

The Impact of Personalized System of Instruction (PSI) on the Achievement of the Students in Vocational Courses

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Abstract

The purpose of this study is to identify the impact of personalized teaching strategy on the achievement of the students of vocational courses. The descriptive analytical method was used in order to answer the questions of the study, and a sample which consists of (62) female students was selected purposefully from among the students of Irbid University college, which is a branch of the Balqa' Applied University, in the academic year 2017/2018. The participants of the study were divided into two groups, the experimental group which was taught using the personalized system of instruction, and the control group which was taught using the traditional teaching method. Results of the study showed significant differences in the achievement, between the experimental and control group, and on behalf of the formal group.

Keywords: Personalized system of Instruction, Vocational Education, and traditional teaching method.

Introduction:

In the last decades, a radical change in educational literature, practices, as well as the attitude of psychology towards learners, has been witnessed. Concern is being directed to the achievement of high levels of balance between the educational system in one hand and learning in the other hand. The changes in all the aspects of education were reflected on the ways in which learners are prepared, both academically and practically. Furthermore, the knowledge explosion, knowledge economy, and the emergence of modern educational technologies, introduced several challenges to current educational systems, which resulted in their seeking out new ways and methods through which to enable the learner to cope with these changes. Thus, individualization of learning was used as a method to make the learner more active in organizing the educational material, building the knowledge therein, linking them to previous knowledge, which results in a more firm knowledge structure (Al-Otaibi, 2015).

The Personalized System of Instruction was introduced by Fred Keller in the late 1960s, in order to help Brazilian students to learn the school subjects without the assistance of teachers. Due to the success of the program, Keller applied it in the USA. Based on the behaviorist principles on which the program is designed, it was adopted widely, by the tutors at universities as well as various other groups (Paiva, Ferrira, &Frade, 2017).

Keller identified five basic components for the application of the program, which included: 1) mastery of the school subject, 2) the use of proctors, 3) learning based on the pace of the learner, 4) focusing on written texts, 5): using lectures for motivational purposes (Eyre, 2007).

The Personalized System of Instruction can be defined as a system which aims to teach the learner through activities performed personally, based on his abilities and needs, in order to acquire knowledge, attitudes, and skills, in addition to self- learning skills with the least amount of the supervision and guidance from the teacher (Al-Zboun et al, 2016).

The personalized system of instruction is based on urging the students, individually, to pass through the various learning units, based on their pace, and the precondition of achieving mastery of the previous learning unit, with the provision of encouragement, guidance and assessment from their peers who completed the units and tasks before them (Murphy, Redding, &Twyman, 2016).

The role of the teacher in the personalized system of instruction is restricted to the provision of assistance to students in developing personalized learning plans, as well as diagnosing the points of strength and weaknesses in their knowledge, and modifying the learning setting and the teaching process according to the needs of students, in addition to seeking to provide an original learning experience for the students (Bautista, 2012). Thus, the philosophy of the personalized system of instruction is based on modifying the teaching methods based on the needs of the students, instead of urging the students to

cope with the applied traditional teaching methods. Flexibility is one of the basic concepts related to the personalized system of instruction, because learning can occur at any time, in any place, and in any method. The purpose herein is to urge the students to be inventive and responsible for their own learning (Houchens et al, 2014; Kalaivani, 2014).

The personalized system of instruction is a differentiated system of teaching, which can be adopted to the capabilities and competencies of the learners, as well as their needs, attitudes and preferences (Murphy, 2016). The personalization of learning requires forming a unique relationship between the teacher and the student, the use of various tools and means, in order to support the learning of every individual learner. This requires flexibility in terms of time, place, and the pace of learning, and in which the student contributes to the identification of the direction and development of the learning process, and in which modern techniques are used in documenting the learning process and the use of rich sources of knowledge (Twyman & Redding, 2015).

The competencies of the student in this context include the cognitive, metacognitive, social, and emotional competencies. The aim of these competencies is the achievement of mastery for the learner (Figure 1), which is the prerequisite for moving to the next learning unit (Redding, 2016).

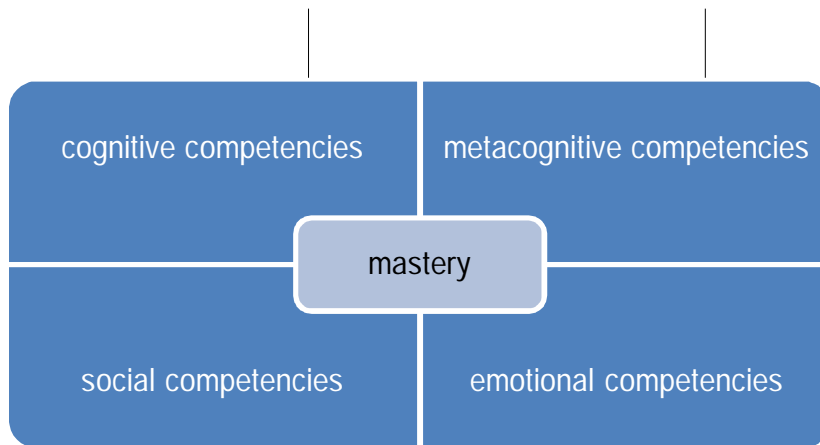


Figure (1): matrix of competencies and mastery.

