

Problems of Competency Approach in Developing Students' Creativity Qualities for Creating a Database

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Today, the training of personnel with high qualifications in information technologies is the need of the hour, it is very important to form not only skills but also professional competence, independent thinking, and decision-making skills. Many countries of the world, in their demands for their personnel, definitely require competencies in working with information and using information and communication technologies. The main purpose of writing this article was to study the problems of their creative approach to creating a database, educational methods based on the competence approach to developing their individual qualities, and the effective use of pedagogical technologies in the process of providing students with knowledge about databases in the higher education system. During the study, scientific research conducted by many eminent scientists of the world was studied. Based on observation, analysis, synthesis, and other methods, effective methods were selected for forming students' creative qualities in creating a database. As a result of the research, effective results were achieved through the Real project, mixed education methods. The obtained results and recommendations can be applied in the higher education system's database training process. The practical significance of the research results is that in the process of creating a database of future specialists, it will serve to form their professional competence, to achieve the qualification of creating a database based on an independent and creative approach.

Keywords: creativity, competence, competence approach, database, educational methods, educational technologies

INTRODUCTION

The use of modern educational technologies based on competence in the educational system is one of the main factors that prepare future qualified specialists to perform highly competitively in their professional field and to be able to act independently and effectively. Today, society and production demand educated and highly competent people.

Demands and views on qualified personnel are changing based on society's demand. As a result, educational goals are changing in content. Qualified, educated personnel are now being replaced by competent personnel. Training of competent personnel is carried out through a competent approach with the help of modern educational technologies. The modern labor market requires graduates to have high educational indicators, the ability to use modern technologies and their application, the ability to solve problems encountered in professional activities, the ability to communicate in foreign languages, and the general skills of information literacy.

The following can be cited as the competence approach and its important elements:

- personalization of education;
- defined by two main concepts, i.e. competence and competence.
- educational competence forms the basis of the student's activities necessary for education.

The main problem and shortcoming of the traditional form of education is the student's encounter with the problems of applying the acquired knowledge and skills in the process of practical activity. Today's demand for education is determined by the introduction of competence-based approach technologies in education.

PROBLEM STATEMENT

Students' knowledge of the database is formed in the process of continuous education. In the higher education system of many foreign countries, database knowledge is given based on database science. Dr. Muhammad Luthfi Hamzah [1] of Riau State Islamic University in Indonesia surveyed students in several prestigious Chinese universities. According to the results, students reported the following shortcomings and problems in the process of imparting knowledge about databases:

- the fact that direct education is based more on theory than on practice. As a result, there are situations of encountering problems in the formation of practical skills and the application of knowledge in practice;
- when modern methods and multimedia technologies are used in the teaching process, they remain in the mold of old pedagogical technologies, the main thing is that there are many problems in developing personal educational initiatives for students, fully demonstrating their talents;
- they mentioned that the practical tasks of creating a database are limited to very simple and narrow organizational tasks, which are far from real practice.

The main aspect of the above shortcomings is that students' initiative and creative approach in creating a database are severely limited. According to the approach of E.P. Torrens, creativity is an ability formed based on general intelligence, individual description of a person, and the existing state of productive thinking. Based on this, we consider it an important task to form students' creative abilities.

RESEARCH QUESTIONS

In the course of our research, we focused on the following problems in achieving the effectiveness of teaching knowledge about databases and the development of student's creative approach to database creation:

- formation of competencies of students along with knowledge, skills, and qualifications;
- use of modern educational technologies to properly organize students' practical activities;
- encouraging students' academic initiatives and shaping creativity;

- defining a personal learning trajectory for students' knowledge sharing in the database.

