



The Effectiveness of a Training Program Based on the Dimensions of Professional Learning Communities in Developing the Competencies of the Knowledge Economy among Primary School Teachers

¹Sarah Bint Ahmed Ali Amer Al Manams, ²Hanan Ahmed Alsaedi

¹Abah, Education College, King Khalid University

Sarrah82412@gmail.com

²Abah, Education College, King Khalid University

halsoaydi@kku.edu.sa

Abstract: The research aimed to prepare a training program based on the dimensions of professional learning communities, and to identify its effectiveness in developing the competencies of the knowledge economy for primary school teachers, and to achieve this goal, a list of knowledge economy competencies was prepared for primary school teachers, and the experimental approach with a semi-experimental design with pre- and post-applications was used. The research tools were represented in a note card for the degree of availability of knowledge economy competencies for primary school teachers, and the research sample consisted of (23) teachers, and the research reached several results, the most important of which are: The presence of statistically significant differences at the level of significance ($0.05 \geq \alpha$), between the average scores of primary school teachers in the pre- and post-applications, for the knowledge economy competencies observation card, in favor of the post-application, and that the percentage of adjusted gain for some competencies was greater than the value set by Black, which is (1.20), and some are greater than (1.00) and less than (1.20), which shows an effectiveness ranging from medium to large, to use the training program based on the dimensions of Professional learning, in developing the competencies of the knowledge economy among science teachers at the primary stage.

Keywords: Dimensions of professional learning communities - knowledge economy competencies.

Received: 09 July 2024 **Revised:** 29 August 2024 **Accepted:** 10 September 2024

Research Introduction

Education plays an important role in the development of society, achieving its development and economic goals, and keeping pace with successive changes in various fields of life, by producing thinking and creative human capital, which is one of the pillars of progress and development.

The teacher is considered one of the most important pillars on which the educational process is based, and he is the one who provides learners with knowledge and skills, develops values, contributes to shaping the future, and forming a constructive generation, adapts to changes, and maintains values and principles, which contributes to changing life for the better, and building the knowledge society that the future plans of the Kingdom of Saudi Arabia seek (Maher Hassan, 2019). The educational system (Al-Roqi, 2018).

Professional learning communities emerge as an educational philosophy, a reformist development project, and an introduction to professional development, and this has been confirmed by several studies,

such as Atif and Sharahili (2021), Al-Dhafiri et al. (2020), MohamedD (2019), Moussa (2020), Admiraal (2021), Dogan et al. (2016), and Meesuk et al. (2021).

Based on the above, and in light of the importance of professional growth processes and building professional learning communities, and their desired impact on developing qualified competencies of teachers, capable of achieving the requirements of the knowledge economy, achieving human development, and developing the educational process, to reflect positively on the skills of the learner, the need arose to build a training program based on the dimensions of professional learning communities, Which may contribute to the development of the competencies of the knowledge economy for female teachers.

Search problem

The teacher is one of the most important elements on which the educational system is based, as the need has become urgent to train him and develop his abilities, to become an effective professional product, and a creative teacher who keeps pace with the developments of the times, keen to seek knowledge and continuous learning, and is not limited to academic preparation.

Many local studies have recommended activating professional learning communities in schools, and their importance in acquiring sustainable professional growth, and as an entry point for developing teachers' performance and skills, which are reflected in the quality of human outputs, and stressed the need to include training programs, and provide the appropriate environment, with appropriate support, in light of the knowledge society, such as the study of: Al Kasi and Al-Ahmari (2019), Al-Shehri and Al-Asiri (2021),

On the other hand, the studies of: Al-Sharif (2018), Asiri (2018), and Al-Ghamdi (2020) confirmed the low degree of teachers' possession of some competencies of the knowledge economy, which reflects negatively on the ability of both the teacher and the learner, to link the subject of the lesson to the real life of learners, their experiences and interests, and the development of their skills.

Several studies (such as: Al-Bassiouni et al., 2021; Al-Banna, 2021; RaqbaN et al., 2016; Abdul Majeed and Sawadi, 2019; Matar, 2020) recommended the need to provide developmental training programs for the teacher, which qualify him to develop and refine the life skills of learners.

Based on the above, and in light of the professional development trends of the teacher, which are reflected in the quality of education outputs sought by the Ministry of Education, within the directions of the future visions of the Kingdom of Saudi Arabia, the research problem has emerged, as the current research seeks to prepare a proposed training program, based on the dimensions of professional learning communities to develop the competencies of the knowledge economy, among primary school teachers, and the life skills of their students.

Research Questions

The current research sought to answer the following questions:

- 1- What is the training program based on the dimensions of professional learning communities to develop the competencies of the knowledge economy among science teachers at the primary stage?
- 2- What is the effectiveness of the training program based on the dimensions of professional learning communities in developing the competencies of the knowledge economy among science teachers at the primary stage?

Research Objectives

The objective of the current research is to:

- 1-Building a training program based on the dimensions of professional learning communities.

2- Revealing the effectiveness of the training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, among science teachers at the primary stage.

Importance of research

Theoretical significance:

The importance of theoretical research lies in providing the following:

- A training program based on the dimensions of professional learning communities, which may contribute to the benefit of those in charge of professional development programs for teachers.
- An observation tool to identify the availability of knowledge economy competencies for science teachers at the primary stage.

Applied importance:

The importance of applied research lies in the following:

- Contribute to improving the competencies of the knowledge economy among science teachers at the primary stage.
- Inform teachers and educational supervisors about the possibility of using the dimensions of professional learning communities as an internal reform approach that may contribute to improving the performance of the educational institution.
- Research tools and materials may be useful to researchers and educational supervisors in using them in the educational field, or to create similar tools and materials.

Search terms

In the light of the researcher's review of the relevant educational literature, it was possible to reach the following definitions of search terms:

Dimensions of professional learning communities:

Hord & Sommers (2008) defined it as: a society in which teachers and school management are constantly seeking to participate in learning, and build on this learning, with the aim of enhancing their professional effectiveness, for the benefit of students, and its dimensions were defined by five elements: participative leadership, shared values and vision, and supportive work environment conditions (Supportive conditions, collective creativity, and sharing of professional experiences and personal practices (p. 38).

The dimensions of professional learning communities are defined procedurally as: a set of key elements represented in the vision and shared values, creativity, collective learning and sharing of professional experiences and pedagogical practices, on which the professional learning community is based consisting of primary school science teachers, who share professional experiences and personal practices, and have opportunities for direct interaction through frequent meetings, according to a time plan, seeking to achieve continuous improvement through a common vision that includes goals to develop their competencies as teachers in an era Knowledge economy, and the development of life skills for their students.

Training program based on the dimensions of professional learning communities:

Al-Taani (2009) defined it as: "organized and planned efforts to provide trainees with renewed skills, knowledge and experience, and aim to bring about continuous positive changes in their experiences, attitudes and behavior in order to develop the adequacy of their performance" (p. 44).

The training program based on the dimensions of professional learning communities is defined procedurally as: an organized plan with specific objectives, specific content, and sequential organized procedural steps, represented in a set of specific and intended methods and activities, based on the

dimensions of professional learning communities represented in (vision and common values, creativity and collective learning, sharing professional experiences and educational practices), to develop the competencies of the knowledge economy among science teachers for the primary stage and develop the life skills of their students.

Competencies of the knowledge economy:

Ali Al-Ghamdi (2020) defines it as: "a set of knowledge, attitudes, values, skills, experiences and competencies that benefit the teacher in carrying out his social and educational role, and that increase the student's ability to create, innovate, think, solve problems, and interact, using multimedia information to learn, employ and use knowledge" (p. 72).

The competencies of the knowledge economy are defined procedurally as: a set of information, experiences and skills that should be possessed by a science teacher at the primary stage, to meet the requirements of the knowledge economy, with the aim of improving the quality of practical and social life, and enabling her to provide the learner with life skills to build human capital, which faces the accelerating challenges, and forms the knowledge society through the effective investment of knowledge and sustainable professional development.

Search limits

The current research was limited to the following limits:

Human limits:

- A sample of primary school science teachers at the Mahayel Education Office, where the research problem was diagnosed and the exploratory study was conducted.

