



Designing a Training Program in Light of SBAE Standards for Teaching Competency-Based Curricula to Improve Teaching competencies among Student-Teachers of Agricultural Sciences

Rafeek Elmeanawy¹; Elsayed Elfouly²; Mahmoud Taha³; Abdelmalk Elrefai⁴

¹ Assistant lecturer of curricula and Instruction, Faculty of Education- Tanta University
rafeek.elmeanawy@edu.tanta.edu.eg

² Lecturer of curricula and Instruction, Faculty of Education- Tanta University
elsayed.elfouly@edu.tanta.edu.eg

³ Professor of curricula and Instruction, Faculty of Education- Kafr El-Sheikh University
mahmoud.taha@edu.kfs.edu.eg

⁴ Professor of curricula and Instruction, Faculty of Education- Tanta University
abdelmalk.elrefai@edu.tanta.edu.eg

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Abstract

The research aimed to investigate the effectiveness of designing a training program based on SBAE standards for teaching competency-based curricula to improve the teaching competencies of student-teachers of the Agricultural Sciences. A training program was designed and built in light of SBAE standards to achieve the objectives of the study according to the ADDIE model. A mixed research approach with an embedded design was used. The study tools were an achievement test, a performance test, and a self-report instrument. The study sample was 25 male and female students from the fourth Grade of the Agricultural Sciences Division at the Faculty of Education - Tanta University. The results indicated that: there were statistically significant differences between the average scores of the two applications: pre-test (12.84), which represents (37.76%), and post-test (27.64), which represents (81.29%) for the research sample in the total score of the test in favor of the post-application, which has a higher average (27.64), as well as the sub-levels of the cognitive test. The results also revealed that there is significance for the differences between all the averages of the research sample and the hypothetical average for each task of the performance test tasks. It is also clear that there is significance for the differences between the overall test average of 63.08 (93.42%) compared to the hypothetical average of 48 (66.6%). The research recommended the necessity of adding a course on the CBC and how to work within it to the courses for preparing student-teachers of agricultural sciences in colleges of education.

Keywords: *SBAE Standards, Competency Based Curriculum, Teaching Competencies, Student Teachers of Agricultural Sciences*

Introduction

Agricultural education aims to prepare agricultural technicians who have sufficient agricultural culture, practical skills, and the ability to establish and manage small projects in various agricultural fields. In light of

the developments occurring in this sector, and the emergence of modern systems for preparing technicians, such as a system Agricultural professional competencies that focus mainly on specialized technical and technical competencies. The professional

competencies curriculum is one of the contemporary regulations in technician preparation programs in agricultural secondary schools in Egypt, which seeks to achieve the necessary competency to cover the labor market.

The history of competency-based curricula (CBC) returns to the early of 1970s, when they first appeared in the United States of America [17]. It is an educational movement that aimed to define educational goals in terms of precise, measurable descriptions of the knowledge, skills, and behaviors that students must possess at the end of the educational level. After diffusion of that movement in European countries such as the United Kingdom and Germany in the 1980s [23]. Then, Australia adopted CBC in the 1990s. The CBC was also adopted for the first time in South Africa by 1998, following a severe shortage of professionals such as engineers, technicians and craftsmen. South Africa adopted the CBC as an attempt to develop employable skills and deal with difficult issues in the twenty-first century[21]. The CBC was designed and implemented in the Arab Republic of Egypt three years ago (2021) in some schools, and it is reported that this system will be circulated to all technical secondary schools by 2024.

The CBC deals with simple cognitive details about different professions/trades, as it is a framework that focuses on the final performance outcomes. Which means that, it is based on the skills required to practice a profession, and allows students to focus on the best way to employ their possibilities to make a living . CBC also does not prepare school graduates for white-collar jobs, but rather prepares them to work in sectors that accelerate the country's economic growth such as agriculture, construction and fishing. According to the Kenya Ministry of Education, CBC is the best education system in Kenya, even if it is not teacher-centred [6]. The CBC also seeks to develop the learner's ability to know, learn, learn how to learn, accomplish tasks, and work with others [14]. Such a shift had educational repercussions, as competency-based curricula required a shift from evaluating learning content to evaluating each learning outcome [20]. Likewise, we find that moving toward competency-based curricula rather than content-based curricula necessitates student-centered teaching and the learning process [23]. Also, some scholars view the competency-based curriculum as the best solution for designing instruction, preparation, and training for the requirements of the complex contemporary world [8].

In the light of the philosophy of the current CBC system, the teaching process, with its regarding the three stages: planning - implementation - evaluation, is completely different from what exists now. As a result, the teacher's roles change within the classroom, as he becomes a guide, facilitator, evaluator of the students' competencies, and the students become more active

than before, they rely more on themselves in the learning process to accomplish the required tasks, while providing more opportunities for the evaluation process, activating the continuous evaluation process, and not relying on the result of the final test, after completing the training unit, and evaluating the student on the basis of what he can accomplish in a practical way, and not just based on what he knows about his major. After completing each sub-competence of the training unit, the student is evaluated, and the result of his performance is kept in his Portfolio.

Many studies have been conducted on the CBC, for example: a study of Kafyulilo et al. conducted on the implementation of CBC in Tanzania, which revealed that pre-service teachers need some type of teaching practices for training in CBC; So that they are able to effectively implement these curricula in school.[11]. Moreover, the results of the study of Wangeleja indicated that teaching competency-based curricula requires teachers' understanding of the content, teaching methods, evaluation methods, and preparing student achievement files; therefore, those responsible for preparing student-teachers in agricultural sciences must keep pace with this development, and train student-teachers to teach in light of the professional competencies system.[22].

Some studies such as Kamel; Halawa; Hassan, and Khallaf were also conducted on the CBC and its application in the Egyptian environment in the field of technical education[12];[7];[9];[13].

Based on the importance of preparing students as agricultural science teachers and constantly upgrading (ubdating) their qualifications to suit the requirements and needs of society; Specific standards should be relied upon to help develop their teaching competencies. The American Association for Agricultural Education (AAAE) has established a set of standards that define specifications for high school agricultural teacher preparation programs, which are the learning objectives for graduates of the agricultural education teacher preparation program.

The US National Council for Agricultural Education developed the US National Strategic Plan for Agricultural Education: which aimed to restructure agricultural education for the year 2020. The first goal within this strategic plan was: to provide an abundance of enthusiastic and well-educated agricultural teachers in all disciplines, from Pre-kindergarten through university. Through this initiative, the National Council for Agricultural Education aimed to develop agricultural secondary school teachers through preparation programs to help develop an innovative curriculum in appropriate teaching strategies and techniques [16].

The American Association for Agricultural Sciences Education has indicated that the preparation of the 21st century student who completes his college

Program as a student teacher, and who will obtain a license to teach in agricultural secondary schools, must be prepared in light of the following SBAE standards for agricultural secondary school teacher preparation programs [15].

- Knowledge of educational content.
- Knowledge of specialized content.
- Diversity.
- Personal dispositions.
- Program planning.
- Professionalism/professionalism.

The American Association for the Preparation of Agricultural Sciences Teachers standards represent the learning objectives for the graduates of Agricultural Education Teacher Preparation Program, whereby graduates obtain a license to teach agricultural sciences in agricultural secondary schools. These standards are not a curriculum, as institutions and agricultural science teachers can choose their own curricula, but rather serve as a guide for educational institutions when planning their programs. The American Association for Agricultural Sciences Education also indicated that the preparation of the twenty-first century student who completes his university program as a student teacher, and who will obtain a license to teach in agricultural secondary schools, must be prepared in light of these standards[15].

The responsibility for preparing agricultural science teachers who are able to effectively implement comprehensive agricultural teaching programs falls primarily on university professors who have agricultural secondary school teacher preparation programs [18]. There is an urgent need to conduct more research on secondary agricultural education, to determine the best characteristics of successful agricultural secondary school teacher preparation programs [3]. Therefore, the call to develop teaching competencies for agricultural secondary school teachers is quite clear [4].

