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Pedagogical support of technical college students during professional training

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Abstract

Relevance. The training of future specialists, especially in technical fields, is highly relevant today. This priority for pedagogical research involves analysing current methods and effective approaches for supporting future specialists. The urgency is heightened by socio-political changes and the informatisation of the educational environment.

Purpose. This study aims to examine the features of pedagogical support during the educational and professional training of students at a technical college.

Methodology. The study employs various scientific methodological tools, including functional and dialectical approaches, and methods of analysis, synthesis, comparison, and generalisation.

Results. The study explores the concept of pedagogical support, detailing its theoretical characteristics and practical application. Based on an analysis of Kostanay Polytechnic Higher College, identifies key methods such as personalized learning paths, integration of technology, and continuous assessment. These methods address the specific needs of students, enhancing their professional competence and readiness for the workforce.

Conclusions. The research confirms the effectiveness of pedagogical support in technical colleges, showing that well-implemented support significantly enhances professional training quality. The findings offer insights for developing programmes to improve educational outcomes through individualized learning strategies and technology use. The complexity of the subject suggests ongoing research is needed, especially in optimizing individual educational trajectories to further refine training processes and outcomes in technical education.

Keywords: professional establishment; individual trajectory; educational process; development.

Introduction

In the conditions of active changes in society, all spheres of life activity must be updated and modernised in time. Admittedly, this also applies to the educational environment, in particular the professional one, based on which future specialists are trained. Notably, the educational process is quite complex, and under the influence of external factors, including the COVID-19 pandemic and distance learning, it requires modernisation [1]. The above refers to changing several aspects at once, namely psychological and social. In their study, N. Revyakina and E. Sakharova [2] cover this problem on the part of such subjects of the educational process as parents and peers. However, it is advisable to analyse the process

of professional development, in particular, the acquisition of professional knowledge and skills of students through their interaction with the teacher, which will certainly help to increase the effectiveness of the educational process. In addition, T.M. Makoelle and V. Burmistrova [3] claim that teachers at the stage of pedagogical support are endowed with a set of tasks that aim to not only transfer educational material and check the level of knowledge of students, but also to support and accompany them. Special approaches and methods, determined by the individual characteristics of students and teachers are used to achieve this goal. However, this aspect is insufficiently disclosed, which indicates the need to search for more effective ways to establish interaction between students and teachers.

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The priority of considering the pedagogical support of technical college students is disclosed in its essence. In particular, a study by Z. Almagul [4] describes it as a special form of pedagogical activity, which is based on the provision by the teacher of assistance to the student in an amount sufficient for self-overcoming difficulties aimed at their comprehensive development and achievement of the set educational and personal tasks. Nevertheless, this concept does not fully describe its purpose and functions. Therefore, it is necessary to consider the entire scope of functions that are put before the process of pedagogical support, namely: teaching, educational, developmental, professional-economic, cultural, political-ideological, and humanistic. Accordingly, the educational aspect concerns the transfer of knowledge and skills from the teacher to the student.

The educational aspect also includes implementing psychological effects on the students' consciousness and perception. The developmental aspect involves not only the development of professional abilities but also the comprehensive development of the students' personalities. The professional and economic aspects are reflected in establishing the intellectual component of specialists. The cultural function involves the spiritual development of the student, fixing the main principles of life in society in their mind. The political and ideological function plays a special role in the development of national consciousness since it affects the political culture among the younger generation. In conditions of acute socio-economic changes, pedagogical support performs a humanistic function, which allows not only for the transfer of the acquired skills to young citizens but also for development processes such as self-knowledge and self-fulfilment in them.

In the course of the analysis of pedagogical support, it is advisable to consider this process from the standpoint of implementing the author's multi-level programme to increase the readiness of teachers for the pedagogical support of technical college students. The provisions mentioned in this study are of particular value because they reveal the basic principles of direct training of teachers for the implementation of pedagogical support in their future professional activities. However, they need to be further analysed to properly monitor changes both in students' minds about the role of the teacher and the teacher's understanding of the scope of their professional powers. Because of the effective implementation of this form of pedagogical activity in the daily educational process, it will be possible to increase the level of professional competence of future specialists. In particular, this can be done through the implementation of high-quality interaction of subjects of educational and professional training, which will ensure the prompt solution of various kinds of problems and obstacles for students that may arise during their educational, scientific, and professional activities.

