

A STUDY OF THE EFFECTS OF MODES OF COURSE INSTRUCTION ON STUDENTS' LEARNING MOTIVATION AND OUTCOMES

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Abstract

This study aimed to investigate the effects of the mode of online course instruction on the learning motivation and outcomes of university students. Self-efficacy was used as the mediator so that teachers could understand whether students' learning motivation could improve their learning outcomes through self-efficacy so as to provide a reference for the reform of the modes of instruction in universities, and as well for teachers in their instruction in the future. The research subjects were 5 universities in Hainan offering online courses. There were 425 returned effective questionnaires, which were analyzed and validated using structural equation modeling (SEM). The findings showed that under the mode of online course instruction, students' learning motivation and self-efficacy had

positive effect on their learning outcomes. At the same time, their positive learning motivation could strengthen their perceived self-efficacy, which in turn improve their learning outcomes. Thus, this verified that the mode of online course instruction can indeed elicit students' learning motivation, facilitating their performance and outcomes in learning.

Key words: Online Instructional Mode, Learning Motivation, Self-efficacy, Learning Outcomes

Introduction

Research Background and Motives

As a result of the widespread establishment of universities and colleges all over China following its reform and opening up, university and college acceptance rates have gradually increased. This continuous expansion of the scale of higher education has generated a series of problems; in particular, the contradiction between the increase in student numbers and the improvement in instructional quality has become increasingly prominent. Among these problems, the one that has drawn most attention is students' learning outcomes. Given the increase in the number of universities and colleges, acceptance rate rises accordingly, as a result of which some students entering colleges with less than satisfactory results, no learning motivation and poor learning outcomes, contributing to a negative mentality that they can graduate without having to make real effort in their studies (Ho & Peng, 2016).

Related studies on higher education have pointed out that students' learning outcomes can be significantly enhanced through diverse modes of course instruction, such as improvement in teaching quality, course design and

innovation, and optimization of resources and equipment (Maringe & Sing, 2014; Pike, Smart, & Ethington, 2012). With respect to the learning conditions of university students, if the chances for interaction between teachers and students increase, the latter will be more focused on the courses, which can further increase their learning motivation (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005). The key to learning motivation and outcomes lies in the instruction and guidance of teachers, whether in the form of randomly picking students for feedback and discussion or simply asking one-way questions, either of which can improve students' loss of focus arising in the learning process (Astin, 1999).

Under the traditional mode of classroom instruction, university instructional mode is always associated with such factors as teachers (faculty members), multi-media platforms, classroom desks, and teaching materials, with teachers, teaching materials, and lecture rooms occupying the central position. The learning of students is reduced to the path of passively receiving the knowledge transmitted by their teachers, a form so monotonous that is hardly conducive to increasing students' learning motivation, not to say enhancing their learning outcomes. Weng (2012) found that university education is now

facing narrow and backward educational ideas and modes of instruction, which are expressed in its narrow view of cognitive development, distorted view of respect for teachers, and mechanical and monotonous instructional mode of lecturing and listening. In such a mode, the emphasis is on the imparting and reception of knowledge without an education for sound personality; rote learning takes the center stage, while independent thinking, creative thinking and imagination, critical consciousness and ability, innovative spirit, and practical ability have not been cultivated and improved as they should have.

Further, the spoon-fed education, with its utilitarian examination mode geared to credentialism, comes to be an impediment to students' learning, depriving them of self-learning motivation and learning efficiency. Huang and Chen (2018) held that there is a need for the differentiation of the modes of course instruction, for differentiated instruction stresses that teachers have to make pedagogical adaptation in response to the learning needs of their students so that each student can attain the effectiveness of self-learning, instead of expecting students to adjust themselves to accommodate to the courses. Thus, teachers should provide a mode of customized course learning so as to enhance students' learning motivation and outcomes to supplement the inadequacy of the traditional didactic instruction. Further, Means, Toyama, Murphy, Bakia, and Jones (2009) argued that the learning performance of hybrid learning that combines online and classroom instructions is better than that of the traditional learning mode.

