

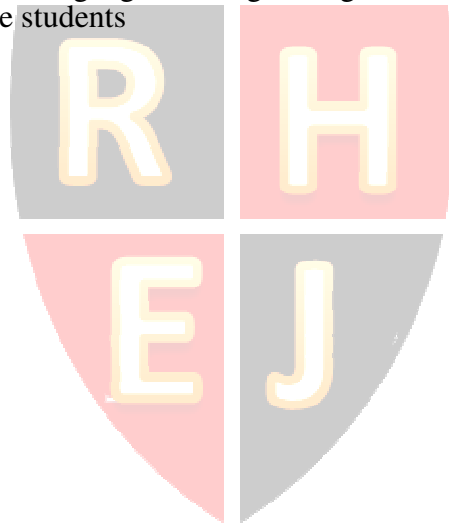
Assessing a theoretical model on EFL college students

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ABSTRACT

This study aimed to (1) integrate relevant language learning models and theories, (2) construct a theoretical model of college students' English learning performance, and (3) assess the model fit between empirically observed data and the theoretical model proposed by the researchers of this study. Subjects of this study were 1,129 Taiwanese EFL college students. The instruments utilized in this study, designed by the researcher of this study, included Self-regulated Inventory and English Achievement Test. LISREL 8.72 was employed to analyze the collected data. The results of this study showed that there was a statistically significant direct effect on affection/motivation and academic achievement. In addition, the statistical result showed a mediating effect of action control in language learning process. Based on the results of this study several suggestions for further research and implications for future EFL instruction were also offered at the end of the paper.

Keywords: English performance, language learning strategies, self-regulation, English as a foreign language (EFL), college students



INTRODUCTION

With the increase of international exchanges upon globalization and the coming of knowledge-based economy, the enhancement of students' English proficiency, vision and competitiveness has become the important policy of education in many countries. Unfortunately, according to the Ministry of Education result of English examination survey on the freshmen students of vocational and technological colleges in the academic years of 2000, the English proficiency of vocational and technological college students in Taiwan is inferior and only 15% students meet the primary level of GEPT. Thus, how to enhance these students' English proficiency has become one of the important tasks in vocational and technological education.

In order to enhance EFL Taiwanese college students' English proficiency, schools are devoted to constructing a bilingual environment, organizing English camps and contests, and planning remedial instruction. Despite these efforts, many researchers put their emphasis on the field of English (e.g. Wu and Chang, 2003; Chang and Wu, 2010). This study treated EFL technological and vocational college students as the targets and English as the specific learning field, and validated the theoretical model on technological and vocational college students' English learning performance by SEM. The research purposes were below:

1. to integrate relevant learning models and theories,
2. to construct a theoretical model on technological and vocational college students' English learning performance, and
3. to evaluate the quality of the theoretical model on technological and vocational college students' English learning performance.

LITERATURE REVIEW

Recent studies on learning have successfully integrated expectancy-value theory (affection/motivation), action control theory and learning strategy theory, and indicated their importance on learning, as detailed below.

Research related to affection/motivation

Expectancy-value theory indicated that beliefs which influence learners' motivation include affection, value and expectation. Bandura (1986) suggested that the individuals' affective self-reaction to their performance could result in self-incentive. Thus, the individuals would construct higher level of goals, and adopt more effective strategies. Value refers to the internal reasons of a person to involve in some jobs (Pintrich, 1989). Current empirical studies (Eccles, 1994; Wigfield, 1994; Wigfield & Eccles, 2000) demonstrated that work value would influence learners' selection in future courses, use of learning strategies, action control and academic achievement. Expectation refers to the learners' anticipation to the success of the learning, and includes success expectation and perceived self-efficacy. Success expectation is the estimation of the learning result (Pintrich, 1989). The research of Wigfield (1994) indicated a significant correlation between success expectation and academic achievement. Cherng and Lin (2002) in Taiwan also demonstrated the significantly positive relation between success expectation and academic achievement. Self-efficacy refers to the individuals' belief in their abilities in specific situations (Bandura, 1986). In the past 20 years, self-efficacy could highly predict the students' motivation and learning (Bandura, 1997; Pajares, 1997; Schunk, 1989; Zimmerman, 1995, 2000). Thus, this study treated positive affection, success expectation, work value, and self-efficacy as the variables of affection/motivation.

