THE EFFECT OF PROBLEM-BASED LEARNING ON STUDENTS' LEARNING MOTIVATION IN ENGLISH READING FOR JUNIOR HIGH SCHOOL STUDENTS

Fan Shanshan[1],
Pasana Chularut and Paradee Kambhu Na Ayudhaya
Srinakharinwirot University
Email: 31487624@qq.com[1]

Received 8 January 2025**; Revised** 8 January 2025**; Accepted** 8 January 2025.

Abstract

This Article aimed to study: (1) Study the definition, components of learning motivation for students in junior high school. 2) Development of the problem-based learning model to enhance students' learning motivation in junior high school. 3) Assess the effectiveness of the problem-based learning model for enhancing students' learning motivation in junior high school.

The sample was from 6 classes of Grade 8, with Class 4 as the experimental class (EC), and Class 5 as the controlled class (CC). 66 students from these two classes were at the age of 13-14, with similar educational experience. In the selection of schools and grades, the researchers adopted the method of multi-stage random sampling. The researcher adopted a simple random method in the process of selecting two classes as the experimental group and the control group respectively. The instrument for collecting data was developing questionnaires, and testing, modifying the questionnaire through project analysis, validity, reliability. Analysis data by Descriptive statistics and Content Analysis. The data was analyzed using SPSS statistical software package. A paired t test was to use compare the results of the two questionnaires. Pearson's correlation coefficient was performed to determine the relationship among the students' learning motivation and Problem-based Learning. In addition, descriptive statistics were used to analyze the students' responses to the questionnaire. The research results were found as follows: 1) It indicates that girls' motivation for English reading is higher than that of boys. 2) PBL learning model has a positive impact on students' learning motivation in English reading. 3) PBL learning model has positive effects on Activation, persistence, and intensity of students' learning motivation in English reading. Persistent is statistically correlated with activation and Intensity. The higher the activation and Intensity, the higher the persistence.

Keywords: Learning motivation; Problem-based Learning; Junior High School Students

Introduction

Motivating students to learn at school is a topic of great concern for educationist today and motivating them to succeed is one of the greatest challenges (Awan, Noureen & Nas, 2011). Students at the Junior High School are included in the early adolescence stage with an age range of 12-15 years who need support and attention in achieving their developmental tasks (Sari et al, 2018). According to Maulida (2009), education of adolescence, especially in junior high school is more apparent, because the lack of learning motivation or learning motivation is not sustained, teenagers generally exist lazy learning, irregular learning, do not do homework, skipping class and other problems. Therefore, learning motivation is an important factor in student learning and achievement (Elliot & Dweck, 2005). Getting students to learn and sustaining their interest in what they are learning therefore should be one of the biggest challenges in the classroom. According to Filgona et al. (2020), learning motivation for students is essential as they learn best when they recognize the need and develop the desire to learn. Without learning motivation, students may not start the learning at all, and they may not be able to maintain their learning once experiencing hardship in the process (Gardner, 2007). Dörnyei (2014) states that motivation is responsible for why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it.

On the basis of literature review, Hmelo-Silver (2004) used the problem-based learning (PBL) teaching model: the teacher acts as a facilitator throughout the process, and students work in small groups to learn new knowledge, solve problems, and reflect on their learning strategies, which ultimately enhances their motivation to some extent. Providing students with a realistic interactive scenario between the learner and the e-learning game (ELG) to accomplish tasks, which can promote students' motivation. (Laura Batson & Susan Feinberg, 2006). Karina et al. (2016) enhanced students' learning motivation to learn through the implementation of Reflective Journal Writing (RJW) strategies while increasing learning efficiency and self-confidence. Sarwinda et al. (2020) improved students' motivation through the learning process using audio-visual learning media based on Contextualized Teaching and Learning Approach (CTL). Among vary learning models, Hmelo-Silver (2004) research emphasizes the potential for problem-based learning (PBL) to change the way we educate more effectively. Researchers have more interest in and support for this learning strategy, believing that it can significantly improve students' motivation to learn.

