

Enhance perceived self-efficacy, skill performance, and cognitive level in fencing using Jigsaw Technique

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The importance of this study in being one of the studies that is concerned about involvement of female students in the learning process by using an Interactive learning technique in learning fencing, which may contribute to improving their skill performance and cognitive level and enhancing perceived self-efficacy. This study aimed to enhance perceived self-efficiency, skill performance, and cognitive level in fencing using Jigsaw technique, for female students on the Faculty of Physical Education, Sadat City University. The researcher used the experimental method for two groups, experimental (used Jigsaw technique) and control (used Lecture method), by using pre and post measurements for perceived self-efficiency, skill performance, and cognitive level in fencing, for experimental and control groups, the researcher used, Perceptive Self-Efficiency Scale, and Cognitive achievement test in fencing, on a sample of (63) second year female students on the Faculty of Physical Education, Sadat City University, (15) for survey study, (48) for basic study. The results showed that the students' perceived self-efficacy was at an intermediate level. there were statistically significant differences between pre and post measurements for experimental and control groups, in perceived self-efficacy and both the skill performance and cognitive level in the direction of post measurements. there were statistically significant differences in the post-measurement between the experimental and control groups in both the skill and cognitive levels, in the direction of experimental group, while there were no statistically significant differences in the level of perceived self-efficacy.

Key words: *perceived self-efficacy, Jigsaw Technique, fencing.*

Introduction:

Learning from a constructive perspective is a continuous creative building process, during which the individual reorganizes his experiences, so that he seeks a broader and more comprehensive understanding of that understanding that previous experiences suggest (Appleton, K., 1997, 304).

Many scholars emphasize that constructivism is a theory in learning and not just a teaching approach, where teachers can teach their students in ways that are described as constructive, if they are aware of how these students learn. Structuralism expresses in its simplest form and its clearest meanings that knowledge is actively built by the learner and does not receive it negatively from the environment.

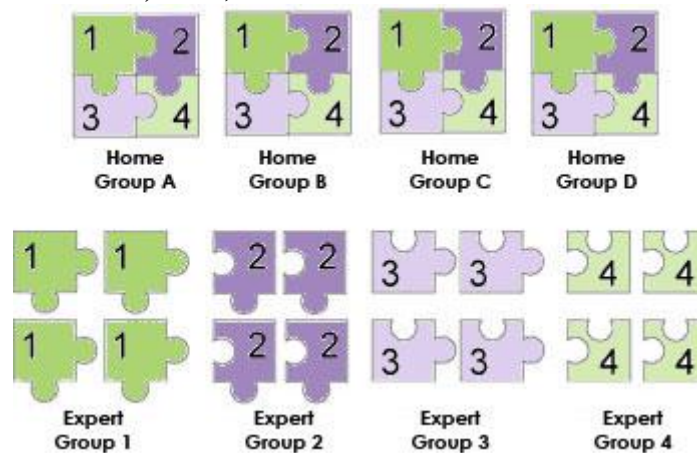
Active learning is an educational philosophy, dependent on the positive of the learner in the educational situation, and it aims to activate the role of the learner through work, research, experimentation, and the learner's self-reliance in obtaining information, acquiring skills, and formation of values and trends (Al Shammari, M. B., 2011, 13). So, it is not based on memorization and indoctrination, but rather on the development of thinking, ability to solve problems, teamwork and collaborative learning. And (Zaitoun, H 2003, 190) also notes that effective teaching is what focus on the learner's cognitive structure, accompanies his cognitive development, appropriate for learning outcomes, and it helps him achieve a higher degree of information processing, and discovery based on a network of concepts in his mind.

Maftai, G., Maftai, M., 2011, 1606, indicated that the brain processes information like a computer. For a computer to start working, you have to press the start button. When learning is passive, brain power button is not activated and cannot make connections between

what is being taught and what the student knows, and to “save” the information, he must explain it to the others. The true learning is that which allows the transfer of acquisitions in new contexts. This is best facilitated by the interactive learning.