Moreover, online instructional mode can increase students' learning motivation and perceived self-efficacy that in turn facilitates their learning development and performance. However, as for the factors influencing the learning motivation and outcomes of today's university students, other than the changes in the educational system, another possible factors may lie in the types and modes of course instruction. Hence, this study intended to understand the effects of university students' learning motivation and self-efficacy on their learning outcomes, by investigating online instructional mode. This was the main theme of its motive.

Research Purposes

In light of the above investigation of the learning motivation and outcomes of university students, one can understand that the factor of mode of course instruction has relevant effects on students' learning motivation and outcomes. Therefore, this study sought to understand the effects of the mode of online course instruction on the relationships among learning motivation, self-efficacy, and learning outcomes. It thus had the following research goals.

1. To investigate the effect of students' learning motivation on their learning outcomes under the online instructional mode.
2. To investigate the effect of students' self-efficacy on their learning outcomes under the online instructional mode.

3. To investigate the effect of students' learning motivation on their self-efficacy under the online instructional mode.
4. To investigate the mediating effect of students' self-efficacy between their learning motivation and learning outcomes under the online instructional mode.

Literature Review

In recent years, different scholars have defined learning motivation and learning outcomes rather differently, but all emphasized learning motivation as one of the indispensable factors for maintaining learning behavior (Gage & Berliner, 1998). Learning achievement is defined as the knowledge, skills, and abilities they can apply in their work (Pham & Huynh, 2018). Pulkka & Niemivirta (2013) proposed eight dimensions and investigated their predictive power for students' learning outcomes. These include interest, teacher competency, quality of teaching materials, course satisfaction, quality of assessment methods, students' efforts and outcomes, and classroom participation. Further, learning outcomes are an indicator of learners' learning achievement, and also one of the key items in the evaluation of teaching quality. Students' motivation and their learning outcomes are related (Bain, McCallum, Bell, Cochran, & Sawyer, 2010). Tella (2007) also believed that motivation is a necessary factor for learning; if motivation is missing in learning, it is impossible to produce satisfying learning effects.

Therefore, when universities are concerned with the issue of the performance in running a university, they should consider the important dimensions of effective learning, and understand how to elicit the learning motivation of university students.

Keller's (1999) ARCS motivational model of learning has been regarded as a more structured and effective teaching strategy. The main point of this theoretical model is as follows: if teachers can apply the structured motivational model to improve existing teaching materials, they can maximize the effectiveness of that instructional strategy, for learners' motivation and instructional material design will affect the effort of learners in that activity, and directly affect the motive force of learner to actively seek knowledge as well. Schär and Krueger (2000) considered that if instructions can combine with visual and audio multimedia, it can reduce students' cognitive burden in learning, and can readily attract learners' attention, increase their learning motivation and enhance learning outcomes. Li (2017) argued that the introduction of instructional media and differentiated instructional mode produce a certain degree of influence on students' learning motivation and outcomes. So, teachers should pay attention to their students' learning motivation. If students can have a more positive learning motivation and instructional media use with regard to such media, their learning outcomes will be further enhanced. Multimedia instruction can indeed increase the learning motivation of students, which as a result can maintain an enthusiastic attitude to learning in the learning process, and in

turn attain effective and meaningful learning (Keller, 1999).

Zhang & Ardasheva (2019) stated that self-efficacy plays a crucial role in the learning process and outcomes, rendering learners to be more cognitive, responsive and motivated in the learning process (Anam & Stracke, 2016). Self-efficacy refers to an individual's judgment of her/his skills and competences (Skaalvik & Skaalvik, 2014), while learning self-efficacy refers to students' perceptions of their learning goals and ability to realize such goals (Wiggins, Grafsgaard, Boyer, Wiebe, & Lester, 2017). Bandura (1986) took an individual's self-efficacy as originating from a synthetic evaluation of four sources, namely, performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. Further, self-efficacy remains the major factor influencing an individual's behavioral motivation. In other words, an individual's expectation of the result of her/his performance depends mainly on her/his judgment of her/his ability to cope with a certain situation (Bandura, 1986; Zimmerman, 2000). The motivation for self-regulated learning is the key affecting learners' interest and academic achievement, and motivational belief includes self-efficacy, intrinsic value and test anxiety (Pintrich & De Groot, 1990). Also, an individual's evaluation of her/his self-efficacy has a causal effect on academic motivation (Zimmerman, 2000). Schunk (1996) also found that learning motivation is an important predictor of self-efficacy, which means the higher the learning motivation, the higher the perceived self-efficacy, and vice versa. According to Moreno's (2006)