Spatial boundaries: Government General Education Primary Schools in the Mahayel Education Office.

Time limits: The research was applied during the academic year 1444 AH.

Theoretical framework and previous studies (professional learning communities)

Objectives of professional learning communities:

The main goal of professional learning communities is to achieve high levels of learning, for both the learner and the teacher, and to improve professional performance, and the work teams adhere to certain standards for the overall development of the educational institution and participatory improvement, as well as aims at sustainability and the use of the scientific method in solving problems (Richard and Robert, 1998/2008).

Nassef (2017) categorized the goals of professional learning communities as follows:

- Repair and development of defects within the educational institution.
- Creating a supportive and stimulating school environment for learning
- Develop a sense of collective participation
- Developing the expertise and skills of teachers and learners

The importance of professional learning communities:

The importance of professional learning communities lies in their focus on the competencies and capabilities of teachers, as well as the skills of learners, as they contribute to achieving continuous professional development of the teacher, by providing various opportunities for training, raising the level of the teacher to the maximum, and enabling him to keep pace with developments and developments, and the strength of learning communities comes as they also promote sustainability, and being communities for continuous research and development that leads to increasing the scientific productivity of teachers (Mohammed, 2019).

The results of field studies (such as: Al-Osaili, 2019; AttiF. and Sharahili, 2021; Farraj and Moussa, 2017; Mohammed, 2019; Makhoul, 2015; MossY, 2020) show the positive impact of employing the professional learning community, as an input to professional development, as she indicated that professional learning communities are a good way of thinking, help predict future problems, and help the sustainable professional growth of teachers, by exchanging experiences and ideas, cultural diversity, and openness. On different points of view.

Characteristics of the professional learning community:

The learning community is characterized by certain characteristics, which give it a special form, and among the characteristics are the existence of a common vision, collective inquiry, teamwork, continuity in improvement, and benefit from results, and can be clarified as stated in Richard and Robert (1998/2008) as follows:

- Mission, vision and shared values: Members of the learning community adhere to common rules and values, clear to all, guiding them to accomplish tasks and achieve goals.
- Collective survey: Members of the learning community are constantly looking for new ways to improve, testing these methods, and reflecting on the results.
- Collaborative teams: The infrastructure of the learning community is united by a common goal.
- Focus on work and practice: The team turns theory into practice, and learning occurs in the context of work.
- Continuous improvement: The continuous search for the best methods and the most productive applications is the basis for the formation of a learning community.
- Focus on results: When a professional learning community is formed, it is created to achieve tangible results so that there is no randomness in the work.
- Common goals: Teamwork and interaction between individuals to achieve common goals.
- Safety: It provides a kind of security, self-confidence, and a sense of value for each individual, which helps individuals to take initiative and experiment.

King (2016) added through his study that one of the most important characteristics of learning communities is to focus on the needs of teachers, which has a clear role in identifying and overcoming the challenges they face, and learning in the context of procedures and implementation, through roles distributed among team members.

Application of learning communities for science teachers:

There are many vessels through which the professional learning community can be activated, and each of them has its role and importance, and the choice of the appropriate container depends on the needs of the professional community and the available capabilities, and in the current research the training program has been adopted, as a container for activating the professional learning community, as follows:

- Building a training program based on the dimensions of learning communities represented in (common vision, supportive conditions, teamwork, sharing of professional experiences and practices), so that a work team is formed that forms a professional learning community, studying the primary stage, for the same specialization, and science teachers have been selected for the primary stage.
- The program begins with the theoretical definition of what professional learning communities are, and then begins with practical application.
- The application is carried out according to the dimensions specified in the research, where the most important common problems of teachers in their schools are discussed, and a procedural plan is built to solve problems during the actual program according to a common vision, joint work and exchange of views and experiences in order to develop the skills of learners, as well as benefiting from the

experiences of some teachers in the team, and communication and repeated meetings extend to follow up on achieving the goals after the program through application in their schools and documenting the results of work and the degree of progress in solving the problem or achieving the goal.

In view of the importance of continuous growth and improvement of the educational institution, and the need for reform and development from within, many local, Arab and international studies have directed to the use of the professional learning community as an entry point for reform and development, and building training programs based on the professional learning community to improve the performance of teachers, as in the Johnson study, 2015.), which revealed the impact of participation in professional learning communities on the teaching, reflective and collaborative practices of teachers, and used the qualitative approach represented in observations, interviews and documentary tools, and the results concluded the positive impact of teachers' participation in the professional learning community, on their practices of reflective thinking in teaching strategies, and methods used in teaching. The study of Dogan et al., 2016), which aimed to reveal the impact of professional learning communities on the knowledge and practices of science teachers and the learning of their students, and the study used the qualitative desktop and analytical approach, through a review of 14 studies that focused on professional learning communities, and the study resulted that professional learning communities, help the teacher to know the content of the specialization, change teaching practices, and use the inquiry.

Moussa's study (2020) aimed to find out the effectiveness of a proposed training program based on professional learning communities, to develop decision-making skills, and the trend towards cooperative work, and the researcher used the experimental method, where the sample consisted of 30 teachers, and used two decision-making test tools, and a measure of the trend towards cooperative work, and the results of the study confirmed the effectiveness of the program in developing decision-making skills, and the trend towards cooperative work.

And the study of Al-Dhafiri et al. (2020), which aimed to know the effectiveness of professional learning communities, in developing the thinking skills of primary school teachers, and the researchers used descriptive and semi-experimental approaches, and was designed based on one group with a pre-test and a post-test, where the study sample consisted of (32) teachers in primary government schools, and teachers participated in a professional learning community that was applied, and included written activities, reflective notes, group discussions, and the use of electronic blogging, and resulted in The results of the study on the effectiveness of the applied professional learning community in developing reflective thinking skills among teachers.

Yoon et al. (2020) explored the effectiveness of developing an educational model within a community of practice and its impact on relationships between community members. This study was applied to a community of practice consisting of eight teachers (six males and two females) and a university professor. Teachers had different levels of teaching experience and were working in different high schools in South Korea, and the data was collected using semi-structured personal interviews, focus group and field observations, and analyzed using coding techniques. Showed The results are that developing an educational model within a community of practice can lead to improved relationships between community members. Among the main recommendations is the need to encourage cooperation and interaction among members of society and to provide appropriate support for the development of the educational model.

The study of Meesuk et al. (2021) tended to research the sustainable professional development of the teacher, through the professional learning community, and work to evaluate the results of the professional development program that is in the form of a professional learning community, and the opinions of teachers were collected through the questionnaire, and the results resulted in that professional development projects represented in learning communities are necessary for the development of many skills, including positive thinking, with the need to work on changing curricula and learning methods.

Requirements for building professional communities for learning (dimensions of learning communities):

The literature and educational studies have identified a set of components and foundations for building a professional society, although they differ among themselves in determining these foundations, as well as their number, but Hord & Sommers (2008) set five conditions for building any community for vocational education, as follows:

- 1- Participatory leadership: It is the participation of the school principal leadership and authority, and the participation of staff in decision-making.
- 2- Common vision and values: All members of the school community agree on a common formulation, expressing their aspirations for a successful future.
- 3- Collective creativity: the cooperation of the school community in all its elements to obtain new knowledge and skills, and apply them to develop educational practices
- 4- Supportive conditions: include the physical and cultural dimensions of the school community, such as time, place, and the availability of trust and respect among members.
- 5- Sharing professional experiences and educational practices: It is to review the elements of the school community for educational practices, teaching skills, and provide each teacher to his colleagues with new experiences and feedback.

Training programs based on the dimensions of professional learning communities:

Learning communities have taken different containers in their formation, it can be a team to provide support to students who face a challenge in learning and achievement, and it can be a network of distinguished teachers in a specific skill, whose work is coordinated by the educational supervisor to provide support to their peers, regarding that skill. Learning communities operate through several pools, and face-to-face training is one of those important vessels through which learning communities can be disseminated and used more widely. Learning communities according to their focus as follows (Tatweer, 2015):

- Student-centered community: looks at student learning in more than one subject.
- Subject-focused community: looking at the development of best practice for learning the subject.
- Educational community: focuses on issues of developing educational work in and outside the school.