Educational literature emphasizes the value of continuing professional development for teachers. So that, teachers can be trained on the latest information and new research on classroom management, emerging technological tools for classrooms, and new curricula, which are aspects that reflect positively on the graduate and the academic and personal skills he possesses that facilitate his entry into the labor market effectively. According to the CBC system, teaching competencies represent a major component of the entire system. It is assumed that the effectiveness of teachers is due to their possession of teaching competencies related to the CBC, this is because educational performance depends greatly on them. These basic competencies and characteristics in the classroom require monitoring the classroom, controlling students, standardizing their responses, and evaluating their progress.

The concept of teaching competencies refers to the availability of a set of knowledge, skills, and behaviors that must be possessed by the teacher, so that he can perform his teaching role and reach the desired outcomes [2]. The teaching competencies related to the CBC are: teacher's ability to design the learning environment and distribute roles, and follow learner-centered teaching strategies, as well as follow authentic evaluation methods that depend on the learner's performance in a realistic environment. Moreover, the ability to write self-reflections and provide feedback to his students and himself; this is for the continuous improvement and development of teaching performance. Also, the skills of the learners themselves. In this context, Rutayuga proposed a set of conditions to ensure the effective implementation of the competency-based curriculum, among which was improving the teaching competencies of teachers and trainers in educational systems, especially with regard to their tasks and roles during the implementation and evaluation processes[19]. Chung'e's study adds that working with a competency-based curriculum system requires preparing student-teachers to be qualified to practice the profession after graduation, as this system requires certain teaching competencies, which they may not be accustomed to, especially with regard to their roles as teachers under the traditional system. This is because the development of a teacher's skills is closely linked to the skills of his students[5].

As a result, it is clear from the above the extent to which educational literature and previous studies have emphasized the importance of the CBC system, as well as the preparation and training of student-teachers in agricultural secondary schools on how to teach agricultural sciences in light of requirements of the CBC. In addition to the standards of the American Association for Agricultural Sciences Education confirming the importance of moving towards preparing Student-teachers of agricultural secondary schools in light of national needs, the importance of their familiarity with educational knowledge of agricultural sciences.

Statement of the Problem:

During the supervision of field, the researcher noticed that schools that adopted the CBC system declined to provide opportunities for student-teachers- this is unusual - for field training. Then, by verifying the reasons for rejection from the managers of those schools, they stated the following: *"That Student-teachers are not qualified to teach in light of the recent changes in these schools, and that they must receive extensive training on the philosophy of the competency-based curriculum in order to be allowed to teach in it, and that it is a matter of priority that teacher preparation systems precede us, because by 2024 the CBC system will be applied to me; In all technical schools in the Arab Republic of Egypt, this requires*

those responsible for preparing agricultural science teachers in colleges of education and agricultural institutes to introduce programs or courses related to the competency methodology".

To ensure that, an exploratory study has been processed which aimed to determine student-teachers' knowledge with the CBC requirements, where an electronic questionnaire, including: nine statements about aspects of the CBC, and three about their desire to learn it. That was applied to the students of the third year (33) and fourth year (34) with a total of 67 individuals, and the results were as shown in the following figure (1):

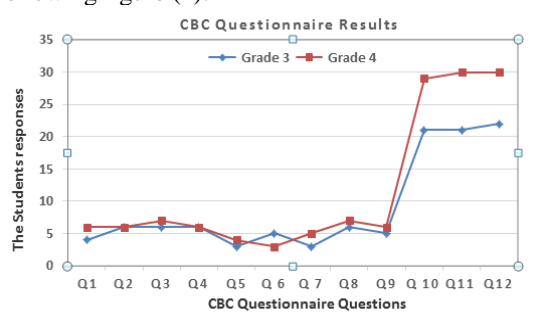


Figure (1): Results of the exploratory study.

It is clear from Figure (1): The student-teachers of agricultural sciences in the fourth and third year at the Faculty of Education - Tanta University are not sufficiently aware of the knowledge of the CBC, from the concept to the final evaluation process, but the fourth year students expressed their desire to be trained in light of the CBC requirements. This is in contrast to the third year students who slightly expressed a low desire for them. The researcher attributes this to the fact that the fourth year students were exposed to a situation that required them to teach agricultural sciences in agricultural secondary schools in light of the competency methodology, but they were unable. That's why they were excluded from schools that applied the competence system, so their need to learn stemmed from real requirements.

Moreover, through a review of educational literature and previous studies related to standards for secondary school teacher preparation programs, which indicated the necessity of developing the skills, characteristics, and practices of student-teachers in light of national requirements and changes, as well as international standards.

Therefore, the problem of the current research is the weak teaching performance of student agricultural science teachers in light of the CBC, which makes them unqualified to work in agricultural secondary schools according to the standards of the American Association for Agricultural Science Education.

Research questions:

The research problem can be defined in the following main question: *How can a training program be designed in light of SBAE standards to teach*

competency-based curricula to improve the teaching competencies of student-teachers in the Agricultural Sciences Division? The following questions branch out from the previous main question:

What is the effectiveness of designing a training program in light of SBAE standards for teaching competency-based curricula to improve knowledge related to competency methodology among the research sample?

What is the effectiveness of designing a training program in light of the SBAE standards for teaching competency-based curricula to improve performance related to planning, implementing, and evaluating teaching according to the requirements of the competency methodology among the research sample?

Research Hypotheses:

There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average scores of student-teachers in the achievement test of knowledge, pre-and post-test, in favor of the post-test.

There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average performance scores of student-teachers in the performance test for teaching according to the requirements of the CBC and the hypothesized average (66.6%) in favor of the average of the research sample.

Research Terms:

1- Instructional design:

It is one of the branches of knowledge that is concerned with theory and research on educational strategies, and the processes of developing and implementing those strategies. It also aims to determine the precise specifications for developing, implementing, evaluating and reforming situations that facilitate the learning process, whether for small or large units of the academic subject at all levels from simple to complex [1].

2- Competency-Based Curriculum (CBC):

It is one of the forms of educational design for the educational process, which aims to focus on life skills and evaluate the mastery of the skills necessary for an individual to work efficiently in a particular society. It also seeks to develop the learner's ability to know, learn, learn how to learn, accomplish tasks, and work with others [14]. It addresses simple cognitive details about different professions/crafts, as it is a framework that focuses on the final performance outcomes, which means that it is based on the skills required to practice a profession, and allows students to focus on the best way to employ their potential to make a living. [6].

3- A training program for teaching competency-based agricultural science curricula:

The researcher defines it procedurally as: a number of training sessions designed to train student-teachers on how to plan, implement and evaluate agricultural science lessons in light of the CBC. The number and

nature of the sessions will be determined on the basis of the list of competencies necessary for teaching agricultural sciences in light of the CBC.

4- Standards for preparing students as secondary school agricultural teachers (SBAE):

It is a set of indicators that describe the nature of student-teachers preparation programs for agricultural secondary schools. As they are not curricula or courses of study, but rather main learning objectives that include a number of sub-indicators that must be present in those who will obtain a certificate to teach in agricultural secondary schools [15].

5- Teaching competencies in light of SBAE standards:

The researcher defines it as: the knowledge, skills, and values that student-teachers must demonstrate upon completion of the teacher preparation program, which were defined by the American Association for Agricultural Education (AAAE), which included six basic standards, namely: knowledge of educational content, knowledge of specialized content, diversity, and professionalism, Personal preparations and project planning. Each basic standard includes a number of precise sub-indicators that determine the behavioral practices required of student agricultural secondary school teachers after completing the study program.

6- Competencies for teaching agricultural science curricula based on CBC and SBAE standards.

The researcher defines it procedurally: a set of teaching performances that must be available in agricultural science-teachers after graduation so that they become qualified to teach agricultural sciences in light of the CBC and in light of SBAE standards, and they will be measured using measurement tools prepared for that.

