Assessment of specialists’ effectiveness within Competency-Improvement Approach (Based on quality criteria)

Evaluación de la efectividad de los especialistas dentro del Enfoque de Mejora de la Competencia (Basado en criterios de calidad)

ABSTRACT:
Introduction. The current social and economic changes taking place in the Russian Federation have shown a considerable shortage of specialists who are able to be effective and competitive in the free-market world. The problem may be solved through modernizing the system of professional education due to continuous learning in the economic field. Research Methodology. Within the research, the author developed a competence-improvement teaching complex as a practical aid for permanent economic education, which is being implemented in modern universities. The complex considers the educational level and the focus of the chosen programme, which supports a person in his/her economic activity fulfilled in the professional context. Research results. When mastering economic skills of future specialists, it is desirable to resort to both conventional and innovative teaching means, methods and technologies. This approach should allow consolidating pedagogical theory with the applied achievements of continuous education in the economy.

RESUMEN:
Introducción. Los cambios sociales y económicos actuales que tienen lugar en la Federación de Rusia han mostrado una escasez considerable de especialistas capaces de ser eficaces y competitivos en el mundo del libre mercado. El problema puede resolverse mediante la modernización del sistema de educación profesional debido al aprendizaje continuo en el campo económico. Metodología de investigación. Dentro de la investigación, el autor desarrolló un complejo docente de mejora de competencias como una ayuda práctica para la educación económica permanente, que se está implementando en las universidades modernas. El complejo considera el nivel educativo y el enfoque del programa elegido, que apoya a una persona en su actividad económica en el contexto profesional. Resultados de la investigación. Al dominar las habilidades económicas de los futuros especialistas, es conveniente recurrir a medios, métodos y tecnologías de enseñanza tanto convencionales como innovadores. Este enfoque debería permitir consolidar la teoría pedagógica con...
1. Introduction

A developing society needs fully educated, entrepreneurial people, who can take independent decisions in the situation of choice, who are able to collaborate, who are flexible, dynamic, constructive, responsible for the country’s prospects and its future thriving [Mikheeva, 2016; Bourina & Dunaeva, 2017; Tatarinceva, Sergeeva et al., 2018; Wang et al., 2018].

An integral part of modern education is its economic component, which includes economic knowledge and skills of economic thinking. Both are formed in the course of a whole life and enable an individual to react to the surrounding world adequately, facilitate their active social position and help form a proper assessment of economic circumstances and find their own place in them [Sergeeva & Nikitina, 2016; Milovanov et al., 2017; Sergeyeva, Ippolitova et al., 2018; Sergeeva, Sokolova et al., 2018].

The effectiveness of economic competences on different educational levels is determined by a range of factors, which were taken into account in creating the model of economic competences development on different educational levels as well as the concept of continuous economic education, both serving as a normative and organizational concept for the experimental work:

for students of higher professional education at the Tver branch of St. Petersburg State Engineering-Economic University;

for students of secondary professional education at Tver Chemical-Engineering College;

for students of primary professional education at a vocational school.

2. Methodology

The experiment in each educational establishment was carried out in three stages.

The first stage was motivational and value-based. Its content included: to elaborate the content of experimental work in students’ economic competences development by means of the scientific methodological and pedagogical support; to determine factors and conditions influencing the effectiveness of this process; to describe the criteria and indexes of students’ economic competences; to test the diagnostic materials (questionnaires, tests, diagrams, scales of assessment and self-assessment, etc.); to work out a purpose-built comprehensive program of scientific methodological and pedagogical support in economic competences development in the process of professional education; to arrange theoretical and practical instructive methodological seminars for supervisors and teachers. This stage mostly focused on developing students’ key economic competences [Ju et al., 2017; Mukhin et al., 2017; Sergeeva, Komarovskaya et al., 2018].

The second stage was cognitive-pragmatic. This stage suggested the following work: the
purpose-built comprehensive program of forming economic competences was implemented; its scientific methodological and pedagogical support was realized; students’ economic skills development was monitored; the research methods were tweaked; the intermediary results were summarized at teachers councils and scientific methodological sessions; the reasons which caused deviations from the prospected results were studied, and necessary action was taken to adjust the system of educational activities in accordance with the experimental model. This stage placed the focus on accomplishing students’ key economic competences and developing professional economic competences [Mukhin, Mishatkina & Sokolova, 2017; Sergeyeva, Flyagina et al., 2017; Samokhin et al., 2018].