This study is aimed at the students of Gangcheng No. 2 Middle School in Wuhan, Hubei Province, China. The research method is to investigate the current situation of junior high school students' learning motivation by questionnaire and interview, and to design a learning model to cope with the lack of junior high school students' English learning motivation. The overall idea of this research is: Determine the topic - design the questionnaire and interview outline - test the questionnaire and interview outline - issue the questionnaire and collect the interview data - analyze the questionnaire and interview data - sort out the results. This paper analyzes the

current situation of students' learning motivation in Gangcheng No. 2 Middle School, and explores the learning model to promote learning motivation, so as to motivate students to learn English actively and promote their overall progress and development. First of all, the review of literature, to explore the research status quo of students' English learning motivation and theoretical basis. Secondly, using the survey method and interview method, collect the present situation of the steel city of the second middle school students' English learning motivation. And then through the analysis of the questionnaire and interview data, describes the students' learning motivation status problem, and put forward the corresponding effective learning mode to improve junior middle school students English learning motivation. Finally, the learning mode of intervention effect is compared and evaluated.

This research presents that applying problem-based learning to promote students' learning motivation in junior high school so as to provide a reference to verify the feasibility and practicability of it in English reading class.

Research Objectives

There is an urgent need to study the practical effects of PBL in the English classroom and how it can enhance students' learning motivation. In this paper, researcher attempted to design an empirical study based on cognitive and social constructivist perspectives, aiming to:

1. Study the definition, components of learning motivation for students in junior high school.

2. Development of the problem-based learning model to enhance students' learning motivation in junior high school.

3. Assess the effectiveness of the problem-based learning model for enhancing students' learning motivation in junior high school.

Literature Review

1. Learning Motivation

1.1 Definition and Importance of Learning Motivation

The term motivation comes from the Latin verb "move" which is the force that makes someone do something and give behavior its energy and direction. (Reeve, 1993). According to Pintrich and Schunk (1996), learning motivation is a process that involves goals, physical and mental activity, and is both instigated and sustained. If earlier researchers descried motivation as needs for satisfaction (Maslow, 1987), the more recent psychologists portray motivation as a product of conscious decision. Gardner (1985) defines motivation as the combination of effort plus desire to achieve the goal of learning the language plus favorable attitudes towards learning the language. Learning motivation is a force that energizes, sustains, and directs behavior toward a goal" (Paul & Kauchak, 2005).

As for learning motivation, its understanding and definition do not always conform to psychological ones. Some researchers consider learning motivation to be the biggest simple factor that affects students' success (Harmer, 1991), as something producing "engagement in and persistence with the learning task". According to Crookes and Schmidt, a motivated student is the one who "becomes productively engaged in learning tasks and sustains that engagement, without the need for continual encouragement or direction" (Crookes & Schmidt, 1991). A conclusion can be drawn that motivation can be considered a process that greatly influences learner's success.

Learning motivation is considered as another factor that influences more to the learning outcome other than learning arrangement (Paris, et al., 1983). When students have strong intrinsic motivation to do a certain activity, then the extrinsic factors can be coped. It also means that the locus of control of an individual is more dominant than the self-internal factor (Winkel, 2004). Motivation can be said as an intrinsic function as well as an extrinsic factor. Students, who have learning motivation, will pay careful attention to the lesson, read material so they can understand the content and use various supported learning strategies. Learning motivation focuses on a cognitive response, such as a propensity of students to achieve meaningful and useful academic activity and to obtain benefits from the activity (Brophy, 2004; Santrock, 2007). Promoting learning motivation is one of the main principles for efficient education (Kim & W. Frick, 2011). Rehman (2013) stated that students' learning outcome might be improved by motivating them.

1.2 Classification of Learning Motivation

a. Instrumental motivation and integrative motivation

Gardner and Lambert (1972) divided the motivation into two types: Instrumental motivation and integrative motivation. Instrumental motivation attaches importance to some specific goals of mastering foreign language knowledge, such as the guarantee for future work and further study through foreign language learning. The core characteristics of this kind of learning motivation are selective and not persistent. For integrative motivation, the learning goal of students is able to effectively integrate into the foreign language community system, expect to have effective communication with other members, and strive to become a member of the community. Both integrative motivation and instrumental motivation have an important impact on foreign language learning.

b. Intrinsic motivation and extrinsic motivation

Deci and Ryan (1985) proposed that the learning motivation can classified into intrinsic motivation and extrinsic motivation which based on Self-determination Theory (SDT). Santrock (2007) stated that extrinsic motivation was also a way to reach goals that is frequently influenced by external incentives such as reward and punishment. Extrinsically motivated students are tending to put forth the least amount of struggle necessary to get the most reward (Afzal et al., 2010).