Method:

The current section provides a description of the procedures followed by the researcher in preparing the training program in light of the steps of the general model of instructional design ADDIE. The procedures passed through three basic stages: the training program preparation stage, the training program implementation stage, and then the training program evaluation stage, as follows:

First: Preparing the training program:

This included three steps of the general model of educational design: analysis, design, and development/production of training program materials and tools, as follows:

1- Analysis phase:

In it, the reality and need of students who are agricultural science teachers for the training program was determined, through an exploratory study, identifying the need of the school community, interviewing mentors and trainers in the field of

specialization, and reviewing the educational literature related to the research variables, as follows:

The school community needs: The analysis phase began since the idea came to the researcher's mind. The researcher noticed, during his supervision of field training for student teachers of agricultural sciences, that schools that adopted system of the CBC declined to providing opportunities for student-teachers for field.

Needs of student-teachers of agricultural sciences for the program: The researcher conducted an exploratory study and the results mentioned within the research problem above.

Reviewing educational literature and previous studies which are related to standards for secondary school teacher preparation programs, which indicated the necessity of developing the skills, characteristics, and practices of student-teachers in light of national requirements and changes, as well as international standards.

The researcher conducted an interview with a number of specialists and trainers for teachers on applying the competency system, in order to determine the scientific and administrative aspects related to the applying of the competency system, which differ from the traditional system. In this context, N.S. pointed out: *"That training student-teachers majoring in agricultural sciences in colleges of education on the competency system and their roles and responsibilities in the competency methodology is extremely important, and it must be paid attention to early, and there should be a detailed course that addresses the nature of the competency system within the courses for preparing these students"*.

In light of the above analyzes of the school's need, and student-teachers' needs, as well as what the educational literature has indicated regarding the difference between the competency system from the old system. Also, what trainers in the field have confirmed.

As a result, the researcher has extracted a list of general knowledge and skills, which should be available to those who work in the field. The schools in which the competence system is applied are as follows:

A- Knowledge related to the CBC, which the student-teachers must be familiar with:

- Knowledge of basic terms related to the CBC.
- Understanding the goals and foundations of designing the CBC.
- Understanding the roles and responsibilities of the teacher, the learner, and the school managers in the competency system, from the planning process to the final evaluation, and granting a license to practice the profession to technical students.
- Knowing how to prepare a lesson plan according to the CBC.

- Knowledge of appropriate strategies for implementing the CBC
- Understanding how the evaluation process takes place in the competency system, whether the formative evaluation or the final evaluation.

- Knowledge of the roles of the teacher, mentor, external investigator, and the role of community men (agriculture) in the final evaluation process.

B- Skills related to the CBC system, which the student teacher should be proficient in:

- Preparing plans for agricultural science lessons according to the requirements of the CBC.
- Teaching agricultural sciences in its various specializations according to the plan prepared in accordance with the CBC system, taking into account the roles of both the teacher and the learner.
- Evaluating technical students' acquisition of knowledge, skills and values Included in the teaching plan according to the competency system, which includes:

The ability to prepare an observation card according to the standards for its preparation.

Being able to prepare a product card observation and the steps for preparing it.

The ability to prepare a portfolio and how to make a decision regarding the student through it.

The ability to prepare various tests according to their preparation standards

The ability to carry out the tasks and roles of the internal investigator.

Ability to carry out the tasks and roles of the external investigator.

After the researcher reached these main points in light of what student-teachers should be prepared on, he moved on to designing the training program in light of them.

2- Design phase:

In this phase, a preliminary list was determined to design the topics and sessions of the training program for student teachers of agricultural sciences, as well as a final list of topics after the arbitration procedures, and then a vision was presented for designing a proposed training program to develop the teaching competencies of student-teachers of agricultural sciences according to the CBC, SBAE standards, as follows:

- 1- The initial list of topics proposed for building the competencies programme.

The main topics which proposed - by the researcher - to build the training program are nine topics, as follows: basic terms, competency methodology 1, competency methodology 2, planning and implementing agricultural science lessons according to the competency methodology, evaluation according to the competency methodology and tests, and evaluation Performance, Portfolio, internal and external verification. The list was presented to (9) arbitrators

who were professors of curricula and instruction, and trainers of teachers on the CBC. The aim of the arbitration was to determine the important topics and their suitability for research population, and in light of the opinions of the arbitrators. The final list of proposed topics has been reached.

- 2- The final image of the proposed topics, and the proposed design for building the program.

The main topics proposed - in light of the opinions of the arbitrators - to build the training program are six topics, as follows: basic terms, competency methodology, planning agricultural science lessons according to the competency methodology, implementing agricultural science lessons according to the competency methodology, and evaluation according to the competency methodology. Internal and external verification. The second and third topics have been merged in the initial list to become one topic: competency methodology. The topic of planning and implementing agricultural science lessons according to the competencies methodology has been separated into two separate topics, and teaching strategies have been added that are appropriate to the competencies methodology. The entire evaluation topics have been combined into one topic - taking into account the number of sessions appropriate to the content of preparing the trainer's guide - and this has been maintained on the last topic as it is.

3-Development/production:

The research materials were prepared, including the training program (student's book), the trainer's guide, and the trainee's guide, as well as the preparation of research tools, including: the cognitive test, the performance test, and the self-report.

A- Preparing the student's book.

- a- Building the content.

In light of the data of the analysis stage, and what the researcher reached in the design stage, this stage comes to translate the proposed design for developing teaching competencies and self-efficacy among student agricultural science teachers into a realistic program. The first step was to compile the scientific content of the competencies program, after reviewing many sources. Literary and communication with experts, the program was prepared, consisting of the following: introduction to the programme, the philosophy of the programme, learning outcomes of the programme, the first topic: basic terms, the second topic: competency methodology, the third topic: planning agricultural science lessons according to the competency methodology, and the fourth topic: Strategies for implementing agricultural science lessons according to the competencies methodology, and the fifth topic: evaluation according to the competencies methodology, and the sixth topic: internal and external verification.

b- The Validation of the content:

Each of the six themes included the sub-elements included in the final list of program themes that were reached in the previous design phase; To ensure the validation of the scientific content contained in the program; The program was presented to a number of (5) arbitrators, and the arbitration process was carried out in light of the following:

Scientific, educational, and linguistic integrity.
 Suitability of content to develop teaching competencies among student teachers.

After presenting the content to the arbitrators, some phrases were modified, and some terms were deleted from the first topic, due to their synonymy or lack of clarity in their definition, such as: ratification. The terminology was also rearranged to make terms that are close to each other or express one topic, such as: competence, competence-based curriculum, complementary unit...etc. Likewise, for the other five topics, some unclear or linguistically incorrect phrases were modified and formulated, and then the program (as content) became ready to be applied to the survey sample.

B- Preparing the trainer’s guide.

a- Building a trainer’s guide:

A guide has been prepared to be a clear guide for training student-teachers to practice their teaching work according to the competency methodology, with the aim of developing teaching competencies related to the CBC. The guide also addressed the general objectives of the training program and the topics selected and divided into specific training sessions. Also, the performance standards of the trainer’s guide, methods of interaction within the program, the environment and time of training, the teaching strategies used, and appropriate evaluation methods built in light of what the CBC indicates. In addition to the sources of knowledge and learning that can be used to achieve the maximum possible benefit for the trainee. The guide consists of 12 training sessions distributed over the program topics, as shown in the following table:

Table (1) Number of sessions and learning outcomes of the training program.

Subject	Sessions	learning outcomes	Subject	Sessions	learning outcomes
First	2	6	Fourth	1	5
Second	2	12	Fifth	4	27
Third	1	4	Sixth	2	7

It is clear from Table (1) that the total number of learning outcomes amounted to 61 learning outcomes. The general training plan consists of the following steps:

The trainer begins by presenting the topic title, then presenting the steps of the K.W.L strategy, then

directing the student teachers to answer the first question, which is: What do you know? This is followed by the answer to the second question, which is: What do you want to know? For example: Dear student teacher, you have a table consisting of two parts, which you must answer

What do you know about the CBC?	What do you need to know about the CBC?
.....
.....