In light of the above, the axis of learning communities in this research focuses on the educational community, to address the issues of developing educational work, using one of the important vessels for professional learning communities, which is training programs.

Educational studies and research (such as: Al-Dhafiri and AkherYen, 2020; Al-Osaili, 2019; Atif Sharahili, 2021; MossY, 2020) have also confirmed that building and activating a professional learning community can become an important entry point for professional development and an effective strategy aimed at improving the level of teacher performance and developing his skills and abilities.

Based on the above, the direct training pot was selected to activate professional learning communities in this research, based on the importance of teacher training programs, both pre-service and in-service.

The continuation of the preparation of the teacher during the service, sustainable development of the teacher, as the preparation before and after service two sides of the same coin and complementary, and can not dispense with one of them, and previously recognized that training is the core of the process of preparation during the service, and pointed out Shwaiteer (2009) to the types of in-service training as follows:

Supplementary training: It is a continuation of pre-service preparation, academic or conductive.

Remedial training: to address weakness in one of the competencies.

Regenerative Training: Response to Developments

Commenting on the research literature

Many previous researches and studies have been reviewed, which have clarified the role of activating professional learning communities in the sustainable professional development of the teacher, and the importance of professional learning communities as an entry point to develop teachers' capabilities and skills adapted to the requirements of the times (e.g., Al-Dhafiri et al., 2020; Al-Osaili, 2019; Atif and Sharahili, 2021; Musa, 2020; Admiraal, 2021; Dogan et al., 2016; Johnson, 2015; Meesuk et al., 2021; Yoon et al., 2020).

It concluded that there are many vessels of professional learning communities, and direct training is one of the most important of those vessels, as the training program adopted the axis of the educational community, which focuses on the issues of educational work, and identified the dimensions represented in: (vision and common values, creativity and collective learning, sharing professional experiences and educational practices), as determinants of building the program, which aims to develop the competencies of the knowledge economy for primary school teachers, and life skills for female students.

Research hypotheses

The current research tried to test the validity of the following hypotheses:

- 1- There are statistically significant differences at the significance level (0.05) Among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (personal competencies), in favor of the post-application.
- 2- There are statistically significant differences at the significance level (0.05) Among the average grades of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (professional competencies), in favor of the post-application.
- 3- There are statistically significant differences at the significance level (0.05) Between the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (social competencies), in favor of the post-application.
- 4- There are statistically significant differences at the significance level (0.05) Among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (ICT competencies), in favor of the post-application.
- 5- There are statistically significant differences at the significance level (0.05) Among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (competencies of teacher preparation for life and the labor market), in favor of the post-application.

Research Materials

The research materials were: (1) a list of knowledge economy competencies for science teachers at the primary stage, and (2) a training program based on the dimensions of professional learning communities. These materials have been prepared according to the following:

List of knowledge economy competencies for science teachers at the primary stage.

A list of knowledge economy competencies has been prepared for primary school teachers:

- Build the list in its initial form:

This was done by extrapolating the sources, and listing the competencies of the knowledge economy that must be available to primary school teachers, and then placing them in an initial list to poll the opinions of specialists about them, which are: (personal competencies, professional competencies, social competencies, information and communication technology, preparing the learner for life and the labor market), each of which is followed by a number of Sub-competencies.

- Menu settings:

The list was presented to a group of arbitrators specialized in curricula and teaching methods (Appendix No. 2), and they were asked to express their opinion on the suitability of these competencies for their purpose, and to add what they deem appropriate, and delete the inappropriate, and based on the opinions of the arbitrators, some amendments were made

The proposed training program to develop the competencies of the knowledge economy .

The proposed training program for the development of knowledge economy competencies is built according to the following procedures:

- Initial image of the training program: The initial image of the training program was designed and included the following:

- Dimensions of professional learning communities.

- Competencies of the knowledge economy.

- Life skills.

- The content of the proposed training program based on the dimensions of professional learning communities to develop the competencies of the knowledge economy, among primary school teachers: The program included (10) sessions divided into (5) days, by (4) hours per day, in which the concept of professional learning communities was clarified, and the mechanism of their application to develop the competencies of the knowledge economy. Primary school teachers, with the aim of developing the life skills of primary school students, by teaching the content of the science curriculum.

- General guidelines for the trainer and trainee during the implementation of the program.

- Program sessions, each session includes the following: the objectives of the session, the training methods used initially, the training methods, its content, and includes a detailed presentation of the topics of the session, the duration of its implementation, the activity related to it, the method of implementation, discussion of the results, and working papers on the activities.

- Verify the sincerity of the content of the program: Presenting the training program to a group of arbitrators specialized in curricula and teaching methods (Appendix No. 2), in order to express their opinions on: the measurability of the program's objectives, the appropriateness of the elements of the training program, and their adequacy to achieve the training objectives, the appropriateness of the training program for the research sample, the scientific and linguistic validity of the training program, the proposal to add, delete or modify the elements of the training program

Based on the opinions of the authors, the necessary adjustments were made, and the program in its final form is ready to be applied to the research sample.

Research Tools

To achieve the objective of the current research, measurement tools have been prepared that meet this purpose, which were: (Knowledge Economy Competencies Observation Card for Primary School Teachers, and Life Skills Scale for Sixth Grade Primary Students), and the following is a description of the research tools:

Knowledge Economy Competencies Observation Card for Primary School Teachers.

The content of the knowledge economy competencies observation card in this research was determined in light of the list of knowledge economy competencies for primary school teachers, which was reached in the current research.

Initial image of the observation card: After determining the goal of building the observation card, the observation card was drafted in its initial form, which consisted of (54) indicators to measure (5) main competencies.

Adjust the note card: The note card adjustment process means verifying the authenticity and stability of the card, and this has been verified according to the following procedures:

A- Estimating the validity of the card: The apparent honesty was calculated, which means the general appearance of the note card, in terms of the type of vocabulary, how it was formulated, the extent of its clarity, the instructions of the card, its accuracy, and the degree of objectivity.

To achieve this, the card was presented to a group of arbitrators specialized in the fields of: (curricula and teaching methods), in order to ensure the integrity of the procedural formulation of the card's vocabulary, its clarity, and the possibility of observing skills. The arbitrators proposed some important amendments and based on the opinions of the authors, the necessary amendments were made.

B- Calculation of card stability: The card stability coefficient was calculated, using the method of multiple observers on the performance of one parameter, and then calculated the coefficient of agreement between their estimates using the equation (Cooper).

Table (1) shows the coefficient of agreement between the observers on the performance of the three parameters.

Table (1)

Coefficient of agreement among observers in assessing the rate of competencies using the observation card

Competency Rate Agreement Coefficient		
Third parameter	Second parameter	First parameter
91.5 %	%94.8	%93.6

By extrapolating the results in Table (3-5), it is clear that the average coefficient of agreement of observers in the three cases is equal to (93.3%), which is a high stability coefficient, and that the card is valid for use and application.

C- Calculation of self-honesty of the observation card:

The self-honesty value for the first parameter was (0.965), the second parameter (0.973), and for the third parameter (0.956), all of which are values that show the validity of the observation card for field application.

Final image of the note card:

After completing the assessment of the validity and calculation of the stability of the card, it became in its final form, consisting of (50) indicators to measure (5) competencies of the knowledge economy, to measure the rate of performance of the competencies of the knowledge economy among primary school teachers.

3.7 Data collection procedures

The research was carried out by following the following steps:

Phase I (pre-application):

- 1- Identifying a random sample of science teachers for the primary stage to attend the training program.
- 2- Create a group link on the WhatsApp program, and add all the trainees to facilitate communication with them
- 3- Pre-application of the observation card for sample parameters.
- 4- Setting an appropriate date for the training program, and informing all members of the sample.

5- Identifying an appropriate hall in the building of the Career Development Center in Mahayel to establish the training program, and the hall is equipped with all the necessary tools to implement the program.

