

Are Traditional Motivation Theories Used in Face-to-Face Classes Valid in an E-learning Environment?: Focusing on the Self-Determination Theory

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This research aims to develop an elementary school English e-learning system based on the 'Self-determination theory (SDT)', which is widely applied to traditional face-to-face foreign language classes. The study also attempts to verify whether SDT—a traditional motivational theory that has been applied to face-to-face classes—is effective in an e-Learning environment with students who use this newly developed system. For the purposes of this project, the following three actions were carried out. First, a motivational strategy based on SDT was deduced. In SDT, the needs for autonomy, competence, and relatedness were introduced as basic psychological needs, and assumed that these three needs provided the natural motivation for learning, growth, and development. Second, an e-Learning system was created based on the deduced motivational strategy. Third, the system was implemented in 115 private tuition academies, and education was provided to 1,400 users for one year across the country. Afterwards, by surveying users, correlation between the role of the three psychological needs in learning English, and also the correlation between each need and motivation were investigated. Research results showed that traditional motivational theories used in face-to-face classes so far were effective in an e-Learning environment.

Keywords : motivation strategy, e-Learning system, self determination theory, elementary English

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Introduction

The purpose of this study is to develop and verify the effectiveness of an e-Learning system (www.englishbuddy.kr) for teaching elementary English that enhances students' intrinsic motivation and that is based on traditional motivation theory. This study is necessary because, first, although various e-Learning programs have been developed, few systems have systematically integrated educational theory. Second, few studies have empirically verified whether the motivation theory used in face-to-face classes is also effective in an e-Learning environment. The e-Learning environment is characterized by flexibility, accessibility, and computer-mediated communication, but it lacks the face-to-face contact of the physical classroom. Accordingly, it is necessary to determine whether traditional motivational theory is applicable in this new learning environment.

Until recently, studies on using motivational strategy to improve learners' motivation during class were conducted from a pedagogical perspective (Dörnyei, 2001; Williams & Burden, 1999). Although some studies have integrated motivational strategies into e-Learning (Carr, 2000; Clark, 2003), most of them have been limited to highlighting the fact that high rates of attrition, which are a negative index of motivation, were putting pressure on e-Learning as a means of motivating students. No studies have empirically verified whether motivational strategies are applicable in an e-Learning environment.

With these considerations in mind, we developed an e-Learning system for teaching elementary school English. This system aims to enhance students' intrinsic motivation based on traditional motivation theory. We also verify the educational effectiveness of the system. Our research questions are as follows:

1. How will we apply the motivational strategies derived from motivation theory to the e-Learning system?
2. How did the new e-Learning system enhance the learner's intrinsic motivation for studying English?

We will make use of the SDT strategies proposed by Deci and Ryan (1985, 2002) because their theories have been most widely applied in motivation studies related to foreign language study. SDT (Deci & Ryan, 1987, 2002) is frequently referenced when reviewing strategies to improve motivation in foreign language study. However, few studies have applied SDT to the e-Learning environment to support foreign language study (Kuan-Chung Chen & Syh-Jong Jang, 2011).

This study intends to develop an elementary English e-Learning system based on strategies derived from motivational theory and to examine its educational effects at 115 private tuition academies over one year. Afterwards, by surveying 1,400 users, the correlation between the role of the three psychological needs in learning English, and also the correlation between each need and motivation were investigated.

Research model based on motivation theory

Self-determination theory and foreign language study

Self-determination theory addresses factors that either facilitate or undermine motivation, both intrinsic and extrinsic. SDT is a motivation theory that started with the systematization of the organismic integration theory by adding the cognitive evaluation theory of Deci (1975); it is based on the humanistic approach. The recent SDT system established by Ryan and Deci (2002) is a macro theory consisting of four mini-theories: cognitive evaluation theory, organismic integration theory, causality orientation theory, and basic psychological needs theory.

So far, SDT has been most widely applied in situations that examine strategies to increase motivation in foreign language learning (Deci & Ryan, 1987, 2002). The advantages of applying SDT in foreign language learning are as follows (Dörnyei, 1998): 1) Being a comprehensive theory, it can examine a variety of motivation

concepts. 2) As it subdivides motivation according to the learner's degree of self-determination, the developmental change in motivation can be examined. 3) The validity of the theory can be verified by empirical methods.

SDT is prerequisite to increasing human motivation and presumes the satisfaction of the three psychological needs. The first need is for autonomy. Autonomy within SDT concerns a sense of volition or willingness when doing a task (Deci & Ryan, 1985). When activities are done for interest or personal value, perceived autonomy is high. Provisions for choice, use of rewards as informational feedback (rather than to control behavior), and non-controlling instructions have all been shown to enhance autonomy and, in turn, intrinsic motivation. Conversely, events or conditions that diminish a sense of choice, control, or freedom for either the means or ends of action interfere with perceived autonomy and can undermine intrinsic motivation (Deci, Koestner, & Ryan, 1999). That is, when one feels controlled either in pursuing an activity or in how one accomplishes it, one's sense of autonomy is diminished, and subsequent motivation wanes.