The Personalized System of Instruction (PSI), which is also known as the Keller plan, can be described as a teaching method based on the strategy of personalized learning, and can be described also as the learning management technique, whose features include that students are held responsible for their learning, and that some students play the role of guide and supervisors for the learning of their peers, so that they apply the exams, score the results, assess and support the behaviors of their peers, provide guidance and advice to them based on their learning errors and the results of their exams (Hasan, 2010).

The personalized pace of learning is among the basic characteristics of Keller's plan, in addition to the mastery of learning, so that the learner becomes an active contributor to the learning process, rather than a receptor of knowledge provided through the lecturer teacher, in order to master the learning goals (Mare'e& Al-Heilah, 2007).

The advantages of the personalized system of learning (Keller's plan): the basic features of PSI were described in Keller's seminal 1968 article "Goodbye, Teacher", which included (Eyre, 2007): mastery of course material, (2) the use of proctors, (3) self-pacing, (4) stress upon the written word, and (5) use of lectures and demonstrations primarily for motivational purposes.

The main principles of PSI (Keller's plan) are as follows (Kalaivani, 2014):

1-Mastery: the mastery as a requirement is the basis of Keller's plan, because mastering the unit before moving to the next unit based on specified standard results in higher levels of achievement among the learners.

2-The size of the learning unit: the subjects in Keller's plan are divided to several small learning units, so that learners are subjected to various exams, through which the instructors are able to test the learners in every learning objective through the various short exams, and to correct the mistakes of students before they move on in their study.

3-Immediate feedback: the main task for the proctors in Keller's plan courses is to provide immediate feedback concerning the performance of learners through short self-exams at the end of each learning unit, which assist learners in identifying their errors and correct them.

4-Reviewing the learning units: reviewing the learning units is highly important in the courses based on Keller's plan, because they provide learners with a comprehensive view concerning the topics of study, and assist in linking the new knowledge to the previous knowledge.

5-Proctors: proctors are the cornerstone in Keller's plan, and they are selected from among the learners who completed their learning with a high level of mastery, and their tasks include the following:

- Teaching the students who seek help and explaining the concepts to them.
- Distributing the exam papers and scoring them for each individual learner.
- Dealing with the problems faced by the learners in terms of the exams and the educational material.
- Leading the groups in solving the problems which require experience.
- Collecting data and information about the learners in order to direct the process of evaluative analysis of the learning process.

- Direction: at the beginning of each semester, proctors express their confidence concerning the ability of learners to master their learning, and tell them that they are available for those seeking assistance.

- The guide: Keller's plan requires the presence of a printed guide which assists the learner in his learning process, in which objectives are listed, as well as the sources, and the means required for the achievement of the objectives, in addition to the way in which progress through the learning units is accomplished, the mastery standard for each learning unit, as well as the tools needed for the learning of the unit as well as the recommendations for additional activities.

- The printed word: communication between the teacher and the student is performed through the printed texts, which include the curriculum, and the guide. The educational material is kept in a portfolio so that it is always accessible.

- Evaluation: evaluation in Keller's plan includes:

- Final exams: which are prepared by the teacher, or the board of teachers, and are usually multiple-choice, with short answers, which are comprehensive for all the levels of objectives, and are prepared at the end of the learning unit immediately.

- Follow up exams: these exams are applied with an interval of time.

- Attitudes of learners: at the end of the course a questionnaire is distributed and completed in order to assess the attitudes of learners towards Keller's plan.

Review of Literature:

Friskawati, Ilmawati, and Suherman (2017) examined the effect of Personalized System for Instructions (PSI) on the physical fitness of Senior High School nursing's student. This research used experimental methods, research design pretest-posttest control group design. A population of 233 of Senior High School nursing's student from Bhakti Kecana at Cimahi, the sample consisted of 25 students for the experimental and control groups has been taken by cluster random sampling. Results showed an effect of Personalized System for Instructions (PSI) to the physical fitness of Senior High School nursing's student with the significant value is 0,000. Implications of this research shows that to improve the physical fitness of the students, Personalized System for Instructions (PSI) can be used. With notes, the modules at Personalized System for Instructions (PSI) sheet should be easy to understand students.

