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The Effectiveness Of A Professional Learning Community Based On TPACK Model In Developing Pedagogical Knowledge And Teaching Performance Of English Teachers For Early Grades In Qassim

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Abstract

This study aimed to identify the effectiveness of a professional learning community based on TPACK model in developing both pedagogical knowledge and teaching performance of English teachers for early grades in the Qassim region. It used the descriptive analytical method and the quasi-experimental method. It was conducted on a sample of (40) English teachers for early grades, distributed into two groups: experimental and control. The study tools consisted of a training program based on a professional learning community through TPACK model, a test of pedagogical knowledge of English teachers for early grades, and a teaching performance classroom observation checklist for English teachers for early grades. There were statistically significant differences at (0.05) level between the mean scores of the experimental and control groups in the pedagogical knowledge post-test in favor of the experimental group. The pedagogical knowledge pre-posttest is in favor of the post-test, and statistically significant differences appeared at (0.05) level between the mean scores of the experimental and control groups of the teaching performance classroom observation post-checklist in favor of the experimental group. There were statistically significant differences at (0.05) level between the mean scores of the experimental group of the teaching performance observation pre-post checklist in favor of the post-checklist.

Keywords: professional learning community, Pedagogical Knowledge, Teaching Performance

1- Introduction

Scientific and technical development is considered one of the main features of our current era. Educational systems are seeking to keep pace with rapid developments and take advantage of the current capabilities to provide more efficient education, urging teachers to adopt the idea of innovation in their educational practices to facilitate the learning and teaching process. The success of the educational process depends on a qualified teacher. The teacher is the basis of the educational process. Many researchers [1-2] (Hassan, 2020; Abu Dayyeh et al., 2021) indicated that, in the era of the cognitive and technological revolution, the successful teacher is the one who is able to employ technology in teaching academic content in a well-thought-out educational manner. Nowadays, employing technology and integrating it into the knowledge content of students in an educational way has become a basic requirement for the teacher. It presented a model that shows the types of knowledge needed to prepare the teacher to teach efficiently. It includes two important dimensions: knowledge of the content of the specialization subject and knowledge of the methods of teaching this content [3] Koehler and Mishra (2009) add a third dimension to this model: knowledge of technology. It provides the teacher with technical knowledge related to the methods of teaching the content. This model was called: Technological Pedagogical Content Knowledge framework (TPACK). The results of many

previous studies emphasized the importance of developing the teaching performance of teachers in general, and of early grade English teachers in particular, in various fields and at various educational levels. However, there may be a shortcoming in the quality of training programs offered to English teachers for early grades, which negatively affect the teaching performance of teachers. This is based on a pilot study carried out by the researcher who conducted field visits to some primary schools.

2- Research Problem

The traditional method for preparing teachers in education colleges, based on two main majors: specialized knowledge, and knowledge of teaching methods, are considered an outdated. It does not keep pace with the requirements of the 21th century. Hence, there should be an essential change in this method to include technology as an integral third dimension of teacher preparation and the development of their knowledge and skills [4] (Alsuwaify & Tulba, 2021, 306). The problem of the study crystallized for the researcher by conducting a pilot study. A questionnaire was applied to a sample of (30) English teachers for early grades in Qassim region. It included questions related to the teachers' TPACK model, and the integration of content knowledge (CK), education and technology, in addition to questions related to the teachers' pedagogical knowledge (PK) and the level of their teaching performance. The results of this pilot study revealed a deficiency among teachers in terms of familiarity with TPACK model [5] Almahaya (2020, 246) points out the danger of the low level of teacher qualification in employing information and communication technology in education is not limited only to lower the level of achievement of students, nor providing them with the skills of the 21th century; rather, leaving space for young people to deal haphazardly with information and communication technology exposes them to more risks than creating opportunities for them to seize the benefits offered by communication technologies. In light of the foregoing discussion, the following question summarizes the problem of the current study: What is the effectiveness of a professional learning community based on TPACK model in developing the PK and teaching performance of English teachers for early grades in Qassim region? From this main question, the following sub-questions are derived:

1- What is the effectiveness of a professional learning community based on TPACK model in developing the PK of English teachers for early grades in Qassim region?

2- What is the effectiveness of a professional learning community based on TPACK model in developing the teaching performance of English teachers for early grades in Qassim region?

3- Research Objectives

This research aims to identify the effectiveness of a professional learning community based on TPACK model in developing the PK of English teachers for early grades.