The second stage (training phase):

The proposed training program (Appendix No. 5) was implemented in the period between (17-21/10/1444), with 21 training hours divided into (5) days, at a rate of (4) hours per day.

Third stage (post-training phase):

1- Activating the possibility of obtaining certificates of attendance for the teachers who attended the proposed training program.

2- Obtaining a statement (Mashhad) of the implementation of the training program, (Appendix No. 8).

3- Post-application of the observation card for science teachers in the primary stage (research sample) and monitoring raw grades in preparation for conducting statistical treatments, after (4) weeks of implementing the training program.

Research results and discussion

Answer to the first question:

The first question reads: "What is the training program based on the dimensions of professional learning communities to develop the competencies of the knowledge economy among science teachers at the primary stage?" To answer this question, previous research and studies that dealt with the competencies of the knowledge economy, professional learning communities, life skills for learners, and reliance on a list of knowledge economy competencies for primary school teachers, and a list of life skills for primary school students, were prepared in this research, and accordingly the training program was designed, and then arbitrated.

Answer to the second question:

The second question reads: "What is the effectiveness of the training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, among science teachers at the primary stage?" To answer this question, and to identify the effectiveness of the training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, among science teachers at the primary stage, the validity of the hypotheses was tested and to verify the validity of the hypotheses, **the (T) test was used for the associated samples (Paired Samples Statistics)**, and the results were as follows:

First, the first hypothesis of the research was tested, which stated: "There are statistically significant differences at the significance level ($0.05 \geq \alpha$) among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (personal competencies), in favor of the post-application. To verify the validity of the hypothesis, **the Paired Samples Statistics test was used**, and the results were as follows:

First: Personal Competencies:

Table (2)

Test results for correlated samples, to indicate the differences between the average scores of the experimental group in the pre- and post-applications of the personal competencies observation card

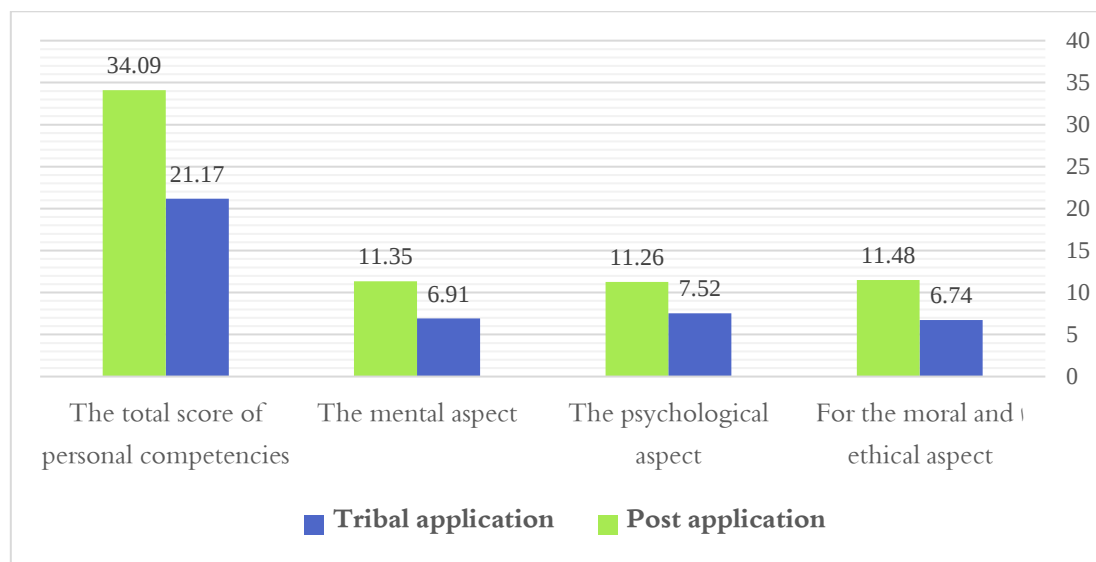
Level of significance	Degrees of freedom	Value (v)	Standard deviation	Average score	Number of parameters	Application	Personal Competencies
-----------------------	--------------------	-----------	--------------------	---------------	----------------------	-------------	-----------------------

	m						
0.00*	22	- 11.74 1	1.764	6.74	23	Tribal	The moral and ethical aspect
function			1.201	11.48		Post	
0.00*	22	6.858-	3.043	7.52	23	Tribal	Psychological aspect
function			1.251	11.26		Post	
0.00*	22	9.120-	2.275	6.91	23	Tribal	Mental aspect
function			0.935	11.35		Post	
0.00*	22	- 18.52 6	4.519	21.17	23	Tribal	Total score of personal competencies
function			2.557	34.09		Post	

* A function at the level of (0.05).

Figure (1)

Average scores of the experimental group in the pre- and post-measurements of the personal competencies observation card



Looking at Table 4.2 and Figure 4.1, it is clear that:

- The superiority of the scores of the experimental group parameters in the post-application of the personal competencies observation card, as one of the competencies of the knowledge economy, as the average scores of the experimental group students in the pre-application of the personal competencies observation card, with regard to the value and moral aspect, reached (6.74), while their average scores in the post-application (11.48), at the degree of freedom (22), and it is also found that the level of significance (0.00), which is a statistically significant value at the level of significance ($0.05 \geq p$), which shows a statistically significant difference at the level of ($0.05 \geq p$), between the average scores of the experimental group students in the pre- and post-applications of the personal competencies observation card, with regard to the value and ethical aspect, in favor of the post-application, and then the validity of the first hypothesis was verified.

Second: Professional Competencies:

The second hypothesis of the research was tested, which stated: "There are statistically significant differences at the significance level ($0.05 \geq \alpha$) among the average scores of primary school teachers, in the

pre- and post-applications of the knowledge economy competencies observation card (**professional competencies**), in favor of the post-application. To verify the validity of the hypothesis, **the Paired Samples Statistics test was used**, and the results were as follows:

Table (3)

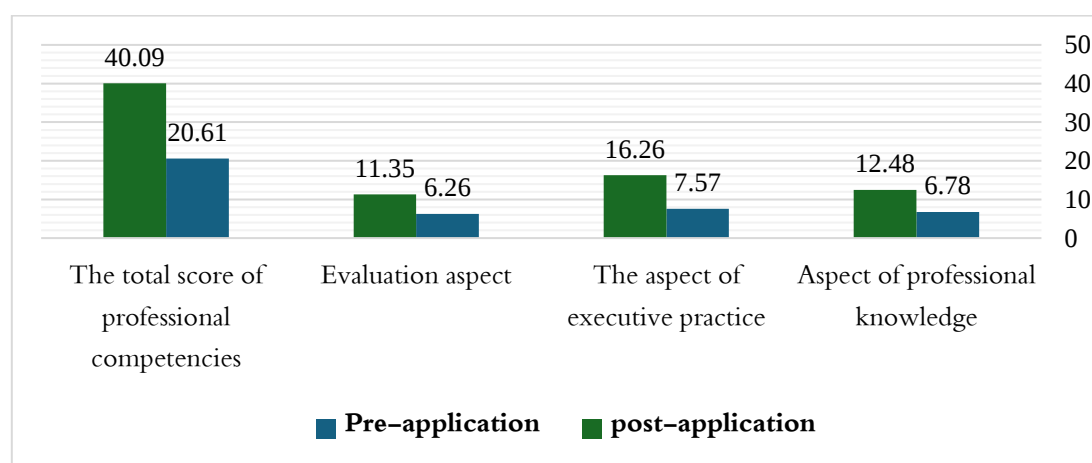
T test results for correlated samples, to indicate the differences between the average scores of the experimental group in the pre- and post-applications, for the professional competencies observation card

Level of significance	Degrees of freedom	Value (v)	Standard deviation	Average score	Number of parameters	Application	Professional Competencies
0.00* function	22	-19.127	0.998	6.78	23	Tribal	Professional knowledge aspect
			1.238	12.48		Post	
0.00* function	22	-17.231	0.896	7.57	23	Tribal	Executive Practice Aspect
			2.472	16.26		Post	
0.00* function	22	-17.693	1.453	6.26	23	Tribal	Calendar side
			0.775	11.35		Post	
0.00* function	22	-30.254	2.641	20.61	23	Tribal	Total degree of professional competencies
			3.274	40.09		Post	

* A function at the level of (0.05).