This is followed by showing a short video or the trainer explaining the main idea of the topic through a presentation in conjunction with asking probing questions, then directing the trainees to conduct the various activities during the lesson in cooperative groups.

After completing each activity within the topic, a number of evaluative questions related to the topic are then asked, as well as directing them to conduct the scheduled activities whether in the training room, at home, or in agricultural secondary schools.

Table (2): Model of the introductory session for implementing the training program.

Session Name	Identify the objectives of the training topic, and apply the tools beforehand.
Session Duration	2 hours
Session Objectives	Identify the objectives of the training topic. Training on group division and role distribution. Apply tools beforehand.
Session Procedures	The trainer divides groups of 4-6 individuals. Each group is assigned to choose an appropriate name and a symbol that they agree on. The trainer supervises the distribution of the roles of the group members as follows: leader, group rapporteur, group writer, group reader, group observer/observer, taking into account the exchange of these roles during the conduct of the various activities. Homogeneity within the groups is also taken into account by ensuring that one group does not contain students who excel in the grade, and another group contains students who have poor achievement. Apply instruments beforehand.

A- The validation of the trainer’s guide:

To verify the validity of the trainer’s guide and its effectiveness in achieving the research objectives, it was presented to a number of (9) arbitrators specialized in curricula and methods of teaching agricultural sciences, as well as training experts according to the CBC in agricultural secondary schools, where it was judged in terms of, the extent to which:

Are the teaching methods and methods used to teach the scientific content of the program appropriate? Linguistic and pedagogical integrity of the guide's contents?

Is the appropriate time for the sessions, the content presented in them, and the related activities?

The results of the arbitration process resulted in the following: More attention must be given to writing clearer guidelines for implementing the trainer's guide, and the time plan for the teacher's guide must be considered according to the results of the exploratory experiment. The teacher's instructions have already been modified to become clearer than before, but the duration of the session has been postponed to the exploratory implementation phase to determine whether it is appropriate or not.

B- Preparing the trainee's guide (trainee activities).

a- Building the trainee's guide.

The trainee guide was built as a guide for the student-teachers. As it provides - the guide - an introduction that explains the importance of the training program, the topics included in it, as well as the learning outcomes of the program and also the learning outcomes for each topic. The guide also included the time distribution of the training sessions, the program's target group, and learning resources. The guide includes program activities that help the trainee develop teaching competency in accordance with the requirements of the competency methodology. And then related self-efficacy. The following table shows the distribution of activities according to program sessions, as follows:

Table (3) Number of training program activities (worksheets) for each topic/session.

Subject	Session	Activities	Subject	Session	Activities
First	2	13	Fourth	1	5
Second	2	11	Fifth	4	27
Third	1	5	Sixth	2	12

It is clear from Table (3) that the total number of learning activities (worksheets) amounted to 73 activities aimed at training student-teachers through implementation of the program.

a- Validation of the trainee's guide:

To verify the validity of the trainee's guide and its effectiveness for achieving the research objectives, it was presented to a number of (9) arbitrators specialized in curricula and methods of teaching agricultural sciences, as well as training experts according to the competence methodology in agricultural secondary schools, where it was judged in terms of the extent to which:

The worksheets are appropriate to the nature of the content presented and the teaching methods.

The worksheets cover the important points in each training session.

Linguistic and pedagogical integrity of activities.

Adding or deleting what you see appropriate.

The results of the arbitration process resulted in the fact that: The worksheets are sufficient, appropriate and commensurate with the targeted learning outcomes, as well as the specified time period.

Exploratory testing of research materials (the program and the trainer and trainee's guide).

The exploratory experiment demonstrated the appropriateness of the content provided to student-teachers, as well as the time period specified for the training. Given the students' time and preoccupation with other academic courses, the solution of some activities was postponed as activities that they can perform at any time, that they are completed before attending the training session in the next week for each session.

Some appendices were also added to the content of the training program as guidance tools for the experimenters later, such as: a model lesson planned according to the CBC prepared by the research group, where the students of the exploratory group explained their need for this, so a model was presented by the trainer, and it was replaced in the end with a model from the reality of the activities.

Students after completing the program, models for checklists used by student-teachers to evaluate their learners in agricultural secondary schools were added as a performance guide, as well as a product evaluation card (product evaluation guide) that was used. And models for the questionnaires of investigators, whether internal or external, and then the training program materials are ready to be applied to the final sample. In most cases, all models in the final program were replaced with models of the sample work, as the researcher saw their superiority and quality over the exploratory sample models.

Preparing the cognitive test.

The researcher prepared a test to measure student teachers' knowledge of CBC, according to the following steps.

A- Determine the purpose of the test:

The test aimed to measure knowledge of the competency-based curriculum among student teachers in the Agricultural Sciences Division, Faculty of Education, Tanta University (research sample). The questions were formulated to address the lower and higher levels of Bloom's Taxonomy (1956) levels of knowledge.

Preparing the test specifications table:

Determine the relative importance of topics:

The relative importance of the program topics was determined by calculating the number of pages for each topic divided by the total number of pages, as in the

following equation: Relative weight of the topic = number of topic pages / number of total pages * 100.

Calculate percentage levels for goals.

The percentages of goal levels were determined through the following equation: Percentage of level = number of goals of the level/total number of goals * 100.

Building a specification table:

The number of questions for each level and each topic was determined by the following equation:

$\text{Number of vocabulary for each level} = \frac{\text{The relative importance of the subject} \times \text{the relative importance of the level} \times \text{the total number of test items}}{100} * 100$. Applying the above, it became clear as follows Table (4).

Table (4) Cognitive Test Specification Table

No	Objectives Topics	low 65%	high 35%	Total
1	Basic terms%7 .	2	1	3
2	Cbc system17% .	4	2	6
3	Planning %7 .	2	1	3
4	Implementation %14 .	3	1	4
5	Evaluation % 46 .	10	5	15
6	Internal and external verification. 9%	2	1	3
Total		22	12	34

Determining the type and wording of the test vocabulary: The multiple-choice type of test vocabulary was selected.

F - Validity of the initial form of the test: The test was presented to a group of arbitrators to determine the validity of the content, in terms of:

Suitability of test vocabulary to measure knowledge related to the program.

The ability of the test items to measure student teachers' knowledge of the competency methodology.

Linguistic and pedagogical integrity of formulating test vocabulary. Some of the questions have been modified from a linguistic standpoint to make them easy and familiar to the student, and from an educational standpoint they have been modified to make some vocabulary brief and sound.

Table (5): Distribution of test questions for Bloom's lower and upper levels.

Levels	Lower levels	Higher levels	Total
			34
Question numbers	-9-6-5-4-3-2-1 -16-15-14-11-10 -25-23-22-21-19 34-33-30-29-28	-12-8-7 -18-17-13 -26-24-20 32-31-27	
Total	22	12	34

Estimating test scores.

The researcher assigned one point for the correct answer to each test question

Exploratory experiment for testing.

The exploratory experiment was applied with the aim of calculating:

1- Difficulty and ease factors: The difficulty factor of each question within the test was calculated, where the difficulty factors ranged from 52% to 88%, and the ease factor ranged from 48% to 12%.

2- Discrimination coefficient: The discrimination coefficient was calculated for each question within the test. The discrimination coefficients ranged from 20% to 70%, which are acceptable discrimination coefficients for the test items.

3- Reliability of the test: The reliability of the test was calculated using the "Cronbach's alpha coefficient" using the SPSS, ver.22 program, and the value of the alpha coefficient reached 0.91, which is an acceptable coefficient that indicates the reliability of the test.

