

Methodology of Preparing Future Specialists for Professional Activity Based on the Principles of Andragogy: An Example of Technical Professional Colleges Pupils

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Abstract—This article describes the methodology for preparing students of professional education in the technical direction for professional activities based on the principles of andragogy. The article provides an analysis of acmeology and akmeological approaches in pedagogical, psychological and philosophical terms. The model of preparation of future specialists for professional activities, as well as models of the innovative-acmeological environment of professional training are presented. In the akmeological assessment of professional activity of students of professional education, the SWOT analysis method was used, and a mathematical-statistical analysis was presented. Digressing from the problem, which is considered in this research, and its solution within acmeological approach, the aim of the study is to find its origins and determination of its role in the development of professional competence of future specialists during their studies in higher education institutions. Synthesizing knowledge of many sciences and applying main elements of modern approaches, the notion of “acmeological culture” presents more specific interpretation of the development of professionalism and professional competence. The purpose of the article is to develop the methodology of professional development of future specialists based on androgogical principles. As a task, to create the “Individual professional development program” module for the professional education curriculum and the implementation of innovative educational technologies in its teaching.

Keywords—professional training, pupils of professional education, acmeological approach, teaching methodology, SWOT analyses

I. INTRODUCTION

The development of professional training of professional education specialists worldwide is carried out in accordance with the Lisbon Convention, the Bologna Declaration, and the general requirements of the

international classification of education standards. The main mechanism of integration of the professional education system into the global educational environment is the practical application of theoretical knowledge.

World experience shows that one of the urgent tasks of pedagogical theory and practice is to develop a methodology for teaching career-oriented subjects in the professional education system. The main goal is to prepare the students of professional education for a profession based on andragogic principles and to improve their professional competencies by developing their individuality and creative abilities in applying their theoretical knowledge to practice.

Based on modern development trends in the field of higher education, Uzbekistan is paying special attention to the problem of introducing the credit education system in order to improve the quality of the educational process. As stated in the action strategy for the development of the Republic of Uzbekistan in 2017–2021, “...further improvement of the continuing education system, increasing the opportunities for quality education services, continuing the policy of training highly qualified personnel in line with the opportunities of the labor market, improving the quality and efficiency of education in higher education institutions” efforts are underway¹.

In the Republic of Uzbekistan, one of the main tasks for the teachers of professional educational institutions is to study their andragogic-psychological needs and to form the ability to rationally solve professional problems.

The purpose of the article is to improve the methodical-technological function of education aimed at analyzing and studying the principles and problems of professional training of students of professional educational institutions specialized in technical direction on the basis of andragogic principles.

Manuscript received August 3, 2023; revised October 24, 2023; accepted November 10, 2023; published April 18, 2024.

¹ A treatise towards rapid development and renewal based on a strategy of action. -T.:2017. B.70-71.

II. LITERATURE REVIEW

Research on the use of theoretical and practical issues of acmeology in professional training of future specialists Liverpool Hope University (England), Maastricht University (Netherlands), Nebraska University (USA), Mara Technology University (Malaysia), Belfield Pedagogical University (Germany), Fatih University (Turkey), University of Waterloo Ontario (Canada), Mangalayatan University (India) and the Russian State Vocational and Pedagogical University, the Acmeological Research Center of the International Academy of Acmeological Sciences affiliated to the Russian State Academy of Education (Russia), the Scientific Research Institute of Pedagogical Sciences of Uzbekistan (Uzbekistan) and Uzbekistan World is being conducted at the University of Languages.

As a result of the research on the problem of applying acmeology in personal development, among other things, the following results were obtained: educational conditions of professional development and social changes were developed (Liverpool Hope University); developed psychological and acmeological problems of personality development (Maastricht University); the problem of personality development was developed based on the acmeological approach (Nebraska University); Pedagogical, psychological and acmeological issues of strengthening students' communication competence are theoretically based (Mara Technology University); Acmeological scientific research on professional development in early adolescence was conducted (Belfield Pedagogical University); effective methods of personality development have been developed (Fatih University); the importance of acmeological training technologies in personal development is scientifically based (University of Waterloo Ontario); personality and social psychology learners' creativity, adolescent and adolescent education and the influence of family relationships, research-oriented education in the application of acmeology theoretically and practically based (Mangalayatan University); the problems of formation of individual competence of specialists based on acmeological approach education were studied (Center of acmeological researching); the development of the skills of designing the educational process in future teachers based on the acmeological approach has been scientifically researched (Research Institute of Pedagogical Sciences of Uzbekistan).