1.3 Components of Learning Motivation

Bandura (1990) combines motivation and cognition into a cognitive–motivational perspective. He defined motivation as a "multidimensional phenomenon indexed in terms of selection of pursuits from competing alternatives, intensity of effort, and persistence of exertion". Schiefele and Rheinberg (1997) argued that learning motivation has three components: (1) persistence and frequency of learning activities; (2) mode of performed learning activities; (3) motivational and functional states of the learner during learning. Learning motivation has been studied in order to answer three kinds of questions: what activates a person, what makes the individual choose one behavior over another, and why do different people respond differently to the same motivational stimuli. Therefore, Major components of learning motivation are activation, persistence, and intensity (Sandhu, 2012). Activation involves decisions to initiate a behavior; persistence is a continuing effort towards a goal, and intensity can be seen that goes to pursue goals. Motivation affects persistence: if sufficient learning time is available then highly motivated learners spend more time, or more often interact, with the learning task than lowly motivated learners (Atkinson & Raynor, 1974). Intensity can be seen that goes to pursue goals which may be thought of as the momentary magnitude of motivational arousal.

2. Problem-based Learning

2.1 Definition and Characteristics

The book Problem-Based Learning: An Approach to Medical Education wrote by Barrows and Tamblyn (1980) stated that the essence of PBL is learning-centered. From Collins et al. (1988) point of view, PBL is a solving process, students and teacher cooperate to solve particular problems, among which process students are the key persons to find out the solutions of the problems. Maudsley (1999) defines PBL is a teaching philosophy as well as a teaching method that students learn from cooperating and solving problems. More specifically, one of the objectives of PBL is to foster intrinsic motivation in students (Silver 2004). Woods (2000) thought that in PBL, the problem promotes learning which means that before students begin to meet a new knowledge point, they will meet a problem learning firstly. However, problem-based approaches appear to require "the acquisition of new knowledge and the solution may be less important than the knowledge gained in obtaining it" (Prince & Felder, 2006). Moreover, David & Barbara (2008) hold the same view who considered PBL was a teaching method that challenged students to learn and encouraged students to find a way to solve problems by cooperating in a group.

Barrows (1988) advises that learners examine all facets of the PBL process to better understand what they know, what they learned, and how they performed. Engel (1991) describes the essential characteristics of a problem-based curriculum as follows: it is cumulative, integrated, progressive, and consistent. PBL has been developed and applied the core model of PBL (Barrows, 1996) in a wide range of disciplines, which is composed of the following seven

characteristics: (1) Students must have the responsibility for their own learning; (2) The problem simulations used in PBL must be ill-structured and allow for free inquiry; (3) Collaboration is essential; (4) A closing analysis of what has been learned from work with the problem and a discussion of what concepts and principles have been learned are essential; (5) Self and peer assessment should be carried out at the completion of each problem and at the end of every curricular unit; (6) The activities carried out in PBL must be those valued in the real world; (7) Student examinations must measure student progress towards the goals of PBL. The transfer of skills learned through PBL to a real-world context is also noted by Brown & Cocking (2000).

2.2 The Basic Process of Problem-based Learning Model

Schmidt (1983) summarized the seven-step PBL teaching method through the analysis of his teaching experience: (1) Describe the problem; (2) Clarify the problem; (3) Analyze the problem and deeply understand the problem; (4) An objective explanation of the problem; (5) Construct learning goals; (6) Collect relevant information through independent learning; (7) Solve problems. Many scholars have proposed different PBL teaching models, Barrows (1996) systematically summarized the PBL classic teaching model: (1) Students should adhere to the main position in teaching, and with the help of teachers, get their own interest in the content, to solve real problems by themselves. (2) Each group has 5-9 students. (3) The teacher is also a guide in teaching and can point out the direction for blind students. (4) The creation and solution of problems are also the motivation for learning. (5) Problems are the carrier for students to master knowledge, learn to consult information, and find solutions to problems in the process of analysis and discussion. (6) Students will take the initiative to learn new content in problem situations and consolidate knowledge through group communication. Ali (2019) compared the traditional learning to problem-based learning, pointed out three steps of PBL: (1) problem assigned; (2) identify what we need to know; (3) learn and apply it to solve problems.

