

A reciprocal relationships between self-directed learning and lifelong learning in undergraduate students

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Abstract: The purposes of this research were: to examine the reciprocal effects between self-directed learning variable and lifelong learning variable, and to compare these effects according to gender. A total of 1,186 undergraduate students from Srinakharinwirot University were selected by stratified random sampling to participate in this study. 53% were females and 47% were males. A Questionnaire was used to collect 2 constructs: self-directed learning and lifelong learning. Self-directed learning comprises three indicators: self-managing, self-monitoring, and self-modifying. Lifelong learning comprises six indicators: knowledge usage, strategies application, information usage, learning facilities usage, self-learning evaluation, and identifying learning objectives. The results were as follows: (1) The coefficient predicting of self-directed learning on lifelong learning was statistically significant and the size was quite strong ($B = .48$) moreover, the reverse coefficient was statistically significant but the size was moderate ($B = .26$). (2) The coefficient predicting of self-directed learning on lifelong learning was not different across genders but the reverse coefficient differed across genders. The result indicated that the reverse coefficient was statistically significant but the size was weak ($B = 0.15$) in females; however, this coefficient was not statistically significant in males. (3) In addition, all of three indicators: self-managing, self-monitoring, and self-modifying were equally important indicators of self-directed learning. Although, two indicators (knowledge usage, and strategies application) (from six indicators of lifelong learning) were important, the others four indicators had moderate effects on lifelong learning.

Introduction

Lifelong education is the major strategy of Thai education. Policy makers and educators have attempted to develop the lifelong education for all levels of Thai education systems since the beginning of Thai educational reform in 1999 such as the meeting agenda in strategy and process of lifelong learning for pre-adult (16 years old) hosted by Thai Commission of Education in 2002. Unfortunately, there are still a few action plans to implement this strategy in real setting.

Higher education institutions are parts of Thai educational system that conduct a mission to educate the people to live in a rapidly changing world. The country needs the people who are capable of taking initiatives for their own education and motivated to continue learning throughout their life and in many different situations. However, there are rare action plans or implementations to complete this mission in Thai higher education institutions because there are no indicators of lifelong education in Thai higher education (Sumretphol. 2004).

From this point, some scholars attempt to stimulate the education policy makers to have more concern about lifelong learning by describing higher education's contribution to the society's lifelong learning system (e.g., Elliott, 1999, and Dunkin, & Lindsay, 2001) in conducting the basic research in this era. For example, in 2004, Sumretphol developed the indicators to clarify the conception of lifelong learning in higher educational institution (Sumretphol. 2004). She used the system theory as her conceptual framework to develop the

indicators. Consequently, her research finding gives the big picture of lifelong learning system in higher education.

Nevertheless, at the individual level, the ultimate goal of lifelong learning is to facilitate the lifelong learning skills/competencies development of population for living and working especially, mature students such as colleges students in the universities. So, the primary goal of this study is to investigate the antecedent characteristic that can predict the lifelong learning competencies.

An antecedent variable that the researchers have chosen to study with lifelong learning is self-directed learning. Literature review indicates that self-directed learning refers to the internal process of individual to 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 evaluation learning outcomes (Knowles, 1975). Many scholars developing the work of Knowles (1975) such as Iwasiw (1987) and Costa and Kallick (2004), outlines the characteristics of self-directed learning.

In lifelong learning, self-directed learning has vast appeals. Knowles (1980) suggested that 'lifelong education based on the notion that in a world of accelerating change, learning must be a continuing process from birth to death (p.22).' Self-directed learners appear to be able to transfer learning in terms of both knowledge and study skill from one situation to another (Race, 1990). The findings of the study of Lunyk-Child's et al. (2001) also showed the perceived advantages of self-directed learning which enhanced developing skills for lifelong learning, increased confidence and autonomy. However, Candy (1991) stated that the relationship between self-directed learning and lifelong education is a reciprocal one (p. 15). On the one hand, self-directed learning is one of the most common ways in which adults pursue learning throughout their life span. On the other hand, lifelong learning takes, as one of its principal aims, equipping people with skills and competencies required to continue their own 'self-education'. In this sense, self-directed learning is viewed simultaneously as a means and end of lifelong education. According to O'Shea's suggestion (2003), the researches on self-directed learning and benefits of self-directed learning are required to identify the conditions in which are most likely to be achieved. So, the researchers have chosen genders to be the condition to interrupt the size of reciprocal relationships between self-directed and lifelong learning.