Thus, the purpose of this study is to investigate the approaches to the implementation of pedagogical support for students during their professional training at a technical college. Therefore, a set of tasks was solved in the study, namely: the concept of pedagogical support was defined, its signs were considered, the main functions were established, effective ways of its implementation were

covered, and ways to increase the success of such support directly in a technical college were determined.

Materials and Methods

Various methodological tools were used to successfully achieve the stated purpose and to effectively perform the tasks of the study. A functional approach was used to organise the study, in particular, the development of a plan, the establishment of work stages, and the determination of its relevance and structural elements. It enabled the consideration of the most promising areas and the determination of the main issues and provisions that need to be considered. As for the internal component, a dialectical approach was used for the content and methods of presentation of the material. It allowed establishing a single trajectory based on which this study was conducted. The main aspects of the issue under study were identified, based on which the study was divided into parts to make it logical and consistent.

Research methods played an important role in the study of the issue posed. Primarily, the methods of analysis and synthesis should be noted. Their essence, as a rule, is determined by categoricity, revealed in their contrariety. In particular, through the method of analysis, several elements were identified coming from a common issue, namely pedagogical support and technical education. Accordingly, their general theoretical analysis was conducted, and the main signs and features formed because of the influence of drastic social changes were identified. In addition, based on the analysis method, the main approaches to pedagogical support of technical college students during professional training were determined, directly at the Kostanay Polytechnic Higher College of the Department of Education of the Akimat of Kostanay Region. As for the synthesis method, its role was important for the establishment of a general idea, since it allowed collecting the results obtained during the work and organising them. In addition, based on the synthesis method, a relationship between the categories under consideration was established. Consequently, this method provided an opportunity to get conclusions on the issue under study.

The comparison method was equally important in conducting this study. The method allowed sufficiently comparing the concept of pedagogical support and the educational process and establishing their connection and common features. Moreover, during the study, various ways and means were analysed to provide such support at the technical college, which was also conducted through the comparison method. This method also allows establishing the positive and negative features of certain approaches to making changes and developing the existing pedagogical support, characteristic of a certain number of educational institutions.

The method of generalisation was used to draw concise conclusions and conduct a proper discussion. Its role in the study was to analyse the results obtained and to present opinions on the issue under study. Therewith, through generalisation, several aspects under study and promising areas for future studies were identified. The study was conducted in three stages. In the first stage, a general theoretical analysis of the subject was conducted. In addition, all structural elements were identified, in

particular, the purpose and objectives were set, and the necessary issues and sections were identified. The direct ways of providing pedagogical support to students in the framework of a technical college, during their educational and professional training, were analysed. A list of the results obtained during the study was determined, and conclusions were formulated on their basis.

Results

It is advisable to begin the analysis of the issue of pedagogical support of students during their educational and professional activities at a technical college by studying its theoretical aspects. Therefore, the general concept of support should be understood as a set of interrelated actions aimed at the interaction of two or more people to implement certain common tasks and goals. Such subjects are in a single social environment characterised by their features determined by their roles in it. Based on this universal etymological concept, it is advisable to define the essence of such a category as pedagogical support.

Notably, it is characterised by the presence of certain specific features based on two elements, namely the social interaction of the subjects of such support, and the features of interaction between them. Based on this, it can be argued that the purpose of the implementation of the pedagogical support of the student is to ensure the comprehensive development of the latter. Admittedly, this process involves the use of specific pedagogical systems that differ in their purpose, for example, for education, upbringing, vocational training or other training, expressed in institutional design [5].

As for the functions of pedagogical support of a technical college student, it consists of the development of personality, which is revealed in more narrowed tasks specified by the characteristics of the chosen pedagogical system. Therewith, they can be detailed to the limit, which will give such functions the character of action technology, in this case, pedagogical technology. Proceeding from this, the content of pedagogical support of a technical college student is largely based on the improvement of consciousness and understanding of the individual, implemented through compliance with several areas of the educational process. Among them are psychological education, the transfer of professional skills and abilities, and the development of scientific potential in an individual, which, admittedly, affects their success in the course of professional training.