Ocheretna [1], Baird [2], Yessenamanova [3], Ivanii [4], and Provorova [5] discussed the problem of acmeology and acmeological approach in professional education and they used both qualitative and quantitative methods to measure the dimensions of emotional stability such as behavioural self-awareness, communication and conflict management, emotional and behavioural self-efficacy, adaptability, and self-programming of a positive mental attitude.

Furthermore, Joldanova [6] and Hladkova [7] analyzed the acmeological approach to the formation of

professional competence in students of higher education. They made up the stages and methods of acmeological training, and presented the results of an experimental study on the effectiveness of the acmeological approach in developing professional competence.

Vladimir, Postavnev, and others made model which consists of four components: diagnostic, prognostic, developmental, and evaluative. Each component has its own objectives, methods, tools, and criteria. The model allows integrating the potential of general professional training courses in the system of psychological support and assistance in students' self-knowledge and professional and personal development [8].

The methodological bases of acmeology, its development stages, branches, scientific-practical problems related to the improvement of a person during his professional activity and the highest manifestation of his vital potential were described in the research work of Asatryan. He determined theoretical and practical issues of andragogy through surveys tend to identify and coordinate the conditions and factors that contribute to or hinder human development and self-realization, attitude towards professional activity, development of personal and professional qualities [9].

The research works of Radchenko [10], Sydorчук [11], Cheremisina [12], and Osipova [13] discussed acmeological development of the future teacher. They paid more attention to enhance the individual to progressive self-development, self-organization and, accordingly, professional self-improvement in achieving the optimal level of professional development.

In the process of our research, we identified the following problems in preparing students of professional education for professional activities based on acmeological approaches:

- Cognitive, affective, psychomotor, professional, creative formation and intensive professional training of the future specialist;

- Formation of the student's creative ability through the innovative didactic structure of introducing the acmeological approach to professional education, methods of acmeological professional orientation of educational activities (student's individual professional development program, student's acmeogram, student's electronic portfolio).

As a solution to these problems, we have developed the following scientific innovations:

- The methodology of increasing the effectiveness of the educational process based on the acmeological approach (using methods such as SWOT, SMART, SCORE) has been developed, improving the professional competence and content of the acmeological direction in students through the harmonious use of electronic educational content and acmeological technologies;

- Development of methods for the use of controversial acme technology, developmental acme technology, training acme technology, and game acme technologies on the basis of ensuring the integration of pedagogical-psychological-acmeological tasks of education in the

teaching of “Basics of Electrical Engineering and Electronics”.

Acmeology means the Greek word acme – peak, perfection, high stage of something, flowering period [14, 15, pp. 5–7].

In the subject of acmeology, the concept that a person should have the maximum maturity achieved in all spheres of his individual activity has arisen. Since maximum maturity is associated with the highest peak of personal development and individual activity, this peak is called “acme” in Greek, and this field is called acmeology. Acmeology is consistency, i.e., striving for the peak of perfection, which is an integral feature of human life, and this expression means personal, professional development and tendency to self-improvement [16, p. 32].

Zeer [17], Ayagan [18], and Ruslana [19] had an active approach that covers the conditions of acmeological development, providing a way to develop a person in active educational and professional activities.

American psychologists Raad [20] and Patton [21] conducted acmeological scientific research on personality problems and modern psychological-acmeological issues in early adolescence, Gamer [22] in acmeology – personality development, Canadian educator – psychologist scientist Thomas [23] in effective methods of pedagogical-psychological acmeological development of personality, Peterson, Seligman, and Vaillant [24] in personality and social psychology, Zullo [25] and Patti [26] in learner creativity, Bandura and Walters [27] in personality and social psychology learner creativity, adolescent and adolescent education and the influence of family relationships, Khanna [28], one of the great Indian scientists research-oriented education in the application of acmeology is theoretically and practically based, and the optimal ways of developing the personality of learners are intensively studied.

It allows to identify such problems as personal development in foreign studies, achievement of professionalism, use of acmeological approach in professional education. For example, the importance of acmeology in the training of scientific and pedagogical staff at the Kazakh National Pedagogical University named after Abay, formation of individual competence of specialists based on acmeological education; Problems of acmeology in professional education at Kyiv State University of Ukraine; Self-development and self-management in acmeology at the Russian State Vocational and Pedagogical University; It is being studied as a scientific problem at the State Service under the President of the Russian Federation and the Academy of National Economy of Russia. Theoretical and practical issues of acmeology are thoroughly covered in the acmeological research center of the international academy of acmeological sciences affiliated to the Russian State Academy of Education and in the scientific-practical magazine “Acmeology” established there.