The second need is for competence, which is the need for challenge and a feeling of effectance (Deci, 1975). SDT proposes that factors that enhance the experience of competence, such as opportunities to acquire new skills or abilities, to be optimally challenged, or to receive positive feedback, enhance motivation.

The third need is for relatedness; this is learners' need to have a friendly sense of solidarity with others while being closely connected to the people around him or her or in society. In a study using exploratory factor analysis, Schmidt, Boraie, & Kassabgy (1996) presented the concept of sociality. In SDT, satisfaction of the learner's need for relatedness is not directly connected to intrinsic motivation, as are the needs for competence and autonomy. Deci and Ryan (2002) claimed that the satisfaction of the learner's need for relatedness is needed, together with satisfaction of the needs for autonomy and competence, to maintain intrinsic motivation. According to SDT, intrinsic motivation is maintained or increased when these three needs are satisfied. The causal relationship between these three

needs and intrinsic motivation has been supported in the field of foreign language learning (Noels, Pelletier, Clément, & Vallerand, 2000) as well as in the studies in psychology conducted by Deci and others (Deci, Schwartz, Sheinman, & Ryan, 1981; Deci, Koestner, & Ryan 1999; Williams, Saizow, Ross, & Deci, 1997). In other words, learners were thought to have actively engaged in learning English when their motivations were internally satisfied, as when the three psychological needs are satisfied in SDT. That is, learning activities that satisfy the three needs simultaneously are strategies to increase learners' intrinsic motivation.

With respect to motivation in English learning, Dörnyei (1994) suggested that SDT does not deal with intrinsic motivation and extrinsic motivation oppositively but, rather, deals with them as a continuum according to the learner's degree of self-determination (Fig. 1). In other words, in SDT, the state of extrinsic motivation, whose degree of self-determination is lowest, is seen as external regulation; the state of extrinsic motivation that is close to intrinsic motivation by being most self-determined, as identified regulation; and the middle of them, as introjected regulation. The five motivations can be described as follows. Amotivation, the state with no self-determination, is the lack of a will to act. External regulation refers to studying due to typical external restrictions such as rewards or deadlines. Introjected regulation, the step in which the cause for the action has just begun to be internalized, involves the individual's will to some extent. Identified regulation is the state in which individuals recognize and accept the value of studying even though they have not internalized the goal of the action fully as their own. Finally, intrinsic motivation, the type appearing completely as a result of internal regulation, is the most autonomous type of motivation with the highest level of

Type of Amotivation	Amotivation	Extrinsic Motivation			Intrinsic Motivation
Type of Regulation	Non regulation	External Regulation	Introjected Regulation	Identified Regulation	Intrinsic Regulation
Quality of Behavior	Non self-determined			self-determined	

Figure 1. Continuum of motivation based on SDT (Dörnyei, 1994)

self-determination to study, that is, because it is interesting.

Noels, Pelletier, Clement, and Vallerand (2000) found that the continuum structure of motivation can also be applied to the area of foreign language learning. And without limiting to such continuum structure, it is shown that SDT may be applied to foreign language education area not only in the context of 2nd language learning but also in the context of English education in countries where English is not the 2nd language(Hayashi, 2005; Hiromori, 2006).

Research model

This study develops a total of eight motivational strategies through an analysis of theories, including two strategies for each of four concepts: interest and the three needs. Figure 2 concerns the verification of the system model. To this end, the strategies of the e-Learning system that were intended to heighten motivation were implemented, and the subsequent effects on motivation were then verified.

Thus, the e-Learning system model is verified through an analysis of relationships among the motivational strategies, the three needs, and the learner's intrinsic motivation for studying English. Educational validity is assessed by whether the

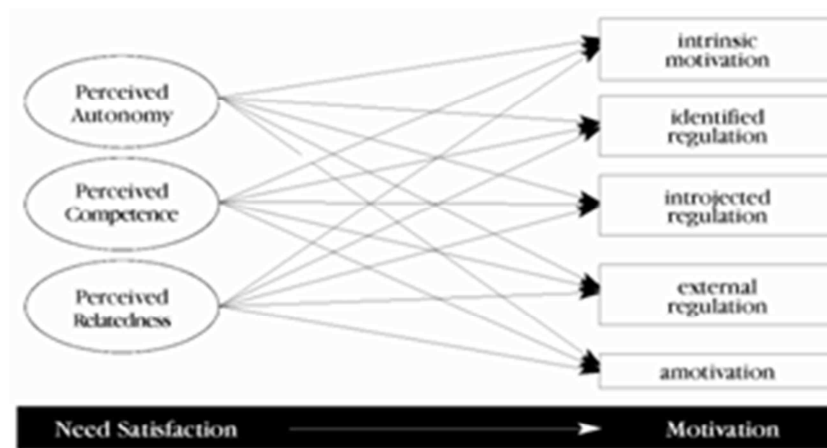


Figure 2. Verification of system model using correlations among the motivational strategies, the three needs, and the intrinsic motivation for studying English.

applied motivation theory satisfied the learner's three needs, thereby increasing the learner's intrinsic motivation for studying English.