4- Calculating self-validity: The self-validity of the test was calculated by finding the root of the test's reliability, and its value reached 95.0.

5- Determining the test time: The test time was determined through the following equation: (time of the first individual + the last individual on / 2). By applying the above, the researcher found that the appropriate time to answer the test questions is 60 minutes.

The final image of the test:

After verifying the reliability and validity of the test, and determining the appropriate time for it, the test became valid for applying to the real sample of the research, in the form of 34 multiple-choice questions that measure all of Bloom's levels of knowledge distributed over two main dimensions: the lower levels, which include 22 questions, The upper levels include 12 questions. The question booklet included the student's data and test instructions. The test included an answer sheet that consisted of a table with the question number, in front of which were four alternatives from which the respondent determined the correct answer.

Performance test:

A - **The purpose of the test:** The test aims to verify the ability of agricultural science teachers to plan agricultural science lessons according to the competency methodology, as well as to implement those lessons in a way that achieves the targeted learning outcomes, as well as to design tools to evaluate the competencies of students in agricultural technical schools, and use them in the evaluation process.

B - **Determining the type of tasks:** The researcher determined the type of tasks assigned to student agricultural science teachers to perform within the scope of the three stages of teaching: planning, implementation, and evaluation. The researcher aimed to assign the research sample a set of performance

tasks, through which he could verify their ability to plan, implement, and evaluate agricultural science lessons. According to the competencies methodology.

C- Formulating performance tasks: When formulating performance tasks, the criteria for designing performance tasks were taken into account. They consisted of four main tasks, and each task had a descriptive rating guide that included standards for the quality of task performance.

D- Estimating the hypothetical average: The hypothetical average was determined for each of the test tasks, or the criterion for accepting students' performance to calculate the hypothetical average for the descriptive performance estimation guide used in evaluating the performance of the research sample for each of the performance test tasks; This is done using the following equation: (total ranks / number of ranks * number of indicators). (As the performance assessment guide in the test has three levels/ranks, which are 1+2+3 / number of performance assessment guide items * number of statements),

Then the hypothetical average for each task becomes = $1+2+3/3 \times \text{number of statements/items}$.

Then this equation was adopted to calculate the hypothesized average to accept the performance of student teachers on the performance test. As shown in Table (6):

Table (6) Performance Test Description

No	Main tasks	Descriptive Performance Assessment Guide, Task Criteria and Grade Distribution				
		Number of key indicators	Beginner	Advanced	Exampalry	Hypothetical average
1	Planning a lesson from the agricultural sciences lessons according to the CBC.	7	7	14	21	14
2	Implement one of the agricultural science lessons planned in advance with documenting the implementation process using the phone camera.	8	8	16	24	16
3	Design assessment tools that suit the lessons planned.	4	4	8	12	8
4	Preparing a portfolio.	4	4	8	12	8
Total		23	23	46	69	(%66.6)46

E- Validity of the initial copy:

The performance test was presented to a group of arbitrators to determine the validity of the tasks, in terms of:

The suitability of the test tasks, and the descriptive performance assessment guide for each task to measure the research sample's performances.

Linguistic and pedagogical integrity of the formulation of test tasks, and a guide for correcting tasks.

Some phrases have been modified from a linguistic standpoint to become easy and familiar to the student, and from a pedagogical standpoint some tasks have been modified to take into account the time factor, such as:

Table (7): Sample of arbitrators' amendments.

Task before modification	Task after modification
The Second task: Perform two agricultural science lessons that the student planned in advance in front of your instructor.	The second task: Implement one of the agricultural science lessons that the student planned in advance and document the implementation process using the phone camera / or in front of your trainer.

Despite the importance of the arbitration process (the validity of the arbitrators), the decisive factor and indicator of the quality of the test is the pilot application, and it was implemented in the implementation phase.

F- Results of application to the pilot sample:

It was implemented with the following objectives:

- Determining the test time: It has been concluded that the performance test should not be set at a limited time for all students, due to the following reasons:

1- Regarding the planning stage, the planning process does not take place inside the training room, but rather each student-teacher takes his time, until he chooses the appropriate lesson, and plans for it as he wishes, according to the specified standards.

2- Within the implementation stage, each lesson has its own nature. Some lessons may include a greater practical aspect; therefore, it requires a greater time and training to implement them. In contrast, some lessons do not require a long time and are mostly theoretical in nature. Likewise, the steps of practical experiments and the skills themselves differ from one to another

3- Within the evaluation stage, it may be possible to allocate time to design evaluation instruments, but their use is linked to several factors, including: the nature of the skill, the number of students in the class... etc.

- Determine the possibility of implementing performance tasks and student teachers' acceptance of them:

The results of the pilot application resulted in the students accepting the idea of applying what they learned at school and the trainer following up with them on that. However, they stressed the need to provide appropriate/sufficient time, especially for the fourth task: which is related to the portfolio. Also, the

importance of providing them with the opportunity to work with their students freely within the school, and indeed this is what they achieved.

- **The final performance test:** After ensuring the validity of the test and the acceptance of the students and the possibility of its implementation in the agricultural secondary school in which the competency system is applied, the test is ready to be applied to the final sample of the research, as it consists of four basic tasks and four descriptive indicative measures of performance. The target number was 69 sub-indicators for the ideal level and 23 indicators for the developing level of the research sample, and the test score ranged between 23-69 for each student-teacher. The hypothetical mean for the test as a whole is 46 out of a total of 69.

-Preparing the self-report instrument.

The current research required the collection of qualitative data to support quantitative data. A self-report instrument was prepared according to the following steps:

A - **Determine the purpose of the form:** which is to collect qualitative data from the sample students about: the research sample's view of the necessity, importance and effectiveness of the training program for them, and several other points.

B- **Identifying the students to whom the tool should be applied:** The researcher aimed to give all students the opportunity to express "what they are interested in in the program".

C- **Determining the type and wording of items for a self-report:** The questions were formulated open-ended and numbered eight questions, in addition to allowing students to ask questions/inquiries about the program, or to add other questions by the researcher as the situation requires.

D- **The final form of the report:** After ensuring that the report is suitable for collecting qualitative data related to the training program and its educational and linguistic integrity by the supervisors, the report was prepared in its final form, as it consisted of: eight open-ended questions, in addition to allowing students to ask Questions/inquiries about its topic, or adding other questions by the researcher as the situation requires.

Second: Implementing the training program.

In which pilot testing of the research materials and tools was carried out, the research methodology was determined, and the final implementation was explained, during which the research sample was explained, and the timing of conducting the pre- and post-application of the research, as follows:

A- Pilot implementation (reconnaissance experiment):

1- The exploratory implementation aims to achieve several goals, as follows:

- Verifying the clarity of the contents of the competencies program for the study population.

- Verifying the appropriate timing of training sessions and the strategies used within the trainer's guide.
- Verifying the time of implementation of training activities in the trainee's guide, and the possibility of implementing them.
- Determine the validity, reliability, and timing of the cognitive test.
- Determine the time when the performance test tasks can be applied within the agricultural secondary school.
- Determine the validity, reliability, and timeliness of the self-efficacy scale.

2- **Timing of the pilot experiment:**

The pilot experiment was applied to fourth-year students in the second semester of 2022-2023, and the survey sample consisted of 16 male and female students, 14 females and 2 males. The program tools materials were fully applied, in order to fully verify their validity and reliability, with the exception of the performance test, which was applied afterward to some students only, and the self-report was not applied, because it was prepared after pilot testing to see the extent of the need for it.

3- **Results of the pilot experiment:** The objectives of the exploratory experiment stated above have been achieved, and all results related to the stage of preparing research materials and tools have been explained.

B- Implementing the final research experiment:

1- **Objective of the final experiment:** The final application of the research aimed to develop teaching competencies.

