal education. There has been little recent research into the individual's involvement in learning work related skills outside of a formal setting, especially at the level of a typical hourly employee.

This study seeks to add to current knowledge of self-directed learning within employment settings and to provide a tool for the purpose of furthering understanding in this domain. A theoretical framework was developed, which describes self-directedness in learning within the workplace setting as a psychological construct. The major aspects of this framework addressed self-regulation, motivation, cognitive factors, and the social and environmental setting.

The instrument developed during the course of this study exhibited reliability and validity within the participant population of employees of a manufacturing environment suggesting it would be an appropriate instrument for conducting research in this area. Subsequent statistical analysis of the data obtained as part of the study yielded statistically significant trends in the participant population.

ACKNOWLEDGEMENTS

I wish to acknowledge and express my sincere gratitude to my committee members Dr. James Witte, Dr. Maria Martinez Witte, and Dr. Anthony Guarino for their continued support throughout my graduate studies. Dr. James Witte provided invaluable direction, advice, and guidance and found a way to keep me excited about the project. I also appreciate the assistance of Jennifer Bell in the statistical analysis performed on the research data. Finally, I would like to thank my wife, who convinced me to begin this long process and who has been constant and generous with support and encouragement.

Style manual or journal used: Publication Manual of the American Psychological Association, 5th Edition.

Computer software used: SPSS 16, AMOS 16, Windows 2003, and Microsoft Word 2003

TABLE OF CONTENTS

	Page
LIST OF TABLES	xi
LIST OF FIGURES	xiii
CHAPTER	
I. INTRODUCTION	1
Statement of the Problem.....	2
Purpose of the Study	4
Research Questions	4
Significance of the Study	5
Limitations/Delimitations of the Study.....	6
Definition of Terms.....	6
Organization of the Study	7
Summary	8
II. LITERATURE REVIEW	10
Learning in Work Environments	11
Self-Directed Learning.....	12
Self-Regulation	19
Motivation.....	31
Cognitive Aspects of Self-Directed Learning.....	39
Social and Environmental Elements of Self-Directed Learning.....	41
Existing Measures of Self-Directed Learners	43
Theoretical Construct for Instrument Development	47
Summary	51
III. METHODS	52
Research Questions.....	52
Confirmation Panel	54
Validity	54
Development of the Instrument	55
Q-Sort.....	55
Field Testing	56
Population Sampling.....	58
Analysis of Data.....	59
Summary	59

IV.	RESULTS	61
	Participants.....	62
	Measures	62
	Reliability.....	63
	Motivation and Regulation	64
	Cognitive Elements.....	66
	Social/Environmental.....	67
	Validity	69
	Analysis of Research Questions 1, 2, and 3	71
	Results.....	76
	Motivation and Regulation	76
	Cognitive Elements.....	77
	Social/Environmental.....	78
	Analysis of Research Questions 4, 5, and 6.....	80
	Measures	80
	Data Analysis.....	81
	Results.....	82
	Summary	83
V.	IMPLICATIONS AND RECOMMENDATIONS	85
	Introduction.....	86
	Implications of the Study and Discussion.....	87
	Recommendations for Further Study	89
	Summary	90
	REFERENCES	91
	APPENDICES	101
	APPENDIX A. PARTICIPANT INFORMATION LETTER.....	102
	APPENDIX B. INSTITUTIONAL REVIEW BOARD (IRB).....	104
	APPENDIX C. DEMOGRAPHIC INFORMATION SHEET	106

LIST OF TABLES

Table	Page
1. Comparison of Theoretical Views in Self-Regulated learning.....	21
2. Social Cognitive Model of the Development of Self-Regulatory Competence.....	25
3. Categories of Volitional Control and Specific Volitional Control Strategies.....	30
4. Metatheoretical Models in the Study of Motivation.....	35
5. Alpha Reliability Coefficients for the Survey of Adult Learning Traits Scale.....	64
6. Alpha Reliability Coefficients for the Survey of Adult Learning Traits Scale by Employment.....	65
7. Alpha Reliability Coefficients for Motivation and Self-Regulation Scale by Highest Level of Education.....	66
8. Alpha Reliability Coefficients for Cognitive Elements Scale by Employment Classification.....	66
9. Alpha Reliability Coefficients for Cognitive Elements Scale by Highest Level of Education.....	67
10. Alpha Reliability Coefficients for Cognitive Elements Scale by Employment Classification.....	68
11. Alpha Reliability Coefficients for Cognitive Elements Scale by Highest Level of Education.....	68
12. Alpha Reliability Coefficients for Survey of Adult Learning Traits Scale.....	72
13. Intercorrelations for the Motivation and Self-Regulation Items.....	73

14. Intercorrelations for the Cognitive Elements Scale	74
15. Intercorrelations for the Social/Environmental Items.....	75
16. Means, Standard Deviation, and Univariates for the Motivation and Self-Regulation Items by Highest Level of Education	77
17. Means, Standard Deviation, and Univariates for the Cognitive Items by Highest Level of Education	78
18. Means, Standard Deviation, and Univariates for the Social/Environmental Items by Highest Level of Education.....	79
19. Alpha reliability Coefficients for Survey of Adult learning Traits Scales By Employment Classification	80
20. Intercorrelations for the Survey of Adult learning Traits Scales	81
21. Means, Standard Deviation, and Univariates for the Survey of Adult Learning Traits Scale by Employment Classification	82

LIST OF FIGURES

Figure	Page
1. Illustration of the relationship between pedagogical and psychological in self-regulated learning	19
2. Model of the role of the self-esteem system in self-regulated learning	23
3. Condition, operations, products evaluation, and standards.....	27
4. Chain of response model for understanding participation in adult Learning activities.....	38
5. Initial confirmatory factor analysis model for the Survey of Adult Learning Traits.....	69
6. Restricted confirmatory factor analysis model for the Survey of Adult Learning Traits.....	71

CHAPTER I

INTRODUCTION

The self-directed acquisition of knowledge and skills needed to develop or enhance an individual's ability to adapt and advance within society is a factor in the development of programs to promote independent study within business, industry, and formal education. Long (1998a) describes four major conceptualizations and one minor approach, which have been used to describe and explain self-directed learning. The first is self-directed learning as a sociological paradigm, where a high degree of independent control is exercised by the learner to set goals, select resources and self-evaluate progress. Allen Tough (1978) described self-directed learning as a sociological construct in the context of learning projects.

The second conceptualization identified by Long views self-directed learning from the perspective of promoting behavior in a teaching environment. Malcolm Knowles (1975) examined self-directed learning as a concept, which could be promoted through teaching approaches and techniques. Hiemstra and Brockett (1994) make the observation that business related training programs are often based on the premise of self-directed learning as a teaching technique. The third conceptualization of self-directed learning described by Long (1998a) is a methodological approach, which focuses on education through the application of programs to facilitate relatively independent learning

at a distance from a prepared source. The final conceptualization of self-directed learning is described and proposed by Long (1998a) as a psychological paradigm where:

learning is a self-initiated, self-directed, and self-regulated cognitive process whereby the learner can choose to ignore instruction, to merely absorb it by casual attention, to carefully memorize without critical reflection, or to seek to change or create an understanding of information. (p. 9)

A point of distinction can be made between the psychological construct of self-directed learning and the other major approaches, which concern the environment in which learning takes place and processes, which can be used to promote it. Education is a social construct, which defines the end product of a formal learning program, whereas learning is a psychological construct, which deals with the process of developing knowledge and understanding (Long, 1998a). The psychological approach addresses the personality mechanisms, which shape and influence the individual's self-directed behaviors within the learning environment. An approach to examine the process of self-directed learning from the psychological perspective is supported by research in motivation, self-regulation, and affective factors. Assumptions of self-regulation in learning include the view of learners as active participants, who have the ability to control aspects of their cognition, motivation and behavior (Pintrich, 2003).

Statement of Problem

Guglielmino (1977) and others have investigated and developed instruments for assessing an individual's readiness for self-directed learning. Much of this research has been directed towards learning in the context of the classroom and traditional formal

approaches. Pilling-Cormick (1995) list as many as seventeen instruments developed to assess tendencies towards self-directed learning. Only one of these instruments, the Self-Directed Learning Training Questionnaire was categorized as being associated with a business environment. Assessing self-directed learning tendencies outside of the formal classroom and more specifically in the acquisition of work related knowledge and skills has not been the primary focus of the majority of self-directed learning research. Efforts in this direction usually have been focused on either modifying existing instruments, developed primarily within the context of traditional instructor led educational environments, or expanding the scope of instruments being developed, to be inclusive of the generally more informal self-directed process of learning.

One reason for the focus on formal and traditional teacher-led learning environments is illustrated through connotations associated with the term education, which is often reserved for formal learning at institutions, while the term training is used to describe work related learning. Confessore & Long (1993) focused on self-directed learning, as well as approaches to work related learning or efforts to acquire or improve skills, expertise and knowledge within the work environment. However, instruments used to examine self-education outside the domain of formal instructor led educational programs are perhaps less understood and studied. A more thorough approach is warranted for exploring how individuals assess their potential for success in a self-directed approach to learning, with the purpose of acquiring expertise and knowledge in the domain of work related experience.

Purpose of the Study

The purpose of this study was to expand upon previous efforts of Guglielmino and others (Caffarella & Caffarella, 1986; Conti, 1979; Knowles, 1975; Oddi, 1984; Pilling, 1991) by creating and validating an instrument for measuring tendencies and potentials for engaging in and succeeding with self-directed learning, specifically related to a work environment. The work was structured to develop in the following stages:

1. Create an instrument and scale for ranking tendencies toward successful self-directed learning.
2. Develop effective measures for evaluating the instrument in terms of construct and criterion validity.
3. Evaluate characteristics of self-directed learners based on the results of the instrument within the context of the sampling base.

Research Questions

The following research questions were addressed:

1. Does the highest level of education attained affect hourly employees' motivation to learn job related information?
2. Does the highest level of education attained affect hourly employees' perception of their ability to learn?
3. Does the highest level of education attained affect hourly employees; perception of their social and environmental factors associated with self-directed learning?
4. Does employment classification affect the perception of one's motivation to learn?

5. Does employment classification affect the perception of one's cognitive elements?
6. Does employment classification affect the perception of one's social/environment?

Significance of the Study

A large portion of adult learning is focused on acquiring skills, experience and understanding within the domains of knowledge of work and interests, which often lay outside the formal classroom. This is especially true for the fields of developing technology, where the textbooks and curriculums have not been written yet. The rapid evolution of markets and technologies creates obsolescence at an increasing rate and fuels the need for learning new skills. Universities and colleges continue to explore and examine how fostering self-directed learning efforts contributes to the education process. Companies struggle with determining the most effective methods for providing their employees with the background, experience and skills they need to succeed. Access and support for continuing educational and training programs is not universal through out employment situations. Even with the large investment of money from companies and continued research within formal education, individuals, who wish to move into new positions and improve their opportunities, are often left to their own resourcefulness through self-directed learning efforts.

There is an increasing reliance on self-direction from individuals to acquire knowledge and skills. Many of the methods and programs developed to meet educational and training needs of the individual today are planned and structured for the self-directed

learner (Heimstra & Brockett, 1994). The current study provides additional insight into assessment of self-directed learning tendencies.

Limitations/Delimitations of the Study

The participants of this survey were employees at manufacturing environments and other businesses in the central Alabama area. This is an area transitioning from a traditionally textile and agricultural base to manufacturing environments introducing new technologies to this geographical area. The requirement of training employees to develop competency in unfamiliar job tasks is very common in most area manufacturing businesses. Assumptions and findings from this study may not be applicable to environments outside of this geographical area and environmental setting.

A concern of the study was the truthfulness of participants in the study. Most of the participants were from manufacturing and business environments where there is a general belief that the tendency for self-directed learning would be seen as a positive characteristic and would ultimately enhance an individual's opportunities for promotion. The study did not identify self-directed learning as a direct or primary focus of research. Participants were told an objective of the research was to develop greater understanding of learning preferences of groups in a work related context. It was also made clear that survey forms were to be completed anonymously and individual responses would not be identifiable.

Definitions of Terms

Assessment Instrument - The document consisting of questions and a rating scale used in this study for ranking tendencies in individuals towards self-directed learning activity.

Extrinsic Motivation - Extrinsic motivation in learning is manifest as a desire to acquire skill, knowledge, or expertise within a domain of knowledge for the purpose of obtaining some form of reward.

Intrinsic Motivation - Intrinsic motivation, from the perspective of the learner, is an attribute of the individual who believes in their ability to learn and master a skill or domain of knowledge and expertise and who has the drive to achieve that learning.

Self-Directed Learning - "In its broadest sense 'self-directed learning' describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating their learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18).

Self-Regulation - Self-regulation is the act of an individual in assuming control of their actions directed towards the acquisition of skills, knowledge, and understanding in a learning endeavor. "Students are self-regulated to the degree they are active metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1986).

Organization of the Study

This study seeks to add to current knowledge of self-directed learning (SDL) within employment settings and to provide a research tool for the purpose of furthering understanding in this domain. This approach seeks to examine the psychological aspects of SDL by identification of the primary factors involved in initiation and sustaining the behavior. Theoretical support for the multidimensional approach used in this study is provided through a review of literature pertaining to the topics of self-directed learning,

self-regulation, motivation, cognition, and social/environmental elements of the learning process. The review of literature includes a description of related research and work specifically conducted with the objective of developing instruments for assessing tendencies toward self-directed learning.

Development of the instrument used in this study involves the identified psychological factors as they relate specifically to skills and knowledge within workplace settings. The population base for this research, which consists primarily of hourly workers with little formal education past high school, has been generally under represented in research related to development of instruments for assessing self-directed learning tendencies.

The development of the instrument through stages is explained and the methods used to determine validity, to include methods used to create the instrument, rating scales, establishing sample domains, protocols for sampling, and data collection techniques. Subsequent statistical examination of the data and findings is provided and an interpretation of the data in terms of the research questions.

Summary

There is a recognized need for advancing research into factors which influence the individual's engagement in self-directed directed learning of skills and knowledge used within workplace settings for tasks related to their employment. Instruments developed during the initial years of research, as well as studies conducted during the last thirty years, in this area have predominately focused on the formal classroom environment to the neglect of the hourly employee in a workplace setting.

Numerous authors cited in this study have suggested the focus of an instrument developed to assess the individual's readiness for self-directed learning should be expanded to include a wider range of factors. This study was organized to examine the current and past discussions in the literature concerning development of a more comprehensive model of self-directed learning, with particular focus on work environments. The objective of this study was to develop an instrument to assess the major factors, which determine an individual's likelihood of initiation and successful completion of self-directed learning within the workplace setting.

CHAPTER II

LITERATURE REVIEW

The purpose of this research was to build on the work of Long, Guglimino and others (Caffarella & Caffarella, 1986; Conti, 1979; Knowles, 1975; Oddi, 1984; Pilling, 1991) in the field of self-directed learning by creating and validating an instrument to assess individual traits and behaviors, which are used to scale an individual's tendencies towards success in initiating and completing self-directed learning activities within the domains of work related knowledge and skills. This chapter examines research in the areas of learning within work environments, self-directed learning, self-regulation, motivation, cognitive aspects of self-directed learning, environmental and sociological elements of self-directed learning, as well as existing instruments used to assess self-directed learning in individuals. A theoretical construct is presented as the basis for development of the instrument created for this research. The following research questions are examined as part of this study.

1. Does the highest level of education attained affect hourly employees' motivation to learn job related information?
2. Does the highest level of education attained affect hourly employees' perception of their ability to learn?

3. Does the highest level of education attained affect hourly employees; perception of their social and environmental factors associated with self-directed learning?
4. Does employment classification affect the perception of one's motivation to learn?
5. Does employment classification affect the perception of one's cognitive elements?
6. Does employment classification affect the perception of one's social/environment?

Learning in Work Environments

A study conducted by Confessore and Confessore (1994) summarized the consensus of opinion of practitioners and researchers within the field of self-directed learning. One of the conclusions reached in this report was that self-directed learning in the workplace was not of particular interest among those surveyed. Today there is a large technological shift within business and industry, which is fueling an increased demand for educational and training programs for employees and potential employees (Desai, Richards, & Eddy, 1999). In the 1970s the job market had requirements for 20% of the work force to have four year college degrees, 20% in the high technical skills area and 60% unskilled labor (American Society for Training and Development, 2004).

In a review of literature on self-directed learning within business and industry, Long, Agyekem, & Stubblefield (1995) described the most frequently identified issues from the employee's perspective were related to training needs and adaptation to change. The demands of working a full time job and having a family can add to the challenges employees face when trying to improve their educational and training background. By 2004, companies reported approximately 23% of training programs were developed for self-paced delivery (American Society for Training and Development, 2004).

Heimstra and Brockett (1994) pointedly stated: "...business and industry trainers increasingly will need to depend on self-directed involvement by employees in the future because of declining dollars available for training" (p. 63).