Purpose of the study

The purposes of this research were: to examine the reciprocal effects between self-directed learning construct and lifelong learning construct, and to compare these effects according to gender. The findings would be used to develop further research questions to promote self-directed learning characteristic and lifelong learning in undergraduate students.

Methods

Sample

A total of 1,186 undergraduate students from Srinakharinwirot University were selected by stratified random sampling to participate in this study. 53% were females and 47% were males.

Instrument

A questionnaire was used in this research. It consists of 3 parts. The initial part of the questionnaire includes questions about the demographic status of each student (e.g., gender). The next two parts include Self-directed Learning Scale, and Lifelong Learning Scale.

For Self-directed Learning Scale (SLS), the researchers developed this scale from Costa, and Kallick's definition of self-directed person (Costa, and Kallick, 2004). There are 3 subscales of SLS: self-managing, self-monitoring, and self-modifying. Self-managing includes twelve items tapping the respondent's perception of ability to approaching tasks with clarity of outcomes, a strategic plan, and necessary data, and then drawing from past experiences, anticipating success indicators, and creating alternatives for accomplishment (e.g., "I attempt to find my learning style" "I access the information to support my learning activity"). Self-monitoring includes ten items tapping the respondent's perception of ability to establishing meta-cognitive strategies to alert the perceptions of in-the-moment indicators of whether the strategic plan is working or not and to assist in the decision-making processes of altering the plan (e.g., "I check my study output that meet my initial plan" "I can keep my learning process follow by my initial plan"). Self-modifying includes ten items tapping the respondent's perception of ability to reflecting on, evaluating, analyzing, and construction meaning from the experience and applying the learning to future activities, and challenges (e.g., "My speech and writing is easy to understand", "Problem is the opportunity to learn") Rating of all 3 subscales were based on 6-point scales ranging from 1 (strongly not true) to 6 (strongly true). For each respondent, we calculated a single index score for SLS by averaging over items (Cronbach's alpha = .76, .70, .76, respectively).

For Lifelong Learning Scale (LLS), the researchers developed this scale from Sumretphol's work (Sumretphol. 2004). There are 6 subscales of LLS which measure respondent's perception of competency of knowledge usage (e.g., "I apply the knowledge from classroom to the real life"), strategies application (e.g., "I use the variety of learning strategies to develop my capabilities"), information usage (e.g., "I am interested in improving my English knowledge"), learning facilities usage (e.g., "Access information from the library benefit to me"), self-learning evaluation (e.g., "I use the information from learning evaluation to develop my learning competence"), and identifying learning objectives ("I plan to learn before hand; for example, I schedule to prepare for my exam 2 weeks before the time"). Furthermore, in each subscale, there are three goals of lifelong learning: self-development, self-awareness and social benefit. This scale includes thirty six items; each subscale consists of six items (two per each goal). Rating of all 6 subscales were based on 6-point scales ranging from 1 (never) to 6 (regularly). For each respondent, we calculated a single index score for LLS by averaging over items (Cronbach's alpha = .88, .88, .85, .82, .88, .76, respectively).

Data Analysis

This study was designed to investigate the reciprocal relationships between self-directed learning and lifelong learning. As described earlier, there was more than one indicator in self-directed learning and lifelong learning. Therefore, the structural equation modeling with latent variable is very recommended as the analysis strategy (Bollen, 1989; and Kline, 2005). One of the benefits of this strategy, it showed the weights of each indicator to describe the variance of each latent variable. From this point, we can draw the recommendation in detail about which indicators should be considered first.

Multiple group strategy was conducted to compare the reciprocal relationships between females and males. Before comparing these effects, the baseline model both females and males was conducted separately. Then the researchers tested the invariance of other

parameters except the Beta by constraining these parameters. Finally, the beta parameters between females and males were compared to test the differences of reciprocal effects.