Establishment of Motivational Strategies in the Development of the e-Learning System

This study considers learning activities that satisfy the three psychological needs to be the best strategy for improving motivation based on motivational theory. The details of the motivational strategies applied to the development of the e-Learning system are as follows.

Autonomy support strategy

Autonomous learning in SDT refers to learning in which the learner is immersed at one's own will in an autonomous and self-regulated manner in an organized setting (Deci & Ryan, 1987; Reeve, Deci, & Ryan, 2004). As a result, responsibility for one's own learning behavior is considered a key concept in fulfilling the learner's need for autonomy (Ryan, 1993). Accordingly, English Buddy provides two types of support, namely, study navigation and elective e-Learning lectures, to allow self-regulated learning. In general, in learning, planning, i.e., establishment of learning goal and determination of learning order, is a very important metacognitive activity. In hyper space, usually maintaining/sustaining such metacognitive activity during navigation is not easy, and often there is the so-called navigation problem of failing in the selection of an appropriate path (Hasekawa & Kasihara, 06). This means that much loads are applied to the learner while metacognitive activity accompanied by subjective learning in hyper space is important. In the above respect, in this study, the learner wished to provide learning navigation by adaptively composing a controllable environment under the designing policy of an

e-Learning system centered on the learner. Of course, since the restriction on direction and schedule of realizing learning is set by a developer, etc. in advance, the above support method has the characteristic of limiting the autonomy of an individual learner expected in subjective learning. Therefore, in this system, the authority for the learner to control by him/herself regarding contents/quantity of learning and learning process for effective learning control through the guidance function of a Navigation Map subject to achievement and progress of learning was ensured, and a 4 times a week coaching/modeling program was established for the learner to make the best decision in such a process. And the e-Learning System of this study was designed based upon selective e-Learning basically based upon learning as per level. Learning as per level is a learning method devising maximization of learning effect by providing class and learning contents maximally suitable to the level of the individual learner considering the varying levels of learners. Although the ideal method that may best reflect level and interest, demand, etc. of learners is customized individual learning, the adapted eclectic plan is learning as per level since it is impossible under the present school circumstances. Considering that e-Learning English learning program also is used by such learners of varying levels, in the case of this system, the selection of an A-F course for a total 6 levels was enabled, and was developed as total 3-year program. And implementing 144 weekly/monthly tests, rather than stopping as a learning guide through only one diagnosis/evaluation, the learner was able to confirm the same by him/herself by now and then the progress and results of learners could be checked.

Competence support strategy

The need for competence describes the learner's desire for an opportunity to demonstrate his/her ability to execute a learning activity. This need can be satisfied by letting the learner experience competence by providing diverse experiences of success. Positive feedback is a key element of satisfying the need for competence

(Deci, Koestner, & Ryan, 1999; Blanck, Reis, & Jackson, 1984; Vansteenkiste & Deci, 2003). Therefore, English Buddy incorporates activities that improve the learner's sense of competence with feedback from the teacher or the study program. More specifically, it provides two types of support, Schema Place, and immediate feedback on diverse learning activities.

In this model, the teacher diagnoses and activates the learner's schema by explaining the three elements of conceptual abilities, background, and process strategies that are essential for a psycholinguistic reading model, aiming to heighten the learner's sense of competence. As there were realistic limitations on feedback delivery to learners, including server configuration and client development, an education manual was provided to the teachers regarding how to provide feedback and foster competition among the learners in face-to-face classrooms.

Relatedness support strategy

Solidarity with others in a group is considered a key concept in satisfying the need for relatedness (Baumeister & Leary, 1995). To emphasize this relatedness, English Buddy was designed to be implemented in a blended learning environment. Blended learning is currently attracting attention as an educational practice that integrates face-to-face classes at elementary schools with e-Learning (Myint Swe Khine & Atputhasamy Lourdasamy, 2003). This study elected a blend that focused on group study, which is one of five blended learning models for e-Learning environments (Bersin, 2006). The system was designed to blend teacher-led lessons and self-study with e-Learning that could be used to study before, during, and after class. As a result, this program offers a sense of solidarity because its learners engage in group study through a nationwide network of academies and because it implements learning strategies that promote cooperation among the learners. This type of activity was designed to satisfy the need for relatedness through role-playing.

Development of the English Buddy System

Motivational strategies in the English Buddy system

The three factors—autonomy, competence, and relatedness—and six motivational strategies that were incorporated into English Buddy are depicted in Figure 3.