Figure (2)

Average scores of the experimental group in the pre- and post-measurements of the professional competencies observation card



Looking at Table 4.3 and Figure 4.2, it is clear that:

- The superiority of the scores of the experimental group teachers in the post-application of the professional competencies observation card, as one of the competencies of the knowledge economy, as the average scores of the experimental group students in the pre-application of the professional competencies observation card, with regard to the aspect of professional knowledge, reached (6.78),

while their average scores in the post-application (12.48), at the degree of freedom (22), and it is also shown that the significance level (0.00), which is a statistically significant value at the level of significance ($0.05 \geq p$), which shows a statistically significant difference at the level of ($0.05 \geq p$), between the average scores of the experimental group students in the pre- and post-applications, for the professional competencies observation card, with regard to the aspect of professional knowledge, in favor of the post-application, and then the validity of the second hypothesis was verified.

Third: Social Competencies:

The third hypothesis of the research was tested, which stated: "There are statistically significant differences at the significance level ($0.05 \geq \alpha$) among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (**social competencies**), in favor of the post-application." To verify the validity of the hypothesis, the Paired Samples Statistics test was used, and the results were as follows:

Table (4)

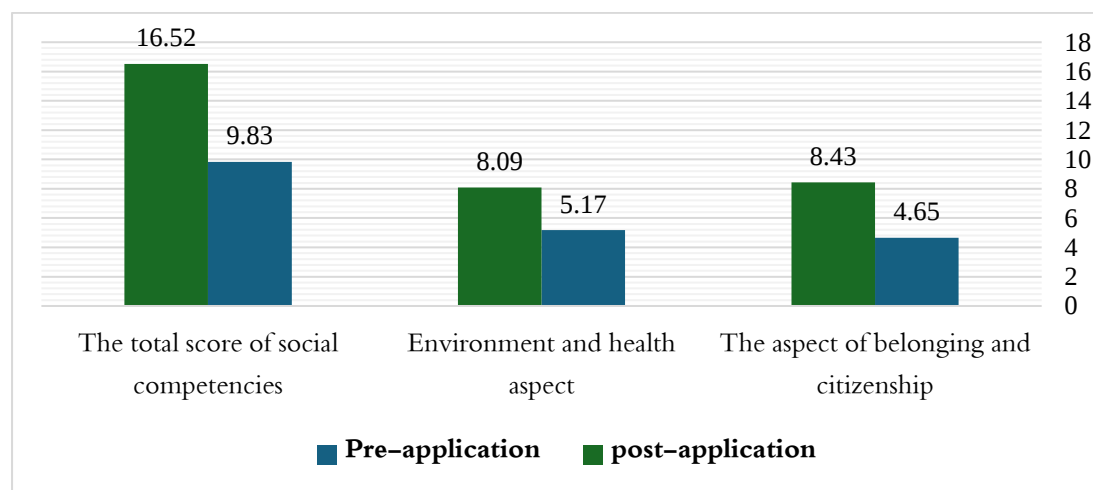
Test results for correlated samples, to indicate the differences between the average scores of the experimental group in the pre- and post-applications of the social competencies observation card

Level of significance	Degrees of freedom	Value (v)	Standard deviation	Average score	Number of parameters	Application	Social Competencies
0.00* function	22	-14.611	0.714	4.65	23	Tribal	Belonging and citizenship
			0.788	8.43		Post	
0.00* function	22	-12.894	1.114	5.17	23	Tribal	Environment and health aspect
			0.949	8.09		Post	
0.00* function	22	-14.850	1.642	9.83	23	Tribal	Total score of social competencies
			1.534	16.52		Post	

* A function at the level of (0.05).

Figure (3)

Average scores of the experimental group in the pre- and post-measurements of the social competencies observation card



Looking at Table 4 and Figure 3, it is clear that:

- The superiority of the scores of the experimental group teachers in the post-application of the social competencies observation card, as one of the competencies of the knowledge economy, as the average scores of the experimental group students in the pre-application of the social competencies observation card, with regard to the aspect of belonging and citizenship (4.65), while the average score in the post-application (8.43), at the degree of freedom (22), and it is also found that the level of significance (0.00), which is a statistically significant value at the level of significance **(0.05 ≥ 0)**, which shows a statistically significant difference at the level of **(0.05 ≥ 0)**, between the average scores of the experimental group students in the pre- and post-applications of the social competencies observation card, with regard to the aspect of belonging and citizenship, in favor of the post-application, and then the validity of the third hypothesis was verified.

IV. ICT Competencies:

The fourth hypothesis of the research was tested, which stated: "There are statistically significant differences at the significance level ($0.05 \geq \alpha$) among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (**ICT competencies**), in favor of the post-application". To verify the validity of the hypothesis, **the Paired Samples Statistics test was used**, and the results were as follows:

Table (5)

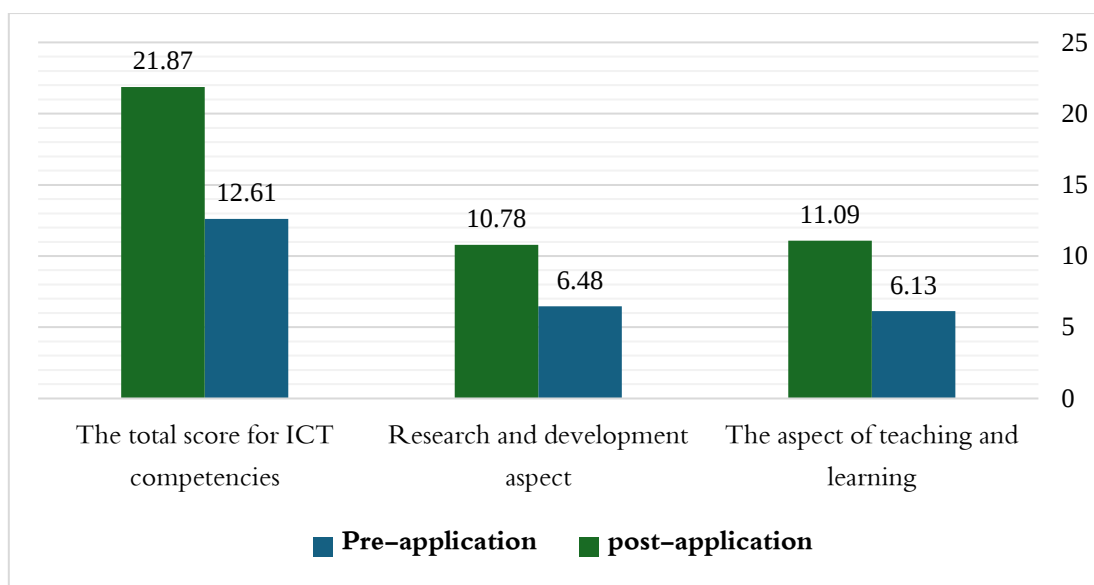
Test results for correlated samples, to indicate the differences between the average scores of the experimental group in the pre- and post-applications of the ICT Competency Observation Card

Level of significance	Degrees of freedom	Value (v)	Standard deviation	Average score	Number of parameters	Application	ICT Competencies
0.00* function	22	-16.271	1.424 0.996	6.13 11.09	23	Tribal Post	Teaching and learning aspect
0.00* function	22	7.045-	2.778 0.850	6.48 10.78	23	Tribal Post	R&D side
0.00* function	22	-14.714	3.285 1.392	12.61 21.87	23	Tribal Post	Overall ICT Competency Score

* A function at the level of (0.05).

Figure (4)

Experimental group scores averages in the pre- and post-measurements of the ICT competency observation card



Looking at Table 5 and Figure 4, it is clear that:

- The grades of the experimental group teachers in the post-application of the ICT competency observation card as one of the competencies of the knowledge economy, where the average scores of the experimental group students, in the pre-application of the ICT competency observation card, with regard to the aspect of teaching and learning (6.13), while their average score in the post-application was (11.09), at a degree of freedom (22), and it is also found that the level of significance (0.00), which is The value of a statistically significant at the level of significance ($0.05 \geq p$) or less, showing a statistically significant difference at the level of ($0.05 \geq p$), between the average scores of the experimental group students in the pre- and post-applications of the ICT competency observation card, with regard to the aspect of teaching and learning, in favor of the post-application, and then the validity of the fourth hypothesis was verified.