Interactive learning is the learning process that aims to develop students both socially and intellectually. The jigsaw cooperative learning model trains students to have more courage to express opinions, to cooperate, to develop themselves, to be individually responsible, to have positive interdependence, and to be involved in personal interaction and group processes. As indicated by (Kilic, 2008) Various research have shown that especially at the primary, middle school and the university level, Jigsaw technique, is effective in the learning process of theoretical courses, in the development of critical thinking process of the students in their ability to express themselves and in their communication skills..

The jigsaw classroom is a research-based cooperative learning technique invented and developed in the early 1970s by Elliot Aronson and his students at the University of Texas and the University of California. Since 1971, thousands of classrooms have used jigsaw with great success (Elliot Aronson, 2014).



Shape (1)

Jigsaw technique

The Jigsaw technique is designed for cooperative learning in small groups. Students are provided the opportunity to become "experts" in a particular subject and share that knowledge with their peers. This technique promotes both self and peer teaching which requires students to understand the material at a deeper level and engage in discussion, problem solving, and learning (19).

The “Mosaic” method (JIGSAW technique) has been used in the educational process in many countries on all continents, both in the study of specific curriculum subjects and in various social activities. This method can improve the performance of pupils and students in all subjects by using the collaborative learning method (Maftei, G., Maftei, M., 2011, 1605).

Fencing is one of the games that requires high technical skills, considerable time and effort when teaching beginners, due to its many skills, as there are many motor skills that must be learned. The task of fencing's coach/teacher, is to make it simpler, if he organizes both the motor skills and the cognitive information according to classification, makes the design of the lesson to some extent simple,

On the other hand, it is an individual sport, most of its skills require that the teacher / coach use the individual teaching lessons method for each learner, and this requires a great time and effort from the coach / teacher, especially if there are a relatively large number of learners. Therefore, some educational methods and techniques must be used, to learn and master the skills, including active learning strategies.

Theories and principles of kinetic learning help to understand how to learn, acquire and maintain movement patterns and forms, as well as how to apply those skills. It also gives fencing coach/teacher Ideas for the best methods to learn complex motor skills such as fencing skills. In addition, various learning methods and strategies help fencing coach / teacher to create a systematic and structured educational lesson that suits the individual and the group, to reach successful and good performance.

Several studies indicated that some effective teaching strategies positively affect many variables of the learner, such as achievement, motivation, and problem-solving skills in addition to some social cognitive variables such as perceived self-efficacy. Such as studies of **Asha, I., Abu Awwad, F., Al-Shalabi, E., and Rasmy, E., (2012), Gull F., Shehzad S. (2015), J. M. Timayi, C. Bolaji, Y. K. Kajuru (2015), Ramdan, M.H., (2018).**

Perceived self-efficacy is one of the most important processes of self-organization, where whenever a person is distinguished by a high level of self-efficacy, he gains confidence in his ability to perform behaviors that allow control of a difficult circumstance. And in this case, it can be considered a form of trust, as it determines not only if the person will try to do something, but also determines the quality of performance when the attempt is made. (**Bem, P. Allen, 2016: 308**).

(**Bandura, 1997, 123**) noted that perceived self-efficiency depends on the image being developed by the individual about himself, through his daily experiences that go through, this image affects the level of effort exerted in performing tasks, and also depend on the experiences of success and failure experienced by the individual.

Because obtaining better results is one of the motives for research and exploration of more effective scientific methods, and as many studies have indicated the effectiveness of using Jigsaw technique in learning theoretical courses, , the researcher believes that the use of mosaic technique “Jigsaw” in fencing teaching, positively affects both the performance and cognitive level in fencing, in addition it can improve the students' successful experience, which enhances their perceived self-efficacy.

Aim of the study:

This study aimed to enhance perceived self-efficiency, skill performance, and cognitive level in fencing using Jigsaw Technique, for female students on the Faculty of Physical Education, Sadat City University.

Hypotheses of the study:

- There are significant differences between the averages of pre and post measurements for each experimental and control group in the direction of post measurements in perceived self-efficiency, skill performance, and cognitive level in fencing
- There are significant differences between the post measurements averages of the experimental and control groups in perceived self-efficiency, skill performance, and cognitive level in fencing, in the direction of the experimental group.