The following sub-objectives are derived from the main objective:

- Identifying the effectiveness of a professional learning community based on TPACK model in developing the PK of English teachers for early grades.
- Identifying the effectiveness of a professional learning community based on TPACK model in developing the teaching performance of English teachers for early grades.

4- Research Literature

The TPACK model is based on the concept of integrative teacher preparation by integrating technology with educational and specialized courses in teacher preparation programs. As TPACK's framework goes beyond knowledge, it even goes further by emphasizing the types of knowledge that lie at the sub-intersections among the three basic forms: the teacher's knowledge of integrating educational content with teaching, educational content with technology, and teaching with technology, ending with the teacher's full integration of technology with teaching and educational content [5] (Almahaya, 2020, 250). Thus, TPACK model includes a comprehensive methodological framework, based on the integration of CK, education and technology to provide teachers with a set of knowledge, skills and educational practices as basic requirements for effective teaching [1] (Hassan, 2020, 618). Many researchers [6-8, 2] (Muhammad, 2018; Alanazi &

Alshaddadi, 2018; Muhammad, 2020; Abu Dayyeh et al., 2021) argue that TPACK model includes three main forms of knowledge, emphasizing the new knowledge resulting from the integration of knowledge; therefore, the TPACK framework consists of seven types of knowledge: technological knowledge (TK) efficiency, CK efficiency, PK efficiency, technological PK efficiency, pedagogical CK efficiency, technological CK efficiency, and technological, pedagogical, and CK efficiency. It is clear that TPACK model is a framework to determine the knowledge and competencies that teachers should have to be able to effectively employ technology to implement appropriate teaching methods and strategies to achieve the teaching goals of specific content. The development of the teaching profession is linked to preparing the teacher well in all academic and professional aspects. These programs should keep pace with the rapid developments, especially in the field of technology. The TPACK model is one of the teaching models that emphasizes the integration between knowledge of the subject's content, knowledge of appropriate teaching methods for the subject's specialization, and knowledge of technology to achieve effective teaching [1] (Hassan, 2020, 619). PK is the deep knowledge that a kindergarten teacher must have about teaching and learning methods, which includes knowledge of educational goals and strategies, how children learn, classroom management, educational planning and implementation, and also includes knowledge of educational methods used in the classroom, together with the nature of children's needs and preferences, and strategies to assess their understanding. It also includes knowledge of how children build knowledge and acquire skills in a variety of ways [9] (Alawadi, 2019) [10] Ghoneim and Ayyash (2016) identified the basis of knowledge necessary for effective education in seven areas: CK, general PK, curriculum knowledge, pedagogical CK, learner characteristics, knowledge of educational contexts, knowledge of educational goals and objectives, values and their philosophical and historical basis. PK is characterized by many features, which **[**11**]** Abdalal (2019, 277) points out that the teacher's PK of the content is influenced by knowledge and beliefs about the seven elements. The components of PK are interrelated and should be used in a flexible manner. PK of the content is knowledge specific to each teacher in addition to being specific to each topic in the content. The teacher's knowledge of the pedagogical content is crystallized around a specific topic by repetition of its planning and reflection. Teaching performance is defined as "a behavior or effort made by the teacher to achieve the desired goals, according to a set of rules regulating the planning and preparation process, lesson implementation, performance evaluation for learners, and the related professional responsibilities" [12] (Alali, 2007, 11). It is also defined as "every activity that the teacher performs during the service in the teaching situation that helps to achieve the desired learning" **[**13**]** (Almousa, 2015, 414). Improving the competence of the teacher requires some standards that should be applied by teachers. Therefore, taking care of the quality of the teacher's performance in terms of roles is a necessary requirement that cannot be overlooked [14] (Awad & Alshammari, 2020, 20). Therefore, the urgent call for in-service teacher training is linked to a number of justifications confirmed by the literature in developing the teaching performance of teachers in various disciplines [15]. Hassan (2018, 236) summarizes these justifications as follows: knowledge revolution, technological revolution, educational renewal, and quality concepts. Recent developments have imposed the need to improve the level of teacher performance to be able to keep pace with the changes and challenges of the digital age and possess the competence in employing modern technology in the teaching process in a professional manner. This has to be done by linking technology and learning content. Building a new framework helps to understand the knowledge and skills that teachers need to employ technology competence in learning [16] (Mabrouk, 2021, 166).