Moreover, when determining the signs of this type of support, it is possible to focus on the presence of a clear institutional design, developed and conducted by specially trained teaching staff. Based on the latter statement, it can be established that to implement the functions of pedagogical support, a teacher must have a highly developed professional competence, in particular in the context of the implementation of high-quality pedagogical support [6].

The given understanding of the content and functions of pedagogical support of technical college students during their professional training allows disclosing its functional structure, expressed by comparing various forms of the pedagogical activity and the roles of subjects in the educational process. Consequently, the establishment and implementation of pedagogical support for students are not

isolated from their educational and professional activities, but in close connection with the basic foundations and provisions that provide for their development and education. It should be understood that the essence of pedagogical support concerns not only educational aspects but also psychological ones, while the latter substantially affects its features. In particular, this is expressed in the context of full-fledged psychological and pedagogical support, which involves a set of professional-pedagogical actions of the teacher, which they implement to create and ensure positive psychological and pedagogical conditions. The priority of such support lies in the fact that with its implementation it is possible to increase the level of academic performance, and the quality and effectiveness of the student's professional training, which is expressed in the level of their professional development.

Based on the theoretical analysis of pedagogical support and its features, the main purpose of such a process is to provide support and assistance to the student by the teacher about their educational activities, which in turn is aimed at maximising their personal and professional development. Therewith, special attention should be paid to the fact that successful achievement of such a goal is possible only if the tasks assigned to the student are fulfilled both at the initial and at the final stage of their activity [7].

It is possible as a result of the passage of certain stages by the student in conjunction with the teacher. It is attempted to establish them in the context of the analysis of the activities of the Kostanay Polytechnic Higher College of the Department of Education of the Akimat of Kostanay Region, the purpose of which is to provide the subjects of the educational process with support and assistance to improve their professional competence. Thus, the initial stage is characterised by the establishment and provision of students with everything necessary for their active educational and scientific activities in a technical college. Therewith, the establishment and implementation of this goal in the above-mentioned educational institution are conducted through a system of intellectual, emotional, motivational, and behavioural influences, which in turn allow identifying personal characteristics of students, based on which an individual learning trajectory is developed. This approach lays the proper foundations for the development of professional competence in individuals at the initial stage of a college education.

As for the final stage of interaction between the teacher and the student, in the context of pedagogical support, it is expressed in the full and proper development of the latter's psychological, professional, and creative readiness, which will allow them to effectively exercise their professional powers and tasks in the future. In the course of the study, a model of pedagogical support for the professional development of technical college students was created. Notably, the model under consideration is based on close and productive interaction between a teacher and a student of a technical college, characterised by dynamism. This property indicates the high adaptability and efficiency of the model, which allows for quickly responding to the needs of students. Pedagogical support, which is implemented in the Kostanay Polytechnic Higher College of the Department of Education of the Akimat of Kostanay Region can also be characterised in the context of a full-

fledged mechanism that allows a student to conduct successful professional and personal development, in close cooperation with a teacher. It is also necessary to pay attention to the fact that the educational process is divided into different stages, which were discussed above, the features of which must necessarily be considered when implementing pedagogical support. In particular, each of these stages is characterised by the presence of goals, concretised in the form of a system of clearly defined tasks, which in turn fully reveal the specific features of such support [8].

Based on this, it is necessary to determine the processes that characterise the areas of pedagogical support for technical college students. In particular, there are three of them, namely: the establishment of the professional and technical orientation of the student's personality; the establishment of creative readiness for professional activity; the development of an innovative professional and technical position. Notably, the idea of implementing pedagogical support is one of the priority elements in the process of improving the effectiveness of training in colleges, in particular technical ones. Moreover, this process is quite complex, since it involves the establishment of important areas based on which it is implemented. Admittedly, such approaches to pedagogical support are determined at their initial stage and include goals, objectives, principles of organisation, and approaches to work [9].