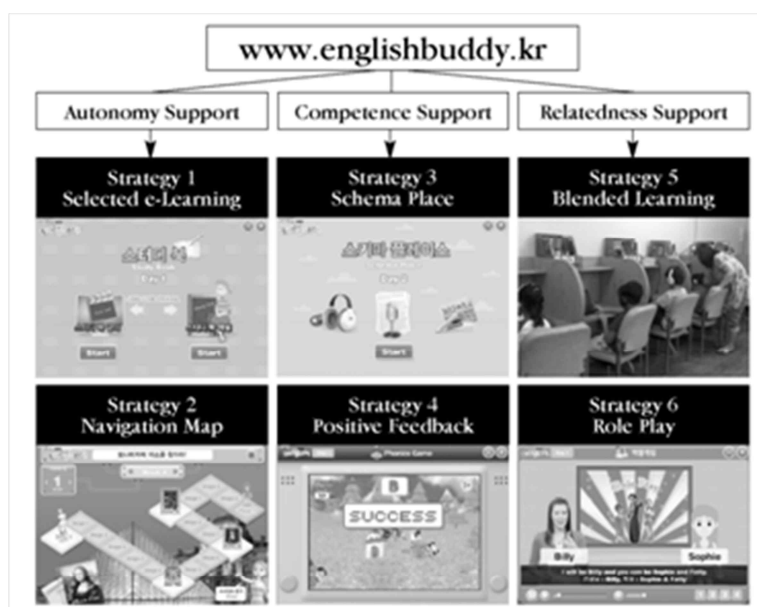


Figure 3. Motivational strategies applied to the English Buddy system

The English Buddy system

As English Buddy is a study program to be implemented at academies, only those students who take English Buddy classes are given identification and passwords for logging in. Additionally, a separate website for teachers was constructed to support the teachers teaching English Buddy, providing support

related to classes, as well as a learning management system (LMS), to track learners' results (Fig. 4).

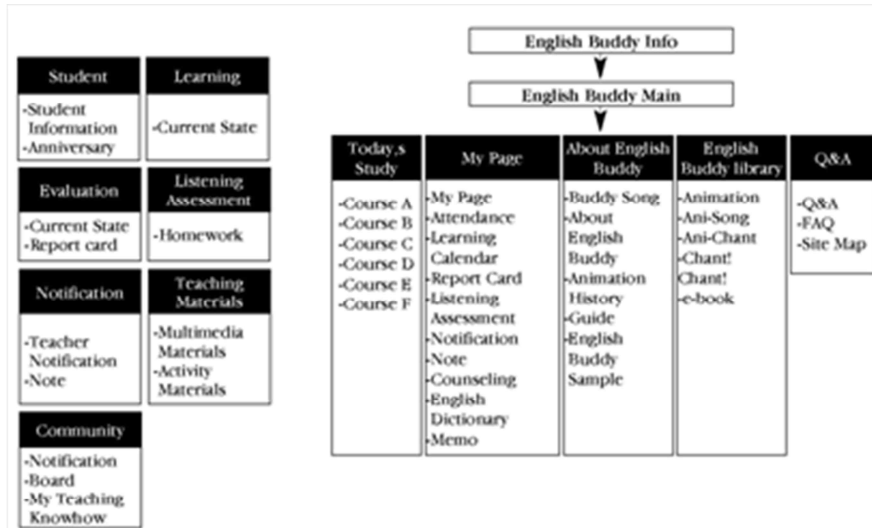


Figure 4. Site map of Teacher and Student

English Buddy Service Technology

The English Buddy system is compatible with all web browsers equipped with Adobe Flash Player, is a multi-platform, multi-browser, and supports automatic installation of the Flash player (Table 1, 2). The DC mark supplies a page showing student progress, and the grade report menu confirms whether a lesson has been completed and what progress has been made. Additionally, the overall study schedule can be checked, and the grade breakdown and past test results can be viewed. Taking the characteristics of elementary school students into consideration, the tree-form menu structure was rejected, and the menu was constructed as 1Depth. In addition, a production tool for video-based web content was employed to enable faster development and modification of contents. The server diagram is shown in Figure 5.

Table 1. Installation Software

Category	OS	Software	Etc.
Web Server	Unix	WebtoB 4.1	English Buddy Web Server
Servlet Container	Unix	Jeus 6.0	English Buddy Servlet Container
Java	Unix	JDK 1.5	English Buddy Java Runtime
Media Server	Unix	Red5	English Buddy Media Server-Recording
Mail Server	Unix	Sendmail 8.13	English Buddy Mail Server – Sending Client Arrangement Test Result to Teacher
DB Server	Unix	MySQL 5.1	Web-based Contents produce
FMS Server	Windows Server 2008	Adobe FMS INTERACT EDTNVersion3.5	FLV, MP4, F4V Streaming

Table 2. Browser Compatibility

Service	MS Explorer	Mozilla Firefox	Google Chrome	Apple Safari
Web Site	Applicable	Applicable	Applicable	Applicable
Contents (Flash)	Applicable	Applicable	Applicable	Applicable

