The Effectiveness of a Training Program According to the TPACK Model in Developing Classroom Teaching Skills Among Students in Geography Departments in Colleges of Education

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Abstract

This research aims to identify: (The Effectiveness of a Training Program according to the TPACK Model in Developing Classroom Teaching Skills among Students in Geography Departments in Colleges of Education)

To achieve the goal of the research, the researchers followed the procedures of the descriptive approach, as they prepared the proposed training program according to the steps of (planning, implementation, and evaluation). The current research includes educational objectives, training content, appropriate training strategies, accompanying activities, training methods, and evaluation methods (which consist of eight training sessions), and the researchers have verified its validity by presenting it to a group of reviewers.

In order to determine the effectiveness of the training program in developing classroom teaching skills, the researchers adopted the experimental method and the experimental design was partially controlled, which is a one-group design with a pre- and post-test.

The research experiment continued for a semester, and one of its results was the effectiveness of the proposed training program according to the TPACK model in developing classroom teaching

skills among students of Geography departments in colleges of education. It is necessary to pay attention to developing teaching skills within teacher preparation programs in colleges of education by considering it as an independent subject in itself that emphasizes the theoretical and applied aspects, with giving the applied (practical) aspect a large space, and taught within more than one academic stage.

Keywords: TPACK Model, teaching skills, training program, evaluation methods.

1- Introduction to Research

1. 1 The Research Problem

What is noticeable about the current reality of teacher preparation programs is the presence of a weakness in skill and professional preparation due to its reliance on traditional programs that do not come up with the developments in the teaching profession and the changes that occur to it. Many teacher preparation programs focus on knowledge and mastery as a standard in practicing the profession, and most practical education programs rely on the theoretical knowledge as a reference framework considering that knowledge is sufficient for student teachers to be able to teach their students the information and facts contained in the textbook prescribed by mostly traditional teaching methods. It is worth mentioning that most practical education programs are unable to provide the student teacher with the skill of self-learning, which makes him unable to follow the changes and come up with the developments that occur in the contents of the comprehensive book as a result of scientific and technological progress in the information era (Farman, 2015: 268: 269). Therefore, in line with the needs of

society in keeping pace with the requirements of the information and technological revolution, the researcher decided to prepare a training program for student teachers in the geography departments in the colleges of education according to one of the training models. Accordingly, the research problem helps answer the following question: - Is the training program based on the TIPAC model effective in developing classroom teaching skills among students of geography departments in colleges of education?

1.2 Research Importance

Colleges of education are one of the largest educational institutions that interact with knowledge and culture as a center for scientific and research expertise in all disciplines. They also contribute to creating a climate of creativity and innovation in all other branches of science, and they also assume the responsibility of developing society's wealth, which is human wealth. (Al-Alfi, 2013: 16)

Attention to teachers, their preparation and training occupies a great place in all countries of the world, because the prepared and qualified teacher contributes effectively to achieving the goals of the educational process, and the success of educational institutions in achieving educational and educational goals and achieving their role in developing life depends on several components such as educational policies, administration, organization and the curriculum, school and others; but the teacher is considered the most important of these components and constitutes the main factor and the basis for change and development in the education system. His roles and responsibilities have changed comprehensively in order to achieve the goals of education in accordance with the developments

of the current era and its capabilities (Abu Rayash et al., 2009: 45). Given the multiple and diverse roles and functions that the teacher undertakes in building society, the quality of the teacher and the quality of his preparation are the key that ensures education achieves its goals and objectives, and based on the educational saying that confirms that "no educational system can rise above the level of teachers in it" (Higginson, 1996, p. 27). Therefore, preparing the teacher for the demands of the profession and the requirements of the times is one of the matters that receives constant attention in all educational systems, and no other profession has enjoyed the same degree as the teaching profession. (Al-Mufarji, 2012 :10)