Fifth: Competencies of preparing teachers for life and the labor market:

The fifth hypothesis of the research was tested, which stated: "There are statistically significant differences at the significance level ($0.05 \geq \alpha$) among the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card (**competencies of preparing teachers for life and the labor market**), in favor of the post-application. To verify the validity of the hypothesis, the **Paired Samples Statistics** test was used, and the results were as follows:

Table (6)

T test results for correlated samples, to indicate the differences between the average scores of the experimental group in the pre- and post-applications of the teacher preparation competencies observation card for life and the labor market

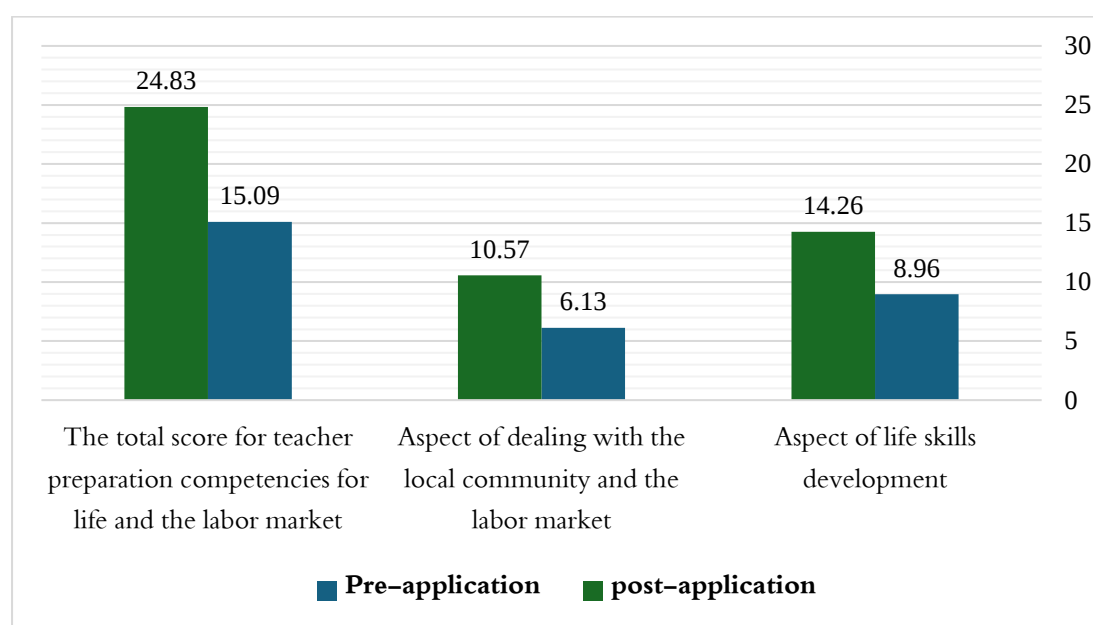
Level of significance	Degrees of freedom	Value (v)	Standard deviation	Average score	Number of parameters	Application	Competencies of preparing the teacher for life and the labor market
0.00* function	22	- 7.094	3.637	8.96	23	Tribal	Life skills development aspect
			1.322	14.26		Post	
0.00*	22	-	2.399	6.13	23	Tribal	Dealing with

function		9.798	1.376	10.57		Post	the local community and the labor market
0.00* function	22	- 9.109	5.846	15.09	23	Tribal	The overall degree of competencies of teacher preparation for life and the labor market
			2.167	24.83		Post	

* A function at the level of (0.05).

Figure (5)

Average scores of the experimental group in the pre- and post-measurements of the observation card of the competencies of preparing the teacher for life and the labor market



Looking at Table 6 and Figure 5, it is clear that:

- The grades of the experimental group teachers in the post-application of the observation card superiority of teacher preparation competencies for life and the labor market, as one of the competencies of the knowledge economy, as the average scores of the experimental group students, in the pre-application of the teacher preparation competencies observation card for life and the labor market, with regard to the aspect of life skills development (8.96), while their average scores in the post-application (14.26), at the degree of freedom (22), as it turns out that the level of significance (0.00), which is a statistically significant value at the significance level $(0.05 \geq p)$, which shows a statistically significant difference at the level of $(0.05 \geq p)$, between the average scores of the experimental group students in the pre- and post-applications of the teacher's preparation competencies observation card for life and the labor market, with regard to the aspect of life skills development, in favor of the post-application, and then the validity of the fifth hypothesis was verified.

In order to identify the effectiveness of the training program based on the dimensions of professional learning communities, in developing the sub-aspects of the competencies of the knowledge economy among science teachers at the primary stage, the Black equation was used.

In order to ensure the effectiveness of the training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, among science teachers at the primary stage, according to the arithmetic average of the experimental group scores in the two applications: pre- and post-observation card, and the following table (4-7) illustrates this.

Table (7)

Percentage of adjusted gain for knowledge economy competencies, as well as the total score of the observation card

BlackBerry Adjusted Gain Percentage	Maximum Class	Average Dimensional Application Score	Average Pre-Application Score	Card sub-dimensions
1.30	12	11.48	6.74	The moral and ethical aspect
1.15	12	11.26	7.52	Psychological aspect
1.24	12	11.35	6.91	Mental aspect
1.23	36	34.09	21.17	Personal Competencies
1.07	15	12.48	6.78	Professional knowledge aspect
1.32	18	16.26	7.57	Executive Practice Aspect
1.31	12	11.35	6.26	Calendar side
1.23	45	40.09	20.61	Professional Competencies
1.29	9	8.43	4.65	Belonging and citizenship
1.09	9	8.09	5.17	Environment and health aspect
1.19	18	16.52	9.82	Social Competencies
1.26	12	11.09	6.13	Teaching and learning aspect
1.14	12	10.78	6.48	R&D side
1.20	24	21.87	12.61	ICT Competencies
1.23	15	14.26	8.96	Life skills development aspect
1.13	12	10.57	6.13	Dealing with the local community and the labor market
1.18	27	24.83	15.09	Competencies of preparing the teacher for life and the labor market
1.21	150	137.39	79.30	The total score for all competencies of the knowledge economy

Table 7 shows the following:

It was found that the adjusted gain ratio for each dimension of the card amounted to (1.30-1.24), all of which are values greater than the percentage set by Black, which is (1.20), which indicates that the proposed training program has great effectiveness in developing competencies related to all aspects included in the card.

Discuss research results

First: By analyzing the results of the research, it was found that there are statistically significant differences at the level of significance ($0.05 \geq \alpha$), between the average scores of primary school teachers

in the pre- and post-applications of the knowledge economy competencies observation card, in favor of the post-application, as well as the percentage of adjusted gain for some competencies came greater than the value set by Black, which is (1.20), and some of them are greater than (1.00) and less than (1.20), which shows an effectiveness ranging from medium to large, to use the training program based on the dimensions of professional learning communities in developing the competencies of the knowledge economy, among science teachers at the primary stage. Although the current research is distinguished from previous studies by studying the effectiveness of a training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, for primary school teachers and the life skills of their students, it agrees in its results with a number of studies that linked training programs based on professional learning communities and their effectiveness in developing knowledge economy skills (as studies: Al-Dhafiri and AkherYen, 2020; Al-Osaili, 2019; Atif and Sharahili, 2021; Moses, 2020; Dogan et al., 2016, Johnson; 2015), and differed from them in the type of skills that were targeted, in the study of Moses (2020), it targeted the development of decision-making capacity and collaborative work, and in the study of Dogan et al. (2016), it targeted the knowledge and practices of science teachers and the learning of their students, In the study of Al-Dhafiri andYen (2020), and Johnson (2015), reflective thinking skills were targeted, and in the study of Atif and Sharahili (2021) targeted teaching practices, and among the studies that specialized in identifying the effectiveness of training programs in developing the competencies of the knowledge economy, the study of: Zwain (2023), Al-Afoun and Jallo (2018), and they agreed with the current research in the classification of competencies of the Knowledge economy, as well as the effectiveness of training programs in developing knowledge economy competencies