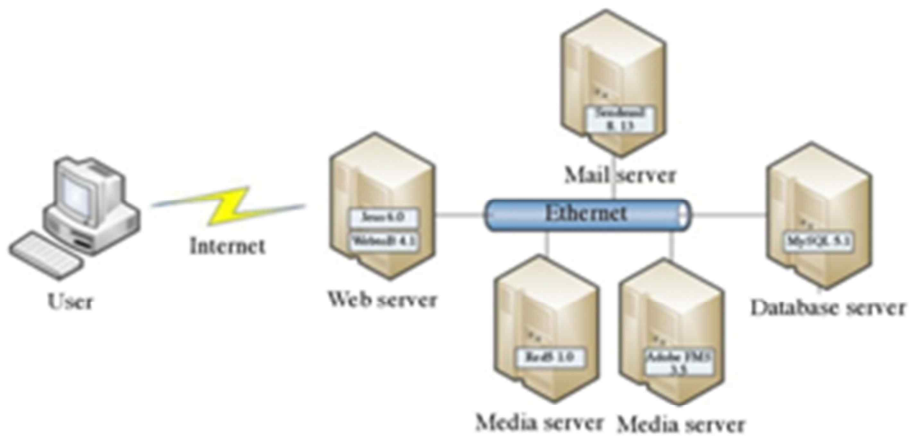


Figure 5. Web server

Educational Practice

An educational practice was implemented for over 8,000 elementary school students (1st–6th graders) at 115 private educational institutes over the country for one year (beginning July 2010) using the English Buddy System (Fig. 6). The students learned by using the lab system three times a week for 60 minutes.



Figure 6. Educational practice using the English Buddy System

Research

Specific research issues and analysis details regarding the question, “How did the new e-Learning system enhance the learner’s intrinsic motivation for studying English?”, is as follows.

1. What were the analysis results of psychological needs when learning English?
2. What were the analysis results of motivation when learning English?
3. What was the correlation between psychological need and motivation?

In order to deduce answers to the above questions, the following analyses were conducted. First, with the 1,400 students learning through English Buddy, a mean test for the three psychological needs and five motivation groups introduced in

SDT were carried out. Simultaneously, the correlation between psychological need and motivation was examined.

Methods

The investigations were conducted during the one-month period from July 1, 2011 to July 30, 2011. A survey was administered to 1,400 elementary school students who were studying with the English Buddy system at 115 academies. To accomplish the goal of this investigation, this study adopted the following two criteria for the survey.

Measurement of psychological needs related to learning English

Based on previous studies that applied SDT to other research areas, such as interpersonal relationships and the workplace (Ryan & Deci, 2000, Hiromori, 2006), a survey consisting of 11 questions was created with special attention paid to reflecting the three variables (autonomy, competence, and relatedness), the realities of the participant, and the e-Learning approach.

Assessing motivation to study English

To develop a scale of motivation regarding English language study, previous studies based on SDT (Noels, Pelletier, Clement, & Vallerand, 2000; Vallerand, 1992, Hiromori, 2006) were considered. A survey consisting of a total of 18 questions covering amotivation, intrinsic motivation, identified regulation, introjected regulation, and external regulation was devised with a focus on reflecting the realities of the participants and the e-Learning approach. Because English Buddy is an e-Learning system targeted at elementary school students, the

survey subjects were 7 to 12 years old. However, there was a lack of studies containing questions developed for elementary school students; therefore, all surveys were partially modified into wording suited for elementary school students after the initial and secondary pilot tests (June 1-7, 2011, 32 students; June 13-20, 2011, 260 students). Furthermore, all assessments were made using the 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Data analysis

Method of analysis

The motivational strategies were three categories of autonomy, competence, and relatedness. The learners were then classified into two groups (who used English Buddy by study period) by profiling the 1,265 surveys that were returned from a total of 1,400 distributed surveys.

Group A (792 people who studied for one to six months out of the 1,400 experiment participants who studied with English Buddy at an academy).

Group B (473 people who studied for seven to 12 months out of the 1,400 experiment participants who studied with English Buddy at an academy).

The purpose of this study's use of a complete enumeration method is to verify a hypothesis derived from a theory in actual classes. For this reason, the results reflect the learners' overall tendencies, rather than observations about one person's changes over the one-year education practice period.

The questions were grouped by category for the later comparison of their mean values, and the consistency of the questions was examined using the Cronbach alpha coefficient from reliability analysis. The resulting reliability was as follows: Autonomy = .620; Competence = .783; Relatedness = .857; intrinsic motivation = .877; identified regulation = .807; introjected regulation = .638; external

regulation = .717; and amotivation = .859. The Cronbach alpha coefficient was higher than 0.6, which indicates a very high consistency. Therefore, sufficient reliability for categorizing questions was confirmed.

In terms of the method of analysis, descriptive statistics, the t-test and structural equation modeling(SEM) was used to compare the means of the groups. The validity of the model was established through confirmatory factor analysis, and the relationships between the model fit and the factors were examined using a structural equation model (the indices of model fit were as follows: CFI = 0.844, NFI = 0.824, PCFI = 0.749, PNFI = 0.731, RMSEA = 0.055).