Hence the importance of integrated preparation in building training programs is highlighted, it is one of the effective factors leading to sound integrated performance and achieving the required outputs in their optimal form (Al-Amin, 2005: 46). The process of pre-service teacher preparation and training during it represents the two wings of professional growth and academic advancement for the teacher. Accordingly, it is wrong for the teacher training process to be random, but rather to be an organized process defined by its goals and plans, and takes a sufficient period of time to implement it, and preparation is made. The conditions and facilities make it successful for the sake of renewal and development in various educational fields (Nasrallah, 2001: 76). Therefore, preparing the student/teacher academically and professionally is the starting point for qualifying him for the profession. Consequently, practical education is a training program offered by colleges of education over a specific period of time, under their supervision. With the aim of providing applied students with the opportunity to apply what

they have learned theoretically in a practical application, while they are actually teaching in school, which works to provide them with the desired teaching skills, and achieves familiarity between them and the human and material elements of the educational process. (Al-Zuhairi, 2015: 15). The preparation and training movement based on paying attention to teaching skills is one of the most important features of contemporary global education, and it is most common in educational circles interested in developing its staff. This movement has prevailed in most training programs with the aim of preparing skilled teachers, and training them in accordance with the latest theories of teaching and learning on the teaching skills necessary for them, so that they can carry out their teaching work properly. (Al-Azami, 2021: 4)

The TPACK model is one of the global trends that support this trend, as its philosophy is based on the necessity of integration between teachers' knowledge of technology and knowledge of the content of the subject, along with knowledge of the teaching methods best suited to the content of the specialty subject, as basic requirements for effective teaching using educational technologies (Fontanilla, 2016: 193). It is a framework for understanding and describing the types of knowledge that the teacher needs, for effective teaching practices in a learning environment enhanced by technology, and aims to achieve interconnection between the content of the academic subject, the method of teaching it, and the practice of activities related to the academic subject through modern technological technologies and not using technology separately, because merely using it in the classroom is not enough for true technological integration to occur. Effective technology integration is achieved when the teacher is able to choose the appropriate

technology for the content, learning outcomes, and learner needs, thus transforming the learning process from a process centered around the teacher to a process centered around the learner. The TPACK model differs from technology integration models, because it does not focus only on the teacher's knowledge, but also on the procedures for integrating technology, how to adapt to modern technological tools, and the ability to make decisions when integrating them into the educational process. (Koelher & Mishra, 2009, p.6)

The TPACK model derives its importance from its main and sub-fields that make up it, which are represented by the intersection of the primary forms of content knowledge (CK), pedagogical knowledge (PK), and technology knowledge (TK), to produce from this intersection new knowledge, which is pedagogical content knowledge (PCK), technological content knowledge (TCK), Knowledge of technology and pedagogy TPK, knowledge of technology and pedagogy and content TPACK. The importance of this approach is highlighted by its close connection to teaching practices by integrating educational and technological knowledge into the field of social studies among teachers, in addition to introducing technology into the context of educational situations in the classroom. In addition, the possession of geography teachers in the field of information technology draws a road map. For teaching practice to achieve educational goals and objectives related to the academic subject according to the most successful methods and theoretical foundations that guide their application within the classroom. (Moreno, Montoro, & Colon, 2019: 1)

The teacher's teaching skills and their development are at the forefront of the areas that teacher preparation programs seek to

develop in colleges of education. The role of the teacher is no longer limited to transmitting information, but has become much more than that. (Al-Toudari, 2002: 207)

The researchers decided to apply their research at the university because it has a significant impact on students' behavior because it gives an organized educational opportunity that qualifies applied students to enter the future, by directing and advising them to achieve integrated and comprehensive growth in several aspects, and training them according to the experiences of others, understanding their points of view, and raising the level of their skills, and also by using modern educational strategies and techniques, and how to employ classroom teaching skills in classroom situations to realize the true value of teaching now and in the future.