cognitive-affective theory of learning with media (CATLM), multimedia affect the effectiveness of learning methods, and improve the smoothness of the cognitive-affective process; it also demonstrates how affect and interest improve the handling of cognitive processes to facilitate the enhancement of affect. Therefore, this study took the CATLM theory as its theoretical foundation in its investigation of the effect of the learning motivation of students receiving online instruction on their learning outcomes, and the mediating effect of self-efficacy.

Research Methods

Research Framework

The theoretical foundation of this study was Moreno's (2006) cognitive-affective theory of learning with media, with the aim to investigate the effect of the learning motivation of students receiving online instruction on their learning outcomes, and the mediating effect of self-efficacy. Structural equation modeling (SEM) was used to analyze the data, and the concrete path of its research hypotheses is shown in Figure 1.

Research Hypotheses

The research hypotheses below were proposed based on the literature review and research framework.

H₁: Students' learning motivation has positive effect on their learning outcomes.

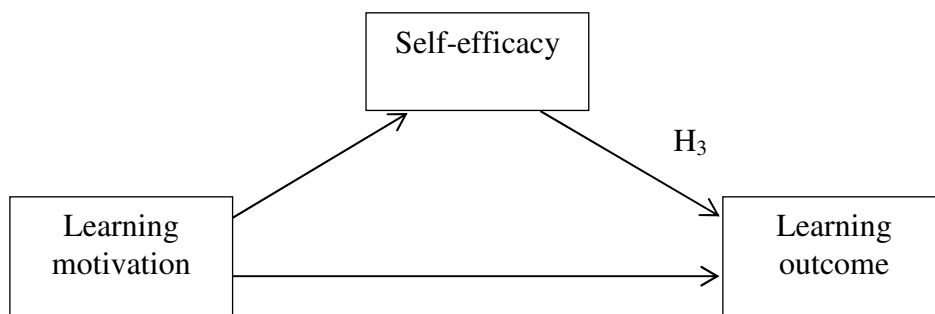
H₂: Students' learning motivation has positive effect on their self-efficacy.

H₃: Students' self-efficacy has positive effect on their learning outcomes.

H₄: The mediating effect of students' self-efficacy between learning motivation and learning outcomes.

Research Sample

The research samples were the university students in Hainan. By means of purposive sampling, 5 universities with online instruction were selected, and 90 students were picked from each of them, totaling 450 students. 435 questionnaires were returned, with 425 effective ones after removing the invalid ones. Of the 425 samples, 153 were male students and 272 were female.



Research Tools

This study employed Keller's (1987) ARCS Motivated Strategies and Learning Questionnaire to measure the learning motivation of Hainan university and college students, with a total of 10 questions. The results of the confirmatory factor analysis (CFA) showed that the factor loadings of the questions in each dimension fell between 0.656 and 0.840; the construct reliability (CR) was respectively 0.935, which exceeded the evaluation criterion of 0.60, indicating the good discrimination of this scale. The average variance extracted (AVE) was respectively 0.593, which exceeded

the evaluation criterion of 0.40 (Fornell & Larcker, 1981).

This study drew on Scholz's, Doña's, Sud's, & Schwarzer's (2002) self-efficacy scale to investigate the self-efficacy of Hainan university students in online instructional mode, with a total of 10 questions. The CFA results showed the factor loadings as between 0.466 and 0.819; the CR was 0.891, and the AVE was 0.455, indicating the good discrimination of this scale.

This study employed the students' learning outcomes scale developed by Pike, Kuh, McCormick, Ethington, &

Smart (2011), which is divided into 2 dimensions, namely cognitive and non-cognitive gains, and with a total of 15 questions. According to the CFA results, the overall factor loadings in the cognitive gain dimension fell between 0.663 and 0.787, while those of the questions in the non-cognitive gain dimension were between 0.627 and 0.761; the CR was 0.893, and the AVE was 0.472, indicating the good discrimination of this scale.