Acmeological-psychological issues of personal growth, scientific analysis of professional development conditions Liverpool Hope University (England); human acmeological personal development plans Maastricht University Holland (Netherlands); acmeological scientific research in the direction of professional development of children in early adolescence: processes, problems, research needs under the direction of Susan M. Sheridan at the research center of the University of Nebraska (University of Nebraska, Lincoln City, Nebraska State USA); (pedagogical, psychological, acmeological) issues of strengthening students’ communication competence, in the center of scientific research (Mara Technology University, Malaysia) under the leadership of Suriani Binti Mohd Kasim; Problems related to personality development are being studied on a large scale in scientific institutions such as Belfield Pedagogical University (Germany), Fatih University Istanbul (Turkey).

It requires the development of technological support and theoretical-methodological aspects of the process of professional and personal development of a student of a professional college. The solution of this task provides a factor of successful socio-professional orientation of the student of the professional college to acquire a comprehensive professional activity, that is, their professional mobility and competitiveness. Given structure provides information about system of acmeologically-oriented educational process for learning pupils of technical professional colleges. In this case, we should pay more attention to develop their theoretical knowledge in lectures, practical skills in practice lessons, professional creative ability in self-study time and professional competencies during the whole semester integrating with other subjects. As a result, we could obtain professional acmeorientation which tends to improve acme person-professional skills of future specialists (Fig. 1).

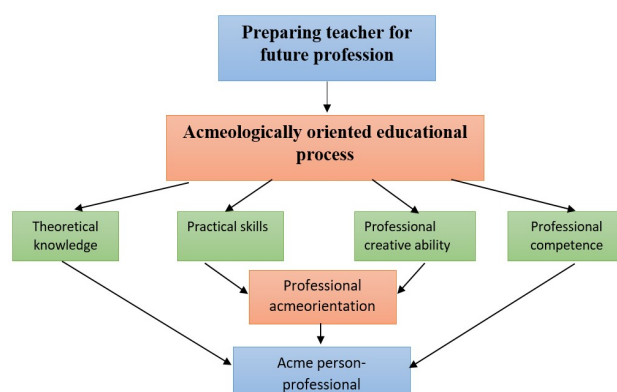


Fig. 1. The model of preparing future specialists.

Acmeological approach is one of the new innovative approaches in education, which consists of several structural directions (Fig. 2).

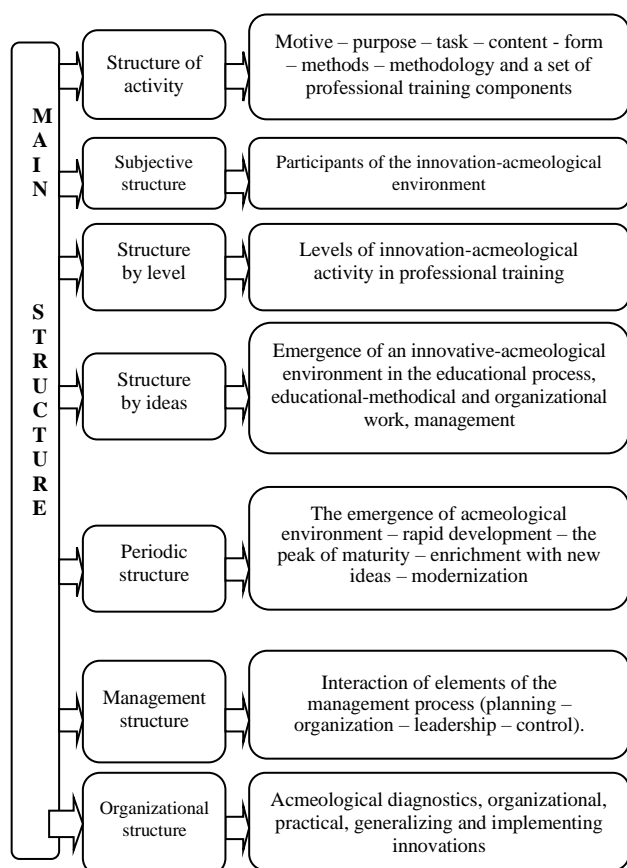


Fig. 2. Structure of innovation-acmeological environment in professional training.

