The effect of active learning on academic achievement motivation in high schools students

Liele Soltanzadeh[1], Seyed Reza Nazari Hashemi[2] and Sakineh Shahi[3]

[1]*Department of Management, Khozestan Research and Science Branch, Islamic Azad University, Khozestan, Iran*
[2]*Shahid Beheshti University, Tehran, Iran*
[3]*Shahid Chamran University of Ahvaz, Iran*

_____

ABSTRACT

The purpose of this study was to examine the effect of active learning on academic achievement motivation in high schools. Participants included 1013 students that studied in Karaj high schools. There were 561 boys and 462 girls, and their ages ranged from 15-18 years-old. To data collection, all subjects filled in the Achievement Motive Scale Test (AMST) and demographic questionnaire. Also, the collected data was analyzed by inferential statistical tests such as a independent t test at the P<0.05 significant level. Results showed that the differences between two groups were significant at the level of P<0.05 and active learning group obtained higher scores than traditional group in achievement motivation. Based on our results, the use of active learning method in classroom is vital to have a positive impact on the quality of the students learning process and achievement motivation.

Key words: Active Learning, Traditional Learning, Achievement Motivation, High School Students
_____

INTRODUCTION

The traditional teaching method begins with the instruction of the teacher, then practice of students [1]. In this approach to teaching, students passively receive information from the professor and internalize it through some form of memorization. This process is characterized as traditional learning. Although traditional learning has been the dominant teaching method, many educators argue that students require more than a mere transfer of knowledge [2]. The search for the best approach to business education has led educators to explore many different teaching techniques, ranging from the traditional lecture class to various experimental approaches such as active learning [3]. Teacher's behavior occupies a dominant position in the whole learning process, which cannot provide students with a chance to active learning and less opportunity to communicate with other students [4].

Bonwell and Eison, (1991) defined the active learning as an instructional method that engages students in meaningful activities during the process of learning [3]. Ebert et al. (1997) viewed active learning as a way of improving student learning in the classroom by involving the student directly in the learning process [5]. Active learning is simply engaging the students in some activities that stimulate them to think about and react on the information presented. Students are required to develop skills in handling concepts and to analyze, synthesize, and evaluate the provided information in discussion with other students, through asking questions, or through writing [6]. Active learning techniques focus on the direct involvement of the student with the learning material and can include short writes, brainstorming, quick surveys, think-pair-share, formative quizzes, debate, role playing, cooperative learning, collaborative learning, and student presentations to name a few" [6-7].

_____

Although the proposed improvements noted above differ in detail, a remarkably consistent theme is the call to bring student-centered instructional strategies, such as active- and inquiry-oriented learning, into the classroom. This form of instruction emphasizes interactions with peers and instructors and involves a cycle of activity and feedback where students are given consistent opportunities to apply their learning in the classroom [8]. By placing students at the center of instruction, this approach shifts the focus from teaching to learning and promotes a learning environment more amenable to the meta-cognitive development necessary for students to become independent and critical thinkers [9]. A substantial number of studies have shown that active-learning instructional approaches can lead to improved student attitudes [10-12] and increased learning outcomes [13-16] relative to a standard lecture format.

Despite the effectiveness of active learning, teachers are resistant to such instructional shifts and rely on more traditional didactic means of instruction [17]. In the literature, numerous barriers to this adaptation are cited. For teachers, experimenting a new pedagogy creates feelings of discomfort and lack of confidence [18]. Faculties feel comfortable with lecturing and consider it an effective means of transmitting large amount of information [17]. According to faculty, heavy course contents, limited time span and large classes prohibit active learning [3].

Therefore, the reform of instructional practice at higher education needs attention, it is important to promote student learning, which involve students actively and engage them in problem solving activities. Active learning approach has been successfully used in integration with the lecturing technique across the disciplines by the insertion of brief demonstrations, class discussions, ungraded written exercises etc [6].

On the other hand, motivation is one of the most important psychological concepts in education. It can be classified into intrinsic and extrinsic motivations; intrinsic motivation refers to doing something because it is inherently interesting or enjoyable, while extrinsic motivation refers to doing something because it leads to a separable outcome [19]. It has been shown that intrinsic academic motivation (academic achievement motivation) results in better educational outcomes, such as higher academic performances, better quality of learning, increased persistence and effort in studies, and better psychological adjustment of learners, in comparison to extrinsic motivation [19-20]. In addition, it has been reported that academic achievement motivation is heightened by academic reward which induce a sense of competence and achievement [21].

Over the years, academic achievement motivation becomes extremely important for a student. Their academic achievement motivation can be related to their choices of subject or streaming and even their secondary school, university and scholarship. Although education is not the only road to success in the working world, much effort is made to identify, evaluate, track and encourage the progress of students in schools [22].

As a consistent practice traditional lecture methods, in which teachers talk and students listen, dominate our classrooms. Teaching in the high schools in Iran also depends on lecture method. The primary objective of the study was to determine whether active learning teaching could improve the academic achievement motivation in high schools students when compared with the traditional teaching method.