Therefore, the PBL teaching process in this study consists of five steps: (1) Problem posing; (2) Task allocation; (3) Information collection; (4) Group presentation; (5) Comprehensive evaluation.

Conceptual Framework

This research is a study to enhance the learning motivation of junior high school students under the implementation of problem-based learning model. The researcher defines the research conceptual framework based on cognitive theory and constructivism theory. The study involves two variables: the independent variable is problem-based learning model; the dependent variable is students' learning motivation in English reading.

According to the cognitive level and characteristics of junior high school students, PBL constructs learning models from five steps to promote students' learning motivation. It mainly studies and evaluates whether students' motivation can be enhanced from three aspects: activation, persistence, and intensity. The core of PBL is to emphasize students as the center in

the process of learning. Therefore, under the guidance of PBL, teachers create a suitable reading situation for students, and give students enough time to find related information and have a discussion. PBL also emphasizes to dealing with problems, which needs many learners solve them together. In group activities, students share their opinions with each other, it may train students' learning ability even greatly improve their motivation in English learning.

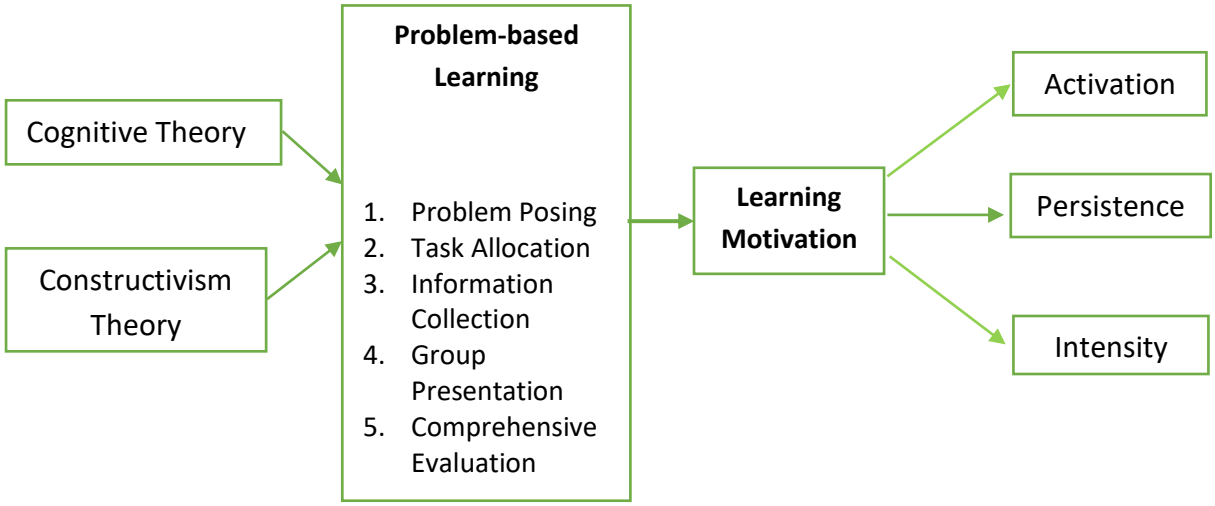

Figure 1 Conceptual Framework

Research Methodology

1. Participants and Procedure

The study is conducted in two parallel classes in Grade eight of No. 2 Middle School. The participants of this study were 66 students who were taking English reading as a 60-minute regular course once a week. The goal of the course is to improve students' English speaking and listening abilities. The role of the teacher was the facilitator, the questionnaire creator, the presentation observer, and the assistant of the whole class. Students were told about the Class Planning and English presentations that there would be questionnaires to fill out for the research.

In this study, under the guidance of Problem-based Learning, teachers create a suitable reading situation for students, and give them enough time to find information. Guide students to pose the problems in pre-reading activities. In the while-reading activities, the teacher needs to ask questions connected with the article according to the requirements of the teaching objectives. The students think through questions, conduct group discussions to answer the questions raised. In the post-reading, teacher should give evaluation and feedback in a timely manner and pay attention to encourage students to help them establish their self-confidence and stimulate a stronger learning motivation. PBL also emphasizes to dealing with problems, which needs many learners to deal with together. The relationship of cooperating between

group members can be closer than before, which means that the meaning of cooperative learning is penetrated into the class practice.