As for the internal structure of pedagogical support for students acquiring professional knowledge and skills at a technical college, it consists of three elements that are in close connection with each other. In particular, the first one is a comprehensive and periodic monitoring of the psychological and professional status of a student and their comprehensive development in the process of studying at college. The second element is the establishment and provision of psychological and professional conditions necessary for the development of students' personalities and their effective training and professional development. This component is fundamental in developing and consolidating an individual educational trajectory (IET) for each student [10].

The third element concerns the creation of special favourable conditions for students, allowing the teacher to freely provide timely assistance and support during vocational training. However, to a greater extent, this component is responsible for the student's educational activities, in particular, the teachers' identification of gaps and difficulties in their training conducted in previous courses or other educational institutions. Based on the identified problems, the teacher should choose special approaches to ensure effective further pedagogical support. Thus, at the moment, pedagogical support is the leading means to increase the success of the level of professional competence of the future specialist. Based on the analysis of the approaches used in the Kostanay Polytechnic Higher College of the Department of Education of the Akimat of Kostanay Region, the means of pedagogical support are implemented in several areas. These include identifying the individual trajectory of students' professional development and including students in quasi-professional activities through a system of practice-oriented tasks. Additionally, metered assistance is

provided to students when they encounter difficulties during professional training.

Discussion

Based on the results obtained in the study concerning the essence and main features of pedagogical support for technical college students during their professional development, it can be noted that certain specific conditions make its successful implementation possible. This study suggests that several conditions are necessary. First, there should be the development and implementation of an adaptive system of educational activities that considers the individual learning trajectory, including a modular rating mechanism of pedagogical control. Second, the educational and cognitive process should involve the successful and high-quality execution of practical projects by students. Lastly, it should include the solution of acute educational problems through methods such as problem presentation, heuristic approaches, and research.

Therewith, this opinion is supported by A.A. Recines-Padilla et al. [11], since the authors somewhat concretise these provisions, narrowing them to recommendations for the introduction of collective-group forms of educational activity, for example, pairs of variable composition, and reform from large to small study groups. Their opinion is mostly based on the implementation of effective psychological support and correction, which in turn develop the necessary conditions for the establishment of the subject and social context of both professional and creative activities of the student.

Considering the studies discussed in the previous part and the opinion of Z. Almagul [4] on components of pedagogical support, its conditions include the provision of special factors for the proper disclosure of students' abilities, in particular, both educational and professional, which are conditioned by their high activity and developed cognitive potential. In addition, based on the provisions enshrined in the works of I. Salpykova et al. [12], V. Poul and I. Volzhentseva [13] concerning the implementation of successful pedagogical support, in particular at a technical university, its mandatory condition is the reflection, in the student's independent assessment of their own educational and professional activities. The priority of this approach is the possibility of involving various educational technologies in teaching, which the teacher can choose according to the individual characteristics of the student and their professional orientation. Therewith, it is important to organise and conduct events related to the system of support for talented students in the course of pedagogical support, for example, contests, academic Olympiads, creative events, scientific conferences, and presentations of research projects.

It is worthwhile to increase the dynamism of the college's work to increase the effectiveness of pedagogical support in the context of the implementation of individual educational trajectories. This is explained in the study of S. Pöntinen and S. Rätty-Záborszky [14], which focuses directly on the idea of reforming education, in particular its modernisation, which should be based on such principles as individuality, versatility, and success. Consequently, this will allow proper implementation of one of the most common ways to achieve the goals of individualisation of the educational process underlying the process of

pedagogical support, namely the introduction of IET technology into it. This aspect should be actively discussed in the scientific community since it is extremely effective and must be implemented during the acquisition of professional skills and knowledge by students. This statement can also be justified through its essence, which reveals it in the context of the individual trajectory of personal development and increasing the potential of a technical college student in an educational and professional environment. T. Fletcher and D. Ní Chróinín [15], who emphasise that the complex individual activity of a student characterises their professional orientation, which is expressed in the level of their independence and readiness to perform the tasks assigned to them properly, also support this statement. Therewith, it should be understood that such activities are possible only if there is successful support by a teacher both in educational and professional contexts.