1.3 Research Objective and Hypotheses

- Research objective: The current research aims to know:

The effectiveness of a training program according to the TPACK model in developing classroom teaching skills among students in Geography departments in colleges of education.

- Research hypotheses: To verify the goal of the current research, the following null hypotheses have been derived:

The first hypothesis: There are no statistically significant differences between the average scores of the pre- and post-tests of the experimental group in the skill of planning classroom teaching.

The second hypothesis: There are no statistically significant differences between the average scores of the pre- and post-tests of

the experimental group in the skill of implementing classroom teaching.

The third hypothesis: There are no statistically significant differences between the average scores of the pre- and post-tests for the experimental group in the evaluation skill.

The fourth hypothesis: There are no statistically significant differences between the average scores of the pre- and post-tests of the experimental group in classroom teaching skills combined.

1. 4 Limits of Research

The research is limited to the following: - Fourth stage students in Geography departments in colleges of education in the city of Baghdad. (Academic year 2022-2023).

1.5 Definitions of Terms

- First: Effectiveness

"The ability to produce an impact, and the effectiveness of something is measured by the impact it produces on something else." (Atiyeh, 2008: 61)

The researchers' procedural definition: The expected positive impact that the training program prepared by the researcher according to the TPACK model will have on developing classroom teaching skills among Geography Department students (the experimental group from the research sample).

Second: The training program: defined by (Shehata and Al-Najjar, 2003)

- "It is a type of training that aims to prepare and train individuals in a specific field and develop their knowledge, skills, and attitudes, in accordance with the trainees' educational experiences, growth, and needs to develop a certain skill." (Shehata and Al-Najjar, 2003: 76)

The researchers define it procedurally: an integrated system of integrated and interconnected goals, activities, training techniques, and evaluation tools prepared by the researcher according to the TPACK model, with which students of the College of Education, Geography Department (the experimental group from the research sample) study throughout the duration of the research experience with the aim of developing their teaching skills.

- Third: TPACK Model (Rosenberg, M. & Koehler, J. 2015)
- The body of knowledge that emerges from the interaction of content knowledge, pedagogy, and technology during teaching to create a new cognitive framework appropriate to the different teaching context and situations. (Rosenberg, M. & Koehler, J. 2015, 186)

The researchers define it procedurally: a comprehensive methodological framework based on the integration of technological knowledge, content knowledge, and educational knowledge to provide the students of the Geography Department (the experimental group) with a set of knowledge and teaching skills that enhance their educational practices during teaching.

- Fourth: Development, defined by Al-Saadi, (2016), as: "raising the level of learners' cognitive and skill performance quantitatively and qualitatively, and increasing and improving it by teaching them according to methods and programs that

develop their cognitive performance inside and outside the classroom." (Al-Saadi, 2016: 17)

The researchers define it procedurally: it is the possibility of raising the level of students (trainees) to the best levels in classroom teaching skills after training them in the proposed training program, and measuring it with the observation card that was prepared for this purpose through comparison between the pre- and post-applications.

1.6 Teaching Skills

According to Al-Fatlawi, (2003): "They are the sets of skills that the teacher practices in the actual teaching situation that are linked to the implementation of the lesson in the classroom and include a set of sub-skills." (Al-Fatlawi, 2003: 67)

The researchers define it procedurally: it means the student/teacher's performance in the geography departments in the colleges of education (the research sample), which is characterized by high accuracy and speed. This work is related to planning the lesson, its implementation and evaluation, and it is measured by the grades he obtains after observing his performance using the observation form prepared by the researcher for this purpose.

Fifth: Student/teacher

It is defined by Al-Khawaldeh, (2020) as: "He is the qualified student enrolled in colleges of education and who practices the teaching profession in the future after providing him with appropriate educational experiences." (Al-Khawaldeh, 2020: 33)

The researchers define it procedurally: They are fourth-year students in geography departments in colleges of education (research sample) who are subject to a scientific, cultural, and vocational preparation program with the intention of preparing them to practice the teaching profession in educational institutions.

