An Examination of the Relationship of Employment Classification and

Self-Directedness in a Large Scale Manufacturing Setting

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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 (1998) 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. Tough (1977) 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. The third conceptualization of self-directed learning described by Long (1998) 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 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. (Long, 1998, 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 the 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, 1998). 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.

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-Cormack (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.

One reason for the focus on formal and traditional teacher-led learning environments is perhaps 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. A large amount of research has 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-directed learning outside the domain of formal instructor led educational programs are perhaps less understood and studied (Confessore & Long, 1992). 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

The purpose of this study was to expand upon previous efforts of Guglielmino and others 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.

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 curricula have not been written yet. Training Magazine (2005) estimated that companies in the United States cumulatively spent 51.1 billion dollars on education and training programs for their employees. Those figures appear large mostly because of the great number of people who need further education and training to be competitive.   Access and support for continuing educational and training programs is not universal throughout 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.

Background

It is was 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 was originally

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. Note: Results of the

field test found that the domains of Motivation and Self- Regulation were so closely related

that the instrument failed to discriminate. A decision was made by the researchers to

combine Motivation and Self-regulation into a single domain.

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, 1977).   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.

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 to 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 general educational diplomas (GEDs) to graduate level degrees. The items on the instrument were scaled by reading level to be understood by all subjects in the study. The grade level of items on the instrument was determined to be at 7.3 using the Flesch-Kincaid rating system.

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. A panel of five individuals representing a large Southern 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.

3. Field Test. A field test of the instrument was conducted at the large southern manufacturing facility. Information obtained in this field test was used to evaluate and correct the instrument for clarity and appropriateness.

Q-Sort

The Q-Sort evaluation consisted of briefly defining the four major factors and recording this information of 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 co-variance of these items. Motivation is identified by many of

the authors as a major factor in self regulation. It was determined by the researchers that

the factors, self-regulation and motivation, should be merged into one group, 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, with only minor editorial changes to the instrument, until an accuracy of

96% was observed on the results of all panel members.

Field Testing

Participants were recruited on a voluntary basis from a pool of employees at a large

southern manufacturing facility. One of the researchers provided an explanation of the

project during 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 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.

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 manufacturing facility.   Two hundred and five completed surveys were returned. The age of participants ranged from 19 to 69 years. The number of years of working experience ranged from 1 to 23 years with an average of 7.61 years work experience. Gender, Employment Classification and Education Level are displayed in Tables 1, 2, 3, respectively:

Table 1

Participants by Gender

Gender	Number of Participants	Percentage of Sample
Male	123	60%
Female	82	40%

Table 2

Employment Classification

Classification	Number of Participants	Percentage of Sample
Management	9	5%
Salary	41	20%
Hourly	155	75%

Table 3

Highest Education Level Attained

Education Level	Number of Participants	Percentage of Sample
Some High School	5	2.4%
High School Graduate	26	12.7%
Vocational Certification	54	26.3%
Two Years of College	18	8.8%
Bachelor's Degree	5	2.4%
Graduate Degree	5	2.4 %

Measures

The Survey of Adult Learning Traits, which consisted of 15 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.

Results

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 results

suggest that the scales within the survey are internally consistent measures. The reliability

coefficients for the three scales were good (ranging from .60 to .81) (See Table 4).

Table 4

Alpha Reliability Coefficients for Survey of Adult Learning Traits Scales

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

Confirmatory Factor Analysis

The model was examined by AMOS version (16.0) maximum likelihood factor analysis (Arbuckle, 2008). The model was evaluated three ways. First, departure of the data from the specified model was tested for significance by using a chi-square test (Joreskog and Sorbom, 1989). Second, goodness-of-fit between the data and the specified model was estimated by employing the Comparative Fit Index (CFI) (Bentler, 1990), the Incremental Fit Index (IFI) (Bentler and Bonett, 1980), and the Root Mean Square Error of Approximation (RMSEA) (Browne and Cudeck, 1993). Third, the measured variables loaded on their respective factors significantly (i.e., < .05) (See Table 5).

The correlated three-factor model yielded acceptably high goodness of fit indices (i.e., > .93) for both the CFI and the TLI. The RMSEA achieved a value of .06 indicating a close fit of the model in relation to the degrees of freedom. The correlations among the three factors are presented in Table 6. The intercorrelations among the factors were all less than .9 indicating that the three factors demonstrated discriminate validity.

Table 5

Chi-square and Goodness of Fit Indices for Confirmatory Factor Model

Factor Model	χ^2	df	CFI	IFI	RMSEA
Three Factor	129.40*	74	.93	.93	.06

* $\underline{p}$ < .05.

Table 6

Correlations Among the Three Factors

Factor	1	2	3
1. Motivation	--		
2. Cognition	.67*	--	
3. Environment	.62*	.60*	--

* $\underline{p}$ < .05.

The factor loadings are provided in Table 7. All items loaded significantly on their

respective factors, $\underline{p}$ < .01.

Table 7

Factor Loadings

Factor Loadings

Motivation	Cognition	Environment
.54		
.41		
.64		
.58		
	.64	
	.74	
	.64	
	.74	
	.67	
		.50
		.45
		.80
		.60
		.78

Conclusion

This study suggests that the Survey of Adult Learning Traits (SALT) is a valid and reliable assessment of self-directedness in the work place. The psychometric properties of the final 14-item SALT indicated acceptable alpha coefficients for the three subscales and the intercorrelations demonstrated discriminate validity. It is designed as a research instrument to identify traits in three broad categories and produce scores for descriptive and comparative analyses. Because this is a recently developed scale, additional studies are needed to further test scale validity and reliability. Until such studies are completed, it is suggested that this instrument be used in conjunction with other methods of trait identification.

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