The third stage was reflective-modifying. The work content at this stage included: the efficiency appraisal of the realized theoretical model, concept and purpose-built comprehensive program; the study and effectiveness analysis of economic competences in the focus and experimental groups; correcting the content, forms, methods and means of the scientific methodological and pedagogical support in forming economic competences; implementation of some elements of the tested model and concept in the educational process of other educational institutions; forecasting the possibility of transmitting the research results to other educational establishments; giving speeches at scientific conferences; holding workshop sessions for the teaching staff of universities, institutes, colleges and vocational schools; receiving experts evaluation of the scientific and methodological value of the experiment results; preparation of scientific publications and monographs describing the results of the experimental work. This stage completed the formation of key and professional economic competences and gave rise to the development of additional economic competences [Sukhodimtseva et al., 2018; Tatarinceva, Sokolova, Mrachenko et al., 2018].

We established three levels in the process of economic competences development: low, average and high. Each level corresponds to the degree of economic competence development, which is a part of students’ personal development.

The level of students’ economic competences development was measured in accordance with three criteria: cognitive criterion, personal motivational criterion and creative activity criterion. Three criteria were assigned in order to assess the experiment results, each supplied with a characteristic of parameters for each criterion and level as well as taking into account key, professional and additional economic competences at different stages, which allowed for a comparing analysis of students’ economic competences in experiment and focus groups.

Following A.K Markova and V.P. Sergeeva, we define a system of criteria as an ideal model to which a real phenomenon is compared, and the level of their similarity is ascertained [Neverkovich et al., 2018; Sergeeva, Bedenko et al., 2018]. The criteria under consideration can be considered as objective ones, since with their help, it is possible to estimate the level of correspondence of a professional institution’s graduate to the real economic requirements.

3. Results

The total value of the economic competences development level was calculated with the help of our own methodic and rated from 0 to 10.

In order to conduct a diagnostic survey among students in experimental and focus groups, a questionnaire was made, which consisted of 100 content open-ended, closed-ended and semi-open questions (see table 1).

Table 1
The diagnostic survey respondents
(the beginning of the motivational and value-based experiment stage)

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>565</td>
<td>206</td>
<td>359</td>
</tr>
</tbody>
</table>
The generalized survey results showed that the level of economic competences development (within the motivational and value-based criterion) slightly varies in the focus groups. Girls showed higher figures than boys, with 6.8 points in female groups and 6.7 points in male groups. The common level of all the respondents (565 people) made up 6.75 points, which is average.

Oral and written students’ answers, watching the educational process, talks to students and teachers led to the conclusion about the insufficient level of graduates’ economic competences development. The results received in the course of the motivational and value-based experiment stage laid a basis of the cognitive-pragmatic stage.

At the initial (preparatory) phase of the cognitive-pragmatic stage, the activity of temporary creative groups was organized as well as of scientific theoretical and practical seminars, scientific methodological councils, teaching staff meetings in order to create a positive attitude of the teaching staff and social partners to the experiment, to increase the economic and scientific methodological competence of heads of departments and teachers in the educational institutions. The most important part of the experiment at this stage was arranging scientific methodological work of subject commissions on economization of educational activity.

We worked out a methodic to determine the real level of economic knowledge and skills in the course of education process. Strategic invariant goals were also assigned for each stage of students’ economic competences development (see table 2).

<table>
<thead>
<tr>
<th>Stages of students’ economic competences development</th>
<th>Strategic goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational and value-based (1st-2nd years)</td>
<td>Digesting basic theoretical knowledge and skills, which constitute the cognitive ground of students’ economic competences</td>
</tr>
<tr>
<td>Cognitive-pragmatic (2nd-3d years)</td>
<td>Acquiring general methods of economic activity as an instrumental basis of students’ economic competences</td>
</tr>
<tr>
<td>Reflective-modifying (3d-4th years)</td>
<td>Supervised self-education on the basis of the acquired basic knowledge and skills</td>
</tr>
<tr>
<td>Evaluative (4th year, immediately before graduation)</td>
<td>Diagnostics and evaluation of the real level of economic knowledge and skills</td>
</tr>
</tbody>
</table>

The main phase of the cognitive-pragmatic and reflective-modifying stages of the experiment appeared to be the most difficult step of our work as it was necessary to bring together all the elements of the theoretical and diagnostic analyses so that they formed an integrated and consistent system and to implement the theoretical model of graduates’ economic competences development.

Having studied works by I.D. Zverev, we found out that economization of the teaching work content within teaching disciplines can be multi-subject, single-subject and mixed.
The mixed model appeared to be the most appropriate for the purpose of our research. It allowed determining subject integration lines for different specializations, thus introducing strategic economic goals in the content of profession-oriented education work. In the course of the cognitive-pragmatic stage, a new simulative teaching method was introduced in the form of the tutorial “Simulative Company” [Dmitrichenkova & Dolzhich, 2017; Micheeva, Popova & Ignashina, 2017; Sergeeva, Sinelnikov & Sukhodimtseva, 2017]. This stage was characterized by choosing simulative teaching methods and pedagogical conditions appropriate for their usage in the education process on each education level, as well as by determining the content and technologies of the method “Simulative Company”.