Tough (1978), in a study examining intentional change initiated through self-directed learning projects, reported that the highest percentage of intentional change sought by interviewees was directed toward career and job training. Fully one third indicated their self-directed learning projects were focused on making improvements to their job position. Employee surveys have been found to rate the opportunity for self-improvement within a work environment at a higher priority than compensation (Shaw, Sterrett, Chesser, & Whitmore, 2001). Candy (1991) notes that:

...it is apparent that only a minority of people (generally estimated at between 10 and 20 percent of the adult population) choose to engage in formal educational activities. By contrast, the overwhelming majority of adults (estimates vary from 80 to 100 percent) undertake sustained self-directed learning activities each year. (p. 145)

Self-Directed Learning

Perhaps the first treatment of self-directed learning as a serious area of study in the field of adult education can be attributed to Cyril Houle (1961) in his book *The Inquiring Mind*. Houle (1961) proposed educators strive to involve learners in as many aspects of their educational process as possible and to foster a climate of interaction and independence.

Knowles expanded on the concepts of his mentor, Houle, by adopting the term, andragogy, to distinguish the differences between adult learning and the education of

children (Knowles, 1980). Five assumptions underlying adult learners in Knowles concept of andragogy were defined as:

1. The adult learner has an independent self-concept, which allows them to direct their own learning.
2. Adults have the advantage of a reservoir of life experiences, which provide a resource for the learning process.
3. Adult learning needs are closely related to their changing social roles.
4. Adult's interest in learning is generally problem centered, with immediate application of knowledge to life situations.
5. Adults are generally motivated to learn by internal or intrinsic factors, rather than external factors.

Knowles (1975) defined the self-directed learning process as one 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. (p. 18)

More specifically this perspective is seen as a question of who is in charge of the learning process, who decides what is to be learned, what methods and resources to use, and how success should be measured. To the extent the individual makes those decisions, they are considered to be self directed (Lowery, 1996).

Allen Tough was the first to focus self-directed learning as a specific area of study, as a continuation of the work of his mentor, Houle (Merriam, 2001). Tough

examined a diverse spectrum of self-directed activities among a group of Canadians (Tough, 1967, 1971). In these studies, he defined self-directed learning in the specific terms of learning projects as:

...a series of related episodes, adding up to at least 7 hours. In each episode more than half of a person's total motivation is to gain and retain certain fairly clear knowledge and skill or to produce some other lasting change in himself. (p. 6)

The early work of both Knowles (1975) and Tough (1971) each presented models of the process of self-directed learning in terms of linear systems of steps, which progress from identifying learning needs through developing instructional formats, to evaluating outcomes (Merriam, 2001). Later models have become less linear and more interactive. Candy (1991) proposes that the term self-direction refers to four distinct and related phenomena he describes as:

...self-direction" as a personal attribute (personal autonomy); "self-direction" as the willingness and capacity to conduct one's own education (self management); "self-direction" as a mode of organizing instruction in formal settings (learner control); and "self-direction" as the individual, noninstitutional pursuit of learning opportunities in the "natural societal setting" (autodidaxy). (p. 23)

The current literature likewise can be categorized by the emphasis and approach of the researcher. Merriam and Caffarella (1999) summarize the literature on self-directed learning up to that time according into three categories;

1. The goals

2. The process
3. The learner.

The first category, the goal, is described by Merriam (1999) as originating in humanistic philosophy and focused on the goal of self-directed learning as the development of the learner's capacity to be self-directed. Knowles, Tough, Brockett, Heimstra are identified by Merriam (1999) as writing from this perspective. The second goal identified by Merriam and Caffarella (1999), is characterized by critical reflection and emphasizes self-knowledge as a prerequisite for development of autonomy in self-directed learning. A third goal of self-directed learning is the promotion of emancipatory learning and social or political action (Merriam, 1999).

The second category of research in the field of self-directed learning identified by Merriam and Caffarella (1999) concerns the process of self-directed learning, which has seen the development and proposal of various models to explain how it works. As an example, the instructional model is proposed by Merriam and Caffarella (1999), to identify stages and characteristics of learner self-direction and provide instructors with methods to promote and foster self-direction in the learner.

The third category of focus for research in self-directed learning identified by Merriam and Caffarella (1999) is learner characteristics, which is characterized by empirical studies through the use of instruments, scales, interviews. The dominate instrument currently in current use is Guglielmino's Self-Directed Learning Readiness Scale, (SDLRS), called the Learning Preference Assessment (LPA) in its self-assessment format (Long, 2000). A total of seventeen instruments were identified during a review

of literature in 1995, which either assess self-directed learning as a learner characteristic or as a characteristic of the learning process (Pilling-Cormick, 1995). Long (1998a) categorizes theoretical perspectives within the field of self-directed learning into four paradigms, the sociological, a teaching perspective, the methodological paradigm, and the psychological. Long (1998a) further categorizes the work of researchers into one or more of these categories. He describes the sociological paradigm as developing from the research and theoretical ideas of Allen Tough, which show the self-directed learner to be highly independent in goal setting, evaluating, selecting resources, and exhibiting openness to guidance from external resources (Long, 1998a).

The teaching perspective for self-directed learning developed from the initial work of Malcolm Knowles (Long, 1998b). Through the work of Knowles, the emphasis within the field was towards self-directed learning as a teaching technique. Garrison's work in distance education, based of Verner's definition of an education method as the way an education provider relates to the learner, proposed the concept of viewing self-directed learning from the perspective of distance education (Long, 1998a).

Long (1990, 1997, 1998a) proposed a fourth conceptual model for self-directed learning from the psychological perspective. Long (1998a) summarizes the psychological paradigm:

It is implied that learners are capable of directing attention, choosing elements from among resources for consideration, integrating the elements, closely monitoring the process, reflecting on tentative conclusions, and creatively fashioning meaning or new approaches... Since those who believe that SDL is explained by psychological phenomena they are interested in how, why, when,

and so forth of attitudes, sets, awareness of learning strategies, metacognitive skills, personal insight, and motivation. (p. 9)

Questions for research relative to the psychological paradigm of self-directed learning are provided by Long (1998a, p. 13):

1. What are the origins of the psychological orientation favoring self-directed learning? Why? How?
2. Is the psychological orientation developmental? How and why?
3. Is the orientation influenced by content? How and why?
4. When and under what circumstances is the orientation a liability rather than an asset and vice versa?
5. Do learners who are more self-directing in their learning have a greater awareness of their life intentions? Why and how?
6. Are self-directed learners more competent in releasing psychic energy? Why and how?
7. How do self-directed learners learn self-feedback procedures? Are they the result of crystallized or fluid intelligence?
8. How do self-directed learners become proficient at developing learning strategies? Does competence vary with content or tasks, or is it universally applicable?
9. How is control of learning in learning projects related to control in other life phases and activities?

Long's conceptualization of the psychological paradigm of self-directed learning extends beyond the simple dimensions of personality, to include motivation, cognitive preferences, and characteristics such as creativity, and attitudes (Long, 2000). His model contains four primary elements; contextual, personality, social, and situational (Long 1991). Long (2000) suggests that: "Self-direction in learning is a consequence of a complex interaction of personal variables and circumstances..." (p. 14)

Implications of the psychological paradigm are explained by Long (1998a):

...fundamentally learning is a self-initiated, self-directed, and self regulated cognitive process whereby the learner can choose to ignore instruction, to merely absorb it by casual attention, to carefully memorize without critical reflection, or to seek to change or create an understanding of information." (p. 9)

Long further describes his psychological as a two dimensional relationship between psychological control and pedagogical control (Long, 2000). Figure 1 illustrates this relationship.

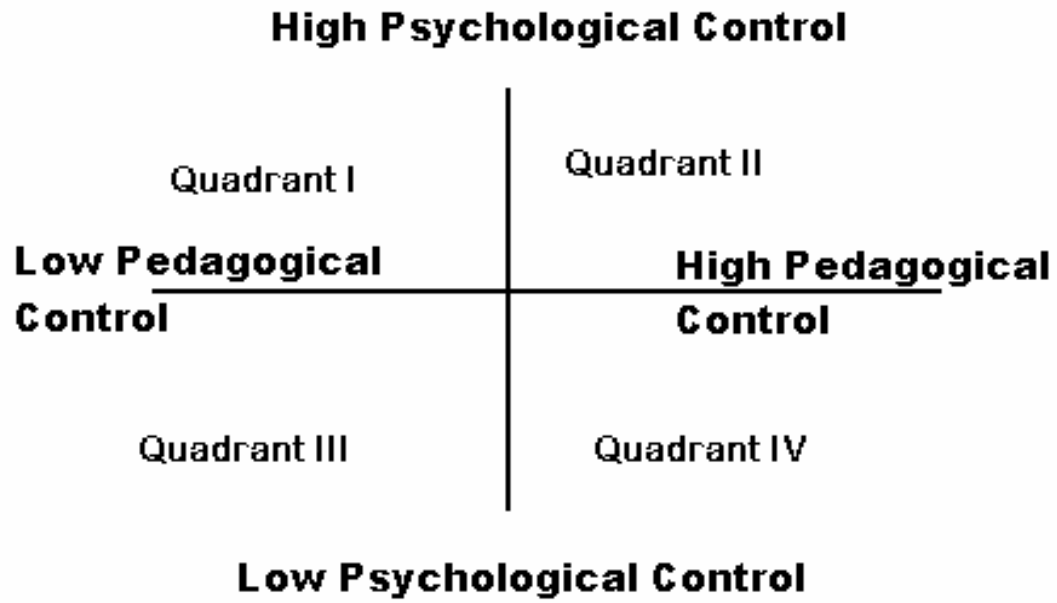


Figure 1. An Illustration of the relationship between pedagogical and psychological in self-directed learning

Long's theoretical position suggests that self-direction is likely to be lowest in Quadrant III, where there is low pedagogical control and low psychological control, and self-direction to be highest in Quadrant I, where there is high psychological control and low pedagogical control (Long, 2000). He also proposes that more self-direction will occur in Quadrant II, with high psychological control and high pedagogical control, than in Quadrant IV, with low psychological and low pedagogical control.

Self-Regulation

From the perspective of self-directed learning as a psychological construct, self-regulation has been identified as a key aspect of self-directed learning (Long, 1998b).

A broad definition of self-regulation is provided by Zimmerman (1986) in the statement: "Students are self-regulated to the degree that they are active metacognitively, motivationally, and behaviorally active participants in their own learning process" (p. 5). Zimmerman (1986) also notes with the preceding statement that more precise definitions of self-regulation are dependant on the theoretical perspective of the researcher, of which there are several in this field. Most definitions include purposive use of processes, strategies, or responses to improve achievement, a self-oriented feedback loop for accessing progress, and a description of how and why individuals choose to use a particular self-regulated process, strategy, or response (Zimmerman, 2001).

Table 1 provides a summary comparison of theoretical views presented by Zimmerman (2001). These models present the different theoretical perspectives of self-regulated learning, with views on how self-regulation functions in learning and how it may succeed or fail.

Table 1.
A Comparison of Theoretical Views Regarding Common Issues in Self-Regulated Learning

Theories	Motivation	Self-Awareness	Key Processes	Social and Physical Environments	Acquiring Capacity
Operant	Reinforcing stimuli are emphasized	Not recognized except for self-reactivity	Self-monitoring, self-instruction, and self-evaluation	Modeling and reinforcement	Shaping behavior and fading adjunctive stimuli
Phenomenological	Self-Actualization emphasized	Emphasizes role of self-concept	Self-worth and self-identity	Emphasizes subjective perceptions of it	Developed in the self-system
Information Processing	Motivation is not emphasized historically	Cognitive self-monitoring	Storage and transformation of information	Not emphasized except when transformed to information	Increases in capacity of system to transform information
Social Cognitive	Self-efficacy, outcome expectations, and goals are emphasized	Self-observation and self-monitoring	Self-observation, self-judgement, and self-reactions	Modeling and enactive mastery experiences	Increases through social learning at four successive levels
Volitional	It is a precondition to volition based on one's expectancy values	Action controlled rather than state controlled	Strategies to control cognition, motivation, and emotions	Volitional strategies to control distracting environments	An acquired ability to use volitional control strategies
Vygotskian	Not emphasized historically except for social context effects	Consciousness of learning in the ZPD	Egocentric and inner speech	Adult dialogue mediates internalization of children's speech	Children acquire inner use of speech in a series of developmental levels
Constructivist	Resolution of cognitive conflict or a curiosity drive is emphasized	Metacognitive monitoring	Constructing schemas, strategies, or personal theories	Historically social conflict or discovery learning is stressed	Development constrains children's acquisition of self-regulatory processes

From Zimmerman (2001)

The operant theory of self-regulation proposes self-regulation behaviors to be ultimately controlled by the environment (Mace, Belfiore, & Hutchinson, 2001). Individuals are seen through this perspective as being shaped by past experiences to react to future situations. The psychology of operant behavior, as proposed by Skinner (1968), deals with behavior, which depends on the environmental consequences it ultimately produces. As such, behaviors become more likely through either positive or negative reinforcement and will promote either a desired result or yields avoidance of a less desirable result.

Four major key processes to self-regulating behavior from the operant perspective are identified as self-monitoring, self-instruction, self-evaluation, and self-reinforcement (Mace, Belfiore, & Hutchinson, 2001). This approach suggests each of these mechanisms can be emphasized to foster greater self-regulation.

McCombs (2001) describes self-identity as a key component of the phenomenological theoretical perspective of self-regulation. How a person views their past success, their perceptions about abilities and potential for future success affects their potential for self-regulation. In describing the relationship to learning McComb (2001) states:

The self's role in the learning process is to generate the motivation to approach and persist in learning activities – as a function of evaluating the personal meaningfulness and relevance of learning activities relative to individual goals and beliefs about one's competencies and abilities. (p. 84)

In order to provide a means of visualizing the concept of self from the phenomenological perspective, McComb (2001) presents a model of the role of the self-system of structures and processes in Figure 2.

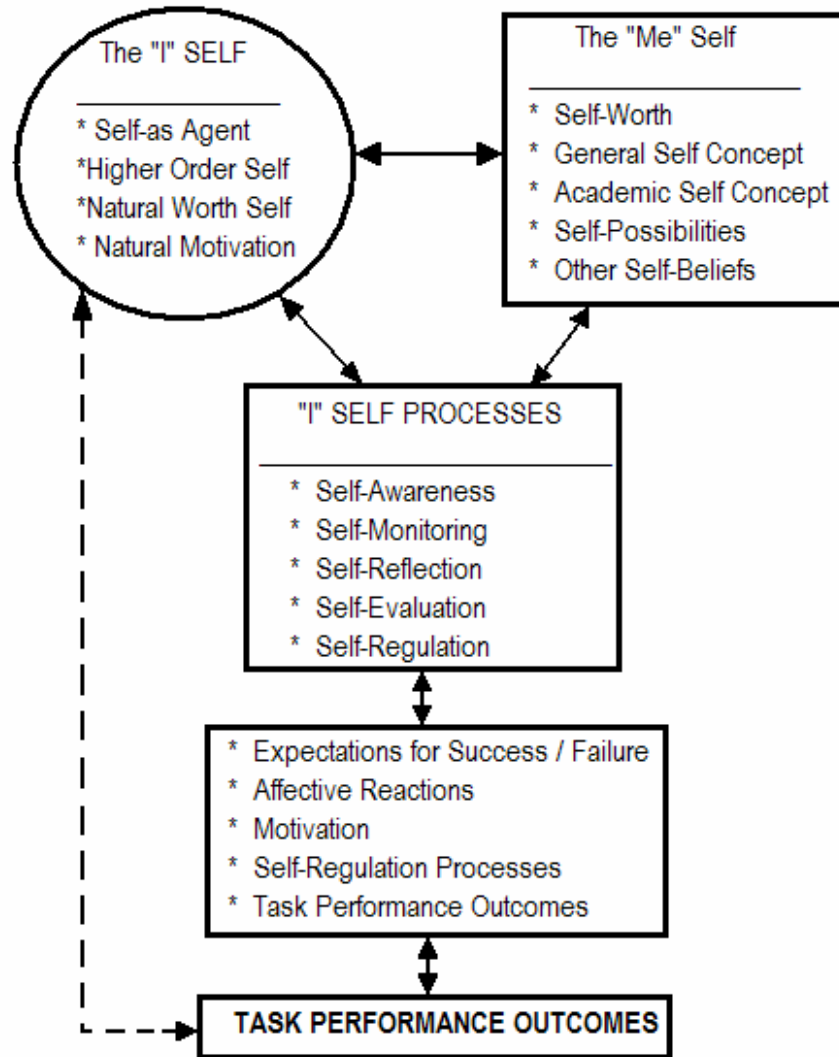


Figure 2. Model of the role of the self-system in self-regulated learning.

This self-systems structure is described by McCombs as:

...global or domain specific conceptualizations individuals generate regarding their attributes, including their self-concept, self-image, and self-worth. These structures are formed over time, as individuals develop from infancy into adulthood through interactions with the social and physical environment.

Information acquired about the self as a result of interactions with the external context is transformed and modified cognitively to fit unique experiences of self or being, including individual perceptions of needs and goals of self-development.