To evaluate the model fitted with the empirical data, six indices were used. These indices included the chi-square (χ^2) index, the goodness of fit index (GFI), the root mean square error of approximation (RMSEA) with confident interval, the standardized root mean residual (SRMR), the nonnormed fit index (NNFI), and the comparative fit index (CFI). These fit indices were chosen because no single fit index is considered to be the definitive marker of a model with “good fit”; each index serves a different purpose and should be interpreted in other indices. The χ^2 index is an absolute index that tests for lack of fit resulting from over identifying imposed on a model and sample size. Value of 1 for GFI and the NNFI indicates perfect model fit; however, some researchers have suggested cut-off values greater than .95 to indicate the reasonable closed fit. The following index cutoff values suggested by Hu and Bentler (1999) were used for determining closed fit: CFI > .95, RMSEA < .06 and SRMR < .08.

To evaluate the model fit differences, the likelihood-ratio (LR) test, also known as the chi-square difference test ($\Delta\chi^2$) was used and significance was evaluated with degrees of freedom (Δdf) (Bollen, 1989; and Cheung & Rensvold, 2002)

Results

Reciprocal Relationships

The result of reciprocal relationships between self-directed learning and lifelong learning in the whole group is presented in figure 1

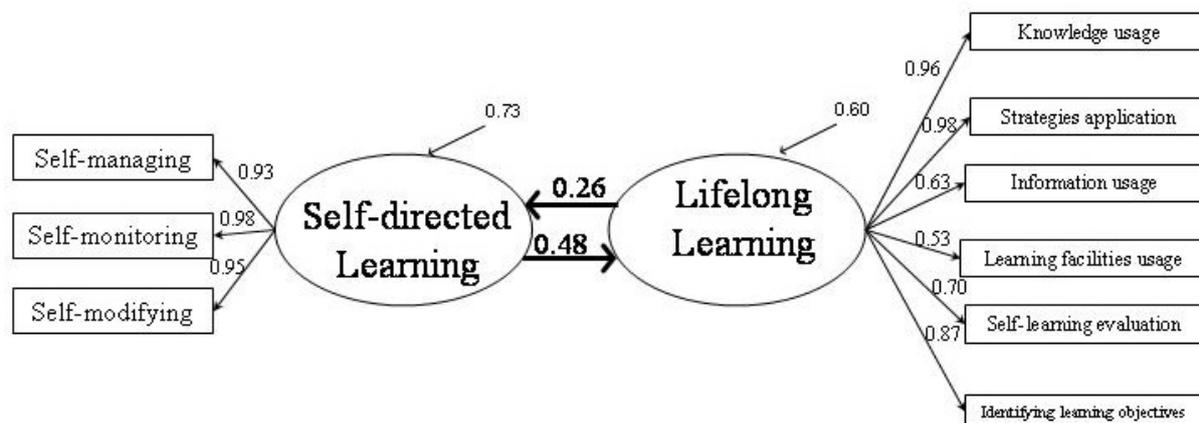


Figure 1: The standardized solution of reciprocal relationships in the whole group

Results of all sample indicated $\chi^2 [14, N=1,186] = 17.22$ (p value = .24), GFI = 1.0, RMSEA = .014 (confidence interval .00 to .033), SRMR = .008, NNFI = 1.0, and CFI = 1.0; in sum, these fit indices suggested that this model provided a good fit to this data. In addition, the parameters indicated that the coefficient predicting of self-directed learning on lifelong learning was statistically significant and the size of standardized coefficient was quite strong

($B = .48$). The reverse relationship predicting of lifelong learning on self-directed learning was statistically significant and the size of standardized coefficient was moderate ($B = .26$). The variance of lifelong learning was explained by self-directed learning = $.40$ ($R^2 = .40$) and variance of self-directed learning was explained by lifelong learning = $.27$ ($R^2 = .27$)

Furthermore, the researchers considered that the indicators of each construct showed indicators that were important to explain the variance of each construct. The results revealed that in self-directed learning, all of indicators, self-managing, self-monitoring, and self-modifying were approximately equally important indicators (.93, .98, .95, respectively). Despite six indicators of lifelong learning, two of them (knowledge usage, and strategies application) were important (.96, .98, respectively) whereas the others four indicators (information usage, learning facilities usage, self-learning evaluation, and identifying learning objectives) had moderate effects on lifelong learning (.63, .53, .70, .87, respectively).