The diagnostics of the students’ economic competences in the education process of professional education institutions was conducted in different stages: prevenient stage (initial diagnostics), initial stage (current pedagogical control), principal stage (mid-term pedagogical control), final stage (final control).

- **Initial diagnostics.** This stage suggested detecting the level of students’ economic knowledge. The survey was conducted with the help of questionnaires and psychological tests among first-year students. The survey was aimed at finding out: the degree of understanding economic categories; the attitude to regional and global economic issues; the degree and motivation for economic activity; having economic values and interests; social and psychological personal features.

- **Current pedagogical control.** At each stage the commission conducted control of the economic knowledge and skills quality in accordance with education programs. The gathered data gave ground to planning further work in the groups and individually, which provided efficiency in developing economic competences. A great deal of attention was paid to working out tasks for students’ individual learning and scientific research work.

- **Mid-term control.** The diagnostics of the level of students’ economic competences development (low, average, high) was conducted in accordance with the education stages in the educational institution. A more detailed study of students’ economic priorities and their attitude to economic activity was conducted as well as of difficulties in the process of preparing economic specialists.

- **Final control.** A diagnostic survey was conducted among undergraduate students, internship supervisors, representatives of basic enterprises and teachers. At this stage, undergraduates digest core professional and economic positions and goals. They solve not only learning tasks, but also purely professional ones in the course of practical training. Comparing the results of the initial and final stages we testified a dynamics of students’ economic competences development during the whole educational process and decided what changes it was necessary to introduce in the economic education program. The received data allowed judging about the effectiveness and efficiency of the theoretical model and concept of scientific methodological and pedagogical support in specialists’ economic competences development and the experiment as a whole. The results of the diagnostic research served a basis for making recommendations to enhance profession-oriented learning activity and students’ economic development.

4. Discussion

For each stage and level of the educational institution and, at some stages, for each group of exercises, specific evaluative criteria were used depending on the subject specifics, professional specialization and the academic course.

The first group of exercises comprised tests which helped to evaluate the level of students’ theoretical economic knowledge. As the main tool of economic competences diagnostics was case-measures. Working on them, we relied on I.P. Pastuhova’s methodic [Sergeeva & Nikitina, 2016; Tatarinceva, Sokolova, Sergeeva et. al., 2018]. Case-measures are a unity of case models comprising problematic tasks and offering a student to think over a real economic situation whose description does not only reflect a life, manufacturing or social problem, but also actualizes a certain complex of economic and professional knowledge, necessary for solving this problem.

With the purpose to determine the level of students’ economic competences, besides the estimate and analysis of the cognitive constituent (the level of knowledge and skills), there was an attempt to diagnose emotionally-valued economic relations (i.e. personal motivational constituent) and students’ economic behavior and actions in different economic situations (creative activity constituent). All these constituents reflect correspondingly...
cognitive, affective and active personality spheres. Each of the criteria was measured in quantitative indexes on the 10-score scale. The criteria under the measurement took into consideration the results of students’ academic performance (the quality of knowledge) in learning modules.

In order to bring each student’s score together we used a pivot table of estimating the parameters development for each criterion: cognitive, personal motivational and creative activity criteria (see table 3).

### Table 3
Cognitive criterion of students’ economic competences (C)

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Diagnostic and estimation methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>knowing economic terms and notions, a competence to explain their meaning</td>
<td>Testing</td>
</tr>
<tr>
<td>C2</td>
<td>showing interest in modern economic issues</td>
<td>Testing</td>
</tr>
<tr>
<td>C3</td>
<td>the expenses planning skill</td>
<td>Testing, Case-measures</td>
</tr>
<tr>
<td>C4</td>
<td>applying the knowledge to characterizing economic issues</td>
<td>Testing, Case-measures</td>
</tr>
<tr>
<td>C5</td>
<td>the competency to analyze properly and to infer cause-and-effect relationships between economic issues</td>
<td>Testing, Case-measures</td>
</tr>
<tr>
<td>C6</td>
<td>the ability to see the laws of market mechanisms functioning</td>
<td>Testing, Case-measures, Questionnaires</td>
</tr>
<tr>
<td>C7</td>
<td>the usage of economic knowledge for handling routine and non-routine tasks</td>
<td>Testing, Case-measures, Questionnaires, Expert estimate</td>
</tr>
</tbody>
</table>

