Professional competencies of students: formation of the entrepreneurial component

Competencias profesionales de los estudiantes: formación del componente emprendedor

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ABSTRACT:
The article justifies the formation process of the entrepreneurial component of professional competence of pedagogical university students. The problem’s state in the scientific literature has been analyzed. The discipline “Entrepreneurial Pedagogy” has been created and evaluated in practice, its specifics and effectiveness in the formation of the pedagogical component have been determined. Research results are recommended for practical use in higher education institutions. The methods of forming the entrepreneurial component are recommended for the development of curricula, academic programs, catalogues of elective disciplines, teaching practicum programs.

Keywords: formation, entrepreneurial component, professional competence, student, pedagogical university.

RESUMEN:
El artículo justifica el proceso de formación del componente empresarial de la competencia profesional de estudiantes universitarios pedagógicos. El estado del problema en la literatura científica ha sido analizado. La disciplina "Pedagogía Emprendedora" se ha creado y evaluado en la práctica, se han determinado sus aspectos específicos y su eficacia en la formación del componente pedagógico. Los resultados de la investigación se recomiendan para uso práctico en instituciones de educación superior. Los métodos de formación del componente empresarial se recomiendan para el desarrollo de planes de estudio, programas académicos, catálogos de disciplinas electivas, programas de práctica docente.

Palabras clave: formación, componente empresarial, competencia profesional, estudiante, universidad pedagógica

1. Introduction
When training personnel for educational institutions, the main efforts are directed not only at future teachers’ (masters’) gaining a certain amount of knowledge and skills required for training and education of the younger generation but also at the development of a free, responsible individual that possesses general culture, worldview, is able to quickly adapt to changing conditions, make responsible decisions and ensure self-development processes. The readiness of
pedagogical university graduate for professional labor activity is determined by the professional competence level.

The goal of the competency-based approach is to ensure the new quality of education, and its introduction into the national education system will make it possible to considerably implement personality-oriented, activity and practice-oriented approaches in educational processes. The separation of competencies in the content of subjects will identify orientations in the selection of the knowledge and skills, which are most important for the development of value orientations and will be in demand in student life. As shown by the analysis of the sources, the diversity of approaches to professional competence has been developed in pedagogical science, which can be systematized within the systematic (Gorenkov 2012; Baymukanova et al. 2013), pragmatic (Budnik 2013; Earl Simendinger et al. 2017), personality-oriented (Masoumi et al. 2019), context-driven (Nurgazina and Sakenov et al., 2016) and competency-based (Berkimbaev and Kerimbaeva, 2012; Arsamerzaev, Sakenov et al., 2014) approaches.

Professional competence is determined as the outcome of professional pedagogical education, which consists of achieving the necessary level of training (formation of general professional, special, technological, communicative, reflexive elements) characterized by professional self-comprehension, holistic vision of professional pedagogical activity, availability of needs and abilities system for self-determination and creative self-realization in professional situations. The analysis of studies dedicated to the teacher’s professional competence shows that they are aimed at developing the fundamentals for the formation of the pedagogical direction (Berkimbaev and Kerimbaeva, 2012; Zholdasbekov, Sakenov et al., 2018); developing the professional and personal qualities (Henner, 2004; Johnston et al., 2009; Vahedi et al., 2009); determining the essence of educational creativity sources (Mirza 2013; Rakhimbekova, Sakenov et al., 2015); psychological-pedagogical foundations of the teacher’s activity (Sakenov et al., 2012).

Despite the significant number of works dedicated to the problem of building the professional competence, the analysis of studies and practice show that the problem of building the student’s professional competence and its entrepreneurial component is still insufficiently explored:

- professional competence structure has not been determined;
- formation levels and criteria for the entrepreneurial component of professional competence have not been sufficiently developed;
- tools for the formation of the entrepreneurial component of professional competence have not been developed.

It follows from the analysis that there is a contradiction between the need of the higher school to improve the process of building the student’s professional competence and the insufficiently developed content of professional competence and its constituent formation levels and expression criteria. The established contradiction makes it possible to identify the research problem: what are the tools for forming the entrepreneurial component of professional competence that ensure that graduates are competitive in the labor market in the future? Based on this problem, the research goal is stated: to theoretically substantiate and experimentally verify the effectiveness of the means of forming the entrepreneurial component of professional competence of pedagogical university students.