Analysis results

Analysis results of psychological needs regarding English education

First, mean difference analysis was applied to Group A and B to ensure their quality. This was completed prior to applying Levene’s equal variance test, and subsequently verified both groups’ identical quality(Table 3). An analysis of all items through an independent samples t-test showed there were statistically significant differences at the > 99.9% confidence level.

Table 3. Homogeneity Analysis of Group A and Group B in Terms of psychological needs

	Levene’s Homogeneity of Variance Test	
	F	p-value
Autonomy	0.927	0.336
Competence	0.668	0.414
Relatedness	3.291	0.07

Confirmative factor analysis was conducted by structural equation modelling in order to review whether lower measures used in this research appropriately reflected the constructs responding to each item (Fig. 7).

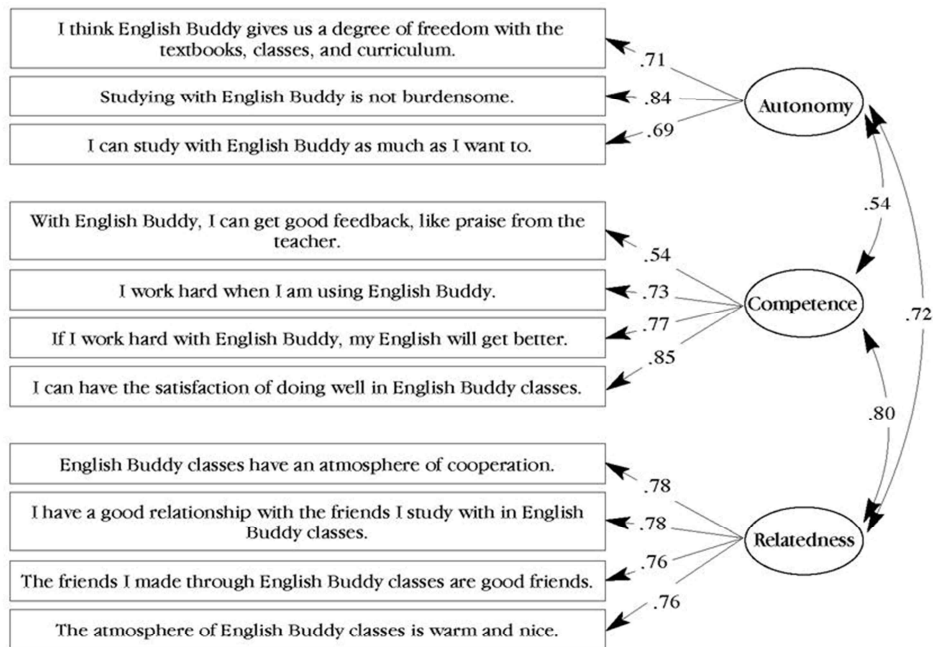


Figure 7. Results of the confirmatory factor analysis of the scale of psychological needs.

The index used to measure goodness of fit was CFI = 0.964, NFI = 0.959 PCFI = 0.599, and RMSEA = 0.053.

Given the fact that the values for CFI and other measurements exceeded 0.9 by a large margin, and the RMSEA was roughly 0.05, the index was conclusive, in spite of the PCFI being somewhat lacking. Validity of the reliability coefficients was secured for each lower measure since they scored above 0.7 in general.

Overall, the results showed a strong correlation between each fundamental psychological need. With an $r = .80$, autonomy and competence had a strong relationship, autonomy and relatedness had an $r = 0.72$, while competence and relatedness had an $r = 0.80$. Such results can be interpreted in the following way. For example, when speaking of the relationship between autonomy and competence, one can assert that students who studied willingly tended to have more competence in that particular environment. Also for students who felt they

had a good relationship with their friends (i.e. their need for relatedness was satisfied), they perceived that the e-Learning environment responded to their needs in a flexible manner (i.e. their need for autonomy was satisfied). Therefore correlation between each factor of the three psychological needs turned out to be high in an e-Learning environment.

Analysis results of motivation in learning English

For each item, the mean was distributed between 3 and 4 and no items showed any extreme tendencies. Therefore subsequent analyses used all 18 items. Confirmatory factor analysis was conducted by structural equation modeling in