2 Previous Studies

The study by Naji, (2016) aims to identify the effectiveness of a program based on the pedagogical approach of TPACK to develop thinking skills in technology among female students at Al-Aqsa University, and it concludes that there were statistically significant differences at the significance level (0.05) between the average grades of female students in the control group. The average scores of the female students in the experimental group in the posttest of thinking skills in technology are in favor of the experimental group.

While the study by Omar, (2018) aimes to find out the effect of a training program based on the TPACK model in developing the teaching performance of social studies teachers in the basic education stage and concludes that there is a statistically significant difference between the average scores of the experimental group in favor of the post-measurement, which indicates a clear improvement in Social studies teachers in their teaching performance.

3 Research Methodology and Procedures

Since this research aims to identify "the effectiveness of a training program according to the TPACK model in developing classroom teaching skills among students of geography departments in colleges of education," the researchers have adopted the experimental method, which is one of the most important scientific methods, due

to the high confidence in the results reached during it, and in light of the variables and nature of the current research, the researchers rely on an experimental design with partial control for one experimental sample with two pre- and post-tests (One Group design with two pre and post tests). In this design, the same group is used, and the results of the experiment are compared in one circumstance. Certain and the results in another circumstance. The process of building the training program is one of the important stages of the training process that includes a set of processes that work to achieve the goals desired by the target group for training, and work on the success of the program. Before starting to prepare the training program, the researchers took the following steps:

- Reviewing literature and previous studies for the purpose of reviewing the designs of training programs and their steps.

- The design of the training program for this study has three stages: (the planning stage, which includes analysis and design, the implementation stage, and the evaluation stage). Details of these stages are as follows: -

First: The planning stage includes:

- Analysis: It is the foundation stone for all other stages of design, and it is the first step and foundation in the process of building the training program, and from it all other stages are launched. (Al-Tamimi, 2021: 84). This stage includes a set of steps: (defining general objectives, determining the training needs, determining the characteristics of the trainees, analyzing the training environment, defining training tasks, and analyzing teaching skills).

- Design: The design phase includes developing a structure for the training program, including defining training and educational objectives based on training needs. The researchers prepared (100) behavioral objectives according to the six levels of Bloom's classification, selecting content items and organizing them from the preparation of a theoretical course that achieves the objectives of the program and takes into account the needs of the trainees. The necessary requirements for the training sessions, which amount to (8 sessions), and determining the training strategies, which are (flipped classroom, cognitive trips, information gap, micro-teaching, evaluation methods and types, and training methods), and that they should be clear and expressive of the importance and how the training program will be organized.

- Preparing the research tool: The researchers have used the observation card as a tool for her research. The researchers have prepared it after reviewing the literature and previous studies that dealt with teaching skills as well as the vocabulary of the practical education subject. It consists of three main skills: (planning, implementation, and evaluation), and each main skill includes a number of skills. The number of subscales reaches (12), and these skills in turn included indicators numbering (50) indicators, and the five-point Likert scale (poor, acceptable, average, good, very good) has been adopted as a quantitative assessment of this card. The researchers verify its validity by presenting it to the experts, as well as it measures its reliability by measuring the degree of agreement between the researcher and other observers, where the reliability coefficient reached (0.88), which is a good reliability coefficient.

- Second: The implementation stage: The implementation stage means defining the general framework for the program's executive

procedures, that is, covering the implementation aspects that the training program is concerned with and is based on managing the training process, preparing the training environment, timing the program, and putting everything that was reached during the design process into actual application in the circumstances. Real, that is, bringing it into existence, applying the training, and ensuring that all activities are conducted with complete perfection and quality (Al-Sakarneh, 2011: 67). It should be noted that the researcher took many procedures before starting to implement the training program.