Research Results

This study first measured the overall goodness-of-fit of the entire model of the effects of the instructional modes in Hainan universities and colleges on students' learning motivation and outcomes. The evaluation was carried out in three aspects, "measures of absolute fit," "incremental fit measures," and "parsimonious fit measures," which took reference from Hair, Anderson, Tatham and Black (1998). In the "measures of absolute fit," the χ^2 value was 1584.597, and $\chi^2/df=2.855$, which conformed to $\chi^2/df<3$; RMSEA =.066, which though greater than the rigorous standard of 0.05, remained acceptable as it was under 0.8; GFI =.817, AGFI=.792, and SRMR=.0482, which was smaller than the standard of 0.05. In the "incremental fit measures," CFI was .889, IFI was .889, and NNFI was .839, which did not reach the standard of 0.9, but still acceptable as they were close to 1. In the "parsimonious fit measures," PNFI and PGFI were .783 and .719 respectively, both greater than the standard of .50 (Ullman, 2001), which also indicated that the entire model possessed the goodness-of-fit.

As shown in Table 1, the path coefficients of the learning motivation and self-efficacy of Hainan university and college students in relation to their learning outcomes were .576 ($p < .05$) and .329 ($p < .05$) respectively. This indicated that Hainan university students' self-efficacy and learning motivation had significant positive effect on their academic achievement, thus validating H₁ and H₃. This shows that students with high learning motivation and high self-efficacy will have better academic achievement. This research result is consistent with the views of Ismail, Hasan, & Sulaiman (2010). Secondly, the path coefficient of learning motivation in relation to self-efficacy was .779 ($p < .05$). This demonstrates that the higher the learning motivation of students, the higher their self-efficacy, which is consistent with the research findings of Zimmerman (2000). Thus, H₂ is valid.

In order to test the mediator model, this study sought to increase the accuracy of the estimated value in testing the mediating effect by using Shrout's and Bolger's (2002) bootstrapping method. As such a method is to obtain the average of the mediating effects and 95% confidence intervals through a resampling program, if the 95% confidence intervals of the mediating effect obtained through resampling do not include 0, it means that the mediating effect reaches the $p < .05$. significance level (Shrout & Bolger, 2002).

Table 1. Bootstrap SEM analysis of total, direct, and indirect effects

Effect	Estimate	<i>p</i> value	Confidence Interval
Direct effect			
Learning motivation -> Self-efficacy	0.779	< 0.05	[.709, .838]
Self-efficacy -> Learning outcomes	0.576	< 0.05	[.435, .699]
Learning motivation -> Learning outcomes	0.329	< 0.05	[.190, .472]
Indirect effect			
Learning motivation -> Learning outcomes	0.449	< 0.05	[.347, .563]
Total effect			
Learning motivation -> Learning outcomes	0.778	< 0.05	[.708, .836]

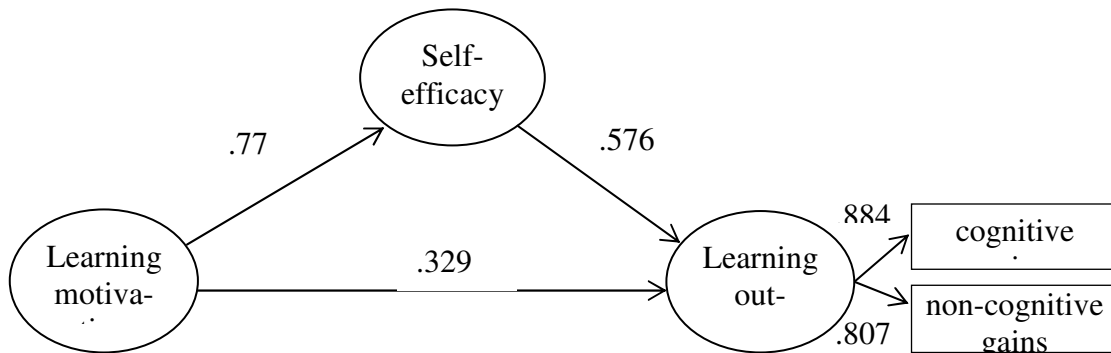


Figure 2 SEM Path Coefficient Diagram

The indirect effect of self-efficacy between learning motivation and outcomes was .449 ($.779 * .576$), and its confidence intervals [.347, .563] did not include 0, thus reaching the significance effect ($p < .05$), indicating that self-efficacy had the mediating effect. Its direct effect was 0.329, confidence intervals [.190, .472] did not include 0, and so its total effect should be .778 ($.329 + .449$). As its confidence intervals [.708, .836] did not include 0, this suggested that the effect was of statistically