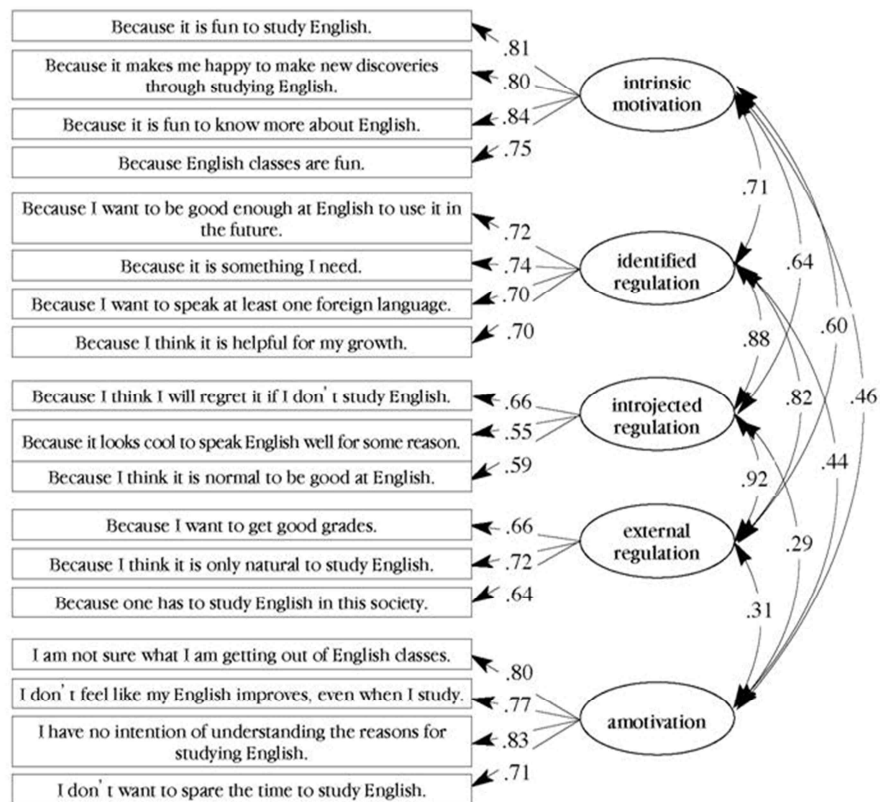


Figure 8. Results of the confirmatory factor analysis pertaining to the scale of motivation

order to review whether lower measures used in this research appropriately reflected the constructs responding to each item (fig. 8). The index used to measure goodness of fit was CFI = 0.952, NFI = 0.945 PCFI = 0.696, and RMSEA = 0.056. Therefore, given the fact that the values for CFI and other measurements exceeded 0.9 by a large margin, RMSEA was roughly 0.05, and the PCFI was also approximately 0.7, the index results were convincing. Validity of the reliability coefficients was secured for each lower measure as such.

With regards to correlation between different factors, Deci and Ryan (1985) introduced the 'simplex structure' between motivation groups. As evident in figure 1, which outlines the continuum of motivation based on SDT, a simplex structure refers to an ordered coefficient structure where, given the existence of multiple concepts with varying degrees placed upon a single dimension continuum, directly adjacent concepts in this correlation matrix have a higher correlation than those situated far apart, and concepts placed at the opposite extremes of a continuum have the lowest correlation or an unqualified form. Therefore calculating the correlation matrix between these five motivation types placed upon the continuous line of self-determination can be expected to result in a simplex structure.

As examples of correlation between factors from the analysis, correlation to intrinsic motivation was weaker for factors further removed from being an adjacent relationship as it was $r = .71$ for identified regulation, $r = .64$ for introjected regulation, $r = .60$ for external regulation, and $r = .46$ for amotivation. Correlation between other factors also yielded the same result. As such, it was confirmed that motivation of SDT within an e-Learning environment formed a continuum based on self-determination in the order of intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation.

Cause and effect model of psychological need and motivation

To review the overall correlation between psychological need and each type of motivation, structured equation modeling was conducted. Here, the cause and

effect model, which was based on preceding research by Deci and Ryan (1985a, 2002), Vallerand (1997, 2000) etc., asserted that the three psychological needs affected each type of motivation separately. Research results were illustrated in Figure 9.

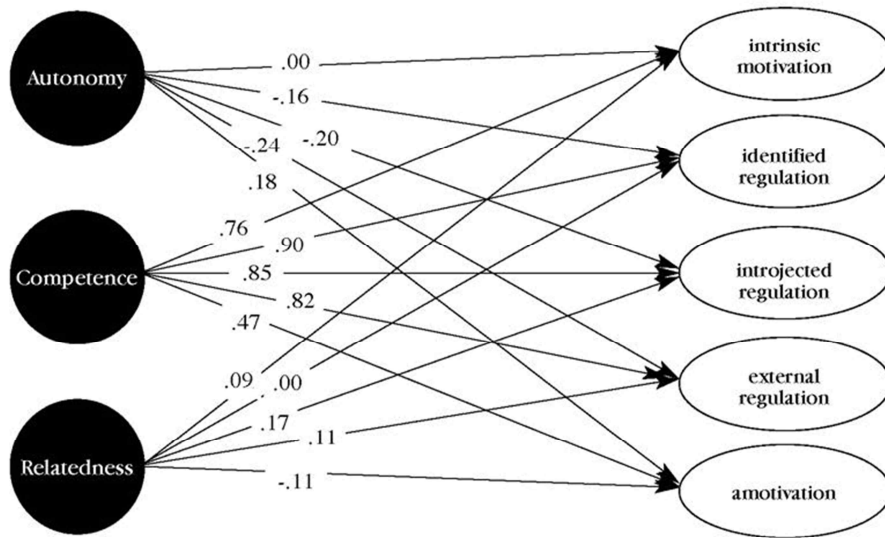


Figure 9. Cause and effect model of psychological need and motivation group

The index used to measure goodness of fit was CFI = 0.853, NFI = 0.841 PCFI = 0.710, and RMSEA = 0.069. CFI and NFI did not exceed 0.9, however, they were at 0.85 and the value for RMSEA was between 0.05 and 0.08, so therefore the validity of the index was sufficient. Interpretations from the model which is appropriate for the theory, can be described from three perspectives.