Female VS Male

This section presented the effect of genders as moderator variable. We applied multiple group analysis strategy to reveal this hypothesis. Two priori analyses were conducted. First, the researchers tested the model fit each group separately. If both models fit well, the next step could be conducted. Second, two baseline models were estimated simultaneously to test the equality of the form and other parameters except BETA between females and males. If model fit well, the final step could be conducted. After tested two priori steps, the differences of reciprocal relationships between females and the males would be conducted.

First of all, a baseline model was estimated separately for each group.

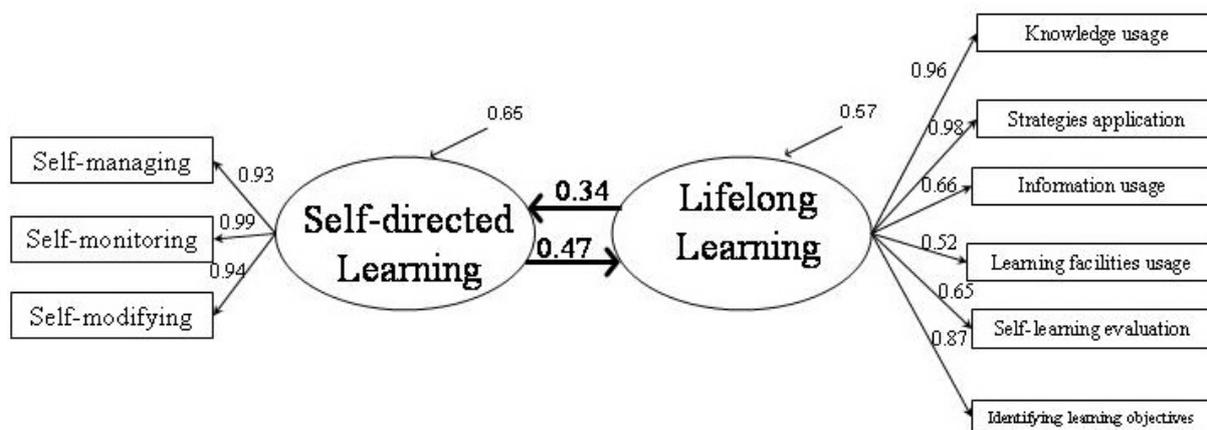


Figure 2.1 Female

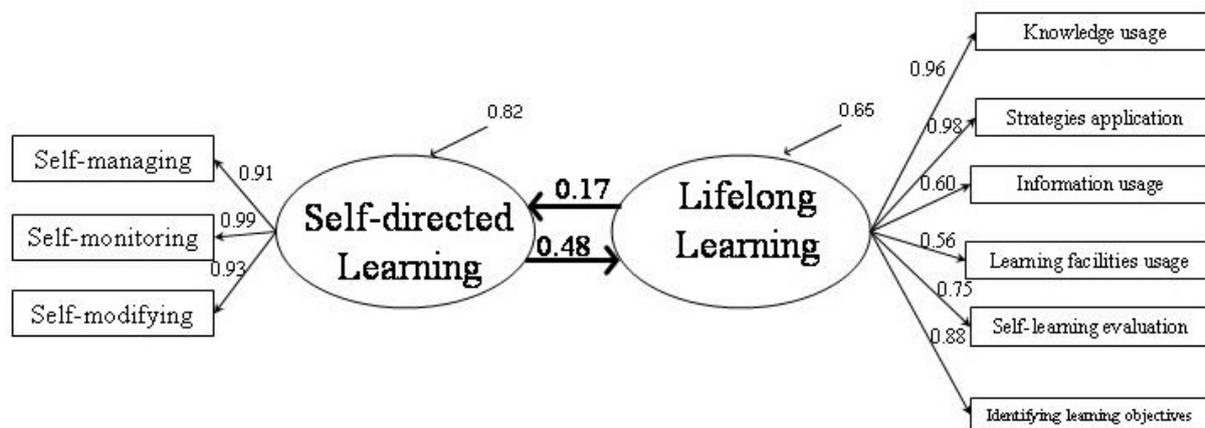


Figure 2.2 Male

Figure 2: The standardized solution of reciprocal relationships in the separate groups