2- **Research methodology:**

The current research followed the embedded design as one of the mixed method research designs, as follows:

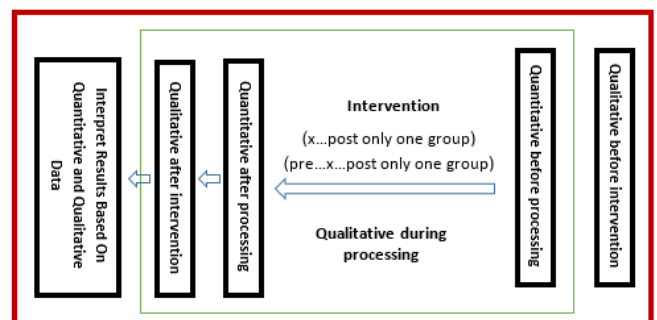


Figure (2): The basic steps of the embedded design followed in the current research.

The design followed required collecting qualitative and then quantitative data, then intervening to implement the experimental treatment, which required following one of the quasi-experimental design designs: the quasi-experimental design, pre-post, one group. Pre-test.... X....Post- test one group, and the post-test one group design was followed. Also, during

the application and after each session, the students' interaction with the training program activities was analyzed. Then, the research variables were quantitatively measured later. Afterwards, The self-report was also presented as a qualitative tool for student-teachers to express their opinions about the program, as well as to determine the effectiveness of the program through the opinions of the students themselves (the research sample). Thus, the appropriate mixed design for the research is the inclusive design[10].

1- Pre-application of research instruments:

Before starting the training and before conducting the training treatment for the research group, the research tools, which were the cognitive test and the self-efficacy scale, were applied to the students of the experimental group at the beginning of the first semester of 2023/2024 AD. The hypothesized average was determined by the researcher and supervisors for the performance test to be 66.6% before starting the program.

2- Applying the program:

The time plan for implementing the training program (Competencies Program) was determined by organizing the program's topics and training activities in the form of successive sessions in a manner consistent with the college's study plan in the first semester. They were addressed in (12) training sessions, and the time of each session was an hour, and by Two sessions per week throughout the first semester of the 2023/2024 academic year. In light of this, the time plan for implementing the research experiment is as follows:

Table (8) Time Plan for Applying the Search Experience

The group	Number of topics	Number of sessions	Time Range	
			from	To
Experimental	6	12 Training Sessions	/10/9 2023	2023/11/20

The application of the training program was also extended until 12-20-2023, in order for the trainer (researcher) to follow up on the processes of completing performance tasks within the Nasser Agricultural Secondary School and Tanta Military Agricultural Secondary School, especially with regard to the second task: implementing teaching.

1- The researcher's observations during the implementation of the research experiment:

When pre-applied to the students of the research group, the students showed their need for the program and before they took the test due to what is actually required of them in practical education, which they are not capable of, and therefore their self-efficacy is of course low with regard to teaching performance related to the competency methodology. **Where A.M.**

mentioned the following: "how do you test us about something that we know very little about through training and agricultural subject teachers talking about the new system implemented in agricultural secondary schools? We want to know firstly, then take the test".

Students asked a lot about the results of the pre-tests and whether they have an impact on grades during the first semester, and will they be added to their grades? It was made clear that the scores of the pre-test are for comparison only with the post-test and that the post-test is the basis, and that their grades in it are considered their grades in the practical education subject, in all research tools.

The students of the research group showed great interest in practicing training activities and collaborative work, and students' participation in electronic training offers increased.

Study groups compete with each other to provide the best answers to training activities, and present examples of their work and training within the school in practical training, such as: evaluating students, performing skills, as well as practicing what they study and try to do with their students and applying it to them, in order to prove evidence of their learning.

2- Post-application of research instruments:

After completing the presentation of the topics of the competency training program to the research group, the research tools represented in the cognitive test was applied within the college's training room, while the students were given their time for a maximum period of one month to follow up with the trainer to complete the performance tasks and compile the complete the portfolio of all evidence that proves it. Their improvement in teaching competencies for the purpose of making a decision regarding the students of the research group passing the training program.

After examining the completion files, a self-report tool was applied, with the aim of determining the effectiveness of the training program from the point of view of the research sample itself. It was applied in the second semester of 2024.

Third: Evaluation of the training program: (Fifth stage: Evaluation)

After applying the research instrument later, the researcher relied on several statistical methods to analyze the data using the statistical package program (SPSS, Ver: 22), the most important of which are as follows:

- Ease, difficulty, discrimination and the reliability coefficient "Cronbach's alpha".
- t-test for dependent groups to calculate the significance of the differences between the averages of the research sample on the cognitive test. As the significance of the differences between the average of the research sample and the hypothetical average was determined using a t-test for one group to compare the

average of a research sample to a hypothetical/standard average in the performance test.

- Calculate Cohen's d equation to determine the effect size.
- Thematic analysis of qualitative data and classification into categories for use in interpreting and supporting quantitative research results; therefore, the PEEL method (Point, Example, Explanation, Link) used to present the qualitative results in the results chapter as support for interpreting the quantitative data.

Research results

The results of answering the first question of the research, which states: *What is the effectiveness of designing a training program in light of SBAE standards for teaching competency-based curricula to improve knowledge related to competency methodology among the research sample?*

These results are also related to verifying the first hypothesis of the research, which states: *There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average scores of student teachers in the Agricultural Sciences Division in the achievement test of knowledge related to the competency methodology, pre- and post-test, in favor of the post-test.*

To achieve this, the following was done:

Table (9): shows Results of the “t” test to calculate the significance of the differences between the average scores of the experimental research group in the pre- and post-applications of the cognitive test.

No	Cognitive test	Application	Total Grade	Mean	Standard deviation	t value	df	Sig.(2-tailed)	d
1	Low levels	pre	22	9.28	2.73	12.95	24	.000	2.59
		post	22	18.68	2.71				
2	Upper levels	pre	12	3.56	1.50	11.17	24	.000	2.23
		post	12	8.96	2.09				
Totally		pre	34	12.84	3.00	15.00		.000	3
		post	34	27.64	4.48				

It is clear from Table (10) that there are statistically significant differences between the average scores of the two applications, pre-test (12.84), which represents 37.76%, and post-test (27.64), which represents 81.29% for the research sample in the total score of the test. In favor of the post-application with the highest average (27.64) as well as the sub-levels of the cognitive test, where all the “t” values were greater than the tabular value, which means an improvement in knowledge of the competency methodology in the test as a whole and in its sub-levels among the research sample. In light of these results, the hypothesis guiding the research hypotheses can be accepted, which states: There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average scores of student teachers in the Agricultural Sciences Division in the achievement test of knowledge related to the

competency methodology, pre- and post-test, in favor of the post-test. Hence, it is clear that the program was effective in improving knowledge of the competency methodology among the research sample.

To determine the effectiveness of the experimental treatment; Cohen's d equation was used and calculated to determine the size of the treatment effect in developing knowledge related to the competency methodology, based on the "t" value calculated when determining the significance of the differences between the two applications (pre and post) for the research sample. It is clear from Table (18) that Cohen's values ranged between (2.23). - 2.59) for the sub-dimensions of the test, and this indicates a large effect size for the experimental treatment and its effectiveness in improving knowledge of the competency methodology among the research sample. Cohen's value for the test as a whole was (3); Which means that the experimental treatment contributes significantly to the variance occurring in the test as a whole, which indicates a large effect size of the experimental treatment and its effectiveness in improving knowledge of the competency methodology among members of the research sample.

Interpretation and discussion of the results of the first research question:

The study concluded that the training program was effective in improving knowledge of the competency methodology among the research sample, The researcher attributes this result to the following:

The suitability of the content of the training program to the needs of student teachers, and what they indicated in the survey study, as well as the fact that the program came in response to the call of school principals to train student teachers before coming to train in schools, or at least their knowledge of the foundations of the competency system and the nature of work during it.