The research hypothesis assumes that forming the entrepreneurial component of professional competence of pedagogical university students will be successful, if:

- it will be considered as the outcome of pedagogical education, consisting in achieving the required training level (formation level of general professional, special, technological, communicative, reflexive elements), which is characterized by professional self-awareness, a holistic vision of pedagogical activity, the presence of needs and abilities system for self-determination and creative self-realization in professional situations;
- the developed discipline “Entrepreneurial Pedagogy” will become a tool for forming the entrepreneurial component and will ensure a qualitatively new level and content of tasks that are planned to be solved by the subjects of the educational process;
- the selected set of diagnostic methods aimed to identify the formation levels of elements of the entrepreneurial component will become an evaluation tool.

2. Methods

The following research methods included a theoretical analysis of the literature on the research problem of forming the entrepreneurial component of professional competence of pedagogical
university students. This method was selected as a way to accumulate and systematize scientific materials that characterize the research process, its understanding, as well as to choose the research direction, set goals, develop research methodology and methods. The method of establishing the research theoretical foundations was chosen as a way to systematize the problem of forming the entrepreneurial component. Empirical methods were chosen as a way to form and justify the discipline “Entrepreneurial Pedagogy” as a tool for forming the entrepreneurial component and ensuring a qualitatively new level of it through summative and formative pedagogical assessment of formation process of the entrepreneurial component. The empirical methods include the survey method, participant observation, simulation, methods of experimental result and mathematical statistics as additional tools. The methods of qualitative and quantitative analysis of obtained data were chosen as a way to systematize and summarize the obtained research results of the formation process of the entrepreneurial component, to discuss the research results, develop findings and conclusions and determine prospects for further research of the problem. The research was conducted at the Pavlodar State Pedagogical University. A total of 83 students of specialties Pedagogy and Pedagogy and Self-Knowledge took part in the study. In the research process, the research materials were summarized and corrected; the main scientifically justified recommendations were stated and introduced in the practical application of the pedagogical institute.

3. Results

In order to develop the problem of forming the entrepreneurial component of professional competence of pedagogical university students, it was required to clarify and specify this concept. We considered various approaches to the details of the concept “professional competence” (systematic (Gorenkov, 2012; Baymukanova et al., 2013), activity (Budnik, 2013; Simendinger et al., 2017), personality-oriented (Masoumi et al., 2019), context-driven (Nurgazina and Sakenov et al., 2016), competency-based (Berkimbaev and Kerimbaeva 2012; Arsamerzaev, Sakenov et al. 2014). In our research, we proceeded from the understanding of professional competence as a systematic attribute. Our perspective is close to the approaches of Berkimbaev and Kerimbaeva (2012), Ali Aldhaheri (2017), Henner (2004). By professional we understand the outcome of pedagogical education that consists of achieving the required training level characterized by professional self-knowledge, a holistic vision of pedagogical activity, the presence of needs and abilities system for self-determination and creative realization in professional situations. However, we believe that this definition does not emphasize what the outcome of pedagogical education is. Therefore, we clarify that it concerns the training level (formation level of general entrepreneurial, special knowledge and skills, technological, communicative, reflexive skills and abilities).

Analysis of the available theoretical and practical experience of forming professional competence based on the designated approaches allowed us to identify the deficiencies in the solution of this problem, among which are the following: the failure to use possibilities of personality-oriented education to the fullest in building the professional competence; the insufficient development of pedagogical mechanisms for implementation of this process; the lack of training packages for disciplines, etc.

When analyzing the studies in the field of entrepreneurial pedagogy (Antonicic 2009; Byers et al. 1997; Davey et al., 2011; Faiz and Safai, 2009; Ismail, et al. 2015), we determined the essence, content and specifics of entrepreneurial activity of future teachers. Based on this, we defined the structure of the entrepreneurial component. We established that it can be considered as the unity of five elements: general entrepreneurial, special, technological (activity), communicative and reflexive.

General entrepreneurial element – possession of basic invariant entrepreneurial knowledge and skills that determine the success of solving a wide range of teaching and educational tasks in various education systems; compliance with certain pedagogical requirements regardless of the future teacher’s specialization; possession of personal entrepreneurial qualities required for successful pedagogical activity. This component development level is determined by completeness, depth, systematic knowledge in the field of pedagogical communication.

Special element – possession of profession-specific knowledge and skills.

Technological element – possession of pedagogical skills, which are understood as the main way of performing pedagogical actions ensured by the body of acquired knowledge in the field of the pedagogical activity, initiative, creativity.

Communicative element – establishing the right relationship with learners, which would contribute to the most effective solution of training and education problems; showing respectful attitude,
interest in the values that make up the contents of student’s perspective, no matter how simple and uninteresting it may seem; possession of professional communication with colleagues.