significant, and that self-efficacy had partial mediating effect between learning motivation and outcomes (Table 1 and Figure 2), and thus H4 is valid. This indicated that Hainan university and college students' learning motivation would directly affect their self-efficacy and learning outcomes, and their learning motivation could also affect their outcomes through self-efficacy.

Conclusion and Recommendations

Research Conclusion

The main purpose of this study was to understand whether students' learning motivation could affect their learning outcomes through self-efficacy when universities and colleges in Hainan are using the online instructional mode, so as to provide a basis of reference for instructional reforms in universities and colleges. The research results showed that students' self-efficacy played a partial mediating role between learning motivation and outcomes. This indicates that the higher the learning motivation of students using online instruction is, the better their self-efficacy and learning outcomes are (Ismail et al., 2010). That is to say, when students find the course content makes sense to them, and are interested in and satisfied with the course, they will be more confident of themselves in learning the course, and can acquire the ability required for the course (Zimmerman, 2000; Schunk, 1996).

When students' have positive learning motivation, they will improve their learning outcomes through their higher self-efficacy. This suggests that students using online instruction find the course pleasurable, interesting and helpful. Such a course can arouse their attention, engendering in them a desire to learn. Thus, they will have greater confidence in facing the challenges posed by the course and completing the learning tasks, which in turn can help them enhance their learning outcomes with respect to the knowledge and skills related

to the course, and their personal values as well. Therefore, the online instructional mode has great help in students' learning development and performance.

Recommendations

Based on the research results, the study puts forward the following recommendations:

1. It recommends that universities and colleges make use of the online instructional mode to elicit students' learning motivation and self-efficacy to enhance their learning outcomes.
2. Teachers have to pay attention to their students' learning motivation. In designing their courses, they have to be able to engage their students' attention and interest so that their students will find the course truly helpful and can obtain satisfaction from learning.
3. Schools and teachers have to reinforce students' self-efficacy so that they can have the confidence in accepting challenges from both their courses and learning; and when confronted with problems, they can believe they have the ability to solve them, and will not be easily swayed by negative criticism.
4. The promotion of the online instructional requires the joint effort of schools and teachers for the sake of establishing a good and suitable online instructional mode and enhancing students' knowledge, techniques and ability related to course learning.

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References

- Anam, S. & Stracke, E. (2016). Language learning strategies of Indonesian primary school students: In relation to self-efficacy beliefs. *System*, 60, 1-10.
- Astin, A. W. (1999). Student involvement: A development theory for higher education. *Journal of College Student Development*. 40(5), 518-529.
- Bain, S. K., McCallum, R. S., Bell, S. M., Cochran, J. L., & Sawyer, S. C. (2010). Foreign language learning aptitudes, attitudes, attributions, and achievement of postsecondary students identified as gifted. *Journal of Advanced Academics*, 22(1), 130-156.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Gage, N. L. & Berliner, D. C. (1998). *Educational psychology* (6th ed.). Boston: Houghton Mifflin.
- Hair, J.F., R. E. Anderson, R. L. Tatham, & W. C. Black. (1998). *Multivariate Data Analysis*. Upper Saddle River, NJ, Prentice Hall.
- Ho, S. H. & Peng, Y. P. (2016). A Comparative Study on the Relationship Between Learning Motivations and Outcomes of College Students in Taiwan and Shenzhen Region of Mainland China: Learning Modes as Mediators. *Journal of Educational Practice and Research*, 29(1), 139-171.
- Huang, Y. C. & Chen, M. J. (2018). A Study on the Effects of Differentiated Instruction on Junior High School Student's Mathematics Learning. *Journal of Teacher Education and Professional Development*, 11(1), 91-122.
- Ismail, A., Hasan, A., & Sulaiman, A.Z. (2010). Supervisor's role as an antecedent of training transfer and motivation to learn in training programs. *Acta Universitatis Danubius*, 2, 18-37.
- Keller, K. L. (1999). *Managing Brands for the Long Run. Brand Reinforcement and Revitalization Strategies*. *California Management Review*, 41(3), 102-124.
- Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates. (2005). *Student success in college: Creating conditions*