(p. 86)

From the perspective of self-regulated learning, this global self-concept is understood as the individual's beliefs and perceptions of their ability to direct and control their cognition, affect motivation, and behavior in learning situations in general (McCombs, 2001). This concept is not limited to what the individual knows about their self, but also what the individual believes about their abilities and potentials. As part of the self-system processes, self-evaluation is a particularly important factor in self-regulated learning (Bandura, 1988).

Social cognitive theory proposes self-regulated learning is construed as situationally specific. That is, self-regulation is not a general trait or level of development in the individual, but is rather highly context dependant. Schunk (2001) states: "People selectively engage in cognitive activities that assist learning and are motivated to learn actions that they value and believe will lead to rewarding consequences" (p. 128).

Schunk and Zimmerman (1997) propose a social cognitive model of self-regulated learning, which predicts that academic competence develops initially from social sources and subsequently shift to self-sources in a series of levels, as illustrated in Table 2.

Table 2

Social Cognitive Model of the Development of Self-Regulatory Competence

Level of Development	Social Influences	Self Influences
Observational	Models Verbal Description	
Emulative	Social Guidance Feedback	
Self-Controlled		Internal Standards Self-Reinforcement
Self-Regulated		Self-Regulatory Processes Self-Efficacy Beliefs

From Schunk, 2001, p. 143

As noted by Schunk (2001) the observational level involves acquisition of knowledge only at an observational level, while the emulative level includes a performance capability. The self-controlled level is distinguished by the learner's use of skills and strategies independently. The self-regulated level allows learners to adapt those skills and strategies to changes on contextual conditions.

Information processing views on self-regulated learning are based heavily on the fields and processes of computing and communication as presented by Shannon & Weaver (1949). The perspective of information processing in learning is described by

Winne (2001) as: "...every occasion for communicating information provides and opportunity for a receiver – a student, if you will – to learn. If the receiver does not learn something new, no information was communicated" (p. 154).

Psychologists have developed extensive theories about how information is received and processed through the process of learning to form usable knowledge Winne (1985). postulates five fundamental types of information processes as: Searching, Monitoring, Assembling, Rehearsing, and Translating. Winne (2001) further explains that searching describes the process of how we retrieve data, while monitoring refers to the comparison of two pieces of information as part of an evaluative process. Assembling is the process of storing information in long term memory through establishing links between the new information and existing information. Rehearsing is a process used by the individual either automatically or deliberately to reinforce the assembly of information with usable links. The deliberate rehearsal of informational links can be seen as a process of self-regulation in acquiring information. Translating is described by Winne (2001) as the mechanism for using one representational format as a basis for creating another, such as the translation of words into mental images and then back again into words.

Key information processes in self-regulated learning have been structured into a model, co-developed and proposed by Winne and Hardwin (1998), described by the acronym COPES, which stands for: Conditions, Operations, Products, Evaluations, and Standards. Figure 3 provides a representation of the structure and interactions of this model.

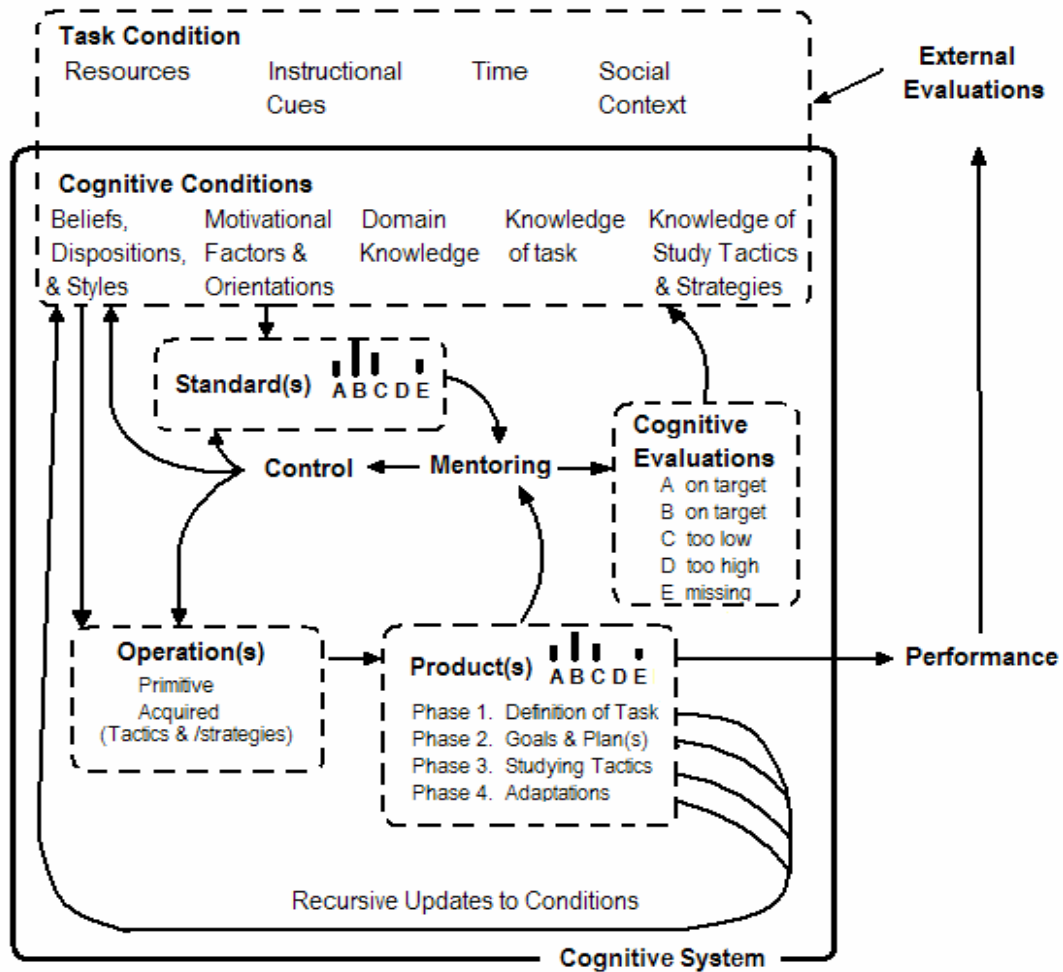


Figure 3. Conditions, operations, products, evaluations, and standards.

The central section of this model involves metacognitive control and monitoring, which is recognized as the primary hub of the self-regulated learning process (Winne, 2001). The overall system described in this model is seen as highly interactive, with

results from each step in the process having either positive or negative influences on subsequent learning activities.

Vygotskian perspectives on self-regulation developed through Vygotsky's observation of experimental data and Leontiev's creation of the theory of activity as an independent area of study, that new psychological structures developed through the process of ontogeny, determine the specific features of human psychology (Bozhovich, 1988). Specifically, this development is both the process of neurological maturation and the individual's assimilation and adaptation of the cultural features of the social environment.

Constructivist theories of self-regulation have been used during the last 20 years in the promotion of self-directed learning strategies (Paris, Byrnes, & Paris, 2001). Constructivism shares the position with Vygotsky that the learning process has to be examined within the entire social, cultural, psychological, and physical environment (DeCorte, Greer, & Verschaffel, 1996). Self-regulation is seen as an adaptive response to the individual's environment. Instead of assuming learners seek to become self-regulated in order to achieve at higher levels, the constructivist approach includes other motives related to the sociocultural environment, such as the need to be seen positively by peer cultural groups (Paris, Byrnes, & Paris, 2001).

Three questions are presented by Paris, Byrnes, and Paris (2001) to address the sources of functional coherence and goals of self-regulated learning, as follows:

1. Why regulate one's actions?
2. How do students acquire regulative strategies?
3. What are the consequences of being a self-regulated learner?

Constructivist theory presented by Paris, Byrnes, and Paris (2001) offers answers to these questions as responses to social environmental situations. The reason for regulating one's behavior is explained as individual desires to present themselves in a positive way to peers in their social environment. Learners acquire self-regulated learning strategies by both invention and instruction. The consequences of being a self-regulated learner extend beyond better learning and higher achievement to include enhancement of their social presentations to others.

Volition, as a key element in self regulation, is a construct within the field of psychology which dates back to the early 20th century, although until as recent as 1980, the term volition rarely appears in psychological research on education (Corno, 2001). Both volition and motivation are identified as processes of self-regulated behavior (Kuhl (1985). Volition is distinguished from motivation in the sense that motivation generates the initial impulse or desire to act, while volition controls the intentions and impulses so that the actions occur (Ach, 1910). Corno (2001) presents an expansion of six strategies of volitional control in Table 3.

Table 3

Categories of Volitional Control and Specific Volitional Control Strategies

I. Covert processes of self-control
A. Control of cognition
1. Attention control
2. Encoding control
3. Information processing control
B. Emotion control
C. Motivation control
1. Incentive escalation
2. Attribution
3. Instruction

II. Overt Processes of self-control: Environmental Control
A. Control of the task situation
1. Task control
2. Setting control
B. Control of others in the task setting
1. Peer control
2. Teacher control

From Corno, 2001, p. 1990

Controlling overt processes includes such strategies as controlling emotions, focusing on potential outcomes to influence motivation, and focusing attention for ignoring distractions. Control of overt processes also includes environmental elements through efforts such as streamlining tasks, reorganizing priorities, or obtaining assistance or intervention from others (Corno, 2001).

Motivation

Early thought on the subject of motivation has roots, which extend back into distant human history. Plato's concept of the mind included three elements; knowing (cognition), feeling (emotion), and willing (motivation) (Pojman, 2003). In more recent times, the study of motivation shifted from the domain of philosophy to become integral in the field of psychology, as well as education. Much of the current thought within the study of self-regulation and self-directed learning draws on elements of the various theories of motivation. A brief overview of theories, which seek to explain motivation and which are related to the study of self-directed learning follows.

During the first half of the 20th century conditioning theories of motivation, which focus on stimulus and response factors in shaping behavior, held a dominate position in psychology (Pintrich & Schunk, 1996). Thorndike envisioned the development of behavior as a trial-and-error process, where consequences resulting from choices an individual makes shapes future behavior (Pintrich & Schunk, 1996). This process is described by Thorndike (1913).

When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased: When made and accompanied or followed by an annoying state of affairs, its strength is decreased. (p. 4).

It follows from this reasoning that motivation to perform actions is learned through the process of having positive experiences with those actions. The concept of classical conditioning was developed through the work of Pavlov and largely ignores cognitive processes by focusing on the effects of conditioned and unconditioned stimulus

and the related conditioned and unconditioned responses (Pintrich & Schunk, 1996). On a basic level, the effects, which develop through conditioning to stimuli, can have both positive and negative effects and are important factors to consider when developing the elements of a learning environment.

Operant conditioning, developed through the work of Skinner, considers the effects of positive and negative reinforcements, in the form of consequences to behaviors, which increase or decrease the likelihood of the behavior repeating (Pintrich & Schunk, 1996). The theory proposes that, through the use of positive reinforcement to desired behaviors and negative reinforcement to undesired behaviors, a pattern of behavior can be molded in an individual to achieve learning objectives.

Drive theories of motivation focus on inner needs as the elements, which shape behavior, in contrast to conditioning theories, which deal with the effects of external factors. The concept of drive as the force which initiates and sustains behavior was proposed by Woodworth (1918). Various theories have been offered to explain the system of interactions between response and stimulus, which create the drive to initiate actions. Hull (1943) proposed Systematic Behavior Theory, which postulated that drive is created when a need exists, or is perceived to exist, that has the potential to impact survival. The effect of incentive, in the forms of reward, was theorized to increase drive as the reward increased (Crespi, 1942; Hull, 1951).

Drive theories in general emphasize the development of extrinsic motivation through positive or negative consequences to actions. The effect of extrinsic rewards on behavior among employees has been demonstrated through research (Shaw, Sterrett, Chesser, & Whitmore, 2001). Incentive motivation was seen by Mowrer (1960) as the

primary instigating factor of action. Mowrer's concept of intrinsic motivation was based on four primary emotional responses to stimuli, which included hope, disappointment, fear and relief (Mowrer, 1960). This perspective is narrow in the sense it does not explain the effect of personal cognition in shaping motivation, which is seen as an essential element in self-directed learning (Long, 2000).

Purposive behaviorism adds the element of goal orientations to the reasoning behind conditioning and drive theories as the primary controlling factor in creating motivation for actions (Pintrich & Schunk, 1996). Behavior is shaped by internal goals rather than being dominated solely by conditioned responses to stimuli (Tolman, 1932).

Arousal theories of motivation are in contrast to the drive theories and purposive behaviorism in that the explanations for are found in terms of emotional arousal (Pintrich & Schunk, 1996). Hebb (1966) proposed that the mind seeks and actually requires activity, which in terms of maximizing learning, has an optimal level. This optimal level of arousal is described as a necessary condition for learning (Berlyne, 1960). Too much arousal and the thought processes associated with learning are challenged, while too little arousal creates boredom. Motivation is created when the level of arousal deviates from the optimal level.

Humanistic theories replace the behavioral theories of motivation with explanations in terms of cognitive processes, with three basic assumptions (Pintrich & Schunk, 1996). The first assumption is that in order to understand human behavior, we have to look at all aspects of the individual, to include behaviors, thoughts, and emotions. The second assumption is that to explain human behavior requires an approach that includes more than the isolated stimulus response characteristics associated with lower

animals. Human creativity, our choices, and self-actualization are all aspects of the whole being, which are necessary elements to examine in this search for understanding. The third assumption described by Pintrich and Schunk (1996) is one of methodology. The humanistic approach is less concerned with the methodology of the study, if the problem is of an important nature.

Carl Rogers (1963) developed the concept of an actualizing tendency, which he believed to be an innate characteristic of humans. This actualizing tendency in Roger's theory represents the source of motivation, in the sense we seek growth, autonomy, and freedom from control (Pintrich & Schunk, 1996). Environmental factors in the form of experiences, which reinforce or impair our sense of self-worth, impact our efforts towards self-actualization (Rogers, 1959). Personal efforts towards self-actualization are nurtured by what Rogers' termed unconditional positive regard and complicated by conditional regard, which represents regard dependant on specific constraints (Rogers, 1959).

Pintrich and Schunk (1996) summarize the various theoretical perspectives in terms of metatheoretical models as a means of organizing theories. Table 4 presents this summary.

Table 4.
Metatheoretical Models in the study of Motivation

Model	Scientific perspective	Relation of complex behaviors to simple behavior	Continuity between levels of behavior and stages of development	Metaphor used to explain behavior	Applicable theories
Mechanistic	Natural science: laws of natural science are basic laws of the world	Reductionistic (complex behaviors can be broken into simpler ones), additive (behaviors sum to more complex ones)	Behavior change and development proceed in continuous fashion, levels differ quantitatively	Machine	Freudian, conditioning, drive, purposive behaviorism
Organismic	Human development: progressive changes in organisms	Nonreductionistic (complex events can-not be broken into simpler ones), multiplicative (behaviors combine to form behaviors more complex than the sum of the parts)	Behavior change and development proceed in discontinuous fashion, levels differ quantitatively	Living, growing organism (plant)	Volition / will instincts, trait
Contextual	Interactionist: relation of person to environment	Nonreductionist and multiplicative	Mostly discontinuous	Historical event	Arousal, field, cognitive consistency, humanistic

From: Pintrich and Schunk, (1996), P. 59

The mechanistic metatheoretical model in Table 4 provides a reductionistic explanation for motivation, with the perspective that complex behavior is the summation of many basic phenomena. Pintrich and Schunk (1996) categorize Freudian theory, conditioning theories, drive theories and purposive behaviorism under the mechanistic metatheoretical model.

The Organismic model in Table 4 disagrees with the assumption in the mechanistic model that complex behaviors can be reduced to the summation of simple behaviors and that progression moves in an empirical fashion (Overton, 1984). Development of behaviors in the organismic model is more discontinuous and influenced by natural stages in the process of maturing. In the organismic model, complex behavior is not explained by stimulus-response associations in the mechanistic fashion. Motivation theories, which Pintrich and Schunk (1996) categorize as organismic include volition / will, instincts and trait theories.

The contextual model is described by Overton (1984) as a compromise between the mechanistic and organismic models, where behavior develops in the discontinuous process of the organismic, but is influenced through subjective interpretations of the individual within their environment, which initiates purposeful change. Motivation theories, which Pintrich and Schunk categorize as contextual, include arousal, field theory, cognitive consistency, and humanistic theories.

Miller (1967) presents one of the earliest theoretical constructs for motivation in the field of adult education. His social class theory builds on the work of Maslow (1954) and Lewin (1947) to explain why people participate, as well as why the focus of study is so different between different social classes (Cross, 1981). Maslow proposed that people

will not be concerned with higher human needs, such as status, achievement, and self realization until the basic needs of the individual are met (Maslow, 1954). Miller used this reasoning to postulate adults from the lower social status groups would be interested primarily in education focused on obtaining better employment, while the upper classes, who do not have the need for basic human needs, would be more interested in education leading to achievement and self-realization (Miller, 1967).