Prior to class introduction, there was a pre-test and a definition of problem-based learning provided. When students encounter difficulties or need help in learning activities, they can communicate with teachers in class, or at any time through letters and interviews. Students need to fill in the "Junior High School students Learning Motivation Questionnaire". At the end of the course, students still need to fill out this questionnaire in order to facilitate the effective comparison and testing of the research.

2. Data Collection and Analysis

Data collection for this study took place over three months, from October 2023 to January 2024. In this study, data were collected through questionnaires. The learning motivation questionnaire consisted of preliminary surveys before the research and follow-up surveys after the class activities. In order to measure the learning motivation, the questionnaire consists of two parts. Part one is associated with participants' individual information; part two is made up of 33 items with 5-point Likert scales that ranged from l to 5 respectively ("1" for strong disagreement, "2" for partial disagreement, "3" for neither agree nor disagree, "4" for partial agreement, "5" for strong agreement.) on English reading motivation, which is designed on the basis of Wigfield and Guthrie's Revised MRQ (1999) and Mori's questionnaire(2002) .

The reliability coefficient (Cronbach α) calculated to check the reliability of the test report was .929. The students' learning motivation was evaluated from three components: activation, persistence and intensity. This was done to explore the comparative situation of learning motivation after students participate in problem-based learning activities, and whether it can enhance the learning motivation of junior high school students. The quantitative data was analyzed using SPSS statistical software package. A paired t test was to use compare the results of the two questionnaires. Pearson's correlation coefficient was performed to determine the relationship among the students' learning motivation and Problem-bases Learning. In addition, descriptive statistics were used to analyze the students' responses to the questionnaire.

Results and Discussion

1. The definition and components of learning motivation

Learning motivation refers to a kind of internal state that promotes and maintains learner’ learning activities, including personal intention, desire, psychological impulse or the goal that they attempt to achieve. Based on the background of junior high school English class, the learning motivation first comes from the students’ needs, and external incentives are used as conditions to motivate students to actively perform in English class, independently complete learning tasks after class, and conscientiously complete relevant English learning activities which are oriented towards certain learning goals. There are three major components to motivation: activation, persistence, and intensity.

2. The effectiveness of the problem-based learning model

2.1 The Effect of Gender on Middle School Students' Motivation

In order to investigate the effect of gender differences on English reading learning motivation of junior high school students, we divided 66 students into two groups according to gender and tested their English reading learning motivation, and independent samples t-test was conducted on the total mean scores of the questionnaire, as shown in Table 1.

As shown in Table 1, the mean of English reading learning motivation of male students is 71.76 and the standard deviation is 18.780. the mean of English reading learning motivation of female students is 82.67 and the standard deviation is 20.226. independent samples t-test was conducted on the English reading learning motivation of male students and female students, and the assumption of chi-square was satisfied by Leven's test. t (64) = -2.271, p=. 027<.05. indicating that girls' motivation to learn English reading is higher than boys'.

Table 1 The Effect of Gender on Middle School Students' Motivation

	M	*SD*	*N*	*df*	*t*
Male	71.76	18.780	66	64	-2.271*
Female	82.67	20.226			

**p<.05*

2.2 The Effect of PBL Model on Improving Students' Learning Motivation in reading class

In order to investigate whether junior high school students' motivation to learn English reading changed significantly after participating in the PBL learning model, we conducted a paired-sample t-test on the total mean scores before and after the English reading motivation questionnaire, as shown in Table 2.

As can be seen from Table 2, the mean value before PBL learning mode is 79.55, and the standard deviation is 17.681. The mean value after PBL learning mode is 143.82, and the standard deviation is 14.123. The mean value of the difference between before and after is -64.273, and the standard deviation is 23.199, and the difference is statistically significant: t (32) = -15.915, p=000<.05. It means that PBL learning model has a positive effect on students' motivation to learn English reading.

Table 2 Pre-test and Post-test of learning motivation

	M	*SD*	*N*	*df*	*t*
Pre-motivation	79.55	17.681	33	32	-15.915*
Post- motivation	143.82	14.123			

**p<.05*

2.3 The effectiveness of PBL learning model on the promotion of students' learning motivation

If the PBL learning model has a positive effect on middle school students' motivation to learn English reading, what are the aspects of PBL on motivation? This study is based on Activation, Persistence and Intensity.