MATERIALS AND METHODS

Participants:
Participants included 1013 students that studied in Karaj high schools. There were 561 boys and 462 girls, and their ages ranged from 15-18 years-old. These participants selected in Karaj high schools and divided in 2 groups (active learning and traditional learning).

Instruments
To data collection, all subjects filled in the demographic questionnaire and Achievement Motive Scale Test (AMST). The Achievement Motivation Scale Test (AMST) was used to determine the achievement motivation. This scale has 30 questions and responses were coded on a five-point scale (from not at all =1, to very much =5). The scale's split-half reliability is 0.77 and validity is 0.58, coefficient of internal consistency is 0.68. Also, the collected data was analyzed by descriptive (mean and standard deviation) and inferential (independent t test) statistical tests at the $P<0.05$ significant level with SPSS Version 15.

_____

RESULTS

Table 1 shows the means (M) and standard deviations (SD) of achievement motivation scores among active and traditional learning groups.

Table 1. The descriptive results of achievement motivation scores among two groups

Groups	Means (M)	Standard Deviations (SD)
Active Learning	**24.015**	**2.00**
Traditional Learning	**23.055**	**2.86**

Also, we used the independent t test to determine the differences between traditional group and active group in achievement motivation scores. Based on our results, the differences between two groups were significant at the level of $P<0.05$ (see table 2 for more details). Furthermore, based on descriptive results that presented in table 1, the active learning group obtained higher scores than traditional group in achievement motivation variable.

Table 2. Independent t test results between traditional and active learning groups

groups	N	T	Degree of freedom	Significant level
Active learning	**1013**	**5.66**	**1011**	**0.001***
Traditional learning				

CONCLUSION

Our results showed that the significant differences between traditional learning group and active learning group in achievement motivation scores (see table 2). Thus, the meaningful differences that obtained in the present research suggested that the active learning method has a significant role in achievement motivation rather than traditional learning method.

Several studies [23-27] have demonstrated both quantitative and anecdotal evidence regarding the effectiveness of active learning techniques. The active learning method can be viewed as instructional activities involving students in doing and thinking about doing. Active learning techniques emphasize meaningful use of the acquired cognition and skills by changing the role of students from passive listeners to active recipients of knowledge. One way to incorporate active learning in classrooms is through active-lecturing. Jesus (2005) suggests pauses to allow students write questions about the issues under discussion [22]. The use of active learning method in classroom is vital to have a positive impact on the quality of the students learning process and outcomes. In the active learning setting, behaviors such as working hard, attending class, participating regularly, acknowledging others' efforts and receiving help from colleagues are encouraged [2]. A primary goal in active learning is that each student becomes a heterogeneous groups to master the content. The students are not only responsible for learning the material, but also for helping their group-mates learns [28]. There is a growing body of research in education that reports the benefits of active learning [29-30]. Substantial evidence exists to support the idea that students working in active learning groups can master material presented by the teacher better than students working on their own [29-31].

There are four major active learning approaches: (a) conceptual, (b) structural, (c) curricular, and (d) complex instruction. First, Johnson and Johnson (1989) have developed the conceptual approach, which is based on the premise that teachers can learn the key elements of structuring effective cooperative learning activities [32]. Johnson et al. (1998) presented five main elements that they believe are necessary for cooperative learning to be successful [31]. First, positive inter-dependence refers to each group member learning to depend on the rest of the group while working together to complete the task. Second individual accountability is defined as practices teachers use to establish and maintain student responsibility for appropriate behavior, engagement, and outcomes. Third, promotive face-to-face interaction is literally head-to head discussion around the group in close proximity to each other. Fourth, interpersonal and small group skills are developed through the tasks and include listening, shared decision making taking responsibility, learning to give and receive feedback, and learning to encourage each other. Finally, group processing refers to time allocated to discussing how well the group members achieved their goals and maintained effective working relationships [2].

On the other hand, academic achievement motivation is defined by Crow and Crow (1969) as the extent to which a learner is profiting from instruction in a given area of learning or in other words, achievement is reflected by the

_____

extent to which skill and knowledge has been imparted to him [33]. Academic achievement motivation also denotes the knowledge attained and skill developed in the school subject, usually designed by test scores. The level of achieving is how far a student succeeds in a particular exam or standardized test [34].

Furthermore, motivation is an abstract term to describe a characteristic possessed by most humans to varying degrees and at different times. It acts as a stimulus for action towards a desired goal, and may be limited in scope, as in the motivation for high monetary rewards, or more general, as is found with those who are "driven" to achieve in a multiplicity of fields. In addition, motivation must engage the working memory system to relate what has been achieved to the ultimate goal. This is especially so during learning, which serves to maintain "on tap" a limited amount of currently relevant information so that it is available for immediate use [35-36]. Hence one might expect that a study of motivation will result in widespread brain activity but especially in the brain systems that have been shown to be related to reward and expectation, and possibly in the motor system as well [37].