The administration of an educational institution can develop such an individual educational programme through the organisational and managerial process. Due to this, students will be able to perform educational activities based on their orientation. Such conditions for the implementation of educational and professional activities are certainly capable of influencing the consciousness of a subject, in particular, a student at a technical college while satisfying their educational interests in accordance with the established standards of the educational process and a specific speciality [16-18].

In addition, N.N. Shomutodova [19], K.B. Kochkorbaevna and I. Hilola [20] indicate that the pedagogical support of students at a technical university can individualise not only a specific set of educational tasks but also the educational environment. Therewith, it becomes possible to attract students to quasi-professional activities, including through individualised practice-oriented tasks. The effectiveness of this process is certainly extremely high since the subjects of the educational process get the opportunity to use the knowledge and skills acquired during educational activities directly in practice, namely in their professional activities. According to the author, such an approach is mandatory and should be one of the fundamental ones during the educational and professional activities of technical college students, since this is the way, they will be able to determine their strengths and weaknesses. Moreover, this process should be based not only on self-reflection but also on pedagogical analysis, which indicates the need for pedagogical support in this case.

It can be argued that pedagogical support can be implemented based on various areas of joint activity of the teacher and the student, which they choose by the goals of such support and educational activities. In this regard, it is necessary to pay attention to the fact that such an educational and professional development of a student can be implemented even using several educational trajectories, which can be implemented simultaneously, in interaction, or sequentially, under the stages of the activity. This allows determining the actual and main task of the teacher in the provision of the pedagogical support of the student, namely, not only to help with the direct implementation of the tasks set but also to suggest possible areas for the development of their capabilities, in particular

in the professional context, and overcoming possible obstacles [21-23]. However, the process of choosing an effective trajectory by a student and a teacher is quite complex, as evidenced by the features of pedagogical support considered in the results of the study. The factors that affect it can be characterized in several ways. First is the freedom of choice for the direct object of the educational process, specifically the student, as the basis of the subjective paradigm on which modernized vocational education is based. Second is the level of self-determination, expressed as the result of one's existential choice when engaging in educational and professional activities. Additionally, the properties, signs, foundations, and needs of both the student and the teacher providing pedagogical support play a crucial role in achieving the desired educational and professional results [24-26].

When discussing the features of the settlement of a programme for the implementation of pedagogical support, it is advisable to consider its logical structure, in particular, the one proposed by V.I. Volchkova et al. [27]. Their study divides such a structure into stages, at each of which the necessary elements are formed. These principles allow not only organising the process of pedagogical support but also increasing its effectiveness by following the individual tasks of the student in their educational and professional activities. Therefore, considering the structure of pedagogical support, at the initial stage, it is necessary to determine the educational goal, which is a priority for the subject of educational activity, while it should combine both educational knowledge and professional skills, which indicates the need to implement this process on an individual basis.

Moreover, during the implementation of pedagogical support, special attention should be paid to proper and timely introspection or reflection, which should be based on the student's awareness and understanding of their own needs and interests in accordance with external requirements, in particular, those determined by future professional areas. An equally important stage, according to the author, is the joint selection by the student and the teacher of the approaches and means necessary for the set goals and objectives. A prerequisite, in this case, is the nature of reciprocity of such actions, due to the importance of establishing the needs of both the student and the teacher, which should be conducted following their individual characteristics. Therewith, special attention should be paid to the fact that the study determined that pedagogical support should include the provision of assistance by teachers to the student, in this context, it should be interpreted as the successful area of the latter to conduct practical activities by performing probable professional tasks.