5- Previous Studies

Following are some previous studies relevant to the current research, which have been grouped into three themes: TPACK model, PK of teachers, and teaching performance of teachers [8]. Muhammad (2020) prepared a proposed program for

developing teaching competencies based on the dimensions of TPACK model for female mathematics teachers using the Google educational platform and developing their perceptions about the integration of technology in teaching. The proposed program is very effective in developing the competencies of TPACK and the perception about the integration of technology in the teaching of mathematics among the female students in the research group [17] Tondeur et al., (2020) explored the effectiveness of the strategies used in preparing pre-service teachers to identify the technological educational content of TPACK. Quantitative analyzes indicated positive associations between teacher preparation strategies and TPACK. The results showed that teachers recognized the importance of the strategies used in their preparation [4] Alsuwaify and Tolba (2021) identified the effectiveness of a training program based on TPACK framework in the light of international standards for preparing language teachers in developing professional applications and confidence in learning among student teachers. The results showed that the students of the experimental group outperformed that of the control group in the professional applications test. It indicated the effectiveness of the training program in developing professional applications and confidence in learning among students and teachers [16] Mabrouk (2021) identified the efficiency of professional performance in the light of TPACK model among home economics teachers according to the study variables (years of experience - academic degree). The application resulted in the effectiveness of the proposed program in developing the professional performance of the home economics teachers in the light of TPACK model in favor of the post-application [18] Filho and Gitirana (2022) determined the effectiveness of digital professional learning communities of pre-service teachers in developing CK and technology TPACK. The results showed that professional learning communities helped in developing educational knowledge related to content and technology knowledge among the study sample. Following are studies about PK of teachers [9] Alawadi (2019) determined the critical pedagogical and TK of kindergarten teachers from their point of view according to the TPACK framework. The results indicated that the relative weights of the responses of the research sample to the pedagogical and TK necessary for kindergarten teachers (as a whole) were relatively high. [19] Shaqr et al., (2020) investigated the effect of a training program based on the dimensions of learning model in developing PK of pre-service mathematics teachers. The results showed that there were significant differences between the performance of the two study groups on the post-test of PK, and at the level of each of its domains (curriculum knowledge, knowledge of teaching strategies, knowledge of students' understanding, and knowledge of student assessment), and in favor of the experimental group who were taught the training program [20] Arjan et al. (2021) prepared a proposed program in the light of the integration of pedagogical and TK patterns and to verify its effectiveness in developing knowledge management processes for chemistry teachers. The results showed the effectiveness of the proposed program in the light of (TPACK) approach in developing knowledge management processes for chemistry teachers [21] Aljhuwairi (2021) investigated the effect of a structural model in teaching fractions on the development of PK of student teachers. The results showed that there were statistically significant differences between the mean scores of the experimental group and that of the control group in favor of the experimental group. Following are studies dealing with teachers' teaching performance [14] Awad and Alshammari (2020) evaluated the teaching performance of female teachers of Islamic sciences at the intermediate stage in the light of the specifications of the future teacher. The results of the study showed that the teaching performance skills of female teachers of Islamic sciences at the intermediate stage in the light of the specifications of the future teacher - in the observation checklist - as a whole achieved an acceptable level [22] Alsamani's study (2021) aimed to identify the reality of the teaching performance of the student teacher in Faculty of Education, from the point of view of the teaching staff. There are statistically significant differences in the level of teaching performance of students from the point of view of faculty members that can be attributed to the nature of the department (Islamic studies - English language - Arabic language). The previous studies that dealt with the

effectiveness of professional learning communities according to the TPACK model in the different academic levels, and the effectiveness of these communities in developing PK among female teachers is evident. However, there is a dearth of previous studies that focused on the effectiveness of professional learning communities in the primary grades. There are also numerous studies that dealt with the teaching performance of female teachers of different academic levels, but there is a dearth of studies that focus on the teaching performance of English teachers in the primary grades. The current research is consistent with most of the previous studies in the use of quasi-experimental. It is also consistent with the studies conducted on similar samples. It confirms the studies that used the questionnaire as a tool for data collection. However, the current research is contrary to the studies that used the descriptive approach. It is also contrary to the studies that used achievement tests as tools for data collection. The current research is different from the previous studies in revealing the effectiveness of a professional learning community based on TPACK model in developing the PK and teaching performance of English teachers for early grades in Qassim region. The previous studies were used to enrich and strengthen the idea of the current research and highlight its problem. The tools that were used in previous studies will also be manipulated when preparing the data collection tool in the current research. In addition, the previous studies directed the researcher to many references and sources related to the topic of the current research.

6- Research Hypotheses

In light of the results of previous studies and discussion, the following research hypotheses are formulated:

1- There are statistically significant differences, at (0.05) level, between the mean scores of the experimental and control groups in the PK post-test in favor of the experimental group.