The acmeological approach is currently the most promising for the educational institution. Its application leads to the transition of the educational institution from the functional to the developing mode, in which the quality of education also increases.

Currently, one of the most pressing pedagogical problems is the formation of the ability and need for regular updating of professional knowledge and skills in future specialists. Without it, they will not be able to achieve the highest levels of professionalism. One of the most effective modern approaches that allows for a targeted and collective solution to these issues is the acmeological approach.

Current methods in acmeology:

- Young people can manage their creativity through a legal standard and in the process raise their career to the highest level.

- Objective and subjective units and conflicting influence factors in reaching a higher level of personal aesthetics and intelligence.

- Such as self-learning, self-organization, and management.

In general, self-development and restoration based on legal standards is to understand one’s own interests, needs, and abilities, to see one’s own achievements and shortcomings in one’s work.

III. RESULT AND DISCUSSION

The level of vocational training of students of professional education, the level of professional training of the graduates of the 2021–2022 academic year (in the example of electrical engineering and technical fields) by the specialty of scientific-pedagogical, theoretical, and experimental research results of analytical analysis in the section of selected professional educational institutions (Table I) was studied.

TABLE I. THE STATUS OF THE PROFESSIONAL TRAINING LEVEL OF STUDENTS OF PROFESSIONAL EDUCATIONAL INSTITUTIONS ACCORDING TO THEIR MAJOR (2021–2022 ACADEMIC YEAR)

№	Professional educational institutions	The experiment is the number of students who participated in the experiment	Vocational training level of students by specialty %		
			On demand %	Average %	% at lower level
1	Gijduvan Polytechnic Vocational College	63	25.4	38.1	36.5
	Gijduvon “Armechan” household service vocational college	72	30.7	33.3	36.2
2	Mubarak Industrial Vocational College	117	29.9	34.2	35.9
	Mubarak Information Technology and Service Vocational College	67	29.8	32.9	37.3
3	Navoi Vocational College of Architecture and Construction	67	31.3	37.4	31.3
	Navoi Technical Vocational College	154	22.7	37.7	39.6
4	Cotton Service Vocational College	71	25.3	29.6	45.1
	Cotton Automobile and Road Vocational College	115	24.4	34.8	40.8
TOTAL:		726	27.4	34.7	37.8

During the analysis, it was found that the level of professional training of the graduates of the vocational college in their specialty is as follows:

1. At the level of demand – 31.95%;
2. At the average level – 35.95%;
3. At the lower level – 32.1%.

The fact that 232 of the 726 vocational college students involved in the experimental work determined at the initial stage of the experimental work, 232 at the required level, 261 at the average level, and 233 at the lower level (see Table I) indicates the need to increase the level of professional training. The status of vocational training of students of professional education according to the specialty they are studying, indicators of employment of graduates in their specialty were analyzed.

Based on this situation, the conditions of professional orientation, the qualification requirements set by the employers’ organizations of these professional educational institutions, increasing indicators for professional levels (ranks), effective professional

formation of students of professional educational institutions, creative attitude towards professional activity and production, and conscious it is possible to make a decision on the approach, to contribute to ensuring that they grow up as well-rounded individuals.

It can be concluded from the identified indicators: special attention should be paid to the development of professional abilities of future specialists, preparation for professional activities. Also, the process of professional formation is complex and requires a number of psychological-acmeological-pedagogical conditions and factors. This problem has not yet been fully addressed in research.

Today, introducing modern forms of organization of the educational process and constantly updating its content, fundamentally improving the quality of training specialists in vocational colleges, organizing the pedagogical process based on new pedagogical forms and methods, using innovative ideas, acme technologies, improving the professional education process important and relevant.

Therefore, theoretical and practical study of methodological, didactic and methodical functions of increasing professional knowledge, increasing the level of professional training of graduates of vocational colleges through the acmeological approach; in order to organize the employment of graduates in professional colleges through the formation of professional knowledge, to create educational and methodological complexes and to implement them in the educational process; development and implementation of vocational guidance technology for students of vocational colleges; it is desirable to conduct tests and experiments using the developed methods and to develop a methodology for organizing the preparation of students of vocational colleges for professional activity based on the acmeological approach and to introduce it into the educational process.