As can be seen from Table 3, the pre-test mean of Activation is 31, with a standard deviation of 4.555, and the post-test mean is 37.94, with a standard deviation of 5.018, t(32)=-6.264,p=.00<.05. The pre-test mean of Persistence is 28.58, with a standard deviation of 3.857, and the post-test mean is 37.18, with a standard deviation was 5.359, t(32)=-7.438,p=.00<.05. The pre-test mean of Intensity was 29.18 with a standard deviation of 4.959, and the post-test mean was 32.58 with a standard deviation of 3.905, t(32)=-3.433,p=.002<.05. It shows that the PBL learning model has an effect on students' motivation to learn English reading. Activation, Persistence, and Intensity have positive effects on all three aspects.

Table 3 Pre-test and post-test Activation, Persistence and Intensity subscales

		M	*SD*	*t*	*p*
Activation	pre	31	4.555	-6.264	.00
	post	37.94	5.018		
Persistence	pre	28.58	3.857	-7.438	.00
	post	37.18	5.359		
Intensity	pre	29.18	4.959	-3.433	.002
	post	32.58	3.905		

Table 4 represents the correlation between Persistence's mean rank and Activation's mean rank. As shown in Table 4, the average grade of Persistent was statistically correlated with the average grade of Activation, r = .884 (p < .01). The higher the student's Activation, the higher the Persistent.

Table 4 Correlation between Persistence and Activation

	Persistence	Activation
Persistence		.884**
Activation	.884**	

*Note.**p<.01*

Table 5 represents the correlation between Persistence's mean rank and Intensity's mean rank. As shown in Table 4, the average grade of Persistent was statistically correlated with the average grade of Intensity, r = .616 (p < .01). The higher the student's Intensity, the higher the Persistent.

Table 5 Correlation between Persistence and Intensity

	Persistence	Intensity
Persistence		.616**

Intensity	.616**

*Note.**p<.01*

Conclusion

The aim of this research is to investigate the effects of problem-based learning on students' motivation. According to the research findings and result of this study, several implications can be derived.

First, problem-based learning can incorporate the use of English language points and reading skills in use when performing reading course, and also stimulate students' learning motivation in English learning. This study can facilitate students' motivation to learn English and cause them to be more attentive to their class activities that can help the teacher ensure activities are relevant to real-life. Problem-based learning can improve students' preference for English learning and participation. therefore, most students were positive about this teaching model. Second, teachers should be aware of the difference of individual students. Third, for teachers who want to enhance the relationships among students, problem-based learning is beneficial.

In conclusion, the result of this study clearly supports the notion that problem-based learning has advantages in students' learning motivation, especially students' activation and intensity, both of which have an effect on persistent learning.

Suggestions

This study, based on the cognitive and constructivism theory, applied mixed method with a view to locating the motivational factors of the PBL model, finding out the relationship between PBL and learning motivation, and setting up a problem-based learning model for junior high school students. There are some limitations to this study.

First, we need to expand the subjects of the study. The sample size of 66 students is not sufficient to generalize the findings. Second, teachers' perceptions and team atmospheres need to be expanded and diversified for the future research. Because these variables can influence students' learning motivation, there may be many others that can serve as variables, so it is important to increase the sample size and participants in various majors and schools to adopt a more effective experimental design. Thirdly, helping learners to acquire and practice relevant strategies is of crucial significance to the sustaining of learner motivation and it is worth the effort to do further research on motivational strategies and their applicability to learners. Besides, more research can be done on the secondary motivational factors classified by the researcher of this study. By providing motivational strategies in a certain treatment study, researchers might even turn a secondary factor into a primary one and draw inspiring and illuminating conclusions. Consequently, comparative studies could be conducted and the conclusions to be drawn would be more reliable and generalizable.

References

Afzal Hasan, Ali Imran, Aslam Khan Muhammad, Hamid Kashif, (2010), A Study of University Students' Motivation and Its Relationship with Their Academic Performance, International Journal of Business and Management, Vol 5, Issue 4, Page(s) 80-88

Ali, S. S. (2019). Problem based learning: A student-centered approach. English language teaching, 12(5), 73-78.

Atkinson, J. W. and Raynor, J. O. (1974). Motivation and Achievement. New York: Winston/Wiley.