REFERENCES

[1] Weltman D., and Whiteside M. *Journal of Statistics Education*, **2010**, 1-13.
[2] Wang M. *Asian Social Science*; **2012**, 108-114.
[3] Bonwell, C., and Eison, J. Active Learning: Creating Excitement in the Classroom. ASHEERIC Higher Education Report No. 1. Washington, D.C. School of Education and Human Development, George Washington University. **1991**.
[4] Bonwell, C. and Sutherland, T. The active learning continuum: choosing activities to engage students in the classroom. New Directions Teaching Learning **1996**, 3–16.
[5] Ebert-May, D., Brewer, C., and Sylvester, A. *Bioscience*, **1997**, 601–607.
[6] Malik, S., & Janjua, F. *International Journal of Academic Research*, **2011**, 963-967.
[7] Patrick M., & Anderson, L. *Innovative Higher Education*, **2000**, 279-294.
[8] Armbruster, P., Patel, M., Johnson, E., & Weiss, M. *Life Sciences Education*, **2009**, 203–213.
[9] Bransford, J., Brown, A., and Cocking, R. How People Learn: Brain, Mind, Experience, and School. Committee on Developments in the Science of Learning. Washington, DC: National Academies Press. **2000**.
[10] Marbach-Ad, G., Seal, O., and Sokolove, P. *J. Coll. Sci. Teach*. **2001**, 434–438.
[11] Preszler, R. W., Dawe, A., Shuster, C. B., and Shuster, M. *CBE Life Sci. Educ*. **2007**, 29–41.
[12] Prince, M. *J. Eng. Educ*. **2004**, 223–231.
[13] Hake, R. *Am. J. Phys*. **1998**, 64–74.
[14] Udovic, D., Morris, D., Dickman, A., Postlethwait, J., and Wetherwax, P. *Bioscience* **2002**, 52, 272–281.
[15] Freeman, S., O'Connor, E., Parks, J. W., Cunningham, M., Hurley, D., Haak, D., Dirks, C., and Wenderoth, M. P. *CBE`Life Sci. Educ*. **2007**, 132–139.
[16] Knight, J. K., and Wood, W. B. *Cell Biol. Educ*. **2005**, 298–310.
[17] Abraham, M. R. and Cracolice, M. S. *Journal of College Science Teaching*, **1994**, 23: 150 –153.
[18] Modell H. *Am J Physiol Adv Physiol Educ* **1996**, 270: S69–S77.
[19] Deci, E.L., Vallerand, R.J., Pelletier, L.G., Ryan, R.M. *Educ. Psychol*. **1991** , 26, 325–346.
[20] Ryan, R.M., Deci, E.L. *Contemp. Educ. Psychol*. **2000**, 25, 54–67.
[21] Maehr, M.L. Meaning and motivation: toward a theory of personal investment. In: Ames, R.E., Ames, C. (Eds.), Research on Motivation in Education. Academic Press, New York, **1984**, 115–144.
[22] Othman, N. *International Journal of Psychological Studies* **2011**, 90-98.
[23] Lee, K. H. *The American Statistician*, **2007**, 61, 351-355.
[24] Raelin, J., & Coghlan, D. *Journal of Management Education*, **2006**, 30(5), 670-689.
[25] Sarason, Y., & Banbury, C. *Journal of Management Education*, **2004**, 28(4), 509-518.
[26] Ueltschy, L. C. *Journal of Marketing Education*, **2001**, 23(1), 63-72.
[27] Umble, M., & Umble, E. J. *Decision Sciences Journal of Innovative Education*, **2004**, 2(2), 213-217.
[28] Antil, L. R., Jenkins, J. R., Wayne, S. K., & Vadasy, P. F. *American Educational Research Journal*, **1998**, 35, 419-454.
[29] Slavin, R. E. *Contemporary Educational Psychology*, **1996**, 21, 43-69.
[30] Cohen, E. G. *Review of Educational Research*, **1994**, 64, 1-35.
[31] Johnson, D. W., & Johnson, R. T. Cooperation and competition: Theory and research. Edina, MN: Interaction Book. **1989**.
[32] Johnson, D. W., Johnson, R. T., & Holubec, E. J. Cooperation in the classroom (7th ed.). Edina, MN. **1998**.

_____

[33] Crow, L.D., & Crow. Adolescent development and adjustment. Mc Graw-Hill Book Company: United States. **1969**.

[34] Reber, A.S. Dictionary of Psychology. New Zealand: Penguin Books. **1985**.

[35] Baddeley, A. *Science* **1992**, 556–559.

[36] Eliassen, J.C., Souza, T., Sanes, J.N. *Exp. Brain Res*. **2001**, 141, 269–280.

[37] Mizuno, K., Tanaka, M., Ishii, A., Hiroki C. Tanabe , Onoe, H., Sadato, N., & Watanabe, Y. *NeuroImage* **2008**, 42 : 369–378.