Houle (1961) conducted a study involving a series of in-depth interviews aimed at examining motivation for adult learning. The twenty-two subjects of these interviews were chosen for their conspicuous activity in continued learning activities, with the goal of obtaining insight into why these people were so active. Out of this study, Houle identified three classifications of sources for the motivation. The first was identified as goal-oriented learners, who engaged in learning activities to acquire knowledge or skills in specific domains. Learning episodes were separate and initiated when a need, or an interest was identified by the learner as an objective. This group can be compared to the adult learner in a work environment, who develops motivation for learning in response to extrinsic rewards related to employment and the opportunity to progress.

The second category of sources for motivation identified by Houle (1961) was activity orientations of individuals, who enjoy the activity of learning enough to supply justification for the effort. Some may participate because of the social environment the learning activity puts them in, while others may engage in the learning activity to satisfy internal needs of social status.

The final category identified in Houle's study was the learner-oriented individual who participates in learning activities purely for the sake of learning. These are the

individuals who have intrinsic motivation to learn and a desire to continually expand their knowledge often in a broad range of topics and fields of knowledge. The reward for the effort put forth is simply the acquisition of knowledge and understanding.

Cross (1988) presented the beginnings of a conceptual framework for a theory of motivation, based on common elements of theories existing in 1988, in her Chain of Response model illustrated in Figure 4. This model assumes participation in learning activities are not single acts, but rather the result of a chain of responses based on ongoing evaluations of the individual's position in their environment. (Cross, 1988).

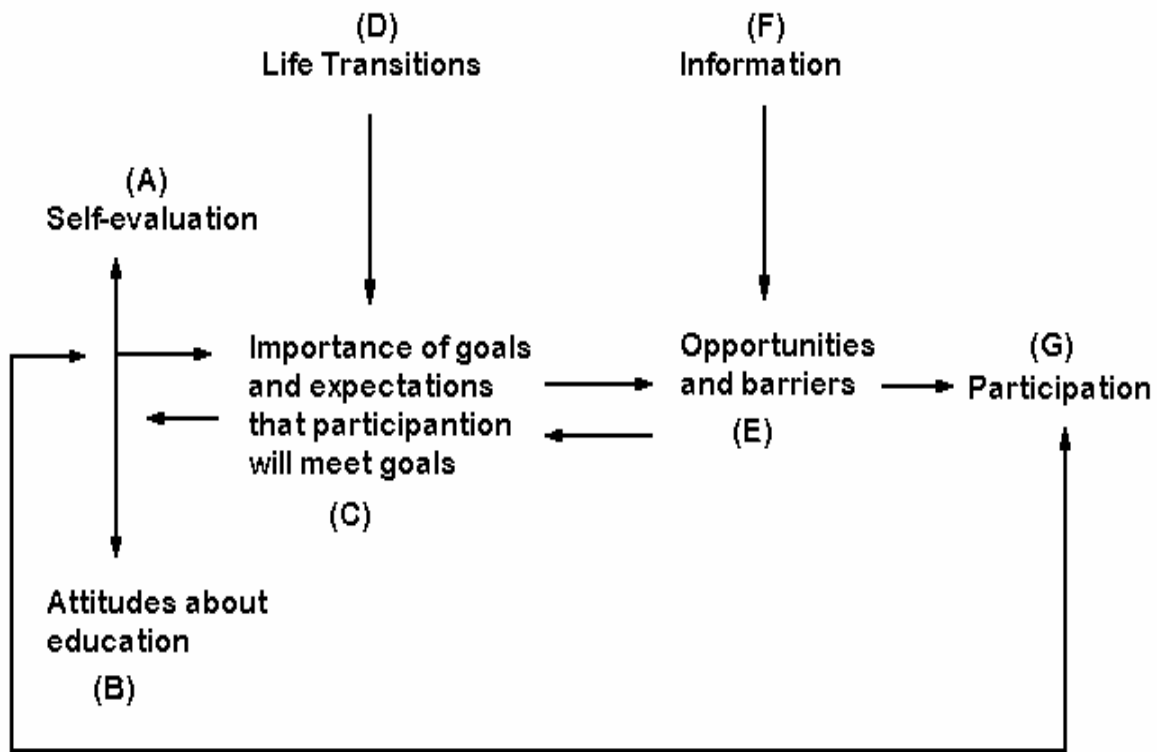


Figure 4. Chain-of-Response (COR) model for understanding participation in adult learning activities.

This model explains adult learning activities in terms of the elements of the activities and motivating factors, which influence engagement in learning activities. The order in this presentation begins with the individual and moves increasingly to external conditions. Each element has the effect of influencing future motivation through rewards, the amount of effort applied, successes, or failures (Cross, 1988). This model presents a dynamic system for explaining progression or regression of motivational forces driving the activity as a function of the individual's interactions with the social and learning environments.

Cognitive Aspects of Self-Directed Learning

The literature of the field of psychology often explains cognition in terms of cognitive structure, which is described as the internal organization of knowledge stored in long-term memory in an individual through a process of recognition of relationships to existing knowledge through associations and inferred meanings (Shavelson & Bolus, 1982). Within the literature, self-directed learning is recognized as a cognitive process, where the learner exercises choices to accomplish learning (Jarvis, 1992). Discussion of cognitive strategies refers to methods used by individuals and fostered by facilitators to aid in the acquisition of new knowledge. The former viewpoint describes the internal structure within the mind in which information is retained in memory for retrieval and use, while the latter deals with the process of acquiring and conceptualizing knowledge.

Jarvis (1992) describes nine characteristics of the self-directed learner as follows:

1. **Decision to learn:** The learner is motivated to respond to a perceived need or want to learn.
2. **Type of participation:** Learners decide between learning independently, learning through and organized activity, or some combination.
3. **Aims and objectives:** Learners choose between learner control, control by others, or negotiated aims and objectives.
4. **Content:** Learners make a decision regarding the selection of content.
5. **Method:** The methodological processes engaged in by the learner.
6. **Thought / Language:** The mode of speech, thought, perception, and so forth, engaged in by the learner.
7. **Assessment:** The process of evaluating how much they have learned, whether their needs or wants have been satisfied, and whether they have achieved their aims and objectives.
8. **Disjuncture:** Acting on a perceived need or want precedes the learner's learning process.
9. **Action / Outcome:** Learner's evaluation of the results.

Nuckles (2000) conducted research to determine whether there are relationships between personality factors, cognitive style, and self-directed learning in adult learners, which failed to identify a psychological profile for the group of learners in the study. The results of this study imply that the differences in psychological orientations may influence cognitive strategies of individuals in their pursuit of self-directed learning.

Merriam (1999) proposed a process of cognitive development to explain transformational learning, which was defined by Mezirow (1997) as the process of

attaining greater autonomy in the process of thinking. Merriam argues: "...mature cognitive development is foundational to engaging in critical reflection and rational discourse necessary for transformational learning" (p. 65).

Development of cognitive strategies is identified as a critical feature of growth within the process of self-regulation of learning, with clear indication that learners become more capable of using various cognitive and metacognitive strategies with age and experience (Pintrich & Schunk, 1996).

Social and Environmental Elements of Self-Directed Learning

Self-directed learning behavior is becoming more frequently recognized today as an interactive process (Long, 2000). The effects of environmental and social elements on the initiation of self-directed learning may be as basic as creating the settings and conditions an individual finds themselves in, which can form constraints or promote the initiation of a SDL endeavor. For the state of optimal learning conditions to exist, the learner's level of self-direction must exist in an environment where opportunities for self-directed learning are present.

The early work of Vygotsky provides a basis for examination of the environmental and social effects on the initiation and sustaining of self-directed learning. In Vygotsky's own description;

The experiencing of a situation, the experiencing of an environment, determines what influence this situation or environment will have on the child. Thus, not any feature in and of itself, taken without reference to the child, but a feature as it is refracted through the experience of the child, can determine how this feature will

influence the course of his subsequent development (A. N. Leontiev, English translation from Russian text, 2005). (p. 16).

A key element in the process of psychological growth is the development of speech, which is a hallmark in the process of becoming aware (McCaslin & Hickey, 2001). The role of the social environment in this process is preeminent. Internal speech differs from external speech in that inner speech involves turning words into thoughts, while external speech turns thoughts into words (Vygotsky, 1962). From the Vygotskian perspective, there is an inherently social nature to the learning process (Leontiev, 2005).

Various strategies for applying Vygotsky's theories about learning within social environments have been proposed. Strong (1958) attempted to link "will with skill" within work environments. His work was based off the premise that if you provide a worker with adequate training, motivation would follow as a natural byproduct. Others (Corono & Mandinach, 1983; Paris, 1988) propose a reversed position of the "will with skill" example, with the position that motivation was a necessary initial condition before the skill could be mastered.

Leontiev (1978) developed the construct of activity theory to further refine Vygotsky's theories about the social context of learning. Activity theory assumes that goals and motives are not limited to the individual, but are a product of the social and cultural environment. Human activity, consisting of goal-directed processes, provides the link between the individual and the environment (Leontiev, 1974-1975). Self-regulation

in the individual from the Vygotskian perspective, can not be examined separately without considering the larger sociocultural context (Leontiev, 1978).

Existing Measures of Self-Directed Learners

The Self-Directed Learning Readiness Scale (SDLRS), developed as the focus of a dissertation by Lucy Guglielmino in 1977, is by far the most widely used instrument, which provides a measure of an individual's potential for self-direction in learning (McCune & Guglielmino, 1989b). Over 150 studies have been conducted using the SDLRS (McCune, Guglielmino & Garcia, 1990).

As designed, the instrument measures "readiness for self-directed learning" (Guglielmino, 1977). Her purpose, as stated in the original study by Guglielmino (1977) was:

...to obtain consensus from a panel of experts on the most important personality characteristics of highly self-directed learners, and to develop an instrument for assessing an individual's readiness for self-direction in learning (p. 3).

The panel of experts consisted of 14 professionals in the field of education, who participated in a three round Delphi survey technique to identify the characteristics of the self-directed learner (Guglielmino, 1977). From this effort, 56 characteristics of the self-directed learner were identified, with 33 being rated as essential for self-direction in learning (Guglielmino, 1989). These 33 characteristics were used to develop a 41 item survey, which formed the initial instrument (Guglielmino, 1977). Eight principal factors were identified in Gugliemino's factor analysis

1. Openness to learning opportunities
2. Self perception as an effective learner

3. Driving initiative as an effective learner
4. Acceptance of responsibility for one's own learning
5. Love of learning
6. Creative spirit
7. Future orientation
8. Ability to use basic study and problem solving skills

The instrument was administered to students in various educational classroom settings. A Cronbach-alpha reliability coefficient of .87 was reported by Guglielmino (1977) for the original 41 item instrument. The instrument was revised by removing nine of the original items and adding 26 new items, to yield the current 58 item instrument. In addition, seventeen of the 58 items were negatively stated and reverse scored to minimize the potential impact of development of a response set. Another study used to validate the revised instrument also yielded a Cronbach-alpha coefficient of .87 as reported by Guglielmino (1997). A significant number of studies have been conducted, which acknowledge the validity of the SDLRS instrument (Bonham, 1989; Brockett, 1982; Finestone, 1984; Savoie, 1980; Torrance & Mourad, 1978; Wiley, 1981).

Mourad & Torrance, (1979) developed the Teacher Rating Scale (TRS) to assess teacher's perceptions of student's abilities and reported a significant relationship between SDLRS scores and teacher ratings of students. Hassan (1981) used the SDLRS to survey a group of adult learners and found a positive correlation between the SDLRS scores and the number of self-directed learning projects accomplished. Long & Agyekum (1983)

conducted and published a review of research literature supporting the claim for validity of the instrument. In this review, Long and Agyekum also noted a correlation between both age and educational level of subjects to SDLRS scores.

There have also been criticisms of the SDLRS within the fields of adult education and self-directed learning. Several researchers have found a number of the items on the instrument did not correlate well to the total score. Field (1989) found 11 of the 58 items on the SDLRS instrument did not significantly correlate to the total score. Field (1989, 1990) found in a subsequent study that 12 of the 58 items did not correlate. Brockett (1985) also found 12 of the 58 items on the SDLRS instrument did not correlate with the total score. Field (1989) makes the additional observation: "...because a value of coefficient alpha above .80 suggests a good degree of homogeneity, this finding [.89] indicates that the SDLRS measures a fairly homogeneous construct" (p. 138).

This observation led Field (1989) to conclude a single construct, identified as love and enthusiasm for learning, was representative of the SDLRS. West and Bentley (1990) concluded that six of the eight factors were more accurate as predictors. After noting the problems with item total score correlations identified by Brockett (1985), Field (1989, 1990) and Leeb (1988), Morris (1997) concludes:

The findings of Brockett, Field, and Leeb may challenge the usability of the instrument based on its diminished reliability and validity. The SDLRS, however may be reliable and valid when its use is restricted to the population in which it was developed (p. 198).

Following his study Morris (1997) concluded: "...the SDLRS is an appropriate instrument for measuring readiness in highly educated adults" (p. 205).

Numerous studies have found a strong correlation between educational levels and SDLRS scores. (Alspach, 1991; Brockett, (1983,1985); Cunningham, 1988; Curry, 1983; Freed, 1997; Fullerton, 1998; Gardner, 1989; George, 1995; Guglielmino & Guglielmino, 1988; Hassan, 1981; Lacey, 1988; Leeb, 1988, Long, 1986; Long & Agyekum, 1983; McCarten, 1999; Morris, 1997; Mourad & Torrence, 1979). The large number of studies provides strong evidence that SDLRS scores are seen to increase with higher educational levels of subjects. The SDLRS has not conclusively demonstrated to be a valid instrument when used within the setting of a population consisting of relatively low education levels where the objective is to assess tendencies towards SDL in the specific domain of work related learning.

The Oddi Continuing Learning Inventory (OCLI) was developed as a doctoral project with the objectives of describing the theoretical foundations for the personality characteristics of self-directed learners, development of an instrument to identify self-directed learners, and to validate the instrument. The instrument is designed to predict self-directed learning behavior through assessing learner characteristics (Oddi, 1984). Oddi (1984) hypothesized the essential personality characteristics of self-directed learners to be six elements, grouped into three dimensions. The first dimension was termed Proactive Drive versus Reactive Drive (PD/RD) and dealt with the ability of the learner to initiate and sustain learning activities without external reinforcement. The second dimension was termed Cognitive Openness versus Defensiveness (CO/D) and was concerned with the individual's openness to change. The third dimension, termed Commitment to Learning versus Apathy or Aversion to Learning, identified the learner's tendencies towards seeing the learning process as enjoyment or as an undesirable event.

Self-directed learners were hypothesized to have proactive drive, cognitive openness, and a commitment to learning (Oddi, 1984).

The instrument developed through this process consists of 24 items with a seven point Lickert scaled response value. The initial internal validity study showed coefficient alpha of .87. Oddi conducted a factor analysis of the 271 responses in her study identified three factors different from the original three domains obtained in her literature review, which compiled personality characteristics of the self-directed learner. These three factors were labeled learning drive / ability to learn independently or with the involvement of others, ability to be self-regulating, and avidity for reading.

The validation study for the OCLI was conducted on undergraduate and graduate college students, which was seen to limit the generalizability of the instrument by Merriam and Caffarella (1991). A subsequent study was conducted by Harvey, Rothman, & Frecker (2006) to assess the generalizability of Oddi's factor structure. This study confirmed the secondary derived three factor model was superior to the original three domains, but also developed a four factor model with an improved fit (Harvey, Rothman, & Frecker, 2006). The four factors in this newly developed model include learning with others, learner motivation / self-efficacy / autonomy, ability to be self-regulating, and reading avidity.

Theoretical Construct for Instrument Development

The purpose of this study was to develop a theoretical basis for a multidimensional model of self-directed learning within the domain of employment related learning and to create and validate an instrument for assessing self-directedness in these domains. This effort does not attempt to explain every aspect of self-directed

learning in all situations, nor is it proposed that any such task is achievable with a single instrument or theoretical construct.

Recent thought on the study of self-directed learning has shifted towards recognition of a broader theoretical basis to explain SDL through the contribution of multiple factors and the proposal of several multidimensional models for this purpose (Harvey, Rothman, & Frecker, 2006). Long (2000) proposed: "...self-direction in learning is a consequence of a complex interaction of personal variables and circumstances..." p. 14 Boekarts (1999) has proposed a three-tier model of self-directed learning, which consists of:

1. Learning or processing styles
2. Students' ability to plan, conduct, monitor, evaluate and correct their own learning
3. Motivation and commitment to self-directed learning

Pintrich (1999) proposes another multidimensional model with factors identified as:

1. Cognitive learning strategies
2. Self-regulating strategies
3. The identification and management of learning resources
4. Motivational beliefs, such as self-efficacy, task-value beliefs, and goal orientations

The multidimensional approach used for development of this instrument focused on four factors, which are proposed to be essential in the initiation and sustaining of self-directed learning of work related skills and knowledge. These four factors are:

1. Motivation
2. Self-regulation

3. Cognitive elements
4. Social / environmental

It has been proposed that there has been a large emphasis on the self-management and control aspects of self-directed learning and insufficient attention given to cognitive processes and motivation (Garrison, 1997). The attention which has been given to motivation in much research related to self-directed learning has largely emphasized intrinsic motivation, to the neglect of extrinsic factors. In a study involving individuals in a career development setting Bare (1983) concluded extrinsic factors, such as the potential for promotion and wage increases, were more dominant than intrinsic factors. It is theorized that within the domain of employment related learning, extrinsic factors may play a greater role in the development of motivation than intrinsic factors, or at least a greater role than much of the research during the last 25 years has considered. Intrinsic motivation may play a greater role in the broader spectrum of SDL involving other domains than employment related knowledge, especially if the individual's greatest interest is outside of work. Instrument items related to motivation developed as part of this study, will be structured from the perspectives of both intrinsic and extrinsic motivation.