Overall fit of females model was (χ^2 [17, N=629] = 32.47 (p value = .013), GFI = .99, RMSEA = .038 (confidence interval .017 to .058), SRMR = .015, NNFI = 1.0, and CFI = 1.0); for the male model was (χ^2 [11, N=557] = 12.27 (p value = .34), GFI = 1.0, RMSEA = .014 (confidence interval .0 to .048), SRMR = .012, NNFI = 1.0, and CFI = 1.0). The results indicated that the female group was reasonable fit with the empirical data and the male group fit well with the empirical data. For parameters estimation, the relationship predicting self-directed learning of lifelong learning between females and males seemed equal and standardized solution showed that the sizes were quite strong in both groups (B = .47, .48, respectively). However, even if the reverse relationship predicting lifelong learning on self-directed learning in both groups was statistically significant, the standardized solution showed that the effect of females was stronger than those of males (B = .34, and .17, respectively). Both variances of constructs that explained by another in females were stronger than those of males.

Second, tests of the equality of model form and other parameters were conducted except the reciprocal relationships. The fit indices were (χ^2 [61] = 118.72 (p value = .00), RMSEA = .040 (confidence interval .029 to .051), NNFI = 1.0, and CFI = 1.0). After constraining the reciprocal relationships, the fit indices were (χ^2 [62] = 121.32 (p value = .00), RMSEA = .040 (confidence interval .029 to .051), SRMR = .042, NNFI = 1.0, and CFI = 1.0). The results indicated that before and after constraining the reciprocal relationships, both models still reasonably fit with the empirical data. Finally, the chi-square difference test was used to test the differences of the reciprocal relationship between genders. The researchers did not test the difference of the relationship of self-directed learning to lifelong learning because the identification reason. Therefore, the researchers fixed its relationship to 1. The chi-square difference of the reverse relationship between genders was $\Delta\chi^2$ [Δdf = 1] = 2.60 (p value = .10). This indicated that it was not statistically significant at .05 level.

Discussion

Testing the reciprocal relationships between self-directed learning and lifelong learning, the analyses show that the size of coefficient predicting of self-directed learning on lifelong learning is quite strong. It indicates that self-directed learning is an important characteristic

to predict the undergraduate student lifelong learning competencies. In addition, the important characteristics of self-directed learning are self-managing, self-monitor, and self-modifying and the important competencies of lifelong learning are knowledge usage, and strategies application. It indicates that to promote individual lifelong learning competencies especially, knowledge usage, and strategies application, all of self-directed characteristics should be considered to promote in higher educational system. Furthermore, the reverse relationship predicting lifelong learning on self-directed learning is also statistically significant. It supports Candy's idea (1991) that the relationship between self-directed learning and lifelong learning is reciprocal one. Anyway, the coefficient size of reverse relationship is weaker and the coefficient size predicts self-directed learning on lifelong learning and also the variance of self-directed learning explained by lifelong learning is weaker than the variance of lifelong learning explained by self-directed learning. It indicates again that self-directed learning is important predictor of individual lifelong learning but there are more antecedents to explain the variance of self-directed learning.

Then, when the researchers tested the consistency of the effect size between females and males, the researchers could not test the coefficient predicting self-directed learning on lifelong learning because of the requirement of identification. However, we can draw the rough conclusion from each baseline model that this coefficient seems equal between females and males ($B = .47, .48$, respectively). Furthermore, the feedback loop is not statistically significant between genders. The researchers can conclude that there are no differences in reciprocal relationships between genders. Thus the educators can use this research findings with both females and males equally. Nevertheless, R^2 of females and males indicated that the model is useful in females than males.

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