The researcher explains this result for the following reasons:

- The trainees were introduced to the nature of learning communities, their importance, and characteristics, and presented experiments and studies that proved effective to communicate the idea to the trainees clearly, sense its importance, and expect positive results.
- The trainees were introduced to the knowledge economy, its nature, and its importance, as well as the competencies of the knowledge economy, and clarification with examples, by activating the multiple competencies of the knowledge economy, as well as presenting models for some products of the practice of action research, and presenting some studies that clarify theories and approaches to teaching, and how to benefit from them in professional work, and presenting models for procedural plans files for learning communities.
- Professional learning communities were implemented during the program at the level of trainees as team members, developing and establishing a theoretical plan based on the field reality and its problems for teachers, discussing their colleagues in the executive plans, participating in setting goals, vision and mission, and then transferring the experience to their schools, which led to clarity of the picture in front of the trainees, and benefiting from the experiences of all members of the group.
- Working in groups contributed to the integration of experiences, reducing the feeling of isolation among teachers, and the existence of a kind of exchange in presenting opinions and discussing problems.
- The use of the training program based on the dimensions of professional learning communities, leads to positive participation, and motivates teachers to exert more effort, thus increasing the level of creativity and functional innovation, and the use of the training program based on the dimensions of professional learning communities is one of the most important incentives to participate in the educational environment, and can easily monitor the progress of students, And to know the extent to which they understand and absorb the skills they learn.

Summary of research results.

The research reached the following results:

– The research indicated that there were statistically significant differences, at the significance level ($0.05 \geq \alpha$), between the average scores of primary school teachers, in the pre- and post-applications of the knowledge economy competencies observation card, in favor of the post-application.

– The research showed that the percentage of adjusted gain for some competencies was greater than the value set by Black, which is (1.20), and some are greater than (1.00) and less than (1.20), which shows the effectiveness ranging from medium to large to the use of the training program based on the dimensions of professional learning communities, in developing the competencies of the knowledge economy, among science teachers at the primary stage.

5.2 Research recommendations

In light of its findings, the research recommends:

– Adopting the training program in the professional development centers in the education departments.

– Utilize the results to design training programs to improve the level of competencies and skills that have emerged to an average degree.

– Benefiting from the knowledge economy competencies observation card for teachers, and the life skills scale for learners.

– Focus on teaching models and strategies that make the learner an active reflective thinker, and allow him to participate freely during the educational process.

– Training teachers in the primary and other stages to develop the life skills of learners, and activating community partnership programs with community institutions.

– Providing a rich classroom environment that supports the educational process by providing the necessary tools, materials and devices to conduct practical experiments and use modern technologies in education.

– Adopting the necessary training programs for teachers, which contribute to increasing their skills towards employing modern teaching strategies in the educational process, focusing on the applied aspect, and avoiding theorizing such strategies.

5.3 Research proposals

In light of the current research findings, the following future studies may be proposed:

– Conducting a similar study to examine the impact of using the training program based on the dimensions of professional learning communities in the educational process, on other dependent variables, such as attitudes, values, motivation for achievement, survival of the impact of learning, and investigating its results in other educational stages.

– Conducting surveys on the obstacles that prevent the use of the training program based on the dimensions of professional learning communities in the educational process to identify these obstacles and try to develop appropriate solutions to them

Acknowledgments

"The authors extend their appreciation to the Deanship of Study and Graduate Studies at King Khalid University for funding this work through Large Study Project under grant number RGP2/501/45"

References:-

- [1] Hassan, Maher Ahmed. (2019). Building professional learning communities as an entry point to improve academic performance in public education schools in the Kingdom of Saudi Arabia. *Islamic University Journal of Educational and Psychological Studies*, 27(6), 62-92.
- [2] Al-Kasi, Abdullah Ali, and Al-Ahmari, Reem Ali Nasser. (2019). Evaluating the effective teaching skills of middle school science teachers in light of the requirements of the knowledge society. *Journal of the Faculty of Education, Assiut University*, 35(1), 22-54. <https://doi.org/10.21608/mfes.2019.104389>
- [3] Al-Roqi, Rashid Mohammed. (2018). A proposed training program to develop the teaching performance of Arabic language teachers at the secondary stage in light of Vision 2030. *um Al-Qura University Journal for Educational and Psychological Sciences*, 9(2), 63-107.
- [4] Al-Taani, Hassan Ahmed. (2009). *Training: its concept and its activities, building and evaluating training programs* (3rd ed.). Dar Al-Shorouk.
- [5] Al-Ghamdi, Salem Hamid. (2012). *Life skills are an applied Islamic educational vision*. King Fahd National Library.
- [6] Al-Ghamdi, Saeed Mohammed Al-Atiq, and Al-Ghamdi, Ali Muhammad Zaheed. (2017). The degree of importance of developing the performance of school leadership in public education in the Kingdom in light of the dimensions of professional learning communities. *Journal of the Faculty of Education, Benha University*, 28(112), 324-381. <https://doi.org/10.21608/0053258>
- [7] Al-Osaili, Laila Ibrahim Mohamed. (2019). *The Role of Professional Learning Communities in the Professional Development of Secondary School Teachers in Qassim Region* [Master's Thesis, Qassim University]. Dar Al-Manzouma Information Base.
- [8] Al-Ghamdi, Ali Awad. (2020). The degree to which the secondary school teacher practices his roles in the era of the knowledge economy as seen by public school leaders. *Arab Journal of Educational and Psychological Sciences*, (16), 67-96.
- [9] Bassiouni, Mohamed Swailem Mohamed, Mohamed, Ibrahim Refaat Ibrahim, Hassan, Shaima Mohamed Ali, Zaghloul, Manal Massad. (2021). A training program for mathematics teachers based on sustainable development and twenty-first century skills and its impact on the development of life skills in their students. *Journal of the Faculty of Education, Port Said University*, (36), 430-466. <https://doi.org/10.21608/jftp.2021.55981.1109>
- [10] Al-Banna, Tahani Attia Mahmoud Ahmed. (2021). Developing the social studies curriculum for the second preparatory grade in light of the requirements of the knowledge economy and its impact on the development of some life skills. *Sohag University Educational Journal*, (88), 590-690. <https://doi.org/10.21608/edusohag.2021.180015>
- [11] Sharif, Muhammad. (2018). The degree of availability of knowledge economy skills among teachers of social and national studies from the point of view of school leaders in the Kingdom of Saudi Arabia. *International Journal of Specialized Education*, 7(12), 107-121. <https://doi.org/10.36752/1764-007-012-011>
- [12] Al-Shehri, Khalid Abdullah Fayez, and Al-Asiri, Reem Mohammed Amer. (2021). The reality of the practice of knowledge economy skills by English language teachers at the secondary stage in light of Vision 2030. *Scientific Journal of Scientific Research and Publishing*, 37(12), 154-202.
- [13] Al-Dhafiri, Naji Badr, Al-Shammari, Ahmed Shalal, and Al-Anzi, Ahmed Mubarak. (2020). The effectiveness of professional learning communities in developing reflective thinking skills among primary school teachers. *Journal of the Faculty of Education, Mansoura University*, (112), 736-798. <https://doi.org/10.21608/maed.2020.180789>
- [14] Raqban, Nima Mustafa, Muslim, Mohja Mohammed, and Hajjaj, Reham Jalal. (2016). Activating human development programs for teachers and their relationship to life skills management for basic education students. *Journal of Home Economics*, 26(4), 79-119. <https://doi.org/10.21608/mkas.2016.170351>