Research related to action control

Recent researches focused on the mediating role of action control between learning intention and learning strategies, and defined action control as the learners' protection intention and the control to fulfill the goals. According to Kuhl (1985), the mediation of action control in

learning process could be observed upon the learners' action control strategies which are allocated by Kuhl (1985) into cautious selection, coding control, emotion control, motivation control, environment control and information processing. Corno (1989) expanded the concept of action control in learning situation and indicated five action control strategies, including cognition control, emotion control, motivation control, situation control, and others control. However, the empirical study of Wu and Chang (2003) demonstrated that these action control strategies could be combined into cognition control, affection control, situation control, and others control. Cherng and Lin (2002) mentioned that action control is the critical intervening variable between learning motivation and learning strategies. Therefore, based on the statements of Kuhl, Corno, Wu and Chang, this study divided action control into cognition control, affection control, situation control, and others control.

Research related to learning strategies

Learning strategies were the main research issues in information processing theory in Cognitive Psychology in the past 20 to 30 years. Flavell (1971) was the first scholar who proposed learning strategies, and indicated that learning strategies are the cognition of cognition. Brown (1987) suggested that learning strategies include the individuals' knowledge and control of the cognitive system and the plan, monitoring and evaluation abilities of the cognitive operation. Wu and Chang (2003) pointed out that the correlation among self-monitoring, self-evaluation, self-adjustment of learning strategies and strategy use is significantly high. It would lead to multi-collinearity. These constructs should be combined. Pintrich (1999) suggested that learning strategies refer to the learners' planning, monitoring and adjustment abilities in self-adjusted learning process. According to Wu (2003), learners with inferior English reading comprehension would use learning strategies differently. Moreover, the students in Taiwan used significantly different learning strategies when reading Chinese and English. Based on the above, this study treated repetition, organization, refinement, planning, monitoring, and adjustment as the valuables of learning strategies.

A theoretical model of EFL college students' English learning performance in this study

As to the test of model fit, this study reorganized the related learning theories and those proposed by Wu and Chang (2003), and considered college students' development characteristics and English learning to further propose the theoretical model of English learning performance, including affection/motivation, action control, learning strategies and academic achievement with regard to technological and vocational college students' English.

METHOD

This study selected 1,129 students, who took the courses of English in freshmen and sophomore years, from 12 technological and vocational colleges in northern, central and southern Taiwan as the targets by stratified cluster random sampling.

The instruments used in this study included Self-regulated Inventory and English Achievement Test. The Self-regulated Inventory is composed of English affection/motivation scale (22 items), English action control strategy scale (22 items), and English learning strategies scale (26 items). The items in all scales used English as the specific field and rated based on *Likert* 6-point scale.

The English achievement test was designed based on the General English Proficiency Test (GEPT), College Student English Proficiency Test (CSEPT), and the principles of language evaluation. The evaluation on the oral test is more subjective and it is difficult to quantify the data. Thus, the test only involves the academic achievements of listening, reading and writing.

After the tests, data were inputted into a computer for statistical analysis by LISREL 8.72; $\alpha = 0.05$ was treated as the statistical significance level.

RESULTS OF THE STUDY

The parameter estimation in LISREL is based on Maximum Likelihood methods which involves strict requirement for multi-variance normal distribution (Bollen, 1989; Jöreskog & Sörbom, 1993). Thus, before conducting the test of goodness of fit, the assumption of multi-variance normal distribution was validated by PRELIS 2.52. The finding demonstrated that data collected by this study did not meet the assumption, $\chi^2_{(2)} = 1465.254, N = 1129, p < 0.05$. Thus, generally weighted least-square (WLS) method was applied for parameter estimation and test of goodness of fit.

The fit test of English learning process model

Upon literature review (Hair, Anderson, Tatham, & Black, 2006), the evaluation of SEM in this study refers to preliminary model fit, overall model fit and fit of internal instruction, as described below.