This was made clear through the opinions of the student teachers (research sample) about the program and its benefit to them. We mention some of these opinions:

Student Sh.B mentioned: *Through the content of the program, she obtained a lot of information that helped her explain it to her students, in addition to the fact that the program is not limited to the theoretical part only.* **Student A. A adds:** *The competencies program helped him learn about the competencies system in all its aspects, including planning, implementation, and evaluation. It also dealt with how to write self-reports, and it also helped him understand the terms that are mentioned to him in practical education in agricultural secondary schools, such as: what is the external and internal investigator, what Meaning of the treatment program.* Also, **Student M.A stated that:** *It was appropriate to learn a lot about the competency system that you were not aware of The program was also an*

appropriate opportunity to learn about the extent of development that has occurred in recent years in technical schools. **Student M.A added:** Through the program, his knowledge and skills were expanded and how to implement them correctly, and the program's information was of scientific value and had a very large scientific content, as at the beginning, our knowledge was little or none, and then it began to gradually improve until they reached the highest efficiency now. **The student E.A said:** It was very appropriate and I benefited from this content in teaching competency subjects in technical schools to students, and that through the content I achieved a very effective result with students while teaching agricultural subjects.

In light of the above, it can be said that the competencies program actually met the needs of the trainees (student-teachers). Hence, it was effective in improving the knowledge of the research sample using the CBC. This is indicated by the standards of the American Association for the Preparation of Student-Teachers of Agricultural Sciences, as they indicate the importance of educational preparation commensurate with the requirements and needs of society and the students themselves.

Providing learning opportunities and real training in teaching skills made available to student teachers, represented by training activities, whether in college or agricultural secondary schools.

Hence, Student M.A mentions: The educational activities are very appropriate, as they helped me greatly, facilitated the training period for them, and also helped them apply the practical education day during the training at school. **Also, M.M adds:** The activities helped to read the content of the training program and understand it through multiple reading. **As Sh. B: mentioned:** The activities played a big role, especially since they made them read a lot in order to extract the answers, and they also encouraged them to participate. **As, A.A. indicated that :** The training activities in the program encouraged them to work together, and that the activities actually revolved around their training needs.

In addition to the nature of the activities provided and their suitability to the research objectives, some students pointed out the importance and keenness of the trainer (researcher) to learn, help them, and overcome obstacles.

In this context, **B.A siad:** The researcher was and still is cooperative, and also allows questions about anything related to the program. **The student, M.A. adds that:** the matter at the beginning of the training was difficult, but with the researcher clarifying the difficult information, the matter became simpler, and that he did not skimp on any information, and that he had a high degree of cooperation. **The student M.M also adds:** The coach had a high level of morals and

seriousness in cooperating and overcoming obstacles in the school. **As, A.E. adds:** The trainer was cooperative with the student teachers, and played a major role in conveying information and knowledge related to the competency system.

Designing the program's activities collectively and considering this an opportunity for cooperation and completing tasks collectively, and the method of presenting and simplifying information and paying attention to teamwork, has a major role in the effectiveness of the training program.

In this context, **M.A. considers the program an opportunity for cooperation, especially with regard to the completion of performance tasks, especially portfolio. Also, M.M. adds:** The program contributed to making the trainees cooperative in completing tasks. **As mentioned by E. E:** The program was a good opportunity for cooperation between her and colleagues because it provided good activities that made them cooperate, so that a real product could be presented, such as completion files. **Additionally, A.S said:** The program was a real opportunity for cooperation between him and his colleagues, presenting opinions and suggestions, respecting each other, and giving their best.

The students mentioned that working with the trainer inside the college on the requirements of the competency program helped them greatly in performing their teaching tasks in agricultural secondary schools.

In this context, **M.A. stated:** The improvement was gradual, as in the beginning they did not have good knowledge about the requirements of the competency system. And that the training had an impact on their performance.

Some also pointed out that the idea of designing the program and the endless activities included made the trainees themselves search for knowledge and models of competencies used in schools, as this polished their skills and made them feel that they had a role in building the program.

Hence, **the student, S.M. mentioned:** The source of information was not just the content of the program or the trainer, as they were tasked with collecting information about what they learned, and training their students to document it. **As, A.A Added:** The source of information was also not limited to the trainer, but rather they were tasked with collecting information, building an achievement file, training their students, and performing performance tasks in practice. As mentioned by **M. F:** Collecting information increased her experience with the system Mother of competences.

It is clear from the above that matching the knowledge and information contained in the programs to the actual needs of the trainees, and designing the program in a way that allows cooperation and interaction among them, and collecting information

that contributes to clarifying some components of the program themselves, made them responsible for their learning, as the source of the information was not only the trainer or the content of the program; As well as the appropriate school environment for field training in coordination with the trainer (researcher); In addition to the nature of the activities, they were encouraged to read the program carefully to complete them. This is consistent with what the educational content knowledge standard indicates, as it is necessary to plan lessons from a local and global perspective, which is what the competencies program aims to plan lessons in order to develop technical professional competencies among technical students, as emphasis has been placed on the learning content being according to the environment, and lesson planning. According to the competencies system applied locally and derived from international systems. As well as the indicator of applying pedagogy based on research and best practices for education, where the competency system requires planning, implementation and evaluation according to the needs of the students themselves, and giving them various opportunities for growth, so training was conducted on how to plan, implement and evaluate agricultural science lessons according to the needs of students and in accordance with best practices, for example. : Training student teachers to prepare achievement files and pay attention to what students can do with what they know; which had a significant impact on the effectiveness of the program. As well as the Inquiry-based learning implementation indicator; By understanding how to carry out safe and effective laboratory activities, the competency system trains technical students to provide real products by implementing safe and effective laboratory activities, which requires training students on appropriate teaching strategies, such as: problem solving, competitive learning, experimentation and presentation. Practical, this has already been done, and this is proven by the opinions of the research sample mentioned previously. Which had a significant impact on the effectiveness of the program. The results of the current study are consistent with the study of Al-Salamouni (2022), which indicated the effectiveness of a training program to develop teaching skills related to the educational competencies system among commercial technical education teachers.

B- The results of the answer to the second question: which states: *What is the impact of designing a training program in light of the SBAE standards for teaching competency-based curricula to improve performance related to planning, implementing, and evaluating teaching according to the requirements of the competency methodology among the research sample?*

Which is related to testing the second hypothesis, which states that: *There is a statistically*

significant difference at the level ($\alpha \leq 0.05$) between the average performance scores of student teachers in the Agricultural Sciences Division in the preliminary test related to planning, implementing, and evaluating teaching according to the requirements of the competency methodology and the hypothesized average (66.6%) in favor of the average of the research sample.

The performance test was applied, which included four tasks (planning, implementation, evaluation, and designing an achievement file), and the results were as shown in Table (21).

Table (10): T-test to test the significance of the differences between the average sample scores on the performance test and the hypothetical average, 66.6%.

Test tasks	Total grade	Hypothetical mean	mean	Std. deviation	t value	df	Sig.(2-tailed)	d
Planning	21	14	20	1.44	20.78	24	.000	4.15
Implementnation	24	16	21.52	1.61	17.13	24	.000	3.42
Evaluation	12	8	11.64	0.63	28.54	24	.000	5.7
Portfolio	12	8	9.92	1.38	6.94	24	.000	1.38
Totally	69	48	63.08	4.2	20.32	24	.000	4.06

In light of the data in Table (10), it is clear that there is a significance for the differences between all the averages of the research sample at the level of ($0.05 \geq \alpha$) and the hypothesized average for each task of the performance test tasks. It is also clear that there is a significance for the differences at the level of ($0.05 \geq \alpha$) between the overall average of the test 63.08 (93.42%) compared to the hypothesized average of 48 (66.6%). Therefore, accepting the second statistical hypothesis, which states that “There is a statistically significant difference at the level ($\alpha \leq 0.05$) between the average performance scores of student teachers in the Agricultural Sciences Division in the preliminary test related to planning, implementing, and evaluating teaching according to the requirements of the competency methodology and the hypothesized average (66.6%) in favor of the average of the research sample, and then it is clear that the program has an impact in improving the ability to plan, implement and evaluate agricultural science lessons according to the requirements of the competency methodology among the research sample?”