Students' eagerness for new things, curiosity about their own destiny, and struggle for tomorrow's prospects are evidences. It is important to guide them in this way. Therefore, the structure of the student's educational activity in the innovative educational environment consists of motivational, creative, technological and reflexive components, and to organize it, the student's current situation should be analyzed in order to develop future plans under the guidance of the group leader and the college psychologist. To do this, we used the "SWOT" method, which is widely used in developed countries.

"SWOT" is derived from the initial letters of the following English words: Strengths; Weaknesses – weak sides; Opportunities – opportunities; Threats. A table consisting of 4 rectangles arranged in the following form was used for the "SWOT" analysis. According to the results of the analysis, the current situation of the students was determined. Individual future plans of students were developed using this method.

Students were helped in personal and professional growth by defining their future plans or eliminating

existing defects, conducting psychological and acmeological counseling. In the study, "Individual professional development program" was developed in order to prepare vocational college students for professional activity based on the acmeological approach, comprehensive study of their professional training, knowledge, skills, qualifications and skills, assimilation of their knowledge and level of education, as well as to improve their preparation for future activities. It allows students to fulfill their future plans, conduct professional and personal development in a balanced manner, achieve individual professional skill goals of the student based on the acmeological approach, and reveal the laws of their professional development. In it, the student's professional orientation, independent implementation of work related to professional activity, professionally important features of the psyche and existing levels of personal qualities were studied pedagogically and psychologically, and future plans of each student were determined according to the above factors.

Gijduvan Polytechnic Vocational College, Gijduvon "Armechan" Household Service Vocational College, Mubarak Industrial Vocational College, Mubarak Information Technologies and Service Vocational College, Navoi Architecture and Construction Vocational College, Navoi Technik Economy Vocational College – Vocational orientation according to the individual development program of the students participating in the pilot test at the Vocational College, Pakhtachi Service and Service Vocational College, Pakhtachi Automobile and Road Vocational Colleges; – practical skills; – the current level of personal qualities was determined as "low", "medium", "high" indicators according to the current situation (Table II). it turned out to have a "high" indicator. These results indicate the need for individual development of students in preparing them for professional activities.

Attention was paid to the creation of conditions and environment for each student to understand his individual indicators correctly, to define his perspective tasks correctly with the help of pedagogues, to improve his individual indicators strictly by self-control. In determining the levels, the individual indicators of the students were determined in the 100-point system, that is, the levels of individual development such as "Professional direction", "Practical skills", "Personal qualities". For example, if the student's "Professional Orientation Level" – 76 points, i.e., "4", "Practical Skills Level" – 69 points, i.e., "3", "Personal Qualities Level" – 62 points, i.e., "3" corresponds to the grade of the student in code A-23, the individual indicator was marked as "low", i.e., "3".

The personal qualities of the students were determined in the same way as above in cooperation with the group leader and the college psychologist. At the same time, it forms the student's self-control and assessment skills, and at the same time, it forms his characteristics of working on himself and moving towards success.

Students' electronic portfolio, individual professional development program, electronic recording of their

results, individual psychological and acmeological counseling, using electronic educational content in the example of “Electrical Engineering and Electronics Basics”: virtual training, modern information communication, expanded electronic education opportunities, electronic information – educational resources were created and used.

It is possible to meet the requirements by improving the modern methods, tools, and forms of organizing the educational system in vocational colleges, and by improving the training of specialists based on the acmeological approach. In acmeological methods (development methods, technologies, video training processes) restoration of cultural and social ideas, mental support of talented people, in general, self-direction and restoration based on norms, from profession and achievements in society, from culture, technology and inner psyche, one’s own interest, understanding the need and ability is being able to see one’s achievements and shortcomings in one’s work.

TABLE II. THE RESULTS OF THE INDIVIDUAL PROFESSIONAL DEVELOPMENT PROGRAM OF THE STUDENTS OF THE EXPERIMENTAL GROUP (IN THE CASE OF THE COTTON SERVICE AND SERVICE VOCATIONAL COLLEGE, THE GROUP OF ELECTRICAL AND ELECTRICAL EQUIPMENT ADJUSTMENT AND REPAIR TECHNICIANS)

Stages of formation of professional creativity in future specialists based on acme logical approach Levels	Description
The stage of acquiring theoretical knowledge	Mastering the theoretical foundations of sciences in the system of professionally oriented education based on the acme logical approach, mastering professional knowledge on the basis of innovative education acme logical professional education and training
Stage of formation of practical skills	Based on the acme logical approach, theoretical knowledge acquired in the vocational training system during production education, training practice and production practice, as well as practical training, formation of practical application skills in the process of independent education, implementation of independent professional projects
The stage of achieving the transformation of practical skills into competence	Accomplishing the transformation of practical skills into skills, professional creative thinking
Stage of preparation for professional creativity	Effective organization of professional activity based on existing theoretical knowledge, practical skills and qualifications, pedagogical-psychological-acme logical preparation for professional creativity

“Electronic educational content” is one of the important resources in aiming every student to achieve high goals in the educational process in a vocational college, in his striving to improve personal qualities, achieve success, cultural development maturity and spiritual and moral qualities based on self-development qualities and self-awareness.