2- There are statistically significant differences, at (0.05) level, between the mean scores of the experimental group in the PK pre-posttest in favor of the post application.

3- There are statistically significant differences, at (0.05) level, between the mean scores of the experimental and control groups in the teaching performance observation post-checklist in favor of the experimental group.

4- There are statistically significant differences, at (0.05) level, between the mean scores of the experimental group in the teaching performance observation pre-post checklist in favor of the post-checklist.

7- Research Methodology

The current research uses the descriptive analytical method and the quasi-experimental method. The descriptive analytical method is used to describe and analyze the literature and studies related to the research variables and tools, by collecting information and analyzing the literature related to the research variables. The researcher studied the effect of an independent variable (a training program based on a professional learning community through TPACK model) on two dependent variables (namely, PK and teaching performance). An experimental design that includes two groups will be used: the experimental group (which is the group that will receive training through a professional learning community based on TPACK model) and the control group. The control group will not receive training through a professional learning community based on TPACK model. The researcher applied the two research tools, namely the PK test and the teaching performance observation checklist for the English teachers of the early grades on the teachers of each of the experimental and control groups.

8- Research population and sample

The current research population includes all English teachers for the early grades in Buraidah, Qassim region, during the 2021-2022 academic year: 208 teachers. As for the research sample, it consisted of 40 English teachers for early grades in Qassim region. The research sample was chosen by the random sampling method. The sample was randomly distributed into two groups: one experimental and the other control. Each group consisted of 20 teachers.

9- Research Tools

The current research used the following tools, prepared by the researcher:

9-1- Training program based on professional learning community through TPACK model

The objectives of the training program used in the current research were to develop PK and teaching performance of English teachers for early grades in the light of TPACK model. The model was based on various bases: knowledge, psychological and social. The preparation of the training program went through certain stages: determining training needs, training program planning, determining the training material, and training program evaluation. The training program included topics for the scientific material: pedagogical practices for effectively teaching English to early grades, pedagogical practices to activate technology in teaching, pedagogical practices to activate technology in teaching, educational practices and technological applications for teaching content, and identifying the training media. The training program used in the current research included a set of training methods: interactive lecture, discussion, brainstorming, training exercises, role-playing, case study, and training workshops. The following evaluation techniques were used: pre-evaluation, formative evaluation, and final evaluation.

9-2- Test for the PK of English teachers for the early grades

The test was prepared following certain steps: reviewing the related theoretical literature, determining the test purpose, preparing the initial form for the test, distribution of test scores, and drafting test instructions. The test was applied on an exploratory sample consisting of (30) participants, to ensure the clarity of formulating test items; to determine the coefficients of ease and difficulty for the test items; and to achieve the validity and reliability of the test.

- Calculating the coefficients of ease and difficulty for the test items:

Table (1) shows the coefficients of ease and difficulty for the PK test items:

Table 1: Ease and difficulty coefficients for PK test items

Item number	Ease coefficient	Difficulty coefficients	Item number	Ease coefficient	Difficulty coefficients
1	0.53	0.47	19	0.65	0.35
2	0.56	0.44	20	0.68	0.32
3	0.62	0.38	21	0.59	0.41
4	0.46	0.53	22	0.59	0.41
5	0.44	0.56	23	0.65	0.35
6	0.68	0.32	24	0.65	0.35
7	0.59	0.41	25	0.68	0.32
8	0.65	0.35	26	0.63	0.38
9	0.62	0.38	27	0.65	0.35
10	0.59	0.41	28	0.56	0.44
11	0.68	0.32	29	0.53	0.47
12	0.65	0.35	30	0.68	0.32
13	0.59	0.41	31	0.53	0.47
14	0.62	0.38	32	0.65	0.35
15	0.65	0.35	33	0.62	0.38
16	0.65	0.35	34	0.59	0.41
17	0.59	0.41	35	0.65	0.35
18	0.62	0.38	36	0.56	0.44

Table 1 shows all the values of the difficulty coefficients for PK test item are appropriate, as the item is acceptable if the value of the difficulty coefficient ranges from 0.30 to 0.70. Determining

the discrimination coefficients for the test items, table (2) shows the values of the discrimination coefficients for the items of the PK test.