Al-Zaboun and colleagues (2016) aimed to compare the impact of the individualized instruction and cooperative learning strategies on students' achievement for the course of the principles of pedagogy at the University of Zarqa in Jordan. The study sample composed of (288) students who were studying the course of principles of pedagogy in the academic year 2013/2014/.The sample were chosen as an intentional sample. Students in the sample were distributed into (3) groups. The first experimental group (92 students)

was taught using individualized instruction (Claire Plan). The second experimental group (99 students) was taught using cooperative learning (Jigsaw 2) strategy. The control group (97 students) was taught using the traditional way. After finishing teaching the three groups, the analysis of variance duo (3×2) was used to see the impact of the study variables (the method and sex) in student achievement. The results showed that the mean of achievement of students who were taught by the way of cooperative learning was better than means of those who were taught by the individualized instruction and the traditional methods. The mean of students who taught by individualized instruction method was better than those who were taught by the traditional way. However, there was no significant difference in achievement is attributed to neither the sex nor the interaction between the teaching method and sex. The study concluded with a set of recommendations.

Butler and colleagues (2015) sought to assess the effectiveness of a modified PSI designed to fit within a traditional academic calendar. Students in two introductory psychology courses were exposed to both a modified PSI and traditional lecture format. Academic performance and student satisfaction were assessed. Results indicate no significant differences in academic performance, course satisfaction, or motivation between PSI and lecture methods. Furthermore, the use of technological supplements available with PSI did not lead to more satisfaction with PSI. This study suggests that modifying PSI by adding time restraints might be detrimental to its increased effectiveness over traditional lecture. Although our study did not support PSI over traditional lecture overall, when students were forced to select a teaching method, 55.2% reported that they preferred PSI .

Prewitt (2014) examined the fidelity of using PSI to teach HRF content knowledge and resistance training skills in a high school physical education class, and to examine changes in HRF content knowledge and in class physical activity levels with a class using PSI compared to a similar class using DI. Students (N=54) from a private, urban high school in a major city within the Mountain West region of the United States participated in the 6-week study. Video and audio taping, along with interviews and journals, were used to determine if criteria standards associated with PSI were met. Knowledge was assessed three times (pre, post, 3-week follow-up) using a standardized HRF knowledge test. Scores were compared between the two groups in addition to changes within each group. Class time physical activity was measured using a modification of the System for Observing Fitness Instruction Time (SOFIT). Study iv results showed that 3 of the 4 components of PSI were met as well as 10 of 12 design features, suggesting that implementing the personal fitness unit using PSI was successful. Knowledge results showed that the PSI group demonstrated a significant increase in knowledge assessment scores from pre- to posttest ($p=0.003$). Between-groups results showed that after the 6-week study, HRF

knowledge scores from the PSI scores were significantly higher than those from the control group ($p=0.03$). Differences in physical activity between the two groups were not significant ($p=0.79$).

Abd-Allateef (2011) examined the impact of PSI on the learning of the basic football skills among the secondary stage students. The sample of the study consisted of (42) students, who were divided into two groups: an experimental group (21 students), which was taught through the use of PSI method, and a control group (21 students) which was taught through the traditional method. Results showed significant differences in the performance of the students in the two groups, and in behalf of the experimental group.

Al-Mawajdeh (2004) aimed to explore the impact of PSI and cooperative learning on the achievement of 7th grade students in the subject of Islamic education in Jordan. The population of the study consisted of all the 7th grade students in the South Mazar directorate of education in the academic year 2003/2004, ($n= 1230$). The sample of the study was selected intentionally, and included (178) male and female students, in 6 classes, who were divided into 3 groups, an experimental group taught through the PSI method, an experimental group taught through cooperative learning method, and a control group which was taught through the traditional method. Results showed that the cooperative learning method was the best method in terms of the achievement of the students, while the PSI method showed better results compared to the traditional method in terms of the achievement of the students.

Thus, the review of literature shows a positive impact for the PSI method on the achievement of students (Al-Zaboun et al, 2016), and on the performative skills of the students (Friskawati, Ilmawati, Suherman, 2017). Some of the students (Butler et al, 2015) showed different results, which may be ascribed to the characteristics of the sample of the study, or the way in which the PSI method was applied.

Problem of the study:

Examining the impact of teaching methods on the various aspects of the achievement of the student as well as his personality is a basis for guiding the educational practices in the various contexts, in order to achieve the effective learning for the students. The lack of effective teaching methods which are suitable for the needs of the students, results in the prominence of the traditional teaching methods, which are not effective enough, and which results in low academic achievement.