Consequently, it was established that pedagogical support is a promising way of developing and improving the professional competence that students receive during training at a technical college. The results of the study identified all aspects on which this process is based, which allowed examining its features. According to them, it is possible to propose such a classification of conditions based on which the selection of an individual trajectory or curriculum, being the object of pedagogical support of the student, takes place. Firstly, those should include the level of proper understanding and full awareness by both the

student and the teacher of the essence of this type of support and its goals [28-31]. Therewith, it was noted that an equally important element at this stage is the settlement of the importance of pedagogical support, in the context of one of the most effective means of self-fulfilment and professional development of a future specialist. It is also important that pedagogical support has common features with psychological, which is expressed in the teacher's assistance not only in the context of the student's educational activities but also in other problems that affect their psycho-emotional state. In particular, support can be provided in an informational context, when a student chooses an educational trajectory or a professional area.

It is crucial to pay attention to the fact that to a greater extent, pedagogical support consists of the activity of the teacher, while the student should also be actively involved in all the processes introduced in the support programme. This condition is certainly mandatory since to achieve an effective result, a proper interaction of two subjects is necessary. Accordingly, in the absence of such factors, pedagogical support is impossible. It is advisable to attract various means that contribute to the implementation of the above conditions to increase the effectiveness of the pedagogical support. Such approaches include specially designed and organised educational and extracurricular classes aimed at self-knowledge and teaching students based on selective and developmental approaches, which consist in the establishment of an individual trajectory. Consequently, a student, in cooperation with a teacher, can determine a priority area of their development, for example, comprehension and proper understanding of the further professional path after completing education; development and improvement of results in a specific area of both educational and professional activities; obtaining successful and effective professional competence, according to the chosen speciality.

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Conclusions

Because of the study, several important results were obtained, which allowed proper resolution of the issue posed. Notably, the study considered not only the theoretical foundations of the implementation of pedagogical support but also the opinions of other researchers on it and developed new recommendations. Therefore, it should be established that pedagogical support is a full-fledged mechanism of interrelated activities aimed at providing the educational process and the successful development of the student through a special individual training programme. Admittedly, the study identified the features and properties that characterise this process. Special attention was paid to a rather important aspect, namely the structure of pedagogical support, and the factors and conditions necessary for its successful implementation.

The process of building an individual educational trajectory should be given due attention as well since it has a number of specific features. Despite this, it was properly disclosed in the context of pedagogical support for students engaged in vocational training at a technical college. Since the issue posed is to be considered in a priority manner, it is advisable to deepen the knowledge gained in subsequent studies by analysing the features of the use of IET sensors during the training of technical college students.

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Conflict of Interest

None.

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Педагогічна підтримка студентів технічного коледжу під час професійної підготовки

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Анотація

Актуальність. Підготовка майбутніх фахівців, особливо в технічних галузях, є надзвичайно актуальною на сьогоднішній день. Цей пріоритетний напрям педагогічних досліджень передбачає аналіз сучасних методів та ефективних підходів до підтримки майбутніх фахівців. Актуальність посилюється соціально-політичними змінами та інформатизацією освітнього середовища.

Мета. Метою дослідження є вивчення особливостей педагогічної підтримки під час освітньо-професійної підготовки студентів у технічному коледжі.

Методологія. У дослідженні використано різноманітний науково-методологічний інструментарій, зокрема функціональний та діалектичний підходи, а також методи аналізу, синтезу, порівняння та узагальнення.

Результати. У дослідженні розглянуто поняття педагогічної підтримки, деталізовано його теоретичні характеристики та практичне застосування. На основі аналізу Костанайського політехнічного вищого коледжу визначено ключові методи, такі як персоналізовані навчальні траєкторії, інтеграція технологій та безперервне оцінювання. Ці методи спрямовані на задоволення конкретних потреб студентів, підвищення їхньої професійної компетентності та готовності до трудової діяльності.

Висновки. Дослідження підтверджує ефективність педагогічної підтримки в технічних коледжах, показуючи, що добре впроваджена підтримка значно підвищує якість професійної підготовки. Результати дослідження дають підстави для розробки програм, спрямованих на покращення освітніх результатів за допомогою індивідуалізованих стратегій навчання та використання технологій. Складність теми свідчить про необхідність подальших досліджень, особливо в галузі оптимізації індивідуальних освітніх траєкторій для подальшого вдосконалення процесів і результатів навчання в технічній освіті.

Ключові слова: професійне становлення; індивідуальна траєкторія; освітній процес; розвиток.