(1) Preliminary model fit of English learning process model

As to preliminary model fit, the estimation results did not show negative error variables (0.13~0.93). All error variables reached the significance level (0.05) and there was no significant standard deviation. It met the standard that theoretical model could not involve negative error variables and significant standard deviation. Error variables must meet the significance level (Hair et al., 2006). However, one factor loading was lower than 0.5 ($\lambda^x_{21} = 0.45$) and it did not meet the standard that factor loading could not be lower than 0.50. Low factor loading would reduce the reliability of the factors. However, for the completeness of the theoretical framework and since all factor loadings reached the significance level, the statistical test is still conducted.

(2) Overall model fit of English learning process model

With regard to absolute fit, chi-square value of the fit between the theoretical model in this study and data observed reached the significance level (0.05). It demonstrated that English learning process model in this study and data observed do not fit. However, in the test of goodness of fit, chi-square value tended to reject the theoretical model due to the increase of the samples. Thus, besides chi-square test, this study also evaluated the fit between the model and data by other measures which were not influenced by the number of the samples. Apart from χ^2 test, the measures of overall model fit demonstrated good fit between the theoretical model and data observed in this study.

(3) Fit of internal structure of English learning process model

With regard to fit of internal structure of model, Hair et al. (2006) proposed the evaluation on fit of measurement model and fit of structural model, as described below:

As for fit of measurement model, factor loadings estimated reached the significance level ($t = 19.37 \sim t = 63.24, p < 0.05$) and it met the standard that factor loading should meet the significance level. In terms of structural model, structural parameters estimated reached the significance level 0.05 ($t = 2.19 \sim 29.61, p < 0.05$). It demonstrated that the structural model was positive.

Effects of latent variables in English learning process model

According to Jöreskog and Sörbom (1993) and Hair et al. (2006) the effects among latent variables included direct effect, indirect effect and total effect, as described below.

(1) Direct effects of latent variables in English learning process model

Direct effect of latent independent variables on latent dependent variables: This study assumed the direct effect of affection/motivation on action control ($\gamma_{11} = 0.81, t = 29.61, p < 0.05$), learning strategies ($\gamma_{21} = 0.25, t = 6.44, p < 0.05$) and academic achievement ($\gamma_{31} = 0.24, t = 3.81, p < 0.05$). The data observed demonstrated that the direct effect was significant. It showed that learners with more affection/motivation tended to frequently use action control and learning strategies, and they would have better academic achievement.

Direct effect of latent dependent variables on latent dependent variables: This study assumes the direct effect of action control on learning strategies and direct effect of learning strategies on academic achievement. The observed data indicated that the direct effects were significant: the direct effect of action control on learning strategies ($\beta_{21} = 0.75, t = 19.06, p < 0.05$), the direct effect of action control on academic achievement ($\beta_{31} = 0.31, t = 2.30, p < 0.05$), and the direct effect of learning strategies on academic achievement ($\beta_{32} = 0.34, t = 2.19, p < 0.05$). In other words, in English learning, the students who defended learning intention by action control tended to use learning strategies, which would enhance their academic achievement. The frequent use of learning strategies would also enhance academic achievement.

Residual variance of latent dependent variables: The residual variance (ζ_1) of action control is 0.34, that (ζ_2) of learning strategies is 0.07 and that (ζ_3) of learning strategies is 0.28. Based on the above, among all direct effect values, that of affection/motivation on action control is the highest (0.81) and the second is that of action control on learning strategies (0.75). The least is that of academic achievement on learning strategies (0.24).

(2) Indirect effects of latent variables in English learning process model

Indirect effect of latent dependent variables on latent dependent variables: Indirect effect of affection/motivation on learning strategies and academic achievement was significant (0.05). Through the mediating effect of action control, indirect effect of affection /motivation on learning strategies was 0.62 ($\gamma_{11} \times \beta_{21} = 0.81 \times 0.75 = 0.61$) which was higher than the direct effect (0.25) ($\gamma_{21} = 0.25$) of affection/motivation on learning strategies. It showed that the students with more affection/motivation tended to defend learning intention by action control, which will increase the use of learning strategies. The observed data indicated that direct and indirect effects of affection/motivation on academic achievement were significant ($t = 3.81, t = 10.62, p < 0.05$). Affection/motivation indirectly influenced academic achievement through three paths. First, the path from affection/motivation, action control to academic achievement, the normalized effect of this path was 0.25 ($\gamma_{11} \times \beta_{31} = 0.81 \times 0.31 = 0.25$). The second one was from affection/motivation, learning strategies to academic achievement. The normalized effect of this path was 0.01 ($\gamma_{21} \times \beta_{32} = 0.25 \times 0.34 = 0.008$). The third one was from affection/motivation, action control, learning strategies to academic achievement. The normalized effect of this path was 0.21 ($\gamma_{11} \times \beta_{21} \times \beta_{32} = 0.81 \times 0.75 \times 0.34 = 0.21$). Total normalized indirect effect of these three paths was 0.54. Among the three paths, indirect effect of affection/motivation on action control was the most significant and that of action control on academic achievement was the most insignificant.