Reflexive element – the regulator of teachers’ personal achievements, professional growth driver, enhancement of pedagogical skills.

We identified the criteria having the same name as the entrepreneurial component elements (general entrepreneurial, technological, special, communicative, reflexive), indicators and on this basis – the formation levels of entrepreneurial component: creative (imaginative), heuristic (active), normative (adaptive), intuitive (reproductive).

The discipline “Entrepreneurial Pedagogy” was developed.

In order to achieve our research goals, it was necessary to solve the following problems during experimental research work:

1. To determine the initial formation level of the entrepreneurial component.
2. To test the effective use of the discipline in forming the entrepreneurial component.

The initial level of an entrepreneurial component was determined for the second-year students of the specialties of Pedagogy (P) and Pedagogy and Self-Knowledge (SK) based on the questionnaire survey conducted after practical training, self-assessment of the formation level and exam results (Table 1).

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Number of students</th>
<th>Levels (in % to the total number)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Creative</td>
</tr>
<tr>
<td>P</td>
<td>41</td>
<td>6.6</td>
</tr>
<tr>
<td>SK</td>
<td>42</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: Authors

Due to this, the following objectives were set based on the discipline “Entrepreneurial Pedagogy“:

1) to promote students' interest in entrepreneurial knowledge and skills;
2) to expand students’ ideas of opportunities and need for the application of entrepreneurial knowledge in their future professional activity;
3) to bring to the forefront professionally and pedagogically important motives of achieving the value system in professional activity;
4) to develop reflexive abilities, self-analysis skills.

In order to solve them, formative assessment was carried out in three stages – value-based, organizational-technological and control-reflexive.

When studying the discipline “Entrepreneurial Pedagogy”, the students of the control group worked in traditional conditions, students of the experimental group used the training package for the discipline (detailed learning and teaching materials: compendium, digital study aids, assignments, instructions, directions).

The tasks of the first stage were completed mainly at lectures. For students from the experimental group, we used problem lectures, visualization lectures, practiced lectures, before which the students from the experimental group received workbooks that they had to fill out directly during the lecture. In addition, lectures of advanced training were used, when the students, prior to studying the topic, were given a compendium for independent homework. This approach notably intensified the students' interest in entrepreneurial knowledge, in acquiring entrepreneurial skills of professional and pedagogical nature. This was also facilitated by panel discussions, the fulfilment of creative assignments, and filling out of auditive cards.

The results of the value-oriented stage in forming the entrepreneurial component of professional competence were associated with the following changes found in the diagnostic process: many students showed interest in entrepreneurial knowledge and skills. The students got a better idea about the meaning of pedagogical communication in professional activities, and about the
possibilities of applying entrepreneurial knowledge in their future professional activities, as well as about the basic discussion principles.

However, the motives of achievement and affiliation were not brought to the forefront for all students, which served as a guide in our future work. Along with the analysis of objectives set at the early stage, the diagnostics also showed other changes in the initial state of the entrepreneurial component of professional competence in the experimental group. The changes affected the special and entrepreneurial elements: students got a strong and fairly rapid initial mastery of entrepreneurial knowledge, categories related to their future teaching activities. Their attitude towards the teacher’s profession changed; in terms of the communicative element, students got familiar with the basic discussion principles, reasoned proof of their point of view. The reflexive element was manifested in the desire for personal growth and ability to assess themselves in communication situations, desire for self-expression.

The organizational and technological stage was implemented mainly in practical exercise. Practical exercises in the experimental group were held as tutorials, which included conversations, debates, discussions of reports, the performance of independent and creative works, solving the recreational problems, individual work and work in micro group.

To carry out the control-reflexive stage of experiment we selected a set of diagnostic methods to identify the level of formation of entrepreneurial professional competence (Table 2).

Comparison of data obtained before and after the experiment allows us to state positive changes in the development of all elements of the entrepreneurial component. Thus, the positive dynamics of general entrepreneurial and special elements in the experimental group are associated with the emergence of cognitive interest, a change in students’ attitude to studying the discipline and future professional activity. The use of problem lectures, visualization tools allowed the students to master complex professional skills more actively.

The dynamics in the development of the communicative element are associated with the mastering of communicative interaction culture. When doing the communicative exercises, solving the communicative problems, the students’ competence in communication was improved, allowing them to achieve a deeper mutual understanding and self-realization.