LITERATURE ANALYSIS

In the course of our research, the scientific works of many scientists who researched database training were studied. As an example of these, Dr. Muhammad Luthfi Hamzah [1] of Riau State Islamic University in Indonesia, "St. Edward's University and New Mexico University researcher Bilal Shebaro[2], Chinese Suzhou University researcher Ai-Dong Fang[3], Russia's Krasnoyarsk State Agrarian University associate professor Titovskaya Natalya Viktorovna[4], France's ISTECC - The work carried out by Assistant Professor Joao Carneiro [5] of the Ecole Supérieure de Commerce et Marketing School of Commerce and Marketing can be cited. E.P. Torrens, Ray M. Simpson, E.L.Soldatova, T.F. The works of such scientists as Bashina and D.B. Bogoyavlensky were analyzed. [6], [7]. Scientific research on modern pedagogical technologies and their effective application in education include Kimmons R. [8], [9], Mallillin L.L., Laurel R. [10], Sean Bui [11], Muslimov N. [12], and others. Research conducted by Adinda Dina [13], a scientist at the University of Strasbourg, France, has as its main goal the improvement of the new approach to the organization of education based on technologies. In the research of the scientist, the problems of the wide application of digital technologies in the higher education system, the formation of students' interest and motivation in learning, and students' interest in self-learning are highlighted. In particular, self-direction in education is related to motivation, and autonomy and self-regulation are related to cognition and metacognition.

EFFECTIVE PEDAGOGICAL TECHNOLOGIES

Ray M. [15] Simpson expressed creativity as a high-level thought process. E. P. Torrens expressed creativity as an ability that is formed based on general intelligence, individual description of the person, and the existing state of productive thinking.

Active Learning Strategies, Blended Learning, and Real-world projects can be mentioned among the modern pedagogical technologies that are highly effective in database training today. The above educational technologies are widely used in the educational system of many countries of the world. These educational technologies are distinguished by their orientation to the individual and their role in the development of the individual characteristics of a person.

PRINCIPLES OF DEVELOPMENT OF STUDENTS' CREATIVITY

- 1) The principle of systematicity in the organization of a holistic pedagogical process aimed at the development of student's creativity in the "Database" classes, its important components (educational goals, tasks, results, learning activities, methodical activities, the main organizational forms of the lesson, technologies, methods, tools) Interrelationship, unity is important.
- 2) The principle of consistency illuminates the consistent organization of the pedagogical process aimed at the development of students' creative qualities in the "Database" classes, gradual development, and logical interconnection of lessons with each other.
- 3) The principle of practical activity orientation. The subject "Database" directs students to practical activities according to its content, theoretical foundations, and educational purpose. Students acquire certain practical skills, competencies, and creative qualities in each lesson organized within the framework of the academic subject. Cognitive and empirical mastering of the basics of certain practical project preparation by students in the "Database" classes, promotion of creative ideas, and preparation of a result with a creative approach confirm that they are practically oriented.
- 4) The principle of creative character. Completion of educational tasks by students, promotion of creative ideas, and preparation of projects related to the creation of creative products show the creative character of educational activities organized in "Technology" classes.

- 5) The principle of integration. The ideas of the "database" science are based on such subjects as programming, mathematical modeling, information systems, and web technologies, and serve to illuminate the interdependence and integration between the topics studied within these subjects, students, and the student's personal, and psychological abilities.
- 6) The principle of compatibility. It means that students' intellectual competence, age interests, and academic trajectory, psychological characteristics, personal capabilities, motivation, and needs are taken into account when preparing materials and assignments. When determining the level of complexity of educational materials, it is necessary to take into account the academic initiatives of students, their assimilation, and the existence of necessary pedagogical conditions for their adequate performance when forming educational tasks.

METHODS THAT DEVELOP THE QUALITIES OF CREATIVITY

As a result of competence-based and person-oriented methods, the creative individual qualities of a person are developed. "Brainstorming", "Case study", and "Problematic education" are among them. "Brainstorming" method. This method is based on Alex Osborne, and its main principle is to develop the ability to develop new ideas and critical analysis in a person. The learner expresses his opinion on the studied problem, and puts forward his proposal.

Organizational Forms of Database Lessons:

Lectures The main theoretical information of the subject is given to the students in the lectures. Lectures on the subjects of the academic subject are held following the time (hours) allocated to the subjects specified in the curriculum. They consistently describe the achievements, proven theories, basic concepts, laws, existing controversial issues, points of view, history of the issue, achieved level, and theoretical and practical importance.

Based on many years of research and research by scientists, lecture classes are shown to perform the following tasks: guiding, informative, methodological, educational, and developmental. The effective organization of lectures depends on the qualifications of the teacher as well as on the teaching methods and educational tools. According to the form of organization and conduct of lecture classes, they are carried out in the form of an oral-illustrative, technological, investigative-creative approach. Conducting theoretical training is carried out by determining the main questions on the subject to be covered and providing the necessary knowledge by providing answers to these questions. The goal of the lesson (the teacher's goal) and the identical educational goals (the learner's tasks) based on this goal is determined for each identified main question.