Indirect effect of latent dependent variables on latent dependent variables: With regard to indirect effect of latent dependent variables on latent dependent variables, indirect effect of action control on academic achievement was significant ($t = 2.17, p < 0.05$). Through action control, indirect effect (0.61) of affection/motivation on learning strategies was the highest. The second was the indirect effect (0.54) of affection /motivation on academic achievement through action control and learning strategies. The least was indirect effect (0.25) of action control on academic achievement through learning strategies.

(3) Total effect among latent variables in English learning process model

Total effect of latent independent variables on latent dependent variables: Normalized total

effects of affection/motivation on action control, learning strategies and academic achievement were 0.81, 0.86 and 0.78, respectively. In this study, total effect of affection/motivation on action control was equal to the direct effect. With regard to the influence of affection/motivation on learning strategies, total effect referred to direct effect (0.25) and indirect effect (0.61). In addition, total effect of affection/motivation on academic achievement was .78, including the direct effect (0.24) and indirect effect (0.54). Noticeably, normalized indirect effect of affection/motivation on learning strategies was 0.61 and it was 70% of total effect, more than the normalized direct effect (0.25). It demonstrated the critical mediating role of action control between affection/motivation and learning strategies.

Total effect of latent dependent variables on latent dependent variables: Normalized total effects of action control on learning strategies and academic achievement were 0.75 and 0.56. This study assumed that action control only revealed direct effect on learning strategies. Thus, total effect of action control on learning strategies was equal to the direct effect. With regard to the influence of action control on academic achievement, the observed data indicated that the normalized total effect of action control on academic achievement was 0.56, including direct effect (0.31) (β_{31}) and indirect effect (0.05) ($\beta_{21} \times \beta_{32} = 0.75 \times 0.34 = 0.25$). Moreover, normalized total effect of learning strategies on academic achievement was .34. Since learning strategies did not reveal indirect effect on academic achievement, the total effect was equal to direct effect. With regard to total effects of latent variables, that of affection/motivation on learning strategies was the highest (0.86), the second was that (0.81) of affection/motivation on action control and the least was that of (0.34) learning strategies on academic achievement.

SUGGESTIONS

In this study, except for chi-square test, the rest measures indicated that the good fit between the theoretical model and data observed in this study. Thus, the theoretical model of English learning performance could explain the actual data. The following two suggestions were derived based on the results of this study.

In English instruction, the integration of affection/motivation, action control, learning strategies, and academic achievement should be valued.

Past studies on instruction and learning tended to evaluate the students' learning effect by intellectual and external performance. However, cognitive psychology conducted in-depth analysis on the internal process of human beings' learning. With new technologies and urgent demand for educational reform, people turned the interest to the internal process of learning. The model validation of this study confirmed the importance of cognition and affection to English learning performance which could be further applied.

Including action control training in English instruction and reinforcing the students' action intention of learning will help students' English learning.

According to the related studies, "action control" was a critical intervening variable in learning process. Past studies have demonstrated that when learners are more educated, they tend to lose the motivation in learning, be less persistent and be lazy (Cherng & Lin, 2002; Wigfield & Eccles, 2000). Technological and vocational college students do not have significant English proficiency back in the studies in vocational schools. Since English courses become more difficult and the students are not willing to overcome the obstacles, the students would lose their interests in English learning and even totally give it up. It is the situation that teachers, educators, or other stakeholders do not expect. Therefore, it is necessary to include action control training in English courses to allow the students to try to recognize the distraction, probe into and fulfill action control, actively deal with learning by varied strategies, continue learning and be more confident in English learning.

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