Self-Regulation has also been identified as an important factor to consider in self-directed learning by Long (1990, 1991). Definitions and discussion of aspects of self-regulated learning in the literature cumulatively describe a broad spectrum of self-control issues. It is proposed that self-regulation of self-directed learning within the domain of work related learning requires the recognition of the learning task as beneficial and the

individual's perception that they have the ability to succeed at the specific learning task. As confidence in abilities and self-concept grows, the individual will be more likely to engage in self-regulation and self-directed learning (McCombs, 2001). The mechanics of self-regulation are concerned with the individual's ability to self-control their actions towards the task of self-learning, self-monitor their actions, and self-evaluate their progress. The items developed to assess self-regulation will concentrate on these aspects of individuals from the psychological perspective.

Cognitive strategies and metacognitive processes have been identified as essential elements of self-directed learning (Long, 1998a; McInerney, 2005). An individual's ability to manage and be successful in self-directed learning endeavors is seen as profoundly influenced by their abilities to develop or adopt cognitive strategies for facilitating the learning process.

Social and environmental factors influence many elements of SDL, including the previously mentioned domains of motivation, self-regulation, and social cognition, as described earlier in this chapter. Within the domain of work related learning those factors may at times become more narrowly described in terms of psychological needs for improving the individual's situation within that environment. Granted, there would certainly be situations where the need to improve work related skills and knowledge reflect personal autonomy rather than the desire for rewards. Both perspectives should be considered when the focus of research is employment.

Candy (1991) notes that since a learner's autonomy and interests are likely to vary from one situation to another, it should not be expected that the individual will exhibit the same level of self-directed learning behavior in every instance and situation. Tendencies

to be self-directed with learning in formal educational environments may not necessarily mean there is a similar amount of self-direction in learning within the domain of work related skills and knowledge. Employment is often a situation of convenience, availability, and transitory positions, rather than an optimal matching of personal interests and talents. Pressures from the social environment may become the dominate factors in goal setting and the development of extrinsic motivation to sustain efforts. The drive to succeed and to be seen as successful can be powerful elements of employment related learning. Items chosen for this study will examine will attempt to be inclusive of a broad spectrum of social and environmental factors influencing SDL.

Summary

The study of self-directed learning has progressed since the early work of Knowles and Tough to comprise a rich diversity of research (Confessore & Long, 1993). Much of the literature during the last 30 years regarding the use of instruments to examine self-directed learning has been narrowly focused within the field of formal education settings, with an emphasis in use of the SDLRS. Some work has been conducted within the domain of employment related self-directed learning, but has not expanded to include learning outside of formally structured curriculums.

An emerging consensus of opinion is suggesting a change of direction toward a multifaceted concept of self-directed learning from the psychological perspective. The focus of this research is to develop and validate an instrument to assess individual traits and behaviors, which can be used to evaluate an individual's tendencies toward success in initiating and completing self-directed learning within the domain of employment related knowledge and skills.

CHAPTER III

METHODS

The purpose of this research was to build on the work of Long, Guglielmino, and others (Caffarella & Caffarella, 1986; Conti, 1979; Knowles, 1975; Oddi, 1984; Pilling, 1991) in the field of self directed learning by creating and validating an instrument to assess individual traits and behaviors, which are used to scale an individual's tendencies towards success in initiating and completing self-directed learning activities within the domain of work related knowledge and skills. A multidimensional model is proposed to explain the major contributing factors for self-directing learning behavior within this domain. Factors identified in this model as contributing to self-direction in learning include psychological elements, such as motivation, self-regulation, cognition/cognitive strategies, and social/environmental elements. Items for the instrument were developed to assess each of these factors based on the review of literature and various statistical methods described later in this chapter.

Research Questions

It is proposed that self-direction in learning, particularly in the domain of work related learning, is comprised of four major factors – motivation, self-regulation, cognitive factors, and social/environmental. The instrument developed in this study is designed to provide a measure of these four factors as a means of evaluating individual's

tendencies towards self-directed learning in the workplace setting. In addition, the following research questions were developed to facilitate the purpose of this study:

1. Does the level of education achieved affect hourly employee's motivation to learn job related information?
2. Does the level of education achieved affect hourly employee's perception of their ability to learn?
3. Does the level of education achieved affect hourly employee's perception of their social and environmental factors associated with self-directed learning?
4. Does employment classification affect the perception of one's motivation to learn?
5. Does employment classification affect the perception of one's cognitive elements?
6. Does employment classification affect the perception of one's social environment?

Studies using other instruments for assessing readiness for self-directed learning, such as the SDLRS developed by Guglielmino have noted a strong correlation between the amount of education the individual has achieved to their scores on the instrument (Guglielmino, 1989). Generally, the more education a person has, the higher their scores are likely to be on the SDLRS. This instrument is not focused specifically on formal education as an object of self-directed learning, but rather on learning related to employment. The successful completion of formal educational coursework and materials can be seen as a functionally different endeavor than simply advancing to the next skill level in a work related task, when an individual has already mastered all of the

prerequisite skills and knowledge. It is hypothesized that the background educational levels of employee's will not show a positive correlation, with higher educational levels of participants yielding higher scores on the instrument.

It is hypothesized that a correlation will exist between both age and years of experience to the scores on the instrument. With both age and experience the individual is likely to have successfully completed more self-directed learning activities related to work tasks and will have developed skills and confidence, which leave them better prepared to successfully manage similar self-directed learning endeavors.

Confirmation Panel

A panel of experts was formed from faculty members at Auburn University within the field of adult education and individuals from private industry involved in human resource development. The purpose of this panel was to aid in evaluating the instrument and for strengthening validity prior to field testing. The members of this panel from industry in human resource development were recruited because of their extensive first hand experience with both evaluating and educating personal in workforce education.

Validity

This study will attempt to validate the use of this instrument for assessing an individual's readiness for self-directed learning in workplace settings. "Validity refers to the utility of the inferences made from a measure's scores" (Aginis, Henle & Ostroff, 2001, p. 37). Criterion validity was examined using the Q-sort technique to establish the items developed for this instrument fit the four major factors identified in the model. Construct validity was examined using confirmatory factor analysis to determine how

well the hypothesized theoretical structure fits the empirical data (Meyers, Gamst, & Guarino, 2006).

Development of the Instrument

The instrument was developed to assess readiness for participation in self-directed learning in a workplace setting. The following sequence of actions outlines the process of developing the instrument into the format used in this study.

1. Researcher. The questions, which make up the instrument, were developed by the researcher to represent the four major factors identified as contributing to self-directed learning within the workplace setting in the model. The subject population consists of employees from a divergent educational background, ranging from those with less than a high school diploma to those having graduate level degrees. The items on the instrument were scaled by reading level to be understood by all subjects in the study.
2. Q- Sort Validation. The Confirmation Panel conducted a Q-sort analysis of the instrument items to the four major factors identified in the model.
3. Field Test. A field test of the instrument was conducted at a southeastern industrial manufacturing facility. Information obtained in this field test was used to evaluate and correct the instrument for clarity and construct before distributing the survey to the larger plant population.

Q-Sort

The Q-Sort evaluation consisted of briefly defining the four major factors and recording this information on four individual cards. The items of the instrument were individually recorded onto slips of paper. Each of the members of the confirmation panel

were given a set of the cards and instrument items and asked to match the items to one of the four factors. Results of the sorting conducted by each of the panel members was analyzed to determine accuracy and corrections to the wording of items subsequently changed to improve accuracy in subsequent Q-sort exercises.

During the initial Q-sort evaluation it was determined that two of the four major factors exhibited considerable overlap. These two factors were self-regulation and motivation. Attempts at rewriting the instrument items in these two domains for increased clarity did not eliminate the overlap. Review of the literature for these two factors also indicated a large amount of overlap. Motivation is identified by many of the authors as a major factor in self regulation. It was determined that the factors, self-regulation and motivation, should be merged into one groups, with the overlapping survey items consolidated. Subsequent Q-sorts guided the consolidation of the original ten items in these two groups into five items on the survey. The process of Q-sort was repeated until an accuracy of 96% was observed on the results of all panel members.

Field Testing

Field testing of the instrument was conducted at a satellite branch of a southeastern industrial manufacturing facility. This population is smaller than the main facility and is representative of the larger sample population. Observations and inferences made during the field test are applicable to the larger population of the manufacturing operation.

Subjects were recruited on a voluntary basis with an explanation of the project provided by the researcher in small group meetings throughout the facility. One hundred and four surveys were distributed, with a total of 30 completed responses. A

confirmatory factor analysis was performed on the limited initial data. Results of the initial statistical analysis indicated one of the five items in the self-regulation and motivation domain did not fit with the other four items. When this item was removed from the analysis, all three factor groups showed validity with a coefficient alpha at or above a level of .50. The self-regulation factor was at .50, the cognitive factor was at .80, and the social/environmental factor was at .79. The survey was modified to remove the one aberrant item in the self-regulation/motivation factor group. The final format of the survey included four items representing the domain of motivation/self-regulation, five items for cognition and cognitive strategies, and five items representing social/environmental elements. The resultant fourteen items are listed below.

Motivation/Self-regulation

1. I enjoy learning something related to my work.
2. I can put off doing something I want to do to study work related information.
3. I am ready to participate in training that helps me advance into a better and higher paying job.
4. I can manage my own efforts to learn outside of a classroom.

Cognition/Cognitive strategies

5. It is usually easy for me to learn something new.
6. I am good at finding helpful resources, such as books or people who can help me learn.
7. I can evaluate my progress towards learning new skills as I go along.
8. I am good at developing strategies for learning new materials or skills.
9. I can change the way I study if what I am doing is not working.

Social/Environmental Elements

10. I have personal time available that I can set aside for learning.
11. I feel encouraged by friends, family, or the people I work with to spend time learning something new.
12. There is somewhere I can go, which is a good place to study.
13. My workplace is free from distractions that interfere with learning new job skills.
14. I am not too tired after work to spend time learning something new.

Population Sampling

The larger population sampling was conducted using the revised survey in a similar manner as the field test. The researcher provided an explanation of the purpose of the study, as well as instructions for completing and returning the survey instrument. Participants were recruited on a voluntary basis. Six hundred and fourteen surveys were distributed in small group meetings to a mixture of hourly, salary and management personnel at the main manufacturing facility. Two hundred and five completed surveys were returned, which consisted of 123 (60%) female employees and 82 (40%) male employees. The employment classification of the group was 9 (4.4%) management, 41 (20%) salary, and 155 (75%) hourly employees. The age of participants ranged from 19 to 69 years, with an average experience of 7.61 years, with a standard deviation of 7.22 years. The number of years of experience ranged from 1 to 23 years. The highest level of education reported by the participants was 5 (2.4%) with some high school, 97 (47.3%) with a high school diploma, 26 (12.7%) with vocational certification, 54 (26.3%)

having 2 years of college, 18 (8.8%) with a bachelor's degree, and 5 (2.4%) with a graduate degree.

Analysis of Data

Confirmatory factor analysis was performed using AMOS version 16. Secondary analysis of the research questions was conducted using SPSS, version 16. Results from the study are provided in Chapter 4.

Summary

The instrument structure and organization was developed through an extensive review of the literature and the development of a theoretical construct to explain self-directedness in learning skills and knowledge related to work place settings. It was established that this domain of self-directed learning was influenced by four main factors – Motivation, self-regulation, cognitive factors, and the influence of social and environmental factors.\

The creation of the instrument items involved repeated exercises in composition and analysis through the Q-sort process. Ultimately, this process identified the need to consolidate two highly related factors, motivation and self-regulation into one composite factor. The initial instrument was composed of fifteen initial items, representing the factors – motivation/self-regulation, cognitive factors, and social/environmental. One item was removed after an analysis of field test data indicated its unsuitability for inclusion in the final instrument.

The instruments were distributed at a large southeastern industrial manufacturing facility in small group meetings to a diverse population consisting of both hourly and

salaried individuals, with a wide range of educational backgrounds. The research questions were developed to examine and contrast responses based on job classifications and educational backgrounds.

CHAPTER IV

RESULTS

The purpose of this research was to build on the work of Long, Guglielmino, and others (Caffarella & Caffarella, 1986; Conti, 1979; Knowles, 1975; Oddi, 1984; Caffarella Pilling, 1991) in the field of self-directed learning by creating and validating an instrument to assess individual traits and behaviors which influence self-directed learning within work environments. This chapter describes the analysis of the survey results to determine how well the instrument fits the theoretical model, as well as assessing aspects of validity and reliability.

The following research questions were addressed as part of this research:

1. Does the highest level of education attained affect hourly employees' motivation to learn job related information?
2. Does the highest level of education attained affect hourly employees' perception of their ability to learn?
3. Does the highest level of education attained affect hourly employees; perception of their social and environmental factors associated with self-directed learning?
4. Does employment classification affect the perception of one's motivation to learn?

5. Does employment classification affect the perception of one's cognitive elements?
6. Does employment classification affect the perception of one's social/environment?

Participants

The Survey of Adult Learning Traits was administered to a sample of 205 employees at a south eastern industrial manufacturing facility. Of these participants, 82 (40%) were male, and 123 (60%) were female. The employment classification of the group was 9 (4.4%) management, 41 (20.0%) salaried, and 155 (75.6%) hourly. The participants' age ranged from 18 to 69 years with a mean of 41.21 and a standard deviation of 11.59. The average employment experience with the company was 7.61 years with a standard deviation of 7.22. Level of experience ranged from 1 to 23 years. The highest level of education reported by the participants classification was 5 (2.4%) some high school, 97 (47.3%) high school diploma, 26 (12.7%) vocational certification, 54 (26.3%) 2 years of college, 18 (8.8%) bachelor's degree, and 5 (2.4%) graduate degree.

Measures

The Survey of Adult Learning Traits, which consisted of 14 items, was developed to measure the impact of a person's ability to be self-directed toward learning new skills, gaining knowledge, and developing an understanding and application of the gained knowledge. The 15 items were divided into three domain scales. The response scale

progressed from a rating of 1, which represented *Strongly Disagree*, to a rating of 5, which represented *Strongly Agree*. The three domain scales are defined as follows:

1. *Motivation and Self-Regulation* consists of four items assessing one's motivation for learning new skills and expanding their knowledge about their job assignments and assessing one's ability to organize and manage the process of learning new information.
2. *Cognitive Elements* consists of five items assessing one's ability to learn, use cognitive strategies, and evaluate their learning process.
3. *Social/Environmental* consists of five items assessing one's social, work, and physical environment that has an impact on one's efforts to learn new information.

Reliability

Reliability analyses were conducted to test that the scales provided accurate measurements. A Cronbach's alpha of .60 or greater was established as the criterion for reliability according to Hair, Black, Babin, Anderson, and Tatham (2006). The reliability coefficients for the three scales were good (ranging from .60 to .81) (Table 5). The results suggest that the scales within the survey are internally consistent measures.

Table 5

Alpha Reliability Coefficients for Survey of Adult Learning Traits Scales

Scale	Coefficient Alpha
Motivation & Self-Regulation	.60
Cognitive Elements	.81
Social/Environmental	.77

To determine the internal consistency by demographic group for the examination of the research questions, reliability analyses were conducted by employment classification and by highest level of education. Participants who reported their employment classification as management and those participants who reported their highest level of education as either some high school or graduate degrees were not used in the subsequent analyses because the group size was less than 10 participants.

Motivation and Self-Regulation

The reliability coefficients for the motivation and self-regulation scale by employment classification were good (ranging from .60 to .67). The results suggest that the scales within the survey are internally consistent measures when examined by employment classification (see Table 6).

Table 6

Alpha Reliability Coefficients for Motivation and Self-Regulation Scale by Employment Classification

Category	Coefficient Alpha
Salaried	.67
Hourly	.60

When examined by highest level of education, the reliabilities for the motivation and self-regulation scale were generally good and ranged from .44 to .68 with two groups, with the groups of 2 years of college and bachelor's degree, falling below the .60 criterion level (see Table 7). The alpha coefficients had a negative relationship with the highest level of education. As the level of education increased, the reliabilities tended to decrease. Generally, when the participants have more education, the reliability coefficients tend to indicate more internal consistency among the participants. One possible explanation for this relationship is the effect of education on one's self-perception of the motivation construct.

Table 7

Alpha Reliability Coefficients for Motivation and Self-Regulation Scale by Highest Level of Education

Highest Level of Education	Coefficient Alpha
High School Diploma	.65
Vocational Certification	.68
2 Years of College	.49
Bachelor's Degree	.44

Cognitive Elements

The reliability coefficients for the cognitive elements scale by employment classification were excellent at .80 for salaried employees and .80 as well for hourly employees by employment classification. The results suggest that the cognitive scales within the survey are internally consistent measures when examined by employment classification (see Table 8). The coefficients were relatively constant across all groups.