To determine the effectiveness of the experimental treatment, Cohen's d equation was used and calculated to determine the size of the treatment effect, as it turned out that:

Cohen's values ranged between (1.38 - 5.7) for the sub-tasks of the test, and this indicates a large effect size for the experimental treatment and its effectiveness in

improving the performance of the research sample related to planning, implementing and evaluating teaching according to the competency methodology among the research sample. Cohen's value for the test as a whole was (4.06); Which means that the experimental treatment contributes significantly to the variance occurring for the test as a whole, which indicates a large effect size for the experimental treatment and its effectiveness in improving the performance of the research sample related to the competency methodology.

Interpretation and discussion of the results of the second question:

The study found that the program has an impact on improving the ability to plan, implement and evaluate agricultural science lessons in accordance with the requirements of the CBC among the research sample.

The researcher attributes this result to the following:

The program includes the appropriate knowledge and skills to work in light of the competency system, which is an urgent need for the research community. This was made clear through the opinions of student teachers (research sample) about the program and its benefit to them.

There are some of these opinions as follows: **student-teacher A.Q mentioned that:** *The program was suitable for developing their performance skills, and it provided all the information and knowledge related to the competence system, and this actually took into account the requirements of the labor market.*

Also, Sh.B: added: *The program combines theoretical and practical parts, and encourages experimentation.*

As A.A mentioned: *The competencies program helped me learn about the competencies system in all its aspects, including planning, implementation, and evaluation. It also dealt with how to write self-reports, and it also helped him understand the terms that are mentioned to him in practical education in agricultural secondary schools, such as: what is the external and internal investigator, what Meaning of the treatment program as well as, M.A added that: Through the program, my knowledge and skills were expanded. The student E. remembers: A: It was very appropriate and I benefited from this content in teaching in technical schools to learners>*

Opportunities for real learning and training in teaching skills that were made available to student teachers, represented in training activities, whether in college or agricultural secondary schools.

In this context, **M.A mentioned:** *The educational activities were very appropriate, as they helped me greatly, facilitated the training period for us, especially during the training at school. Moreover E.A also said: The training activities were excellent and played an important role in improving the teaching performance of agricultural science subjects according to the competence system. As mentioned by Y. N: The*

activities helped her to rely on herself later when explaining to the students, and also helped her understand the competence system. Additionally. A.A indicated that: the training activities in the program encouraged them to work together, and that the activities actually revolved around their training needs.

In addition to the activities within the college's training room, the school had a major role in improving teaching performance related to planning, implementation, and evaluation, as well as preparing and evaluating achievement files for agricultural secondary school students according to the competency system,

Where **S.B mentioned that:** *The school was a great opportunity for training. And the officials and teachers were helping them greatly. Also, A.A added that: The school environment was appropriate, as there was cooperation from the teachers, and they felt that they were teachers like the teachers in the school.*

the school environment was well suited for training according to the opinions of the student-teachers themselves, some students pointed out the importance and keenness of the trainer (researcher) to learn, help them, and overcome obstacles.

In this context, Student **B.A** mentioned that: *The researcher was and still is cooperative and allows questions about anything related to the program. The student adds: M.A: The matter at the beginning of the training was difficult, but with the researcher clarifying the difficult information, and that he did not skimp on any information, and that he had a high degree of cooperation. The student M.M also added: The coach had a high level of morals and seriousness in cooperating and overcoming obstacles in the school. Additionally, A.E. mentioned: The trainer was cooperative with the student teachers, and played a major role in conveying information and knowledge related to the competency system.*

Designing the program's activities collectively and considering this an opportunity for cooperation and accomplishing tasks collectively, and the method of presenting and simplifying information and attention to teamwork it includes has a major role in the effectiveness of the training program.

In this context, **M.A.** stated that: *He considers the program an opportunity for cooperation, especially with regard to the completion of performance tasks, especially the portfolio. Also, Student M.M. added: The program contributed to making the trainees cooperative in completing tasks. As mentioned by the student E. E: The program was a good opportunity for cooperation between me and colleagues because it provided good activities that made us cooperate, so that a real product could be presented, such as the portfolio. The students mentioned that working with the trainer inside the college on the requirements of the competency programs helped them a lot in performing*

their teaching tasks in agricultural secondary schools. In which, M.A. stated: *The improvement was gradual, as in the beginning they did not have good knowledge about the requirements of the competency system; Therefore, that the training had an impact on their performance.* Some also pointed out that the idea of designing the program and the endless activities included made the trainees themselves search for knowledge and models of competencies used in schools, as this polished their skills and made them feel that they had a role in building the program, as the student, S.M mentioned. *The source of information was not just the content of the program or the trainer, as they were tasked with collecting information about what they learned, and training their students to document it. The source of information was also not limited to the trainer, but rather we were tasked with collecting information, building a portfolio, training our students, and performing performance tasks in practice.*

The standard of professionalism refers to engaging in professional development opportunities in content, teaching, and various experiences in agriculture, which is what the competency methodology calls for, as work should be done on the continuous development of teachers and technical students by adopting a strategy of providing constructive feedback and learning by trial and error. As shown by the opinions of the research sample, they were actually trained in a real environment, whether inside the college or in field training, which had a significant impact on the effectiveness of the program. Likewise, what the program planning standard indicates is the necessity of understanding the value of supervised agricultural experiences to apply classroom knowledge in a real environment (field training for student-teachers). Hence, the research sample was trained in the field to plan, implement, and evaluate the learning of technical students in agricultural schools, with follow-up and supervision by the researcher. In this context, the study of Moser and McKim (2021) call for restructuring agricultural science teacher preparation programs to meet contemporary requirements, increasing teacher mentoring efforts, and enabling them to engage in interdisciplinary lesson planning. The results of the current study are consistent with the study of Al-Salamouni (2022), which indicated the effectiveness of a training program to develop teaching skills related to the educational competencies system among commercial technical education teachers.

Recommendations.

In light of the above results, the research recommended the following:

The necessity of adding a course on the competency methodology and how to work in light of its application within the courses for preparing student

teachers of agricultural sciences in colleges of education.

Providing opportunities for students who are agricultural science teachers to truly practice the teaching skills related to the competency methodology within agricultural secondary schools, and that there should be continuous follow-up by the university on this matter, as lack of follow-up diverts the field training process from its primary goal.

Educational supervision should be supported materially and morally, as this affects the performance of supervisors with student teachers in agricultural secondary schools.

Those in charge of preparing lists of student teachers who will work in technical schools must take into account the standards and requirements of each technical specialty/activity; This is because the nature of technical systems is completely different from the general education system.

The cooperation of teachers in agricultural technical schools has had a great impact, despite the reluctance of some to participate effectively, and therefore those responsible for selecting supervisors of student teachers must take into account the personal preparations of these teachers.

Immediate and delayed feedback from the trainer had a significant impact on overcoming obstacles during training. Therefore, the number of student teachers must be reduced for the faculty member so that he can carry out his teaching and guidance role to the fullest extent.

Propositions:

The current research suggested the following:

Developing a proposed vision for preparing a complete course on the competency methodology and how to work in light of its application within the courses for preparing student teachers of agricultural sciences in colleges of education.

Conducting a study aims to developing the electronic assessment competencies related to the competency methodology among student teachers in the Agricultural Sciences Division in the Colleges of Education through a training program; this is to raise the efficiency and quality of student agricultural science teachers to work more efficiently in light of the application of the competency system.

Conducting further studies aims to developing teaching competencies related to the CBC among student-teachers of industrial sciences in colleges of education.

Conducting a study to determine the effectiveness of applying the competency system in agricultural secondary schools and its relationship to the quality of performance of graduates of this system.

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