### Table 4
Personal motivational criterion of students’ economic competences (M)

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Diagnostic and estimation methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>following the economy regime in the educational institution and at home (frugality)</td>
<td>Testing, Questionnaires, Watching</td>
</tr>
<tr>
<td>M2</td>
<td>planning and regulating one’s own behavior in economic circumstances (self-sustainability)</td>
<td>Testing, Questionnaires</td>
</tr>
</tbody>
</table>
### Table 5
Creative activity criterion of students’ economic competences (A)

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Diagnostic and estimation methods</th>
</tr>
</thead>
</table>
| A1  | the competence to analyze economic situations and find ways to increase their efficiency | Testing  
Questionnaires  
Case-measures  
Expert estimate |
| A2  | the skill to transfer knowledge to the practical activity                 | Testing  
Case-measures                                                   |
| A3  | the need in external supervision in economic activity                    | Testing  
Questionnaires  
Watching                                                       |
| A4  | the sense of priorities for achieving the results in economic activity   | Testing  
Case-measures  
Expert estimate                                                  |
| A5  | showing independence in setting goals and choosing ways of achieving them| Testing  
Case-measures  
Expert estimate  
Results of learning and research activity                      |
A6

the skill to model the economic activity

Case-measures
Expert estimate
Results of learning and research activity

A7

preferring innovative and/or short-term projects

Case-measures
Expert estimate
Results of learning and research activity

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Table 6
Pivot table of estimating the economic competences indexes development

<table>
<thead>
<tr>
<th>№ No.</th>
<th>Student’s surname and name</th>
<th>Score</th>
<th>The level of development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each parameter required calculating the generalized index:

\[ C = C1 + C2 + ... C7; \quad M = M1 + M2 + ... M7; \quad A = A1 + A2 + ... A7. \]

We did not intend to fix changes in each of the parameters. We were interested in the general result of the students’ economic competences development. The integrated index (II) was calculated by the formula:

\[ II = \frac{C + M + A}{3} \]

The composite score of the general result varied from 0 to 10.

Taking into consideration the fact that the level of economic competences in most case appears to be average and less frequently high, we diagnosed irregular intervals in grouping the indexes within economic competences, following A.A Kyverialga’s method. In accordance with this method, a low level is characterized by 25 per cent estimate deviation from the average score. In this case, the score from the interval rated R(min) to 0,25 R(max) allows recording a low level of students’ economic competences level. The score higher than 75 per cent of all possible testifies a high level of the estimate. Following this method, the levels of economic competences were determined by the following intervals (see table 7). The level of students’ economic competences was established by comparing their composite score (table 7) with the scale.

This diagnostic method was used at each experiment stage in order to determine the level of students’ professional development.

Table 7
Level intervals of students’ economic competences

<table>
<thead>
<tr>
<th>No.</th>
<th>Intervals of the integrated score</th>
<th>Level of economic competence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The scores allowed determining the efficiency factor of the students’ economic competences development in the educational process. This factor was calculated by the formula:

\[ EF = \frac{\text{factual score}}{\text{maximum score}} \]

Having adapted V.P. Bespalko’s method, we determined the efficiency degree of students’ economic competences development in the educational process as follows (see table 8):

<table>
<thead>
<tr>
<th>Efficiency factor (EF)</th>
<th>Efficiency degree of students’ economic competences development</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,8 ≤ C ≤ 1,0</td>
<td>High</td>
</tr>
<tr>
<td>0,6 ≤ C &lt; 0,8</td>
<td>Average</td>
</tr>
<tr>
<td>less than 0,6</td>
<td>Low</td>
</tr>
</tbody>
</table>

Thus, in order to receive necessary empirical data, we used a system of common methods aimed at qualitative analysis of oral and written answers, tests, talks, watching, experts estimate, case-measures, statistic methods of results processing, particularly calculating the percentage and average figures.

5. Conclusions

Continuous economic education is a compulsory part of continuous professional education. Under the market economy conditions, it is focused on developing a competitive, economically competent specialist, whose economic competences are developed in the course of economic education and who is in demand in the labor market.

The purpose of the experiment which was implemented in educational institutions of higher, secondary and primary professional education was to gain stable positive dynamics of economic competences development among students who learn under the existing economic, regulatory, scientific, technical and manufacturing requirements within the purpose-oriented program, which has been built on the model of economic competences development and the concept of continuous economic development. In order to bring this to life, special criteria and parameters of students’ economic competences development were created; in focus groups, the initial level of graduates’ economic competences development was established; a purpose-built complex program was created in accordance with the theoretical model and concept, as a basis for scientific methodological and pedagogical support in developing students’ economic competences.

The elaborated level (low, average, high) criteria and indexes of students’ economic competences development allowed setting up the correspondence of a professional institution graduate to the modern economic requirements. The perspectives of further research are connected with viewing this problem in terms of adaptation and socialization of graduates in the quickly changing social and economic conditions.


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