- [15] Richard, Dufour, and Robert, Icker. (2008). *Professional Learning Communities at Work; Best Ways to Increase Student Achievement* (Dhahran Original Schools, Translator, Maj.2). Educational Book House for Publishing and Distribution. (Original work published in 1998).
- [16] Shwaiter, Issa Muhammad Nazzal. (2009). *Preparing and training teachers*. Ibn Al-Jawzi House.
- [17] Abdul Majeed, Ahmed, and Sawadi, Hattan Saleh Mohammed. (2019). The effectiveness of a training program to develop the active teaching skills of science teachers in the level of conceptual comprehension and life skills of their students in the primary stage. *Journal of the Faculty of Education, Al-Azhar University*, (183, Part 2), 128-182.
- [18] Atif, Yahya Mansour, ShRahili, Jaber Abdullah. (2021). A training program based on professional learning communities and its impact on improving teaching practices among general education teachers. *Arab Studies in Education and Psychology*, (133), 405-430. <https://doi.org/10.21608/saep.2021.169017>
- [19] Asiri, Sarah Ahmed Ali Al Manames. (2018). Knowledge economy skills needed for secondary school students and the extent to which they are included in the content of biology textbooks. *Journal of Scientific Research in Education*. (19), 471-512. <https://doi.org/10.21608/jsre.2019.28898>
- [20] Mohammed, Maher Ahmed Hassan. (2019). Building professional learning communities as an entry point to improve academic performance in public education schools in the Kingdom of Saudi Arabia. *Islamic University Journal of Educational and Psychological Studies*, 27(6), 62-92.
- [21] Matar, Mahmoud Amin. (2020). *The effectiveness of a training program in realistic assessment in developing the skills of measuring learning outcomes in mathematics among teachers of the basic stage and the life skills of their students* [PhD thesis, Islamic University of Gaza]. The Arabic Digital Database is defined.
- [22] Moussa, Dina Saber Abdel Halim. (2020). A proposed program based on professional learning communities to develop decision-making skills and orientation towards collaborative work among philosophy teachers. *Sohag University Educational Journal*, (Part 78), 888-941. <https://doi.org/10.21608/edusohag.2020.109656>
- [23] Makhoulouf, Asma Muhammad. (2015). Professional learning communities as an entry point for the development of primary schools in the Jazan region in the light of the Oliver model, Heap & Hoffman. *Journal of the Faculty of Education, Al-Azhar University*, (165, Part 3), 356-430. <https://doi.org/10.21608/jsrep.2015.55809>
- [24] King Abdullah bin Abdulaziz Project for the Development of Public Education (Tatweer). (2015). *Professional Learning Communities*. National Program for the Development of Education.
- [25] Farraj, Heshmat Abdel Hakam Mohamedain, and Moussa, Ahmed Mohamed Bakri. (2017). Requirements for the application of professional learning communities in Al-Azhar institutes from the point of view of teachers. *Journal of the Faculty of Education, Al-Azhar University*, (172, Part 1), 12-72. <https://dx.doi.org/10.21608/jsrep.2017.6437>
- [26] Nassef, Muhammad Ahmed. (2017). Learning communities as an entry point for public education school reform in Egypt: an analytical study. *Journal of the Faculty of Education, Tanta University*, .358-269 ,(48)
- [27] Admiraal, W. F. (2021). Supporting professional development of teachers in schools. *Professional Development in Education*, 47(4), 684-698. <https://doi.org/10.1080/19415257.2019.1665573>
- [28] Amedu, O. I., & Gudi, K. C. (2017). Attitude of Students towards Cooperative Learning in Some Selected Secondary Schools in Nasarawa State. *Journal of Education and Practice*, 8(10), 29-34. <https://www.iiste.org/Journals/index.php/JEP/article/view/36520/37530>
- [29] Archer, K. R. (2012). *The historical context and development of professional learning communities* [Doctoral dissertation, University of Kansas]. ProQuest Dissertations and Theses Global.
- [30] Bourguignon, J. P. (2002, July1-6). *New Challenges in Teaching Mathematics* [Conference session]. 2nd International Conference on the Teaching of Mathematics at the Undergraduate level, University of Crete, Hersonisses, Crete, Greece.

- [31] Buchert, L. (2014). Learning needs and Life skills for youth: An introduction. *International Review of Education*, 60(2), 163-176. <http://dx.doi.org/10.1007/s11159-014-9431-3>
- [32] Dogan, S., Pringle, R., & Mesa, J. (2016). The impacts of professional learning communities on science teachers' knowledge, practice and student learning: A review. *Professional development in education*, 42(4), 569-588. <https://doi.org/10.1080/19415257.2015.1065899>
- [33] East, K. A. (2015). *A study of professional learning communities: Characteristics of implementation and perceived effectiveness in improvement schools in West Virginia* [Doctoral Dissertations, Marshall Digital Scholar]. Dissertations and Capstones. <https://mds.marshall.edu/etd/937>
- [34] Erawan, P. (2010). Developing life skills scale for high school students through mixed methods research. *European Journal of Scientific Research*, 47(2), 169-186. <https://doi.org/10.1037/e567102014-001>
- [35] Gabelnick, F., MacGregor, J., Matthews, R. S., & Smith, B. L. (1990). *Learning communities: Crating connections among students, faculty, and disciplines*. Jossey –Bass.
- [36] Gabriela, B. E. (2015). *Students' innovative behavior in the context of knowledge-based economy. International Conference on Economics & Administration Proceedings*, 35-46.
- [37] Harris, A., & Jones, M. (2010). Professional learning communities and system improvement. *Improving schools*, 13(2), 172-181. <http://dx.doi.org/10.1177/1365480210376487>
- [38] Hord, S. M., & Sommers, W. A. (2008). *Leading professional learning communities: Voices from research and practice*. Corwin Press.
- [39] Huffman, J. B. (2001). *The role of shared values and vision in creating professional learning communities*. Southwest Educational Development Lab. <https://eric.ed.gov/?id=ED466028>
- [40] Johnson, K. N. (2015). *The influence of professional learning communities on instructional, reflective, and collaborative practices* [Doctoral dissertation, Grand Canyon University]. ProQuest Dissertations & Theses Global.
- [41] Kemp, L. (2010). Teaching and Learning for International students in A Learning Community: Creating, sharing and building Knowledg, *Insight: A journal of scholarly Teaching*, (5), 36-74.
- [42] King, M. (2016). 6 Key features of a successful community of practice. *The Learning Professional*, 37(6), 12-14.
- [43] Meesuk, P., Wongrugsa, A., & Wangkaewhiran, T. (2021). Sustainable Teacher Professional Development through Professional Learning Community: PLC. *Journal of Teacher Education for Sustainability*, 23(2), 30-44. <https://doi.org/10.2478/jtes-2021-0015>
- [44] National Research Council (NRC). (1996). *National science education standards*. National Academy Press.
- [45] Roth, J. L., & Brooks-Gunn, J. (2014). Academic success during adolescence. In T. P. Gullotta, & M. Bloom, (Eds.), *Encyclopedia of primary prevention and health promotion* (pp. 985-992). Springer Science & Business Media. https://doi.org/10.1007/978-1-4614-5999-6_224
- [46] Samantha, J. (2014). *The use of augmented reality-enhanced reading books for vocabulary acquisition with students who are diagnosed with special needs* [Doctoral dissertation, The Pennsylvania State University]. ProQuest Dissertations and Theses Global.
- [47] Saravanakumar, A. R. (2020). *Life skill education through lifelong learning*. Lulu Publication
- [48] Stegall, D. A. (2011). *Professional learning communities and teacher efficacy: a correlational study* [Doctoral dissertation, Appalachian State University]. NC Digital Online Collection of Knowledge and Scholarship. <https://libres.uncg.edu/ir/asu/listing.aspx?id=7993>
- [49] U.S. Department of Health and Human Services & Administration for Children and Families. (2008, July). *Evaluation of the Life Skills Training Program Los Angeles County, California: Final Report*. Office of planning, research & evaluation. https://www.acf.hhs.gov/sites/default/files/documents/opre/eval_lst.pdf
- [50] Yoon, K., Lee, C., & Jung, H. (2020). Creation of an instructional model in a community of practice and its impact on relationships between members. *Physical Education and Sport Pedagogy*, 25(1), 1-16. <https://doi.org/10.1080/17408989.2020.1823957>