The process of solving an optional problem from the subject "Database" is carried out in the following stages:

1. Analysis of the task - understanding the content of the problem and determining the expected results.
2. Choosing the right model - choosing the model that leads to the solution based on the content of the problem.
3. Creating an algorithm - determining the sequence of solving the problem.
4. Representation on the computer - solve the problem on the computer and get a solution.
5. Justification of the solution - analysis of the obtained solutions.

It is possible to recommend the creation of control tasks for theoretical exercises in the following order, as an example of the topic "Preparation of queries in the Microsoft Access program":

Level 1 quests.

- 1.1. What does Microsoft Access do?
- 1.2. Explain how to start Microsoft Access and how it works.
- 1.3. What is the purpose of creating queries in Microsoft Access?
- 1.4. How do you know how to create queries in Microsoft Access?

Level 2 quests.

- 2.1. Tell me the steps to prepare queries in constructor mode in Microsoft Access?

- 2.2. Tell me the steps to prepare requests in Microsoft Access in master Zapro mode?
- 2.3. How to create a query that creates a table in Microsoft Access?

Level 3 quests.

- 3.1. What is the procedure for preparing SQL queries in Microsoft Access?
- 3.2. Explain how to prepare queries that sort data in Microsoft Access.
- 3.3. Explain the basic tasks and preparation procedure of the Microsoft Access queries.

Level 4 quests.

- 4.1. What are the main advantages and disadvantages of preparing SQL queries in Microsoft Access, and what are the measures to eliminate the disadvantages?

In the process of performing the above-mentioned control tasks, learners perform tasks corresponding to the following levels based on their personal indicators:

The first-level control tasks - the students' knowledge of memorizing, and retelling the knowledge and information they have learned as a result of the analysis of the learning materials and their recall are checked.

Based on secondary control assignments - reproductive level assignments, learners are required to analyze the contents of educational materials and check their acquired knowledge based on their independent work.

Third-level control tasks - with the help of productive level tasks, learners should be able to solve non-standard, problematic issues and tasks based on their acquired knowledge, and should consist of tasks that ensure independent thinking and decision-making. In the preparation of tasks at the productive level, the complexity of the materials does not have to be very high, the most important thing is that the tasks are related to the content and require mental activity, and mental conclusions should be embodied.

Fourth-level control tasks - using tasks that require a creative approach, students' ability to think, perception, creative and non-traditional approach to completing tasks with the help of tasks [20], [21].

The distribution of the content of the tasks selected for practical training in "Database" and science by mastering levels can be recommended in the following order, as an example of the topic "Preparing queries in the Microsoft Access program":

Level 1 quests.

- 1.1. Start the computer and start Microsoft Access.
- 1.2. Create spreadsheets in Microsoft Access.
- 1.3. Add key fields to tables created in Microsoft Access and verbally explain what the key field is and what it does.
- 1.4. Prepare a query based on tables prepared in Microsoft Access.

Level 2 quests.

- 2.1. Sort the text data in the table by specified letters in the queries prepared in the Microsoft Access program.
- 2.2. Create a new table based on the queries prepared in Microsoft Access.
- 2.3. Update table data based on queries made in Microsoft Access.

Level 3 quests.

- 3.1. Create queries that increase the value of numerical data in Microsoft Access tables by 10%.
- 3.2. Create a query that sums numeric values from tables created in Microsoft Access and saves them as a new table.

Level 4 quests.

- 4.1. Prepare queries in Microsoft Access in SQL mode and compare these queries with queries prepared in constructor mode. State the advantages and disadvantages of preparing queries in SQL mode.