Table 8

Alpha Reliability Coefficients for Cognitive Elements Scale by Employment Classification

Category	Coefficient Alpha
Salaried	.80
Hourly	.80

The reliability coefficients for the cognitive elements scale by highest level of education ranged from .74 to .89 (see Table 9). The reliability coefficients suggest that the cognitive elements scales within the survey are internally consistent measures when examined by highest level of education (see Table 9). The coefficients were relatively constant across all groups.

Table 9

Alpha Reliability Coefficients for Cognitive Elements Scale by Highest Level of Education

Highest Level of Education	Coefficient Alpha
High School Diploma	.79
Vocational Certification	.74
2 Years of College	.82
Bachelor's Degree	.89

Social/Environmental

The reliability coefficients for the social and environmental scale by employment classification ranged from .72 to .82 (see Table 10). The coefficients suggest that the scales within the survey are internally consistent measures when examined by employment classification. The coefficients were relatively constant across all groups.

Table 10

Alpha Reliability Coefficients for Cognitive Elements Scale by Employment Classification

Category	Coefficient Alpha
Salaried	.82
Hourly	.72

The reliability coefficients for the social and environmental scale by highest level of education ranged from .68 to .82 (see Table 11). The coefficients suggest that the scales within the survey are internally consistent measures when examined by highest level of education. The coefficients were relatively constant across all groups.

Table 11

Alpha Reliability Coefficients for Cognitive Elements Scale by Highest Level of Education

Highest Level of Education	Coefficient Alpha
High School Diploma	.74
Vocational Certification	.68
2 Years of College	.79
Bachelor's Degree	.69

Validity

A confirmatory factor analysis was conducted using AMOS 7.0 to determine how the theoretical structure fits with the data and to determine construct validity. According to Hair et al. (2006), acceptable model fit indexes include the Goodness of Fit Index (GFI), Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). A value of .95 or greater for the GFI and CFI is deemed as an acceptable fit. For the RMSEA, a value of .08 or less indicates good fit. The initial model, which is presented in Figure 5, had a significant Chi-square ($\chi^2 = 96.89$; $p = .04$), low GFI (.724), low CFI (.809), and high RMSEA (.105).

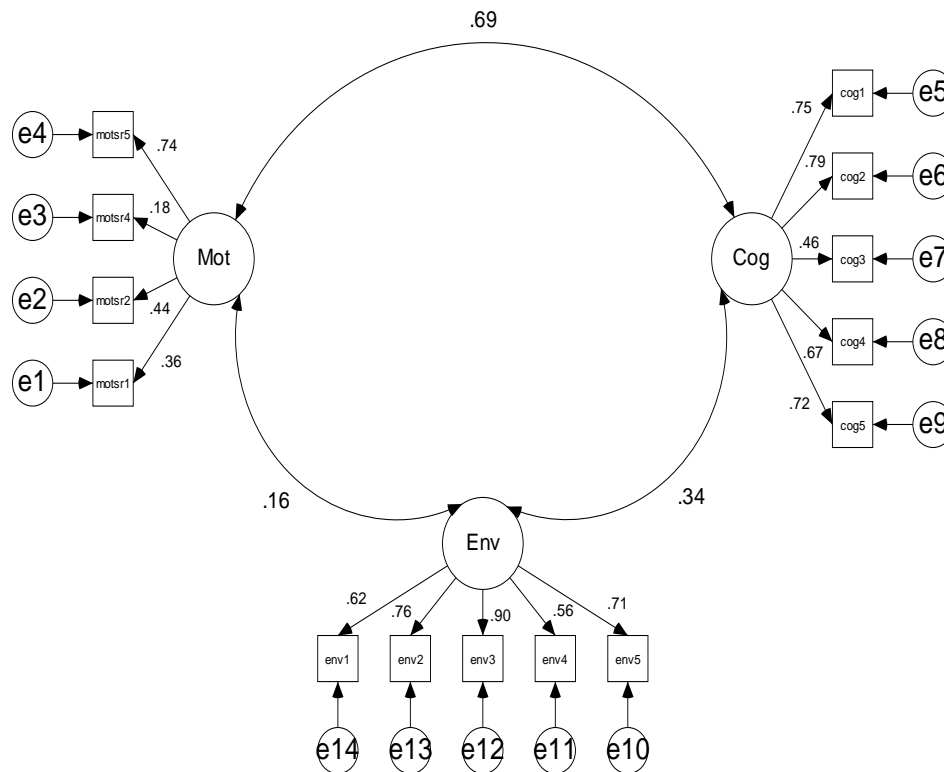


Figure 5. Initial confirmatory factor analysis model for the Survey of Adult Learning Traits

Using the modification indices in the initial model, a more restrictive model was created. While the Chi-square for the restrictive model was significant ($\chi^2 = 84.57$; $p = .13$), the GFI and CFI increased (.732 and .887, respectively), and the RMSEA decreased to .083, which was a difference of .02. Figure 6 displays the restricted model with standardized model estimates.

In the restricted model, the standardized beta weights for the Motivation and Self-Regulation Scale ranged from .34 to .84 and were statistically significant at or below the .05 level. For the Cognitive Elements Scale, the standardized beta weights ranged from .60 to .81, and, for the Social/Environmental Scale, the standardized beta weights ranged from .57 to .88. A criterion of .40 or higher was established for the standardized beta weights as a measure of association (Meyers et al., 2006). These results suggest the questions are statistically significant measures of the respective scales, and these beta weights indicated the model has construct validity.

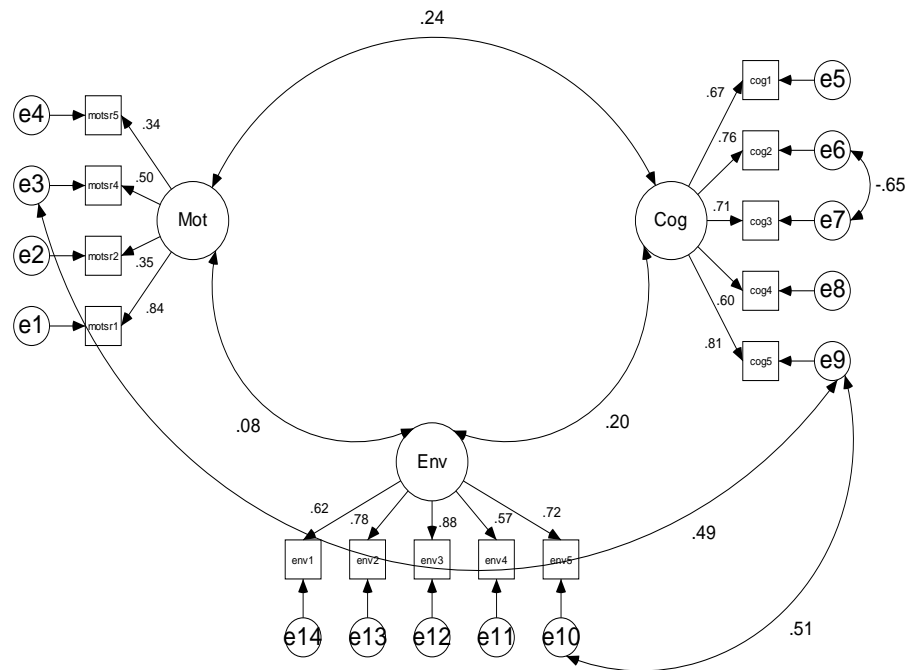


Figure 6. Restricted confirmatory factor analysis model for the Survey of Adult Learning Traits

To measure discriminate validity, a bivariate correlation was conducted using three scales: Motivation and Self-Regulation (Mot), Cognitive Elements (Cog), and Social/Environmental (Env). The correlation coefficients ranged from .08 to .24. With a Pearson correlation coefficient less than or equal to .80 as a criterion (Meyers, Gamst, & Guarino, 2006), these results suggest that the factors have discriminate validity and are not measuring the same concept.

Analysis of Research Questions 1, 2, and 3

1. Does the highest level of education attained affect hourly employees' motivation to learn job related information?

2. Does the highest level of education attained affect hourly employees' perception of their ability to learn?
3. Does the highest level of education attained affect hourly employees' perception of their social and environmental factors associated with self-directed learning?

Reliability analyses were conducted to test that the scales provided accurate measurements. A Cronbach's alpha of .60 or greater was established as the criterion for reliability according to Hair, Black, Babin, Anderson, and Tatham (2006). The results suggest that the scales within the survey are internally consistent measures. The reliability coefficients for the three scales were generally good with one scale, Motivation and Self-Regulation for the College/Vocational group, falling below the .60 criterion level. The coefficients ranged from .52 to .79 (Table 12).

Table 12

Alpha Reliability Coefficients for Survey of Adult Learning Traits Scales

Scale	High School	College/Vocational
Motivation & Self-Regulation	.64	.52
Cognitive Elements	.79	.79
Social/Environmental	.74	.70

To measure discriminate validity, a bivariate correlation was conducted using the Motivation and Self-Regulation items (Table 13), Cognitive Elements items (Table 14), and the Social/Environmental items (Table 15). With a Pearson correlation coefficient

less than or equal to .80 as a criterion, these results suggest that the scales within the survey have discriminate validity and are not measuring the same concept. Tables 13, 14, and 15 display the intercorrelation matrixes for the Motivation and Self-Regulation items, Cognitive Elements items, and the Social/Environmental items. Given these analyses indicating that the measure is reliable and valid, meaningful subsequent analyses were justified.

Table 13

Intercorrelations for the Motivation and Self-Regulation Items

Scale	1	2	3	4
1. I enjoy learning something related to my work.	--	.25**	.47**	.31**
2. I can put off doing something I want to do to study work related information.		--	.24**	.14
3. I am ready to participate in training that helps me advance into a better and higher paying job.			--	.33**
4. I can manage my own efforts to learn outside of a classroom.				--

Note: ** $p < .01$.

Table 14

Intercorrelations for the Cognitive Elements Items

Scale	1	2	3	4	5
1. It is usually easy for me to learning something new.	--	.48**	.32**	.49**	.39**
2. I am good at finding helpful resources, such as books or people who can help me learn.		--	.45**	.53**	.47**
3. I can evaluate my progress towards learning new skills as I go along.			--	.46**	.38**
4. I am good at developing strategies for learning new material or skills.				--	.49**
5. I can change the way I study if what I am doing is not working.					--

Note: ** $p < .01$.

Table 15

Intercorrelations for the Social/Environmental Items

Scale	1	2	3	4	5
1. I have personal time available that I can set aside for learning.	--	.35**	.61**	.25**	.42**
2. I feel encouraged by friends, family, or the people I work with to spend time learning something new.		--	.37**	.24**	.25**
3. There is somewhere I can go, which is a good place to study.			--	.32**	.32**
4. My workplace is free from distractions that interfere with learning new job skills.				--	.31**
5. I am not too tired after work to spend time learning something new.					--

Note: ** $p < .01$.

Data Analysis

A multivariate analysis of variance with follow-up univariate analyses was conducted to determine if highest level of education affected hourly employees' perception of motivation, cognitive elements, and environmental factors using the latent variable of self-directed learning as operationalized by the Survey of Adult Learning Traits.

Results

Motivation and Self-Regulation

The results indicated that the means of the optimally weighted combination of scores for the four Motivation and Self-Regulation items, Wilks' $\lambda = .94$; $F(4, 144) = 3.06$; $p = .02$; $\eta^2 = .08$ differed significantly by level of education. The follow-up univariates, presented in Table 15, revealed a statistically significant difference by group for readiness to participate in training. Participants with some college education or vocational certification tended to be willing to participate in training in order to obtain higher paying jobs.

Table 16

Means, Standard Deviations, and Univariates for the Motivation and Self-Regulation Items by Highest Level of Education

Item	<u>High School</u>		<u>College/Vocational</u>		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1. I enjoy learning something related to my work.	4.24	0.69	4.46	0.77	3.08	.08	.02
2. I can put off doing something I want to do to study work related information.	3.49	0.84	3.39	0.97	0.44	.51	.00
3. I am ready to participate in training that helps me advance into a better and higher paying job.	3.87	0.88	4.27	0.61	9.52	.00	.06
4. I can manage my own efforts to learn outside of a classroom.	4.56	0.78	4.66	0.51	0.84	.36	.01

Cognitive Elements

The results indicated that the means of the optimally weighted combination of scores for the five Cognitive Elements items, Wilks' $\lambda = .92$; $F(5, 143) = 2.67$; $p = .02$; $\eta^2 = .09$, differed significantly by level of education. The follow-up univariates, presented in Table 17, revealed a statistically significant difference by group for ease of learning new information and ability to develop learning strategies. Participants with some college education or vocational certification felt that it was easy for them to learn new

information and that they had the ability to develop strategies for learning new information.

Table 17

Means, Standard Deviations, and Univariates for the Cognitive Elements Items by Highest Level of Education

Item	<u>High School</u>		<u>College/Vocational</u>		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1. It is usually easy for me to learning something new.	4.22	0.68	4.54	0.63	8.36	.00	.05
2. I am good at finding helpful resources, such as books or people who can help me learn.	4.17	0.74	4.39	0.64	3.60	.06	.02
3. I can evaluate my progress towards learning new skills as I go along.	4.11	0.68	4.19	0.66	0.45	.50	.00
4. I am good at developing strategies for learning new material or skills.	4.04	0.73	4.37	0.55	8.61	.00	.06
5. I can change the way I study if what I am doing is not working.	4.09	0.83	4.20	0.94	0.61	.44	.00

Social/Environmental

The results indicated that the means of the optimally weighted combination of scores for the five Social/Environmental items, Wilks' $\lambda = .96$; $F(5, 143) = 1.09$; $p = .37$;

$\eta^2 = .04$, did not differ significantly by level of education. Table 18 displays the means, standard deviation, and univariate analyses results.

Table 18

Means, Standard Deviations, and Univariates for the Social/Environmental Items by Highest Level of Education

Item	<u>High School</u>		<u>College/Vocational</u>		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1. I have personal time available that I can set aside for learning.	3.51	1.01	3.49	1.09	0.01	.91	.00
2. I feel encouraged by friends, family, or the people I work with to spend time learning something new.	3.72	0.84	3.56	1.04	1.12	.29	.01
3. There is somewhere I can go, which is a good place to study.	3.62	0.92	3.71	1.05	0.30	.58	.00
4. My workplace is free from distractions that interfere with learning new job skills.	2.98	1.09	2.86	1.09	0.39	.54	.00
5. I am not too tired after work to spend time learning something new.	3.13	0.99	2.85	1.03	2.89	.09	.02

Analysis of Research Questions 4, 5, and 6

4. Does employment classification affect the perception of one' motivation to learn?
5. Does employment classification affect the perception of one' cognitive elements?
6. Does employment classification affect the perception of one' social/environment?

Measures

Reliability analyses were conducted to test that the scales provided accurate measurements. A Cronbach's alpha of .60 or greater was established as the criterion for reliability according to Hair, Black, Babin, Anderson, and Tatham (2006). The results suggest that the scales within the survey are internally consistent measures. The reliability coefficients for the three scales by employment classification were good (ranging from .60 to .82) (See Table 19).

Table 19

Alpha Reliability Coefficients for Survey of Adult Learning Traits Scales by Employment Classification

Scale	Salaried	Hourly
Motivation & Self-Regulation	.67	.60
Cognitive Elements	.80	.81
Social/Environmental	.82	.72

To measure discriminate validity, a bivariate correlation was conducted using the three scales. With a Pearson correlation coefficient less than or equal to .80 as a criterion,

these results suggest that the scales within the survey have discriminate validity and are not measuring the same concept. Table 20 displays the intercorrelation matrix for Survey of Adult Learning Traits Scales. Given these analyses indicating that the measure is reliable and valid, meaningful subsequent analyses were justified.

Table 20

Intercorrelations for the Survey of Adult Learning Traits Scales

Scale	1	2	3
1. Motivation and Self-Regulation	--	.31*	.37*
2. Cognitive Elements		--	.53*
3. Social/Environmental			--

Note: * $p < .05$.

Data Analysis

A multivariate analysis of variance with follow-up univariate analyses was conducted to determine if employment classification affected the employees' perception of motivation, cognitive elements, and social/environmental factors using the latent variable of self-regulated learning as operationalized by the Survey of Adult Learning Traits.

Results

The results indicated that the means of the optimally weighted combination of scores for the three scales, Wilks' $\lambda = .95$; $F(3, 192) = 3.35$; $p = .02$; $\eta^2 = .05$ differed significantly by employment classification. The follow-up univariates, presented in Table 21, revealed a statistically significant difference by group for two scales: Cognitive Elements and Social/Environmental. Participants who were hourly employees tended to perceive themselves as able to learn, use cognitive strategies, and evaluate their learning efforts. Likewise, this group tended to report they had social and work environments that supported their learning efforts. Motivation to learn and regulate learning efforts was similar for both groups.