First, among the three psychological needs perception of competence had the strongest influence on each type of motivation. Therefore, the results of this research suggest the possibility of the learner's perception of competence performing an important role in enhancing the learner's motivation in e-Learning.

Second, for this research, the needs of autonomy and relatedness had an

insignificant effect on the five motivation groups. In particular, for autonomy, it had a negative coefficient for all motivation groups apart from amotivation. Since results show that autonomy and competence, competence and relatedness have close cause and effect relationships they have a strong correlation (correlation between the two factors are $r = .80$ each). For this reason it suggests the possibility that competence represents the characteristics of autonomy and relatedness. In fact, conducting the model analysis of autonomy and relatedness, excluding the effects of competence, yielded the following results. For autonomy, the value for intrinsic motivation was $r = .75$, identified regulation was $r = .91$, introjected regulation was $r = .93$, external regulation was $r = .85$, and amotivation was $r = .45$. Meanwhile for relatedness, intrinsic motivation had a value of $r = .77$, identified regulation of $r = .8$, introjected regulation of $r = .87$, external regulation of $r = .80$, and amotivation of $r = .43$ (fig. 10).

Therefore it can be argued that, as with competence, autonomy and relatedness performed important roles in enhancing motivation.

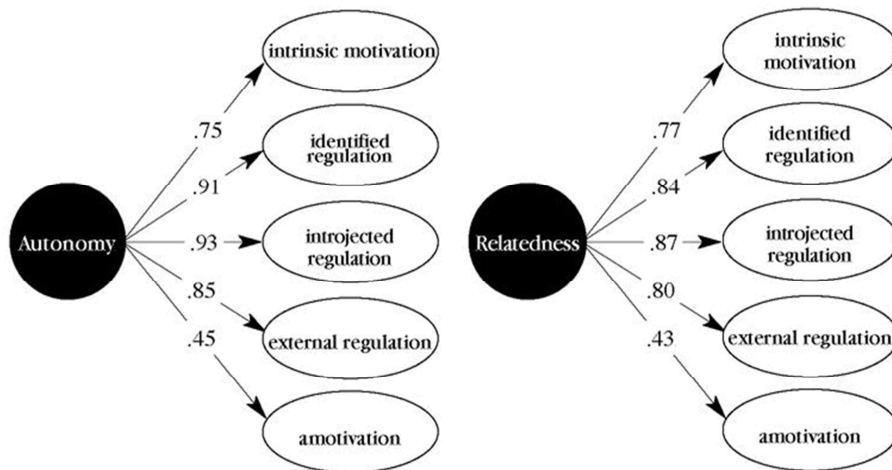


Figure 10. Cause and effect model of the autonomy and the relatedness need and motivation groups

Discussion and conclusion

This study, so far, investigated the functions of the three psychological needs in learning English, and the correlation between each need and motivation. Results confirmed that the three psychological needs and each motivation group formed a close relationship. This research suggests that the three psychological needs, which are assumed to have an important role in enhancing the motivation of learners, have the possibility of regulating the learner's perception regarding their learning environment.

In particular, the study implies that the perception of competence is indispensable when intrinsic motivation increases. Competence refers to the state where the learner feels that a task is possible to perform independently, and it is similar to the concept of self-efficacy advocated by scholars such as Bandura (1977) etc. Therefore activities that enhance the learner's self-efficacy or perception of competence are very important in supporting the learner's eagerness towards learning. Moreover, the research reveals that autonomy and relatedness also play an important role in enhancing motivation, much like competence. Especially, there is a need to focus on not only factors related to the learner personally such as self-determination and perception of competence, but also factors related to others in e-Learning. Clément, Dornyei, and Noels (1994) pointed out that the perception of group cohesion between learners will be highly correlated to not only the learner's positive evaluation of the class, but also the teacher's evaluation of the learning group.

In terms of enhancing the learner's motivation, this research clarifies that SDT variables – autonomy, competence, and relatedness – perform the role of 'factors that enhance motivation', and reveals the fact that "the three psychological needs (autonomy, competence, and relatedness) in SDT have a great impact on augmenting the motivation of English learners". This means that SDT supports the e-Learning environment.

However, this research remains at the stage of discussing the correlation between each need and motivation, much like existing literature by Noels etc. (Noels, Clement, and Pelletier, 1999). Furthermore, the cause and effect relationship between the three psychological needs and motivation, in other words whether motivation does indeed increase by satisfying the three needs, must be re-examined.

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