<table>
<thead>
<tr>
<th>Table 2</th>
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<tbody>
<tr>
<td>Diagnostic methods aimed to identify the formation level of the entrepreneurial component.</td>
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<tr>
<td><strong>Elements</strong></td>
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<tr>
<td>Special</td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>General entrepreneurial</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Entrepreneurial Pedagogy</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Knowledge of psychological and pedagogical conditions for the development of motivation and abilities in the learning process in entrepreneurial pedagogy, fundamentals of developmental learning, differentiation, individualization of training and education in entrepreneurial pedagogy</td>
</tr>
<tr>
<td>Knowledge of monitoring and quality assessment tools for entrepreneurial education, psychological and pedagogical foundations of assessment activity in entrepreneurial pedagogy</td>
</tr>
<tr>
<td>Knowledge of pedagogical possibilities and conditions for the application of principles, forms, methods and means of training and education in entrepreneurial pedagogy</td>
</tr>
</tbody>
</table>
| Technological
- Evaluation of pedagogical goal and objectives setting
- Determination of pedagogical possibilities of using various methods, techniques, methodology, forms of training and education management in entrepreneurial pedagogy
- The non-standard solution of pedagogical objectives in entrepreneurial pedagogy
- Conducting pedagogical observations and diagnostics, interpreting the received materials in entrepreneurial pedagogy | Monitoring the students during tutorials, the outcomes of introductory teaching practicum
Monitoring the students during the tutorial, analysis of individual development diaries
Shadow working during the tutorial, the analysis of individual development diaries, participation in entrepreneurial creativity competitions
Analysis of students’ works during the tutorial, analysis of teaching practicum diaries-reports |
| Communicative
- Proficiency in professional communication with colleagues (students) in entrepreneurial pedagogy
- Demonstration of communication skills in collaboration and collective educational activities
- Proficiency in dialogue communication, discussion, ability to argue and defend the personal point of views in entrepreneurial pedagogy
- Ability to find and analyze information necessary for solving professional problems | Test "Assessment of communicative skills", assessment of self-control in communication (M. Snyder test)
Monitoring the students during tutorials, test "Competence study in communication (V.F. Ryakhovsky test)
Monitoring the students during tutorials, consultations, teaching practicum, public defense of creative works
Analysis of individual development diaries, students’ activities in the... |
pedagogical problems, increasing the efficiency of the pedagogical activity, professional self-education and self-development in entrepreneurial pedagogy

| Reflexive | reflection of the achieved level of a person's development as a professional | diagnosis of interest in mastering professional skills, individual professional direction assessment method, questionnaire "Self-analysis of competence level"

reflection of self-assessment of educational activities in the process of studying the entrepreneurial pedagogy | self-certification sheet, filling in the job profile diagram

Source: Authors

The positive dynamics of the technological element are associated with the students’ gaining the ability to integrate knowledge in various disciplines into a single system. The acquired skills allow them to manage without a teacher’s assistance in finding the means and ways to complete complex and creative assignments. The mastery of educational work culture makes a student susceptible to new types and methods of action in changed conditions, ready to work with digital technologies.

Development of the reflexive element is due to the fact that in the process of special regime of pedagogical interaction (creating a situation of success and achievement, applying facilitative communication techniques, electronic manuals, etc.), using special tasks and assignments for overcoming the barriers and difficulties in studying the topics and for reflection, as well as keeping self-observation diaries, students mastered the autopsychological competence, methods of sanogenic thinking.

Following the diagnostic methods, we obtained the following results upon completion of the course "Entrepreneurial Pedagogy" (Table 3).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Indicators</th>
<th>Specialties</th>
<th>Levels (in % to the total number)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>creative</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EG</td>
</tr>
<tr>
<td>General entrepreneurial</td>
<td>Review work #1</td>
<td>P</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SK</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td>Review work #2</td>
<td>P</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SK</td>
<td>25.4</td>
</tr>
<tr>
<td></td>
<td>Final work</td>
<td>P</td>
<td>29.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SK</td>
<td>27.4</td>
</tr>
<tr>
<td>Special</td>
<td>Review work #3</td>
<td>P</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SK</td>
<td>21.6</td>
</tr>
<tr>
<td></td>
<td>Final work</td>
<td>P</td>
<td>20.7</td>
</tr>
<tr>
<td>Specialty</td>
<td>Number of persons</td>
<td>Levels (in % to the total number in group)</td>
<td></td>
</tr>
<tr>
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<tr>
<td></td>
<td>EG</td>
<td>CG</td>
<td>creative</td>
</tr>
<tr>
<td>P</td>
<td>20</td>
<td>21</td>
<td>25.1</td>
</tr>
<tr>
<td>SK</td>
<td>21</td>
<td>21</td>
<td>25.4</td>
</tr>
</tbody>
</table>

Source: Authors

Based on the students’ analytical individual development maps and data given in Table 3, the following indicators of the formation levels of the entrepreneurial component were determined (Table 4).