Table 21

Means, Standard Deviations, and Univariates for the Survey of Adult Learning Traits by Employment Classification

Item	<u>Salaried</u>		<u>Hourly</u>		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Motivation and Self-Regulation	4.12	0.44	4.10	0.53	0.05	.82	.00
Cognitive Elements	4.03	0.54	4.22	0.54	4.09	.05	.02
Social/Environmental	3.09	0.73	3.37	0.69	5.17	.02	.03

Summary

A confirmatory factor analysis was conducted to determine how the theoretical structure fits with the data in establishing the three major factors used to explain self-directedness in learning within a work place setting and to determine construct validity. These results suggest the questions are statistically significant measures of the respective scales, and these beta weights indicated the model has construct validity.

Reliability analyses were conducted to test that the scales provided accurate measurements. A Cronbach's alpha of .60 or greater was established as the criterion for reliability according to Hair, Black, Babin, Anderson, and Tatham (2006). The reliability coefficients for the three scales were good ranging from .60 to .81. (Table 5). The results suggest that the scales within the survey are internally consistent measures.

To measure discriminate validity, a bivariate correlation was conducted using three scales: Motivation and Self-Regulation (Mot), Cognitive Elements (Cog), and Social/Environmental (Env). The correlation coefficients ranged from .08 to .24. With a Pearson correlation coefficient less than or equal to .80 as a criterion (Meyers, Gamst, & Guarino, 2006), these results suggest that the factors have discriminate validity and are not measuring the same concept.

After establishing reliability and construct validity of the instrument the research questions were addressed through further statistical analysis. Several statistically significant findings were observed from analysis of the data. Participants with some college education or vocational certification tended to be willing to participate in training in order to obtain higher paying jobs. Participants with some college education or vocational certification felt that it was easy for them to learn new information and that

they had the ability to develop strategies for learning new information. Participants who were hourly employees tended to perceive themselves as able to learn, use cognitive strategies, and evaluate their learning efforts. Likewise, this group tended to report they had social and work environments that supported their learning efforts. Motivation to learn and regulate learning efforts was similar for both groups.

CHAPTER V

IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to build on the work of Long, Guglielmino, and others (Caffarella & Caffarella, 1986; Conti, 1979; Knowles, 1975; Oddi, 1984; Pilling, 1991) in the field of self-directed learning by creating and validating an instrument to assess individual traits and behaviors, which are used to scale an individual's tendencies towards success in initiating and completing self-directed learning activities within the domains of work related skills and knowledge. This chapter presents a summary of this study, conclusions, a discussion of the findings, implications, and recommendations for further study.

In the course of this work the following research questions were addressed:

1. Does the highest level of education attained affect hourly employees' motivation to learn job related information?
2. Does the highest level of education attained affect hourly employees' perception of their ability to learn?
3. Does the highest level of education attained affect hourly employees' perception of their social and environmental factors associated with learning?

4. Does employment classification affect the perception of one's motivation to learn?
5. Does employment classification affect the perception of one's cognitive elements?
6. Does employment classification affect the perception of one's social and environmental situation associated with learning?

Introduction

The first objective in this study was to develop the instrument for assessing traits, perspectives, and environmental settings related to an individual's likelihood to engage in self-directed learning within a work environment. This was initiated through a review of literature and the establishment of a theoretical framework to explain self-directedness within work environments. The following three domains, within a psychological framework, were established to explain self-directedness in learning: motivation/self-regulation, cognitive elements, and social/environmental. Items for the instrument were developed to represent distinct elements of these three domains. The items for the survey were examined and analyzed through a series of card sorts to establish their fit within the theoretical framework. A follow-up analysis of the instrument items through the use of grade level review and an extensive card sort process led to final adjustments to the language and a sorting into the final format of the items into three domains.

The instrument was then field tested with a representative sampling of the total company population at a subsection of a southeastern industrial manufacturing facility. An analysis of data from the field test allowed for minor adjustment of the instrument

items before conducting the major sampling at the main section of this manufacturing company. The data obtained using the instrument was analyzed to determine reliability, validity and to assess the results in terms of the research questions.

Implications of the Study and Discussion

The confirmatory factor analysis yielded a measure of the validity and reliability of the instrument in assessing the three domains established in the theoretical construct, which describes self-directed learning within work environments in terms of motivation/self-regulation, cognitive factors, and social/environmental elements. The results of the survey and subsequent analysis suggests the instrument provides a means of assessing adult learner traits within these three domains and yields an indication of how prepared the individual is for self-directed learning of work related skills and knowledge.

Having established the instrument meets the intent of its design, the responses were analyzed from the perspective of the research questions to determine trends and insights. For the purpose of this analysis related to research questions 1, 2, and 3 the sample population was sorted into two groups: those with some high school or a high school diploma and those with some college or a vocational certification. The analysis of research questions 4, 5, and 6 contrasted the results sorted into the two groups of salaried hourly wage respondents.

A multivariate analysis of variance and a subsequent univariate analysis was conducted to determine if the employment classification of employees affected their perceptions in each of the three domains specified in research questions 1, 2, and 3. The univariate analysis revealed a statistically significant difference between the two groups of respondents within the areas of motivation and cognition. Those respondents having

some college or vocational certification were more likely to indicate they were willing to participate in training in order to obtain higher paying jobs. This same group was also more likely to indicate they felt it was easy for them to learn new information and confidence in their ability to develop strategies for learning new information.

One explanation for these results is that the group of respondents with no formal education past high school may have felt less comfortable attempting to engage in learning related to obtaining a promotion. The objective of moving into a higher position in the company may have been perceived as an unfamiliar and greater task than their previous sequential progression in learning new job tasks. The group which had been successful in college or vocational training would likely be more comfortable in repeating a learning task associated with progression into a higher salary classification, which would be seen as similar in scope to their previous educational experiences.

A multivariate analysis of variance and a subsequent univariate analysis was conducted to determine if the employment classification of employees affected their perceptions in each of the three domains specified in research questions 4, 5, and 6. As noted in the results chapter, there was a significant statistical difference by group for two of the three scales; Cognitive Elements and Social/Environmental. Hourly employees were more likely to indicate they felt confident in their abilities to learn, use cognitive strategies, and evaluate their learning. Likewise, this group was more likely to report positively about social and work environments which supported their efforts to learn. There was no significant difference between salaried and hourly employees when considering motivation and self-regulation.

Hourly workers may be focused on the continuation of a process they began and have had success in from their initial employment, when considering the act of learning for the next progression in work related skills or knowledge. The manufacturing facility, which was surveyed, was involved in the introduction of technology new to this geographical area. Hourly employees in this group had to learn a completely new technology, which was heavily dependant on self-directed efforts in learning. In contrast, a large portion of the salaried workers received much of their work related training through formal educational institutions, which generally have less emphasis on self-directed learning. This may account for some of the observed variation in this area.

Recommendations for Further Study

It would be useful to determine how applicable this instrument is for larger domains, such as other employment settings than the traditional manufacturing environment examined in this study. The need for individuals to learn new skills and knowledge related to work assignments is widespread throughout most employment situations. Service related industry, such as health care, formal education providers, and financial organizations would be interesting subjects of study using this instrument.

It would be helpful to examine other population groups, in locations other than the geographical area represented in this study, to determine whether similar findings can be expected. There are cultural trends and differences in various geographical areas of the country, as well as other regional environments subject to varying rates of changing technology.

This study was focused primarily on hourly employees with little or no formal education at the college level and primarily on employment related self-directed learning

efforts. It would be interesting to survey and evaluate a population in a work related category of higher educational backgrounds and professional careers.

A study examining gender differences in perceptions related to self-directedness in learning within work environments in a population of hourly employees would provide useful information. A larger sampling in this population than the present study would be needed.

Summary

A large portion of adult learning is focused on acquiring skills, experience, and understanding within the domains of knowledge related to employment and interests, which often lay outside the formal classroom. This is especially true for the fields of developing technology, where the textbook and curriculums have not been written yet. The rapid evolution of markets and technologies create obsolescence at an increasing rate and fuels the need for learning new skills and information. Universities, colleges, and companies continue to explore and examine how fostering self-directed learning efforts contributes to the education process. The current study provides additional insight into assessment of self-directed learning tendencies.

REFERENCES

- Ach, N. (1910). *Über den Willensakt und das Temperament*. [On the will and temperament]. Leipzig, Germany: Quelle & Meyer.
- Aginis, H., Henle, C. A., & Ostroff, C. (2001). Personal psychology. In N. Anderson, D. S. Ones, H.K. Sinangil, & C. Viswesvaran (Ed.s), *Handbook of industrial work and organizational psychology*. Vol. 1, Thousand Oaks, Sage Publishing.
- Alspach, J. G. (1991). The self-directed learning readiness of baccalaureate nursing students. (Doctoral dissertation, University of Maryland – College Park). *Dissertation Abstracts International*, 52, (06A).
- American Society for Training and Development, (2004). Survey Report. State of the Industry – 2004.
- Bandura, A. (1988). Self-regulation of motivation and action through goal systems. In V. Hamilton, H.G. Bower, & Freijda (Eds.), *Cognitive perspectives on emotion and motivation*. pp. 37-61. Dordrecht, The Netherlands: Kluwer Academic,
- Bare, J. K. (1983). The introductory psychology course in the eighties. *Teaching of Psychology*, 9, (1).
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.
- Boekarts, M. (1999). Do culturally-roted self-constructs affect students' conceptualizations of control over learning? *Educational Psychologist*, 33 (2/3). pp. 87-108.
- Bonham, L. A. (1989). Self-directed orientation toward learning: A learning style. In H. Long and Associates (Eds.), *Self-directed learning: Emerging theory and practice*. pp. 13-42. Norman, OK. University of Oklahoma, Oklahoma Research Center for continuing Professional and Higher Education,

- Bozhovich, L. I. (1988). English translation circa. 2004 M. E. Sharp, Inc., from the Russian text circa. 2001 "Moskovskii psikhologo-sotsial'nyi institut." "O kul' turno-istoricheskoi kontseptsii L.S. Vygotskogo i ee znachenii dlia sovremennykh issledovaniï psikhologii lichnosti," in *Problemy formirovaniia lichnosti: izbrannye psikhologicheskie trudy* (Moscow: Moskovskii psikhologo-sotsial'nyi institute, 2001). p. 288-301. (Originally published in *Voprosy Psikhologii*, 5.
- Brockett, R. G. (1982). Self-directed learning readiness and life satisfaction among older adults. (Doctoral dissertation, Syracuse University, 1982). *Dissertation Abstracts International*, 44,(01A).
- Brockett, R. G. (1985a). Methodological and substantive issues in the measurement of self-directed Learning. *Adult Education Quarterly*, 36(1), 15-24.
- Caffarella, R. S., & Caffarella, E. (1986). Self-directedness and learning contracts in adult education. *Adult Education Quarterly*, 36(4), 226-234.
- Candy, P. C. (1991). *Self-direction for lifelong learning: A comprehensive guide to theory and practice*. San Francisco: Josey-Bass.
- Confessore, S. J. & Confessore, G. J. (1994). Learner Profiles: A cross-sectional study of selected factors associated with self-directed learning. In H. B. Long & Associates, *New ideas about self-directed learning*. pp. 201-227. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education,
- Confessore, G. J., & Long, H. B. (1993). The status of self-directed learning literature 1966-1991. In H.B. Long & Associates, *Emerging perspectives on self-directed learning*. pp. 45-56. Norman, OK: Oklahoma Research Center for Continuing, Professional and Higher Education, University of Oklahoma.
- Conti, G. J. (1979). Principles of adult learning scale. Paper presented at the 20th Annual Adult Education Research Conference, (Ann Arbor, Michigan).
- Corno, L. (2001). Volitional aspects of self-regulated learning. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Corono, L., & Mandinach, (1983) Using existing classroom data to explore relationships in a theoretical model of academic motivation. *Journal of Educational Research*. 77, (1).
- Cranton, P. (1994). Self-directed and transformative instructional development. *Journal of Higher Education*, 65(6).

- Crespi, L. P. (1942). Quantative variation of incentive and performance in the white rat. *American Journal of Psychology*, 55, 467-517.
- Cross, P. K.(1981). *Adults as learners: Increasing participation and facilitating learning*. Josey-Bass Inc.
- Cross, D. L. (1988). The influence of self-directed learning contacts versus a passive therapy treatment in a back rehabilitation program. In H. B. Long and T. R. Redding, (Eds.), *Self-Directed Learning: Dissertation Abstracts 1966-1991*. (Abstract # 28). Norman, OK: Oklahoma Research Center of Continuing Professional and Higher Education. University of Oklahoma.
- Cunningham, J. R. (1988). An examination of the self-directed learning readiness of selected students and graduates of masters degree programs of Southern Baptists seminaries. (Doctoral dissertation, Southwestern Baptist Theological Seminary), *Dissertation Abstracts International*, 49, 11A.
- Curry, M. A. (1983). The analysis of self-directed learning readiness characteristics in older adults engaged in formal learning activities in two settings. (Doctoral dissertation, Kansas State University), *Dissertation Abstracts International*, 44, 05A.
- DeCorte, E., & Greer, B., Verschaffel, L. (1996). Mathematics, learning, and teaching. In D. Berliner & Calfee (Eds.), *Handbook of educational psychology*. New York: McMillan. pp. 491-549.
- Desai, M. S., Richards, T., & Eddy, J. P. (1999). Training systems management implications. *College Student Journal*. 33, (4). 501-502.
- Field, L. (1989). An investigation into the structure, validity, and reliability of Guglielmino's Self-Directed Learning Readiness Scale. *Adult Education Quarterly*. 39, (3), 125-139.
- Field, L. (1990). Giglielmino's Self-Directed Learning Readiness Scale: Should it continue to be used? *Adult Education Quarterly*, 41, (2), 125-139.
- Finestone, P. M. (1984). A construct validation of the self-directed learning readiness scale with labour education participants. In H. B. Long and T. R. Redding, (Eds.), *Self-directed learning abstracts international*, 38, 11-12. 6467A.
- Freed, R. L. (1997). Temperament type and self-directed learning in older women. Doctoral dissertation, University of Nebraska – Lincoln), *Dissertation Abstracts International*, 52, 08A.

- Fullerton, F. E. (1998). Relationship among adult social roles, formal education, Perry epistemological level, and readiness for self-directed learning. (Doctoral dissertation, University of Missouri – St. Louis), *Dissertation Abstracts International*, 59, 02A.
- Gardner, B. S. (1989). A study of the relationship between self-directed learning readiness and work environment among various state government employees. (Doctoral dissertation, University of Missouri – Columbia,), *Dissertation Abstracts International*, 50, 11A.
- Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly*. Fall, 48, (1). 18-24.
- George, R. V. (1995). Readiness for continued learning and empowered nursing practice among graduating nursing students of associate and baccalaureate degree programs. (Doctoral dissertation, Virginia Polytechnic Institute and State University), *Dissertation Abstracts international*, 56, (03A).
- Guglielmino, L. (1977). Development of the self-directed learning readiness scale. *Dissertation Abstracts International*, 38, 11A, 6467, (University Microfilms No. AAC78-06004).
- Guglielmino, L. (1989). Development of the Adult Basic Education form of the self-Directed Learning Readiness Scale. In H. B Long & Associates, *Self-directed learning: Emerging theory and practice*. pp. 63-75. Norman OK: Oklahoma Research Center for Continuing Professional and Higher Education. University of Oklahoma.
- Guglielmino, L. (1997). Reliability and validity of the Self-Directed Learning Readiness Scale and the Learning Preference Assessment. In H. B. Long & Associates, *Expanding Horizons in Self-Directed learning*. pp. 209-222. Norman OK: Oklahoma Research Center for Continuing Professional & Higher Education, University of Oklahoma. p.
- Guglielmino, L., & Guglielmino, P. J. (1988). Self-directed learning in business and industry human resource development. In R. Hiemstra & R. Brockett (Eds.), *Overcoming resistance to self-direction in adult learning*, pp. 39-46, San Francisco, Jossey-Bass.
- Hair, J. F. Jr., Black, Babin, Anderson, & Tatum, (2006). *Multivariate data analysis*. Upper Saddle River, NJ., Prentice Hall.
- Harvey, B. J., Rothman, A. I., Frecker, R .C. (2006). A confirmatory factor analysis of the Oddi Continuing Learning Inventory (OCLI). *Adult Education Quarterly*. 56, (3). 188-200.