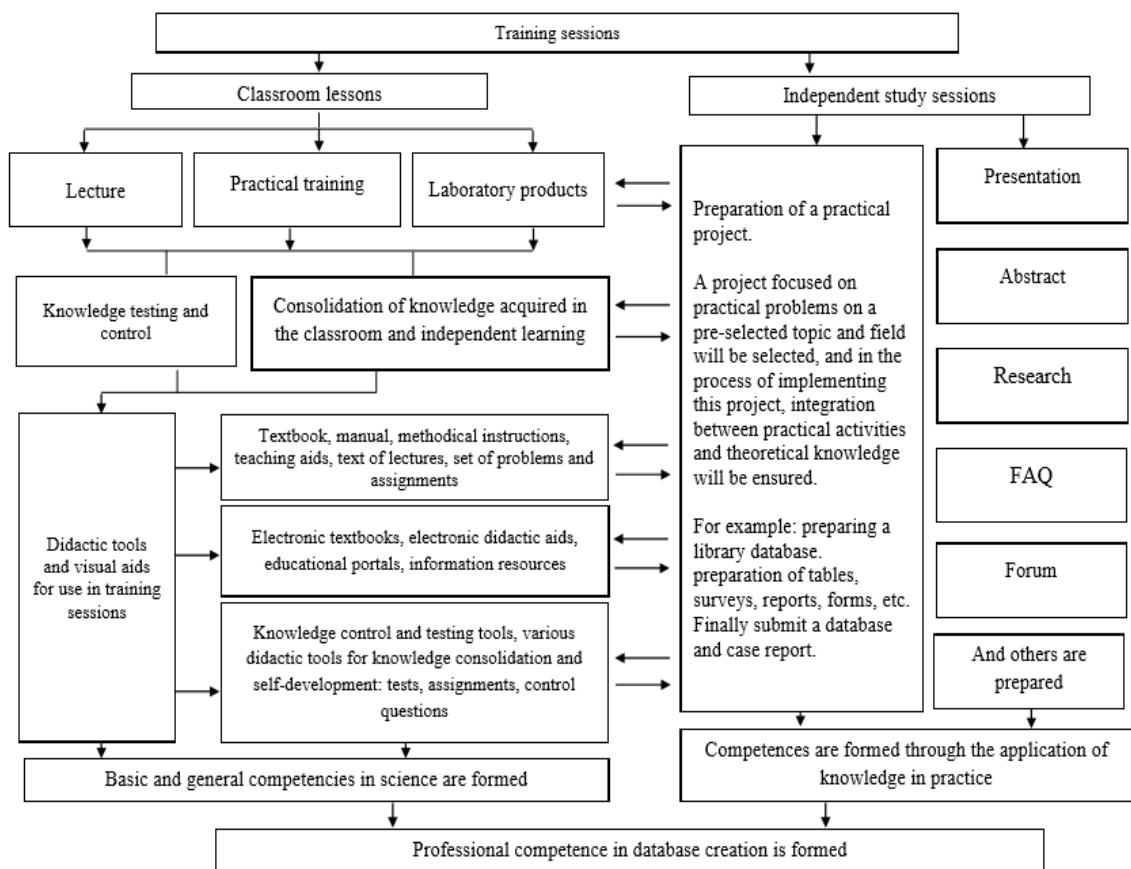
Laboratory training is a form of practical training, students are required to take an independent approach to solve assigned tasks. In this process, it is also appropriate to pay attention to the variety and orientation of tasks from simple to complex. To strengthen and enrich the knowledge gained in theoretical, practical, and laboratory training, it is advisable to give students independent work assignments. Learners use

methodical instructions to work with independent tasks, so it is desirable to be given independent work and to perform the assigned tasks sequentially.

Model of Educational Activities

Taking into account the above analysis, we have improved the form of training in database science. The main focus was on providing integration between theory and practice based on practical project-oriented educational technologies.

FIGURE 1
THE STRUCTURE OF ORGANIZING AND CONDUCTING TRAINING SESSIONS ON THE SUBJECT OF "DATABASE".



ACHIEVEMENTS

As a result of our research, educational technologies that serve to develop individual characteristics of a person, which is one of the main requirements of a competent approach to education, are analyzed. Based on this, effective ones were selected for training the database and practical results were shown. Students' creative approach to database creation is formed primarily as a result of practical activities. For this reason, educational technologies and methods focused on practical activities were used more.

SUMMARY

It can be said that continuous improvement and enrichment of education is first of all an important condition and factor of modern personnel training. In this regard, it is a priority to correctly analyze the

problems, having studied the world experience. Application of the latest technological and methodological advances in personnel training, as in all fields, is a requirement of time and society. Based on our research, we focused on the development of the personal qualities of the student based on the work aimed at improving the teaching of database science.

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