Table 2: Discrimination coefficients for the PK test items

Item number	Discrimination coefficients	Items number	Discrimination coefficients
1	0.71	19	0.59
2	0.65	20	0.65
3	0.65	21	0.59
4	0.59	22	0.47
5	0.65	23	0.59
6	0.53	24	0.71
7	0.71	25	0.53
8	0.47	26	0.77
9	0.65	27	0.47
10	0.47	28	0.77
11	0.65	29	0.71
12	0.47	30	0.53
13	0.47	31	0.59
14	0.41	32	0.47
15	0.47	33	0.65
16	0.71	34	0.47
17	0.47	35	0.59
18	0.77	36	0.77

Table 2 shows all discrimination values for the PK test items are appropriate, as the item is acceptable if the value of the discrimination coefficient is greater than (0.30)

The validity of the PK test was verified in two ways:

Face validity

The test was presented to a jury specialized in the field of curriculum and instruction, in order to express their opinions about the clarity of the instructions, the scientific and linguistic validity of the test items, the suitability of the items for the research sample, and the suitability of the proposed alternatives for each item. Some of the test items were modified in light of the jury' instructions; to make the test valid in terms of content, and in light of this, the final form of the test was prepared.

Internal consistency validity

The validity of the internal consistency of the PK test was verified by applying it to the (30) participants of the exploratory sample, the results are shown in table (3).

Table 3: Correlation coefficients between the PK test items and each of the dimension to which this item belongs and the total score of the test

Item number	Correlation coefficient for the dimension to which the item belongs	Correlation coefficient for the dimension to which the item belongs
1	** 0,80	** 0,78
2	** 0,63	** 0,59
3	** 0,59	** 0,62
4	** 0,77	** 0,67

Item number	Correlation coefficient for the dimension to which the item belongs	Correlation coefficient for the dimension to which the item belongs
5	** 0,72	** 0,61
6	** 0,71	** 0,76
7	** 0,61	** 0,65
8	** 0,59	** 0,77
9	** 0,74	** 0,70
10	** 0,68	** 0,72
11	** 0,77	** 0,79
12	** 0,69	** 0,73
13	** 0,77	** 0,73
14	** 0,60	** 0,58
15	** 0,75	** 0,70
16	** 0,82	** 0,80
17	** 0,59	** 0,77
18	** 0,65	** 0,76
19	** 0,81	** 0,78
20	** 0,64	** 0,61
21	** 0,65	** 0,59
22	** 0,80	** 0,68
23	** 0,82	** 0,77
24	** 0,67	** 0,70
25	** 0,70	** 0,65
26	** 0,67	** 0,72
27	** 0,79	** 0,82
28	** 0,80	** 0,86
29	** 0,57	** 0,70
30	** 0,67	** 0,69
31	** 0,73	** 0,65
32	** 0,66	** 0,67
33	** 0,82	** 0,77
34	** 0,75	** 0,70
35	** 0,77	** 0,79
36	** 0,67	** 0,72

*Significance level 0.05

**Significance level (0.01)

Table 3 shows the values of the correlation coefficients between the items of the PK test and the degree of the dimension to which this item belongs ranged from 0.57 to 0.82. The test ranged between 0.59 and 0.86, all of which are statistically significant values at the significance level 0.01, which indicates that the test is characterized by an appropriate degree of internal consistency sincerity.

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Verifying the reliability of the PK test

The reliability of the PK test was verified by applying it to the participants of the exploratory sample of 30 participants and the values of the reliability coefficients were calculated using Cronbach's alpha method, for each of the test as a whole and its sub-dimensions. The results are shown in table (4).

Table 4: Reliability coefficients for the PK test and its sub-dimensions

Dimension No.	Dimension name	Reliability coefficient
1	Teaching planning	0,92
2	Teaching evaluation	0,90
3	Teaching implementation	0,89
The test as a whole		0,93

Table (4) shows the value of the reliability coefficient for the first dimension (teaching planning) amounted to 0.92; the value of the reliability coefficient for the second dimension (teaching evaluation) amounted to 0.90; the value of the reliability coefficient for the third dimension (teaching implementation) amounted to 0.89; the value of the reliability coefficient for the test as a whole was 0.93, all of them are high values, which indicate that the PK test has an appropriate degree of reliability.

9-3- Classroom observation checklist for teaching performance of English teachers of early grades

An observation checklist for the teaching performance of English teachers for early grades was prepared in the light of the following steps: reviewing the related theoretical literature related, determining the purpose of the classroom observation checklist, and defining the classroom observation checklist dimensions. The five-point Likert method was used to respond to the classroom observation checklist statements. It includes 30 items divided into three dimensions: planning for teaching, implementing teaching, and evaluating teaching. The classroom observation checklist has three dimensions, and each dimension includes a set of sub-skills. Performance is evaluated by choosing one of the alternatives (very high - high - medium - low - very low). An exploratory sample consisting of 30 participants was selected and the observation checklist was applied to the sample in order to achieve the validity and reliability of the checklist.