Table 4
Formation level of the entrepreneurial component

The diagnostics results at summative and formative stages of the research showed positive dynamics of changes in the formation levels of an entrepreneurial component (Tables 1 and 4). Reliability of the obtained results was proved using the analysis of variance. The effective use of the training package when forming the entrepreneurial component was proved using Fisher’s statistical criterion. It showed that the percentage of people who achieved a positive dynamic of the formation levels of the entrepreneurial component elements in the experimental group was higher than that of the control group, which confirms the predominance of positive changes over the negative ones.

Using the training package developed by us made it possible to solve the experimental and research work problems and achieve significant changes in the formation level trends of the
entrepreneurial component of professional competence of pedagogical university students.

4. Discussion

The novelty and originality of our work are related to the fact that unlike Berkimbaev and Kerimbaeva (2012), Henner (2004), Johnston et al. (2009) and Ismail et al. (2015), we specified the essence and supplemented the content of the concept “Professional competence of pedagogical university students” by clarifying the concept of training level as the formation of general entrepreneurial special knowledge and skills, technological, communicative, reflexive abilities and skills. During the research, we developed the structure of the entrepreneurial component of professional competence. We determined that it can be viewed as the unity of five elements: general entrepreneurial, special, technological, communicative and reflexive.

The criteria and indicators were identified having the same name as the entrepreneurial component elements (general entrepreneurial, technological, special, communicative, reflexive). Based on them the formation levels of the entrepreneurial component were developed: creative (imaginative), heuristic (active), normative (adaptive), intuitive (reproductive).

Unlike Rakhimbekova, Sakenov et al. (2015), Davey et al. (2011), Vahedi et al. (2009), our results make a certain contribution to the theory of higher professional education by expanding the problem field of modern theory and practice of building the future specialist's professional competence. The training package of the discipline “Entrepreneurial Pedagogy” developed by us provides opportunities to optimize and intensify its methodological system depending on the progressive and subject direction of an academic discipline. The structure of the training package can be adapted and authorized taking into account the specifics and particular conditions in various educational institutions.

5. Conclusion

Thus, it has been established that professional competence of pedagogical university students is understood as the outcome of pedagogical education, which consists in achieving the necessary training levels, such as formation of general entrepreneurial and special knowledge and skills, technological, communicative, reflexive skills and abilities, and is characterized by professional self-awareness, holistic vision of pedagogical activity, presence of needs and abilities system for self-determination and creative self-realization in professional situations.

The structure of the entrepreneurial component, which contains general entrepreneurial, special, technological, communicative and reflexive elements, was defined. Its criteria of formation levels were developed. Four formation levels of this component were determined and justified: creative (imaginative), heuristic (active), normative (adaptive), intuitive (reproductive). The signs of formation levels of entrepreneurial component elements were stated when studying the discipline of “Entrepreneurial Pedagogy”, a diagnostics set was defined.

The training package for the discipline was developed and evaluated. It consists of detailed educational materials: compendium, digital study aids, tasks, instructions, directions. It was proved that the training package ensures deep personal acquisition of knowledge, skills, and ways of actions by students, thus forming a steady positive motivation for future professional activities; completeness and integrity of didactic cycle (study of new material, its consolidation in learning activities; control and self-control over mastering the conceptual and methodic content of discipline); possibility of independent and variable use of the training package by a student (selection of an individual learning trajectory, free creative self-expression of students, unlimited by subject and time budget); students’ cognitive activity management, possibility of going beyond the subject area of a particular discipline; coordination and optimization of traditional and innovative elements in a common educational process.

During experimental work, it was established that the training package for the discipline is an effective means of forming the entrepreneurial component, which enables the students to deeply and personally absorb knowledge, skills, abilities and ways of action that form a steady positive motivation for future professional activity. Quantitative processing of the experimental results allowed us to establish higher positive dynamics in the formation of the entrepreneurial component using the training package of the discipline in the experimental group rather than in the control one.

This study does not exhaust all aspects of the problem of forming the entrepreneurial component of professional competence of pedagogical university students. In perspective, this problem can be considered using methods of other disciplines. In addition, it may be integrated with the study of
technology for forming the entrepreneurial component, as well as the study of psychological and pedagogical support of its formation.

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