- Procedures (implementation of the training program): This is the stage of applying the training program to the research sample. - Requirements of the implementation stage: The researchers trained themselves as training implementers by reading the content every time and reviewing the training programs, implementation requirements, and training methods used in them. The researchers have trained the trainees, being a training leader, and thus the results of the research have a degree of accuracy and objectivity, because more than one trainer will make it difficult to attribute the results to the independent variable (the proposed training program) due to the different training methods of the trainers because each trainee has his own style and personal characteristics, and other factors.

The number of training sessions is (8 sessions). The researchers rely on many strategies and models in the training sessions, including (flipped classroom, cognitive journeys, information gap, micro-teaching). They have also employed many teaching techniques in these sessions.

- Place for implementing the experiment: One of the halls of the Geography Department at Ibn Rushd College of Education was

chosen, which is considered appropriate for implementing the program.

- Estimating the timetable for implementing the program: One of the necessary matters for implementing the training program is (determining the place and time period), and they have been determined in cooperation with the department administration, at the rate of one day (Sunday) every week, as the researcher began on Sunday 10/9/2022 by applying the observation card (The pre-application) and continued until Sunday 10/30/2022, and the theoretical aspect began on Sunday 11/6/2022 and continued until Sunday 11/13/2022.

The actual implementation of the training program began on Sunday, 11/20/2022, with the first session at two hours per week for a period of two months. Two training hours were allocated for each training day at a rate of two training sessions, interspersed with a short break. The program items were distributed over the period allocated for implementing the program.

- Material requirements: - They include the equipment, educational techniques, and tools required by the training program. The researcher prepared these requirements from data display devices and a computer, as well as the use of mobile phones.

- Preparing a user guide: - The training designer must determine, at a previous stage, the implementation process and the necessary requirements to put into practice the methods, activities, training materials, and evaluation tools included in the training program. These are usually in the form of a guidebook attached to the training program and have been prepared. The researcher has two forms of evidence:

- Trainer's Guide: This guide is in the case of training programs approved by the teacher. Accordingly, this guide has provided clear directions for the teacher showing the procedures that must or should be followed in implementing the session through training plans in accordance with the approved strategies and models. - Trainee Guide: This guide is often used in programs. In this guide, directions are provided to the trainee, which may include instructions on how to progress in the training program. Accordingly, the researcher prepared the trainee's guide to help guide and direct him. It included theoretical aspects about the most important teaching skills that will be the subject of the training.

Third: Evaluation stage: The researchers believe that the process of evaluating training programs is essential, to determine the feasibility of the training program in all its stages, which is the basis for the process of change and development, and a measurement of the final outcome of the total cognitive, skill and behavioral changes of the trainee. The training program was evaluated as follows: Stages of evaluating training programs: These include the following steps:

- By presenting it to arbitrating experts and gaining the quality of honesty in it.

- Evaluating the program before implementation (preliminary evaluation): This step begins with evaluating the program during the planning and design stage in order to ensure its clarity and accuracy and the extent to which it is able to achieve the desired goals, determine the appropriate activities and methods for its implementation, and arrange the program topics and sessions in a sequential manner with the intention of meeting the training needs of the trainees, and selecting appropriate evaluation methods.

- Evaluation of the program during implementation (formative evaluation) has been done by verifying the progress of the training sessions according to what was planned, in a sequential manner according to the established objectives, the suitability of the time, place and dates of the sessions, the availability of the tools that the program needs, the sequence of the program topics, the integrity of their contents, and the extent to which it contains theoretical information or practical experiences that must be provided to trainees, the extent to which these topics relate to training needs, the extent of the diversity of training methods and activities, and that the efforts of the trainees and the trainer are directed in the right direction.

Evaluation of the program after implementation (final evaluation). This evaluation took place at the end of the training program with the aim of determining its effectiveness by applying the research tool (observation card) post-application and comparing the performance scores of the members of the research sample between the pre- and post-applications.