Face validity

The teaching performance observation checklist was presented to a jury specialized in the field of curriculum and instruction in order to judge the clarity of the instructions, the scientific and linguistic validity of the checklist's items, the suitability of the items to the research sample, and the suitability of the proposed alternatives for each item. Some of the items were modified in light of the jury's instructions to make the classroom observation checklist valid in terms of content. In light of this, the final form of the observation checklist was prepared.

Internal consistency validity

The validity of the internal consistency of the teaching performance observation checklist was verified by applying it to the 30 participants of the exploratory sample, the results are shown in table (5).

Table 5: Correlation coefficients between the teaching performance classroom observation checklist statements and each of the dimension to which this statement belongs and the total score of the checklist

Item number	The correlation coefficient for the dimension to which the item belongs	Correlation coefficient of the total score of the checklist
1	** 0,54	** 0,60
2	** 0,51	** 0,57
3	** 0,65	** 0,68
4	** 0,69	** 0,66
5	** 0,63	** 0,66
6	** 0,71	** 0,54
7	** 0,75	** 0,67
8	** 0,54	** 0,59
9	** 0,50	** 0,67
10	** 0,76	** 0,71

Item number	The correlation coefficient for the dimension to which the item belongs	Correlation coefficient of the total score of the checklist
11	** 0,55	** 0,58
12	** 0,68	** 0,62
13	** 0,51	** 0,65
14	** 0,64	** 0,54
15	** 0,69	** 0,62
16	** 0,70	** 0,81
17	** 0,54	** 0,59
18	** 0,77	** 0,67
19	** 0,75	** 0,70
20	** 0,68	** 0,53
21	** 0,52	** 0,58
22	** 0,57	** 0,57
23	** 0,48	** 0,53
24	** 0,72	** 0,70
25	** 0,64	** 0,69
26	** 0,73	** 0,70
27	** 0,61	** 0,59
28	** 0,67	** 0,61
29	** 0,49	** 0,56
30	** 0,53	** 0,57

*Significance level 0.05
**Significance level (0.01)

Table 5 shows the values of the correlation coefficients between the items of the teaching performance observation checklist and the degree of the dimension, to which these items belong, ranged between 0.48 and 0.77. It is clear that the scores of the correlation coefficients between the items of the PK test and the total score of the test ranged between 0.53 and 0.81. They are statistically significant, at 0.01 level, indicating that the test is characterized by an appropriate level of internal consistency validity.

- Verification of the reliability of the teaching performance observation checklist: The reliability of the teaching performance observation checklist was verified by applying it to an exploratory sample of 30 participants. The results are shown in table (6).

Table 6: The reliability coefficients of the teaching performance classroom observation checklist and its sub-dimensions

Dimension Number	Dimension	Reliability coefficient
1	Teaching Planning	0,90
2	Teaching Calendar	0,87
3	Teaching Implementation	0,88
Total		0,91

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Table (6) shows the value of the reliability coefficient is 0.90 for the first dimension (Teaching planning), 0.87; for the second dimension (Teaching calendar), 0.88; for the third dimension (teaching implementation) 0.91; and for the checklist as a whole 0.91. They are all high values, which indicates that the teaching performance observation checklist has an appropriate reliability degree.

10- Statistical Methods

To answer the research questions and to test the validity of its hypotheses, the data were processed statistically by using the SPSS program in terms of the following statistical methods:

1. Pearson's linear correlation coefficient to check the internal consistency of the research tools.
2. Cronbach's alpha coefficient to check the reliability of research tools.
3. Arithmetic averages and standard deviations of the research sample scores in the two applications, pre and post.
4. T-test for two separated groups, in order to verify the significance of the differences between the mean scores of the experimental and control groups in the post application of the PK test and the teaching performance observation checklist.
5. T-test for two related groups, in order to verify the significance of the differences between the mean scores of the experimental group's participants in the two applications, the pre and post, for each of the PK test and the teaching performance observation checklist.
6. Cohen's equation to determine the effect size for two independent samples.
7. Black's modified gain equation to determine the effect size in the case of two correlated samples.

11- Research Results

11-1- First research question results

1. What is the effectiveness of a professional learning community based on TPACK model in developing the PK of English teachers for early grades in Qassim region?