Materials and Methods

Data collection

- Perceptive Self-Efficiency Scale, prepared by (**Abdul-Waeli, J.R., 2018**), consists of (26) phrases, the scale with Five estimate alternatives. The highest score obtained by the respondent is (130) and the lowest is (26). The hypothetical mean of the scale is (78) degrees.
- Cognitive achievement test in fencing, prepared by (**Hijazi, M., 2015**).

Study method

The researcher used the experimental method by using pre and post measurements of perceived self-efficiency, skill performance, and cognitive level in fencing, for experimental and control groups.

Participants

Participants were (63) second year female students on the Faculty of Physical Education, Sadat City University for the academic year 2018/2019, (15) for the survey study, (48) for the basic study were divided into two groups (experimental and control), Each group consists of (24) students. The experimental group used Jigsaw Technique and the control group used Lecture method (The learner is a recipient of information).

The skewness coefficient of the research variables was between (-.080) and (.406) which indicates moderating of distribution. Also, there were no significant differences between the experimental and control groups in the pre-measurements which indicates equality of the two groups in the research variables.

Research procedures:

1. Survey study

The researcher conducted the survey study on a sample of (15) female students from the same research community and outside the research participants in the period from October 1st, to October 2^{ed}, 2018, for the purpose of rationing scientific coefficients for research tools, and make sure that the place appropriate, and the measurement tools are valid.

Scientific coefficients for tests:

First: validity

For perceived self-efficiency scale, the researcher calculated the construct validity through internal consistency by finding the correlation coefficients between each phrase and the total sum of the scale, which ranged between .524 and .875 (statistically significant at 95% confidence level). This means that the scale has an acceptable degree of concept validity or composition (internal consistency).

Second: stability

For perceived self-efficiency scale, the researcher calculates the test stability by Cronbach's alpha coefficient equation, the value of alpha coefficient was 0.833. which means that the scale has an acceptable degree of stability.

2. Pre- measurements:

Pre- measurements were conducted for the basic research sample on October 8, 2018, they included

- Measuring perceived self-efficiency.
- Measuring skill performance level.
- Measuring Cognitive level.

3. Implementation of the Technique:

The Technique was implemented in the period from October 15, to December 17, 2018, at a rate of two hours per week. And the program has continued (10) weeks.

The Jigsaw Technique relied on dividing the fencing curriculum into main sections, which are divided into sub-sections, for example, **the basic skills** are divided into (En garde - Marche - Retraite - Development), **Fencing positions** (Sixte - Quarte - Octave - Septime), **Offensive skills** (Coup Droit - Dégagement - Coupé - Contre-dégagement). **Defensive skills** (Parade Simple - Parade semi circulaire - Parade circulaire - Parade diagonals). Skills are distributed according to the Jigsaw Technique to the study groups.

4. Post measurements:

Post measurements were conducted in December 24, 2018.

RESULTS

Table (1) Significant differences between pre and post measurements for the experimental group for study variables

Variables	Pre-test		Post test		change ratio	t
	Mean	Std. Deviation	Mean	Std. Deviation		
perceived self-efficiency	88.50	15.057	96.29	14.403	8.80%	13.571
skill performance level	6.63	1.096	12.29	1.042	85.37%	17.284
Cognitive level	6.46	1.215	12.17	.868	88.39%	17.178

T Table value for *df* 19 and the level of 0.05 = 2.069

Table (1) shows that there are statistically significant differences between pre and post measurements for the experimental group in each of perceived self-efficiency, skill performance, and Cognitive level.

Table (2) Significant differences between pre and post measurements for the control group for study variables

Variables	Pre-test		Post test		change ratio	t
	Mean	Std. Deviation	Mean	Std. Deviation		
perceived self-efficiency	89.25	11.422	90.08	11.481	0.930%	3.745
skill performance level	6.38	1.173	10.79	1.021	69.12%	11.762
Cognitive level	6.75	1.422	10.67	1.129	58.07%	12.542

T Table value for *df* 19 and the level of 0.05 = 2.069

Table (2) shows that there are statistically significant differences between pre and post measurements for the control group in each of perceived self-efficiency, skill performance, and Cognitive level.