The acme logical approach is the central link of the system of formation of professional creativity in future

specialists and is a creative component that reflects the ability for effective creative activity. Formation and development of professional acme logical direction is based on acme logical approach. The formation of professional creativity in future specialists is one of the main goals. The components of the professional acme logical orientation are creative thinking, creative learning, educational, research, creative ability to work, innovation, creativity, aspiration, rational independent solution of professional tasks, ability to independently design one’s own activities, thinking that allows solving professional creative tasks, designing and modeling situations.

Experiment-testing base of the research: Pedagogical experiment-test works Gijduvan Polytechnic Vocational College, Gijduvon “Armechan” Household Service Vocational College, Mubarak Industrial Vocational College, Mubarak Information Technology and Service Vocational College, Navoi Architecture and construction vocational college, Navoi Technical Vocational College, Pakhtachi Service and Service Vocational College, Pakhtachi Automobile and Road Vocational College. At the end of the experiment, the dynamics of the level of acme logical professional orientation of the students of the experimental group (5- in the example of one group in the figure) was determined.

The results of the experimental tests confirmed that it is possible to achieve a professional acme-personality as a result of the formation of professional creative ability, professional competence and professional acme logical orientation with the implementation of acme logical oriented education during the period of preparation for professional activity.

So, the indicators of preparation for professional activities of the students of the control group and the experimental group are as follows (Table III):

TABLE III. INDICATORS OF STUDENTS’ PREPARATION FOR PROFESSIONAL ACTIVITY

Levels	Control group		Experimental group					
	At the beginning of the experiment, 356 students		At the end of the experiment, 356 students		At the beginning of the experiment, 370 students		At the end of the experiment, 370 students	
	Number	%	Number	%	Number	%	Number	%
High	70	19.7	72	20.2	79	21.3	139	37.6
Middle	100	28.1	105	29.5	118	31.9	157	42.4
Low	186	52.2	179	50.3	173	46.8	74	20
Total	356	100	356	100	370	100	370	100

At the end of the experiment, the high level in the control group increased by 0.5%, the average level by 1.4% compared to the beginning of the experiment, and in the experimental group, the high level increased by 16.3%, the average level increased by 10.5% compared to the beginning of the experiment.

The level of preparation of students for professional activity has a low indicator at the beginning of the experiment, and a high indicator at the end of the experiment.

IV. CONCLUSION

In conclusion:

- Professionally oriented teaching system based on the acme logical approach in “Basics of Electrical Engineering and Electronics”;
- Introduction of the concept of “Preparation of students for professional activity based on the acme logical approach”;
- Introduction of a special course on the subject “Acme logy of Vocational Education”;
- Individual development program of students;
- “Improving the preparation of vocational college students for professional activities based on the acme logical approach” electronic guide program;
- Students’ electronic portfolio, acme gram, electronic educational content;
- To provide professional and acme logical orientation in the teaching of “Basics of Electrical Engineering and Electronics” based on the acme logical approach;
- Increasing the effectiveness of education with the effective use of computer technologies, including electronic educational content, acme technologies, methods of person-oriented educational technologies, in the teaching of professional sciences, can be positively solved through the acme logical approach.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

A. Sobirjonov: Conceptualization (formulated the research question or idea), Investigation (conducted experiments, surveys, interviews, or observations); G. I. Aripova: Funding acquisition (obtained financial support for the project); Gulzakhiryam A. Ablizova: Methodology (developed or designed methods, models, protocols, or algorithms); Nigora I. Sodiqova: Supervision (mentored or guided the work of others), Validation (verified the accuracy or quality of data or results), Visualization (created figures, graphs, maps, or other visual representations); all authors read and approved the final manuscript.

ACKNOWLEDGMENT

We thank Ministry of Vocational Education and colleges professional education in Uzbekistan. We also thank the teachers who participated for this study.

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