The results showed the effectiveness of a professional; learning community based on TPACK model in developing the PK of English teachers for early grades in Qassim region. As the training program used in the current research included knowledge, concepts and information related to the competencies of TPACK model, that are related to TK, CK, and knowledge of pedagogy. They are the types of knowledge positively reflected on the level of PK of the teachers of the experimental group. The training program also provided the teachers with the opportunity to exchange experiences with colleagues from the same specialization through interaction in workshops and application in the field of specialization. This contributed to deepening the PK of female teachers. These results are consistent with that of [23] Canbazoglu (2016) who showed that teacher training on the competencies of TPACK model had an impact on knowledge acquisition and effective use of educational technology tools. They reflect those of [18] Filho and Gitirana (2022) who also found the effectiveness of digital professional learning communities in developing TPACK among teachers. They corroborate the results of [24] Bani Salama (2017) who showed the effectiveness of a training program based on national standards in developing teaching skills and PK of English teachers for the basic stage. They accord with the results of [20] Arjan et al. (2021) who showed the effectiveness of a proposed program in the light of the integration of pedagogical and TK patterns in the development of teachers' knowledge management processes.

Second research question results

2. What is the effectiveness of a professional learning community based on TPACK model in developing the teaching performance of English teachers for early grades in Qassim region?

The results showed the effectiveness of a professional learning community based on TPACK model in developing the teaching performance of English teachers for early grades in Qassim region. The results of the second question of the current research can be interpreted in light of the practical nature taken by the training program. During the training program, the researcher focused on mentioning practical examples for teachers and linking the competencies of TPACK model to the teaching impact in schools, with support by appropriate techniques. This contributed to facilitating the teachers' application of the competencies included in TPACK model, and reflected positively on their teaching performance. The interest in practical activities and tasks during the implementation of the training program gave the teachers the opportunity to solve the problems they face during the teaching process, benefit from the exchange of experiences with their colleagues, search for information and solve

educational, technical and academic problems. This was positively reflected on the level of their teaching performance**.** These results are consistent with that of [23] Canbazoglu (2016) who found that teacher training on the competencies of the TPACK model had an impact on the teaching performance of teachers. They are also consistent with [15] Hassan's study (2018) which showed an effectiveness of a training program based on the TPACK model in developing the teaching performance of teachers. They are in agreement with the results of [6] Muhammad's study (2018) that showed the effectiveness of a training program in the light of TPACK model in developing the competencies and skills of creative teaching among teachers. They support evidence from [8] Muhammad's study (2020) that showed the effectiveness of a program based on the dimensions of the TPACK model in developing teachers' perceptions about integrating technology in teaching. They corroborate the results of [2] Abu Dayyeh et al. (2021) who showed the effectiveness of a training program based on educational technology knowledge of the TPACK model in developing some teaching competencies for teachers.

12- Recommendations

In light of the results of the current research, a set of recommendations are formulated as follows:

- Training of early grades' new teachers on TPACK model skills.
- Including the competencies of TPACK model within the training programs provided to English teachers for early grades.

References

(1) Hassan MAM. (2020). A program based on the TPACK model, developing self-efficacy and reflective thinking among student teachers, Mathematics Department, Faculty of Education in Hurghada. Educational Journal, Faculty of Education, Sohag University, Egypt, 75, 611-645.

(2) Abu Dayyeh HK, Darwish AH, Naga SAA. (2021). The effectiveness of a proposed training program based on TPACK model in developing some PTPDI teaching competencies among students, teachers of the basic stage, at the Faculty of Education at the Islamic University - Gaza. Journal of the Islamic University of Educational and Psychological Studies, the Islamic University of Gaza, 29 (2), 469-501.

(3) Koehler J, Mishra P. (2009). What is technological pedagogical content knowledge? Contemporary Issues in Technology and Teacher Education (CITE Journal), 9(1), 60-70.

(4) Alsuwaify WS, Tulba AH. (2021). The effectiveness of a training program based on TPACK framework in light of international standards for preparing language teachers to develop professional applications and confidence in learning among students-teachers of the Arabic Language Department. Educational Journal, Faculty of Education, Sohag University, Egypt, 84, 301-364.

(5) Almahaya AYH. (2020). the effect of a training program on the knowledge of the students of the College of Education integrating technology with teaching and content: "TPACK framework". King Khalid University Journal of Educational Sciences, College of Education, King Khalid University, 31(2), 243-278.

(6) Muhammad HA. (2018). A proposed conception of a training program in light of the TPACK model for developing its competencies and creative teaching skills for pre-service psychology teachers. Journal of the Faculty of Education, Asyut University, Egypt, 34(7), 485-520.