Table (3) Significant differences between the experimental and control groups in the post measurement for study variables

Variables	The experimental group		The control group		t
	Mean	Std. Deviation	Mean	Std. Deviation	
perceived self-efficiency	96.29	14.403	90.08	11.481	1.651
skill performance level	12.29	1.042	10.79	1.021	5.039
Cognitive level	12.17	.868	10.67	1.129	5.159

T Table value for *df* 38 and the level of 0.05 = 2.021

Table (3) shows that there are a statistically significant differences in the post measurement between the experimental and control group in both the skill performance and cognitive levels, while there are no statistically significant differences in the level of perceived self-efficacy.

Discussion

The results of Table (1) showed that there were statistically significant differences between pre and post measurements of the experimental group, in perceived self-efficacy, and both the skill performance and cognitive level, the rate of change in the level of perceived self-efficacy was (8.80%), while it was in each of the skill performance And cognitive level (85.37%, 88.39%).

The results of Table (2) also showed that there were statistically significant differences between pre and post measurements of the control group, in perceived self-efficacy and both the skill performance and cognitive level, the rate of change in the level of perceived self-efficacy was (0.930%), while for skill performance and Cognitive level was (69.12%, 58.07%).

Table (3) showed that there were statistically significant differences in the post-measurement between the experimental and control groups in both the skill and cognitive levels, while there are no statistically significant differences in the level of perceived self-efficacy. This demonstrates the positive impact of the use of Jigsaw strategy on both the skill and cognitive level in fencing. This is consistent with the results of **J. M. Timayi, C. Bolaji, Y. K. Kajuru (2015)** study, as it revealed statistically significant differences in performance for students exposed to Jigsaw IV Cooperative Learning Strategy, and **Gull F., Shehzad S. (2015)** study whose results were cooperative learning activities had a positive effect on academic achievement of students enrolled. It is also consistent with the results of **Asha, I., Abu Awwad, F., Al-Shalabi, E., and Rasmy, E., (2012)** study where active learning had a positive impact in developing self-efficacy and academic achievement.

The jigsaw cooperative learning model trains students to have more courage to express opinions, to cooperate, to develop themselves, to be individually responsible, to have positive interdependence, and to be involved in personal interaction and group processes.

Although there were no statistically significant differences for the post measurement between the experimental and control groups in perceived self-efficacy, the rate of change of the experimental group was higher than that of the control group, where it was (8.80%) for the experimental group, while (0.930%) for the control group, which shows the effect of Jigsaw's Technique on the level of perceived self-efficacy of the experimental group.

Self-efficacy is one of the most important mechanics of individual personal forces, it represents a great importance in the motivation of individuals to perform any work or activity, as it helps the individual to face the pressures encountered in the different stages of his life (**Hijazi, J., 2013, p. 420**).

In this regard, **Bandura (2002, -)** pointed out that one of the most important sources of individual self-efficacy is performance achievement, which refers to individual experiences, as success in previous tasks generates success and increases its expectations in subsequent tasks.

High self-efficacy indicates confidence in one's ability to perform certain accomplishments and predicts improved performance (**Bem, P. Allen, 2016, 17**). It also helps in achieving challenging goals and gaining new knowledge in performance that includes new grades and high performance. (**Bandura. 1977. 192**) (**Komarraju, M., & Nadler, D., 2013, p 67**).

Conclusions

Based on results of this study, the following conclusions can be drawn:

- Perceived Self-efficacy at an intermediate level for female students.
- The use of Jigsaw technique to teach fencing for female students positively affects both the skill performance and cognitive level.
- The use of Jigsaw technique with female students in learning fencing enhances the level of perceived self-efficacy.

Practical Implications

Based on the aim of the study and the collected data, the following implications can be made:

- Focusing on the use of interactive educational methods as it positively affects both the performance and cognitive aspects, as well as many social cognitive variables such as perceived self-efficacy.
- Focusing on the use of interactive educational methods, as they affect many social cognitive variables such as perceived self-efficacy.
- The use of the Mosaic Strategy (Jigsaw) in various educational levels, whether in schools or universities.
- Use other interactive educational methods to enhance the social knowledge aspects in the various educational stages, especially in the first educational stages.

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