The problem of the current study is related to exploring the impact of personalized system of instruction (PSI) (Keller's Plan) on the achievement of students in the courses of vocational education at Irbid University College, through answering the following question:

- Is there an impact for the personalized system of instruction (PSI) (Keller's Plan) on the achievement of students in the courses of vocational education at Irbid University College?

Importance of the Study:

The importance of the current study is related to its being one of the first studies which sought to explore the impact of the personalized system of instruction (PSI) (Keller's Plan) on the achievement of students in the courses of vocational education, thus it may contribute to raising the level of academic achievement of the students and turn the attention of educationalists towards one of the main modern teaching methods.

It is also hoped that the current study will fill a gap in the literature concerning the impact of teaching methods, on the achievement of students in the courses of vocational education at the university level. Practically speaking, it is hoped that the current study will provide practical information that may be helpful for the educationalists in the field of teaching the courses of vocational education in higher education.

Aims of the study:

The study aims to identify the impact of the personalized system of instruction (PSI) (Keller's Plan) on the achievement of students in the courses of vocational education.

Operational Definitions:

Keller Plan (Personalized System of Instruction (PSI)): a system of teaching and learning, which was developed by Fred Keller in the middle 1960s as an innovative method of instruction for the then-new University of Brasília. PSI was conceived of as an application of Skinner's theories of learning, grounded in operant conditioning strategies of behaviorism. In the current study, PSI is defined as the instruction applied at the Irbid university college, in the course of vocational education, for the purposes of the current research.

Academic Achievement: can be defined as the achievement in a certain subject, or a set of subjects, and measured through the score in exams. Operationally, it is defined as the score of the student in the course of sketches and sewing (1) at Irbid University College.

Method of the study:

The semi-experimental method was used in the current study. The teaching material and the achievement test were designed by the researchers, and were applied on the

students who participated in the sample of the study, in the course of sketches and sewing (1) at Irbid University College, during the first semester of the academic year 2017/2018.

Population of the study:

The population of the current study consisted of all the students registered in the course "sketches and sewing 1", in the first semester of the academic year 2017/2018.

Sample of the study:

The sample of the study included 62 female students in the course "sketches and sewing 1", in the first semester of the academic year 2017/2018, at Irbid University College, and who were divided into two groups:

- An experimental group: which was taught the use of PSI (Keller's Plan), and which consisted of (30) female students in the course "sketches and sewing 1", in the first semester of the academic year 2017/2018.

- The control group: which was taught through the use of the traditional method, and which consisted of 32 female students in the course "sketches and sewing 1", in the first semester of the academic year 2017/2018.

Results of the study:

The **results related to the equivalence of the groups** of the study: In order to ensure the equivalence between the experimental group (taught through PSI method), and the control group (Taught through the traditional method), t-test for the independent sample was applied, and table (1) shows the results.

Table (1): Independent sample t-test for the pretest results.

Method	Number	Mean	DF	t-value	P
PSI	30	14.27	60	1.88	.852
Traditional	32	14.06			

Table (1) shows a difference in the means of the scores of the two study groups, with the mean for the experimental group at (14.27), and for the control group at (14.02), which ought to be tested in order to determine their statistical significance. So, t-test was applied, and showed that the differences were insignificant ($p=.852$), which indicates that the groups of the study are equivalent, prior the execution of teaching.

In order to answer the question of the study, Independent Sample T-Test was applied to the results of the achievement test after teaching, and table (2) shows the results.

Table (2): Independent Sample T-Test results for the posttest.

Method	Mean	F-value	(t)	Sig.
PSI	18.57	60	13.98	.000
Traditional	16.31			

Table (2) shows statistical differences in the means of the scores of the experimental and control groups in the posttest, with a mean of (18.57) for the experimental group, and a mean of (16.31) for the control group. In order to test the statistical significance of the differences, Independent Sample T-Test was used, which showed statistically significant differences, which indicates that the PSI method has a positive impact on the achievement of students, compared to the traditional teaching method, which was used with the control group.

This result is ascribed to the role of PSI method in supporting the autonomy of the student, as well as its suitability to the needs and abilities of the student (Al-Zaboun et al, 2016).

Results of the current study agree with the results of most studies which explored the impact of PSI on the academic achievement of students (Abd-Allateef, 2011, Al-Zaboun et al, 2016, Friskawati et al, 2017).

Recommendations:

Based on the results of the study, the study recommends the following:

1-Applying the PSI method at Balqa' Applied University in teaching theoretical as well as applied courses, due to the positive impact of the method on the achievement of students.

2-Conducting additional studies which explore the impact of PSI on the achievement and motivation of students in various educational settings.

3-Providing training courses for the educators, including faculty at universities as well as teachers in the directorates of education, concerning the use of PSI method and other modern teaching methods, and encouraging them to apply these methods in their teaching.

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