- Hassan, A. M. (1981). An investigation of the learning projects of adults of high and low readiness for self-direction in learning. (Doctoral dissertation, Iowa State University, 1981). *Dissertation Abstracts International*, 42, 3838A-3839A.
- Hebb, D. O. (1966). *A Textbook of Psychology*. (2nd ed.). Philadelphia: Saunders.
- Heimstra, R., & Brockett, R. G. (1994). From behaviorism to humanism: Incorporating self-direction in learning concepts into the instructional design process. In H. B. Long & Associates, *New Ideas About Self-Directed Learning*. pp. 59-80. Norman OK: Oklahoma Research Center for Continuing Professional & Higher Education, University of Oklahoma.
- Houle, C. (1961). *The inquiring mind*. Madison, WI: The University of Wisconsin.
- Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. New York: Appleton-Century-Crofts.
- Hull, C. L. (1951). *Essentials of behavior*. New Haven, CT: Yale University Press.
- Jarvis, P. (1992). *Paradoxes of learning*. San Francisco: Jossey-Bass
- Knowles, M. (1975). *Self-directed learning: A guide for learners and teachers*. New York: Association Press.
- Kuhl, J. (1985). Volitional mediators of cognitive-behavior consistency: Self-regulatory processes and action versus state orientation. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior*. West Berlin: Springer-Verlag. p. 101-128.
- Lacey, C. L. (1988). Readiness for self-directed learning in women during the four stages of pregnancy. (Doctoral dissertation, University of Missouri – Kansas City), *Dissertation Abstracts International*, 49, 09A.
- Leeb, J. G. (1988). Self-directed learning and growth toward personal responsibility: Implications for a framework for health promotion (Perry scheme). (Doctoral dissertations, Syracuse University). *Dissertation Abstracts international*, 45, 03A.
- Leontiev, A. N. (1974-75). The problem of activity in Soviet psychology. In *Soviet Psychology*, 4-33.
- Leontiv, A. N. (1978). *Activity, consciousness, and personality*. Englewood Cliffs, NJ: Prentice Hall.
- Leontiv, A. N. (2005). Language and consciousness. *Journal of Russian and East European Psychology*. 43, (5) 5-13.

- Long, H. B. (1986). *Test-retest reliability of Guglielmino's Self-Directed Learning Readiness Scale: A summary report*. Unpublished manuscript, Athens, GA., University of Georgia, Department of Adult Education.
- Long, H. B. (1990). Psychological control in self-directed learning. *International Journal of Lifelong Education*, 9, 331-338.
- Long, H. B., (1991). Challenges in the study and practice of self-directed learning. In H. B. Long & Associates, *Emerging Perspectives in Self-directed Learning*. pp. 11-28. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education, University of Oklahoma.
- Long, H. B. (1997). Self-directed learning: Smoke and mirrors? In H. B. Long & Associates, *Expanding horizons in self-directed learning*. pp. 1-11. Norman, OK: Oklahoma Research Center for Continuing Professional & higher Education, University of Oklahoma.
- Long, Huey B. (1998a). Theoretical and practical implications of selected paradigms. In Huey B. Long & Associates, *Developing paradigms for self-directed learning*. pp. 1-14. Norman, OK: Oklahoma Research Center for Continuing Professional & higher Education, University of Oklahoma.
- Long, H. B. (1998b). Self-directed learning: Assessment and validation. In Long, H.B. & Associates *Self-directed learning: Application and theory*, pp. 1-10. Athens, GA: Adult Education Department of the University of Georgia.
- Long, H. B. (2000). What we think we know about self-directed learning. In *Practice and theory in self-directed learning*. pp. 1-14. Motorola University Press.
- Long, H. B., & Agyekum, S. K. (1983). Guglielmino's Self-Directed Learning Readiness Scale: A validation study. *Higher Education*. 12, p. 77-87.
- Long, H. B., Agyekum, & S. K., Stubblefield, C.(1995). Origins of self-directed learning readiness. In H. B. Long & Associates, *New dimensions in self-directed learning*. pp. 1-22.
- Lowery, C. M. (1996). Supporting and facilitating self-directed learning. ERIC Digest No. 93.
- Mace, C. F., Belfiore, P. J., & Hutchinson, J. M. (2001). Operant theory and research on self-regulation. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Maslow, A. (1954). *Motivation and personality*. New York: Harper.

- McCarten, K. J. (1999). An examination of the relationship between nurses' learning preferences and practices. (Doctoral dissertation, Florida Atlantic University). *Dissertation Abstracts International*, 60, 06A.
- McCaslin, M., & Hickey, D. T. (2001). Self-regulated learning and academic achievement: a Vygotskian view. In *Self-regulated learning and academic achievement: Theoretical perspectives*. pp. 227-252. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- McCombs, B. L. (2001). Self-regulated learning and academic achievement: A phenomenological view. In *Self-regulated learning and academic achievement: theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- McCune, S. K., & Garcia, G. Jr. (1989). A meta-analytic study of the relationship between adult self-direction in learning and psychological well-being: A review of the research from 1977-1987, In H.B. Long and Associates (Eds.), *Self-directed learning: Emerging theory and practice*. pp. 87-98. Norman, OK. University of Oklahoma, Oklahoma Research Center for Continuing Professional and Higher Education.
- McCune, S. K., & Guglielmino, L. M. (1989b). A statistical critique of Field's investigation. *Adult Education Quarterly*, 39, 243-245.
- McCune, S. K., Guglielmino, L.M., & Garcia, G. Jr. (1990). Adult self-direction in learning; A preliminary meta-analytical investigation of research using the Self-Directed Learning Readiness Scale. In H. B. long & Associates, *Advances in self-directed learning research*. Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.
- McInerney, D. M. (2005). Facilitating conditions for school motivation: Construct validity and applicability. *Educational and Psychology Measurement*. 65, (6). 1046-1066.
- Merriam, S. B. (1999). Time as the integrating factor, *New directions for adult and continuing education*. 84, (67).
- Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. In *New Directions for Continuing Education..* Jossey-Bass.
- Merriam, S.B., & Caffarella, R. S. (1991). Learning as a self-directed activity. *Learning in adulthood: A comprehensive guide*. San Francisco: Jossey-Bass.
- Merriam, S. B., & Caffarella, R. S. (1999). *Learning in adulthood*. San Francisco: Jossey-Bass.

- Meyers, L. S., Gamst, G., & Guarino, A.J. (2006). *Applied multivariate research: Design and interpretation*. Thousand Oaks: Sage Publishing.
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New directions for adult and continuing education*. 74 (5).
- Miller, H. L. (1967). *Participation of adults in education: A Force-field analysis*. Boston: Center for the Study of Liberal Education for Adults, Boston University.
- Morris, S. (1997). Item analysis of Guglielmino's Self-Directed Learning Readiness Scale: Revisiting the issue of internal consistency. In H.B. Long and Associates (Eds.), *Expanding horizons in self-directed learning*. Norman, OK: Public Managers Center, College of Education, University of Oklahoma.
- Mourad, S., Torrence, E. (1979). Construct validity of the self-directed learning readiness scale. *Journal of Education for the Gifted*, 3, 93-104.
- Mowrer, O. H. (1960). *Learning theory and behavior*. New York: Wiley.
- Nuckles, C. R. (2000). Student centered teaching: Making it work. *Adult Learning*. Summer, 11, (4, 5).
- Oddi, L. F. (1984). Development of an instrument to measure self-directed continuing learning. (Doctoral dissertation, Northern Illinois University) University Abstracts International 46/01A, 49.
- Overton , W. F. (1984). World views and their influence of psychological theory and research: Kuhn-Lakatos-Laudan. In H.W. Reese (Ed.), *Advances in child development and behavior*. 18, 191-226.
- Paris, S. (1988). *Fusing skill with will: The integration of cognitive and motivational psychology*. Address presented at the annual meeting of the American Educational Research Association, New Orleans.
- Paris, S. G., Byrnes, J. P., & Paris, A. H. (2001). Constructing theories, identities, and Actions of Self-Regulated Learners. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Pilling, J. (1991). The assessment of self-directed learning among pre-service students in an Ontario Faculty of Education. Unpublished masters thesis, Brock University.

- Pilling-Cormick, J., (1995). Existing measures in self-directed learning literature. In *New dimensions in self-directed learning*. pp. 49-60. Norman, OK: Oklahoma Research Center for Continuing Professional & higher Education, University of Oklahoma,
- Pintrich, P. L. (1999). Taking control of research on volitional control: Challenges for future theory and research. *Learning and Individual Differences*. *11*, (3), 335.
- Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, *95*, 667-686.
- Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and practice*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Pojman, L. J. (2003). *Classics of philosophy*. Louis J. Pojman (Ed.). New York: Oxford University Press.
- Rogers, C. R. (1959). A theory of therapy, personality, and interpersonal relationships, as developed in the client-centered framework. In K. S. Koch (Ed.), *Psychology: a study of a science*, *11*, pp. 1-24. New York: McGraw-Hill. p. 184-256.
- Rogers, C. R. (1963). The actualizing tendency in relation to “motives” and to consciousness. In M. R. Jones (Ed.), *Nebraska Symposium on Motivation*. *11*, pp. 1-24. Lincoln: University of Nebraska Press.
- Savoie, M. M. (1980). Continuing education for nurses: Predictors of success in courses requiring a degree of learner self-direction. (Doctoral Dissertation, University of Toronto, 1979). *Dissertation Abstracts International*, *40*, 6114 A.
- Schunk, D. H. (2001). Social cognitive theory and self-regulated learning. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Schunk, D. H., Zimmerman, B. (1997). Social origins of self-regulatory competence. *Educational Psychologist*. *32*, (4), p. 195-208.
- Shannon, C.E., Weaver, W. (1949). *The mathematical theory of communication*. Urbana, Illinois: University of Illinois Press.
- Shaw, A., Sterrett, C., Chesser, J., Whitmore, J. (2001). Meeting the need for employee development in the 21st century. *SAM Advanced Management Journal*. *66*, (2). Society for the Advancement of Management.
- Shavelson, R. J., Bolus, R. (1982). Self concept: The interplay of theory and methods. *Journal of Educational Psychology*, *74*, 3-17.

- Skinner, B. F. (1968). *The technology of teaching*. New York: Appleton-Century-Crofts.
- Strong, E. K. (1958). Satisfaction and interests. *American Psychologist*, 13, (9), 449-456.
- Thorndike, E. L. (1913). *Educational Psychology: Vol 2 The psychology of learning*. New York: Teachers College Press.
- Tolman, E. C. (1932). *Purposive behavior in animals and men*. New York: Appleton-Century-Crofts. (Reprinted 1949, 1951, University of California Press, Berkeley.)
- Torrance, E. P., Mourad, S. (1978a). Some creativity and style of learning and thinking correlates of Guglielmino's Self-Directed Learning Readiness Scale. *Psychological Reports*, 43, 1167-1171.
- Tough, A. (1967). *Learning without a teacher: A study of tasks and assistance during adult self-teaching projects*. Toronto: Ontario Institute for Studies in Education.
- Tough, A. (1971). *The adult's learning projects: A fresh approach to theory and practice in adult learning*. *Research in Education Series, No. 1*. Toronto: Ontario Institute for Studies in Education.
- Tough, A. (1978). Major learning efforts: Recent research and future directions. In *The Adult Learner: Current issues in higher education*. Washington, D.C.: American Association for Higher Education.
- Tremblay, N. A. (1992). Self-directed learning: Emerging theory and practice. In G. Confessore, & S. Confessore (Eds.), *Guideposts to self-directed learning: Expert commentary on essential concepts*. King of Prussia, PA: Organizational Design and Development Inc.
- Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press.
- West, R. F., & Bentley, E. L. (1990). Structural analysis of the self-directed learning readiness scale: A confirmatory factor analysis using LISREL modeling. In H. B. Long and Associates (Eds.), *Advances in research and practice in self-directed learning*. Norman, OK. University of Oklahoma, Oklahoma research Center for Continuing and Higher Education.
- Wiley, K. R. (1981). Effects of a self-directed learning project and preference for structure on self-directed readiness of baccalaureate nursing students (Doctoral Dissertation, Northern Illinois University, 1981). *Dissertation Abstracts International*. 43, 49A-50A.

- Winne, P. H. (1985). Steps toward promoting cognitive achievement. *Elementary School Journal*, 85, 673-693.
- Winne, P. H. (2001). Self-regulated learning viewed from models of information processing. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Winne, P. B., Hardwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker, J. Dunlosky, & A.C. Graesser (Eds.). *Metacognition in educational theory and practice*. pp. 277-304. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Woodworth, R. S. (1918). *Dynamic psychology*. New York: Columbia University Press.
- Zimmerman, B. J. (1986). Development of self-regulated learning: Which are the key sub-processes? *Contemporary Educational Psychology*, 16, 307-313.
- Zimmerman, B. J. (2001). Theories of self-regulated learning and academic achievement: An overview and analysis. In *Self-regulated learning and academic achievement: Theoretical perspectives*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

APPENDICES

APPENDIX 1
DEMOGRAPHIC INFORMATION SHEET

Survey of Adult Learning Traits

Information sheet

Purpose:

This survey is being developed to provide additional insight into how employees learn new information and skills in a workplace setting.

Background Information:

Age: _____	Number of years employed: _____ (at GKN)	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female													
Position: <input type="checkbox"/> Management <input type="checkbox"/> Salaried <input type="checkbox"/> Hourly															
<table style="width: 100%; text-align: center;"> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Education level:</td> <td>some High School</td> <td>High School diploma</td> <td>Vocational certification</td> <td>2 years college</td> <td>Bachelor's degree</td> <td>Graduate degree</td> </tr> </table>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Education level:	some High School	High School diploma	Vocational certification	2 years college	Bachelor's degree	Graduate degree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
Education level:	some High School	High School diploma	Vocational certification	2 years college	Bachelor's degree	Graduate degree									

Instructions:

The statements on the following pages describe opinions on issues related to how you like to learn new skills and information related to work. You are asked to rate whether you agree or disagree with the statement on a scale ranging from 1 to 5. The following example illustrates how to complete the survey:

Example statement:

strongly disagree disagree neutral agree strongly agree

I enjoy learning something new.

1	2	3	4	5
----------	----------	----------	----------	----------

Circle only one.

After reading each statement on the following pages, please indicate your opinion by circling one number on the scale. Completed forms can be returned in the accompanying self-addressed stamped envelope. In order to maintain confidentiality, do not sign any of the pages. Thank you for your participation.

APPENDIX 2
INSTRUMENT
SURVEY OF ADULT LEARNING TRAITS

Survey of Adult Learning Traits

* Circle the numbers to the right, which most accurately represents your opinion.
(Circle only one per item.)

How I think about his issue:

#1 strongly disagree	#2 disagree	#3 neutral	#4 agree	#5 strongly agree
----------------------------	----------------	---------------	-------------	-------------------------

1. I enjoy learning something related to my work.
2. I can put off doing something I want to do to study work related information.
3. I am ready to participate in training that helps me advance into a better and higher paying job.
4. I can manage my own efforts to learn outside of a classroom.
5. It is usually easy for me to learn something new.
6. I am good at finding helpful resources, such as books or people who can help me learn.
7. I can evaluate my progress towards learning new skills as I go along.
8. I am good at developing strategies for learning new material or skills.
9. I can change the way I study if what I am doing is not working.
10. I have personal time available that I can set aside for learning.
11. I feel encouraged by friends, family, or the people I work with to spend time learning something new.
12. There is somewhere I can go, which is a good place to study.
13. My workplace is free from distractions that interfere with learning new job skills.
14. I am not too tired after work to spend time learning something new.

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

APPENDIX 3
INFORMED CONSENT SHEET



AUBURN UNIVERSITY

COLLEGE OF EDUCATION

EDUCATIONAL FOUNDATIONS, LEADERSHIP AND TECHNOLOGY

The Auburn University Institutional Review Board has approved this document for use from 9/4/07 to 9/3/08 Protocol # 07-182EP0709

NOTE: DO NOT PARTICIPATE IN THIS STUDY UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT

INFORMATION LETTER

for a research study entitled

"Development of an Instrument to Measure Tendencies Toward Self-Directedness Within a Workplace Setting"

You are invited to participate in a research study to develop a survey instrument for gaining insight into how people learn in the workplace. K. Shannon Hogg is conducting the study under the direction of Dr. James E. Witte in the Auburn University Department of Adult Education. You were selected as a possible participant because you are employed and over 19 years old.

If you decide to participate, you will be asked to complete a survey form. Your total time to complete this survey will be about 10 minutes. There are no risks of participation. You will not be judged or evaluated based on this survey and you will not sign your name to the form.

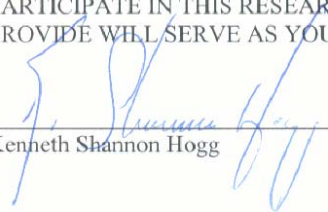
The survey form and demographic sheet should be completed at your convenience and placed in the stamped, self-addressed envelope provided and mailed to the principal investigator. Your participation is completely voluntary. If you change your mind about participating, you can stop at any time and discard the survey. However, once you have mailed your survey, we won't be able to withdraw your information since you will be providing it anonymously. Your decision about whether to participate or not will not jeopardize your relations with Auburn University, the Department of Adult Education, or GKN Aerospace.

Any data obtained during this survey will remain anonymous. We will protect your privacy and the data you provide by not having you sign your name. Information collected through your participation may be used by K. Shannon Hogg to complete the requirements of a doctorate in Adult Education.

If you have questions about this study, please ask them now or contact K. Shannon Hogg at GKN Aerospace in Tallassee, Alabama, phone # (334) 283-9337 or at home, phone # (334) 257-4866. If you would like a summary copy of the findings of this survey when it is complete, contact K. Shannon Hogg at the numbers provided.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.



Kenneth Shannon Hogg

Sept 7, '07
Date