Research results: After transcribing the data of the post-application of the observation card according to the main and subsidiary skills and calculating the grades through comparison between the scores of the pre- and post-applications of the observation card, the researchers have adopted a t-test for two correlated samples, where she reached the following:

1- There are statistically significant differences between the scores of the pre- and post-applications in the planning skill and its sub-skills (the skill of preparing a daily plan, the skill of formulating educational goals, the skill of teaching methods, the skill of

educational methods) and in favor of the post-application, and Table (1) shows this.

Main Skills	Sub-skills	SMA		standard deviation	Value		Significance level 0.05
	Preparing a daily plan	Pre-application Post-application	10,781 17,437	1,361 1,361	26,794	26,794	
Planning	Formulating educational objectives	Pre-application Post-applications	7,312 12,750	0,820 0,762	31.333	2,042	Function in favor of the post-test
	Method of teaching	Pre-application Post-applications	6,812 12,656	0,737 0,865	34.648	2,042	
	Teaching aids						
		Pre-application Post-applications	4,562 8,406	0.669 0.559	25,683	2,042	

2. There are statistically significant differences between the scores of the pre- and post-applications in the implementation skill and its sub-skills (preparing the lesson, classroom questions, reinforcement, feedback, diversifying the stimuli, using teaching aids and pedagogical techniques, and closure) and in favor of the post-application; Table (2) shows this.

Main Skills	Sub-skills	SMA		standard deviation	Value		Significance level 0.05
	Preparing the lesson	Pre-application	6,906	0,928	32,751	2,042	
		Post-application	13,250	0,983			
Implementation	Questions of the lesson	Pre-application	11,875	1,237	54,117	2,042	A function for the benefit of the post-application
		Post-applications	24,843	1,110			
	Reinforcement	Pre-application	4,687	0,644	25,571	2,042	
		Post-applications	9,125	0,707			

	Feedback	Pre-application	4,656	0,787	26,444	2,042	
		Post-applications	8,843	0,766			
	Diversify the stimuli	Pre-application	13,687	0,997	53,908 2,042		
		Post-applications	33,718	2,232			
	Use of educational means	Pre-application	8,031	0,860	35,598 2,042		
		Post-appreciations	17,000	1,107			
	Closing						
		Pre-applicatio	5,500	0,672	35,577	2,042	

		n Post-applications	13,343	1,095			

3- There are statistically significant differences between the scores of the pre- and post-applications in the evaluation skill and its sub-skill (evaluation skill and tests) in favor of the post-application, and Table (3) shows this.

Main Skills	Sub-skills	SMA		standard deviation	Value		Significance level 0.05
Evaluation	Evaluation and testing	Pre-application Post-application	11,093 20,906	٠,٨٥٦ ٠,٨٩٢	50,894	2,042	A function for the benefit of the post-application

4-There are statistically significant differences between the scores of the pre- and post-applications in training skills combined, and Table (4) shows this.

Main Skills	Arithmetic mean	standard deviation	T-Value		DF	Significance
Pre-application	95,906	3,804	82,629	3,646	31	Function for the post-

						application test at the 0.001level of significance
Post-application	192,281	8,527				

Recommendations:

1- Encouraging teachers of the subjects of educational applications and teaching methods to adopt technological integration or integrate technology with education in implementing study subjects in an organized, sequential and planned manner and to use the TPACK model as a framework for technological integration.

2- Paying attention to developing teaching skills within teacher preparation programs in colleges of education by considering it an independent subject in itself that emphasizes the theoretical and applied aspects while giving the applied (practical) aspect a large space in it, and it is taught within more than one academic stage.

Third: Suggestions:

1- The effect of a training program based on the TPACK model in improving the teaching performance of College of Education students and developing their motivation towards practicing the profession.

2- Comparing the TPACK model with another training model and demonstrating its effectiveness in the teaching competencies of students applied in Geography departments in colleges of education.

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