(7) Alanazi MM, Alshaddadi HA. (2018). Design a model based on the TPACK framework and the Instructional Design Model (Gerlac and Ellie) for integrating technology into general education. Specialized International Educational Journal, 10(7), 96-108.

(8) Muhammad RH. (2020). A proposed program based on "TPACK" model, using the Google educational platform, to develop the competencies of TPACK and the perception about the integration of technology in teaching among female mathematics teachers. Journal of the Faculty of Education, Benha University, Egypt, 121(31), 125-178.

(9) Alawadi RA. (2019). Pedagogical and technological knowledge necessary for kindergarten teachers from their point of view according to the TPACK framework. Journal of the

College of Education, Mansoura University, Egypt, 108(6), 1821-1857.
(10) Ghoneim SS, Ayyash AN. (2016). Forms of pedagogical content knowledge for third grade science and mathematics teachers in Jordan and how it is affected by their educational beliefs. Studies - Educational Sciences, University of Jordan, 43, 1463-1481.
(11) Abdalal HM. (2019). A program based on the teacher-centered approach as a scientist and its effectiveness in developing pedagogical knowledge of mathematics content and teaching performance among general diploma students in the College of Education. Journal of Mathematics Education, Egyptian Society for Mathematics Education, 22(6), 265-292.
(12) Alali RA. (2007). Evaluating Sharia science teachers at the intermediate stage in light of the proposed standards for the quality of teaching performance. Master's Thesis, College of Education, King Saud University, Riyadh.
(13) Almousa JM. (2015). Evaluating the teaching performance of social studies teachers in the upper basic stage in the light of quality standards. Journal of Education, College of Education, Al-Azhar University, 165(2), 407-452.
(14) Awad FA, Alshammari AO. (2020). Evaluating the teaching performance of female teachers of Sharia sciences in the intermediate stage in the light of the specifications of the future teacher in Riyadh. Journal of Educational Sciences, Imam Muhammad bin Saud Islamic University, 25, 15-96.
(15) Hassan HAO. (2018). the effect of a training program based on TPACK model on developing the teaching performance of social studies teachers in the basic education stage. Journal of the Educational Association for Social Studies, Educational Association for Social Studies, Egypt, 103, 221-253.
(16) Mabrouk AA. (2021). Evaluation of professional performance competencies in light of the TPACK model and the attitude towards the requirements of the professional learning community for home economics teachers. Journal of Research in Specific Education, Faculty of Specific Education, Minia University, Egypt, 33, 159-233.
(17) Tondeur J, Scherer R, Siddiq F, Baran E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge (TPACK): a mixed-method study. Education Tech Research Dev, 68,319–343.
(18) Filho R, Gitirana V. (2022). Pre-service teachers' knowledge: Analysis of teachers' education situation based on TPACK. Mathematics Enthusiast, 19, 594-631.
(19) Shaqr AM, Khasawneh AA, Al-Barakat AA. (2020). the effect of a training program based on the dimensions of learning in developing the pedagogical knowledge of pre-service mathematics teachers in Jordan. Journal of the Islamic University of Educational and Psychological Studies, the Islamic University of Gaza, Palestine, 28(6), 992-1016.
(20) Arjan IA, Ismail MR, Badawi RM, Adas MM. (2021). A proposed program in light of the integration of pedagogical and technological knowledge patterns and its effectiveness in developing knowledge management processes for chemistry teachers in Hebron District. Journal of Educational and Psychological Sciences, National Research Center Gaza, Palestine, 17(5), 116-141.
(21) Aljhuwairi KM. (2021). The effect of a constructivist model in teaching fractions on the development of pedagogical knowledge of student teachers and their attitudes towards mathematics. Journal of Educational and Psychological Sciences, University of Bahrain, 22(1), 193-208.
(22) Alsamani MAA. (2021). The reality of the teaching performance of the student teacher in the College of Education in Zulfi, Majmaah University, from the point of view of the teaching staff. Taif University Journal of Human Sciences, Taif University, 26(7), 878-907.
(23) Canbazoglu B. (2016). Assessing pre-service science teachers' technological pedagogical content knowledge (TPACK) through observations and lesson plans. Research in Science & Technological Education, 34(2), 237-251.
(24) Bani Salama JA. (2017). the effectiveness of a training program based on national standards in developing the teaching skills and pedagogical knowledge of English teachers for the primary stage in Jordan. PhD Thesis, College of Graduate Studies, University of Islamic Sciences, Amman, Jordan.