- that matter. San Francisco: Jossey-Bass.
- Li Y. H. (2017). A Study of the Relationships Between Learning Motivation, Learning Strategy, and Learning Outcomes - A Case Study of E-Learning," *Journal of Business Management*, 14, 68-86.
- Maringe, F., & Sing, N. (2014). Teaching large classes in an increasingly internationalising higher education environment: Pedagogical, quality and equity issues. *Higher Education*, 67(6), 761-782.
- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of evidencebased practices in online learning: A meta-analysis and review of online learning studies. Washington, DC.
- Moreno, R. (2006). Does the modality principle hold for different media? A test of the method-affects-learning hypothesis. *Journal of Computer Assisted Learning*, 22(3), 149-158.
- Pham, Q. T. & Huynh, M. C. (2018). Learning achievement and knowledge transfer: The impactfactor of e-learning system at Bach Khoa University, Vietnam. *International Journal of Innovation*, 6(3), 194-206.
- Pike, G. R., Kuh, G. D., McCormick, A. C., Ethington, C. A., & Smart, J. C. (2011). If and when money matters: The relationships among educational expenditures, student engagement and students' learning outcomes. *Research in Higher Education*, 52(1), 81-106.
- Pike, G. R., Smart, J. C., & Ethington, C. A. (2012). The mediating effects of student engagement on the relationships between academic disciplines and learning outcomes: An extension of Holland's theory. *Research in Higher Education*, 53(5), 550-575.
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*, 82, 33-40.
- Pulkka, A. T. & Niemivirta, M. (2013). Predictive relationships between adult students' achievement goal orientations, course evaluations, and performance. *International Journal of Educational Research*, 61, 26-37.
- Skaalvik, E. M. & Skaalvik, S. (2014). Teacher self-efficacy and perceived autonomy: Relations with teacher engagement, job satisfaction, and emotional exhaustion. *Psychological Reports*, 114(1), 68-77.
- Schär, S. & Krueger, H. (2000). Using new learning technologies with multimedia. *IEEE Multimedia*, 7(3), 40-51.
- Shrout, P. E. & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New proce-

- dures and recommendations. *Psychological Methods*, 7(4), 422-445.
- Scholz, U., Dona, B. G., Sud, S., & Schwarzer, R. (2002). Is General Self-Efficacy a Universal Construct? Psychometric Findings from 25 Countries. *European Journal of Psychological Assessment*, 18, 242-251.
- Schunk, D. H. (1996). *Learning Theories An Educational Perspective* (2nd ed.). Englewood Cliffs, NJ Merrill.
- Tella, A. (2007). The impact of motivation on student's academic achievement and learning outcomes in mathematics among secondary school students in Nigeria. *Eurasia Journal of Mathematics, Science & Technology Education*, 3(2), 149-156.
- Ullman, J. B. (2001). Structural equation modeling. In B. G. Tabachnick, & L. S. Fidell (Eds.), *Using multivariate statistics*. Boston, MA Pearson Education.
- Weng H. F. (2012). A Strategic Solution to the "Two Inadaptabilities" of Education in Mainland China and Qian Xuesen's Dilemma. *Bulletin of Educational Resources and Research*, 56, 53-68.
- Wiggins, J. B., Grafsgaard, J. F., Boyer, K. E., Wiebe, E. N., & Lester, J. C. (2017). Do you think you can? The influence of student self-efficacy on the effectiveness of tutorial dialogue for computer science. *International Journal of Artificial Intelligence in Education*, 27(1), 130-153.
- Zhang, X. & Ardasheva, Y. (2019). Sources of college EFL learners' self-efficacy in the English public speaking domain. *English for Specific Purposes*, 53, 47-59.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (p. 13-39). Academic Press.