Bandura A. 1990. Self-regulation of motivation through anticipatory and self-reactive mechanisms. Nebr. Symp. Motiv. 36: 69–164

Barrows, H. S., & Tamblyn, R. M. (1980). Problem-based learning: An approach to medical education (Vol. 1). Springer Publishing Company.

Barrows, H.S. Problem-Based Learning in Medicine and Beyond: A Brief Overview [J]. New Direction for Teaching and Learning 1996(6): 3-12.

Barrows, T. S. (1988). Native language, English proficiency, and the structure of the Test of English as a Foreign Language. ETS Research Report Series, 1988(1), i-36.

Brophy, J. (2004). Motivating students to learn, second edition. New Jersey London: Lawrence Erlbaum Associates Publishers Mahwah.

Brown, A. L., & Cocking, R. R. (2000). How people learn (Vol. 11). Washington, DC: National academy press.

Collins, A., Brown, J. S., & Newman, S. E. (1988). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics. Thinking: The journal of philosophy for children, 8(1), 2-10.

Crookes, G. & Schmidt, R.W. (1991), 'Motivation: reopening the research agenda', Language Learning, 41, 4: 469-512.

David, T. & Barbara, M. Problem-based learning: Where Are We Now? [J]. Medical Teacher, 2008:30(8):742-763.

Deci, E., Ryan, R. (1985). Intrinsic motivation and self-determination in human behavior, New York: Plenum Press.

Gardner, R. (1985). Social Psychology and Second Language Learning: The Role of Attitude and Motivation. London: Edward Arnold.

Gardner, R.C.&Lambert, W.E. (1972). Attitudes and motivation in second language learning.Rowley, MA: Newbury House.

Harmer, J. (1991). 'The practice of English Language Teaching'. London: Longman, 371.

Kim Kyong-Jee and W. Frick Theodore, (2011), Changes in Student Motivation during Online Learning, Journal of Educational Computing Research, Vol 44, Page(s) 1 – 23

Maslow, A. (1987). Motivation and personality'. 3rd ed., revised by R. Frager, J. Fadiman, C. McReynolds, & R.Cox ed. New York: Harper & Row.

Maudsley, G. Do we all mean the same thing by “Problem-Based Learning”? A review of the concepts and a formulation of the ground rules[J]. Academic Medicine. 1999, (2): 178-85.

Paris, S. G., Lipson, M. Y., & Wixson, K. (1983). Becoming a strategic reader. Contemporary Educational Psycology, 8, 293-316.

Paul, Eggen., & Kauchak, Don. (2005). Educational Psychology: Windows on Classroom, Shangxi: Shangxi Normal University Press.

Paul, Eggen., & Kauchak, Don. (2005). Educational Psychology: Windows on Classroom, Shangxi: Shangxi Normal University Press.

Pintrich, P. and Schunk, D. (1996). ‘Motivation in Education: Theory, Research & Applications’, Ch. 3. Englewood Cliffs, NJ: Prentice-Hall.

Prince, M. J., & Felder, R. M. (2006). Inductive teaching and learning methods: Definitions, comparisons, and research bases. Journal of engineering education, 95(2), 123-138.

Reeve, J. (1993). The face of interest. Motivation and Emotion, 1, 353-375.

Rehman, A., & Haider, K. (2013). The impact of motivation on learning of secondary school students in Karachi: An analytical study. Educational Research International, 2 (2), 139-147.

Sandhu, N., Hussain, J., & Matlay, H. (2012). Barriers to finance experienced by female owner/managers of marginal farms in India. Journal of Small Business and Enterprise Development, 19(4), 640-655.

Santrock, J. (2007). Child development. New York. McGrow

Schiefele, U., & Rheinberg, F. (1997). Motivation and knowledge acquisition: Searching for mediating processes. Advances in motivation and achievement, 10, 251-301.

Schmidt, H. G. (1983). Problem-based learning: Rationale and description. Medical education, 17(1), 11-16.

Silver, C. E. (2004). Problem-based learning: What and how do students learn?. Educational psychology review, 16, 235-266.

Winkel, W. S. (2004). Psikologi pengajaran (Teaching psychology). Jakarta, Indonesia: PT. Grasindo.

Woods, D. R., & Learning, P. B. (2000). Helping your students gain the most from PBL. Problem-based learning: Educational innovation across disciplines. Singapore: Temasek Centre for Problem-based Learning.