THE EFFECT OF SELF-EDUCATION ON TEACHERS' COMPETITIVENESS

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Abstract

Lifelong learning skills and building competencies necessary for teachers' competitiveness are urgent issues. This work aimed to study the relationship between teachers' self-education and competitiveness. The research method used a questionnaire survey of teachers and principals of general secondary education institutions, as well as the method of comparison and mathematical methods. The results showed that there was a relationship between teachers' motivation factors for independent lifelong learning, directions and sources with the achieved results of self-education was established. According to the framework of competitive competencies, the teacher's qualities' dependence on motivation, directions, sources and results of self-education was also revealed. The results of this study can be helpful as they arrange knowledge and research methods of the self-education process, taking into account motivation, directions, sources, and outcomes. Therefore, teachers should engage in self-education throughout their professional life to improve their competitiveness. They should also constantly update their knowledge of the fields related to teaching. They must develop synchronously with the evolution of science and technology and have a creative approach to learning. Teachers should supplement their knowledge of subject teaching methods, psychology, and health care. Further research should focus on other factors influencing improving teachers' competitiveness.

Keywords: Competition, Cooperation, Digital Competence, Level of Teaching, Pedagogical Ethics, Reflection.

I. Introduction

The education system has undergone changes caused by time requirements and societal changes occurring with the development of science and technology. Educational institutions also face the problem of developing 21st century skills [1] and competencies necessary to be competitive in the labour market [2]. Quality education is gaining importance for society [3], being capable of developing lifelong learning skills. It can be provided by highly qualified teachers in competitive educational institutions [4]. The educational institution's competitiveness impacts the future employment of its graduates and their further career growth. The competitiveness of the educational institution is influenced by teachers' professional ethics and their ability to teach, educate, and develop students and pupils. Therefore, the professional characteristics of teachers become a decisive factor in providing educational services [5], and the quality of the organization of the educational process depends on their competitiveness. So, it is essential to provide conditions for the continuous development of teachers and improve their competitiveness [6]. Teachers' lifelong self-education is one of the ways to support the dynamics of pedagogical professionalism synchronously with the development of science and technology. It has different motivational factors, directions, sources, and results.

Despite the large number of studies on teachers' self-education, no works were found that describe the relationship between self-education and the competitiveness of

teachers. Therefore, the aim of this study was to establish the effect of motivation, directions, sources of self-education and the achieved results on teachers' competitiveness. The aim involved the following research objectives: i) Establish the factors that motivated teachers for self-education; ii) Identify teachers' self-education directions during the research period; iii) Find out the sources teachers used for self-education; iv) Determine teachers' results during the research period and determine the effect of self-education on them; v) Evaluate teachers' competitiveness and the effect of self-education on it; and vi) Compare teachers' competitiveness with the expectations of school principals.

II. Literature Review

Employment is the basis of human existence [7], while competitiveness is the key to remunerative employment and career growth. Many researchers studied the role of competition in the learning process. Yayla and Çevik [8] studied two types of competition: i) Competition with oneself for improvement and achieving better results and ii) Competition with someone else. The first type of competition can be helpful to contribute to self-improvement. The second type prevents fully realising the individual's potential and talent. It also worsens relationships and causes a negative emotional state and stress.

According to Wu and Zhang [9], the professional qualities of teachers working in an educational institution depend on the philosophy of educational activity, academic performance, and innovative potential of the learning model. According to Zhang [10] studies teachers' professional ethics, characteristics, purpose, manifestations, and development strategy. Sitorus et al. [11] developed a strategy for improving teacher's pedagogical competence as an element of competitiveness. Professional norms in the ratio of cooperation and competition of teachers were also studied. According to Panchenko et al. [12] emphasise the need to change the educational programmes for future teachers by new professional standards to increase teachers' purposefulness and competitiveness.

A teacher must have certain qualities to be competitive. Different researchers focused on different qualities of teachers. For example, Zhang [10] emphasises the importance of honesty, adherence to principles, cheerfulness, patience, pedantry, tolerance, kindness, courage, and perseverance. Klemke-Pitek [13] and Cattaneo et al. [14] indicated the need to have the following professional skills and abilities; use virtual and interactive whiteboards, electronic and digital textbooks, educational online multimedia games, file sharing programmes, create tests, games, quizzes, multimedia presentations, films and moving slides, applications for visual work, distance learning, 3D modelling, online surveys, and testing. Blömeke et al. [15] and Daminova [16] note the need for teachers to know the subject they teach, teaching methods, job duties, the fields closest to the subject, and knowledge of social life, politics, economy, law, and health care.

Besides, as Vlachopoulos and Makri [17] note, teachers must have pedagogical, cognitive, technological and, instrumental, communicative, social, and personal skills. According to Listiningrum et al. [18], they must have entrepreneurial competence, self-confidence, be result-oriented, be ready to take risks, lead, and show originality and potential. At the same time, as Noh and Karim [19] indicate, they must show people-centeredness, empathy, cooperation, optimism, innovation and experimentation, and attentiveness. Teachers must also have digital competence [20], and literate language [21]. They should be able to activate meaningful learning by students [1], manage the classroom successfully [3], and be able to evaluate the achieved results [11] objectively.

According to Zhang [10] states that the development of these and other qualities is influenced by teacher's self-education, self-reflection, self-improvement, self-training, self-regulation, and self-control. The world is constantly changing, and the knowledge acquired by a teacher while obtaining a diploma needs to be updated and relevant. That is why, as Daminova [16] emphasises, a teacher must constantly engage in self- education. According to Shynhof [22], the professional self-development of teachers takes place in stages according to individual trajectories. Roca-Campos et al. [23] proved that the quality of teaching affects students' academic performance. Therefore, the authors suggest improving

teachers' qualifications to improve the quality of education.

Sitorus et al. [11] and Lyimar et al. [24] emphasise the importance of planning teacher training in their work. It should be built considering the results of the analysis of teachers' needs and abilities. According to Mihai [25], self-education requires conceptualisation, organisation, implementation, and support. It has differences from formal education. Research by Weng et al. [5] believe that different scales and models were developed to evaluate teacher's work. For example, they combine the analytical hierarchy process and the comparison technique with an ideal solution. A teacher competence framework was created, which helps to evaluate the results of their professional activity. It is used as a criterion for evaluating teachers' competitiveness and enables determining their professional gaps [1]. Several questionnaires, tests and scales have been created, such as self-efficacy assessments [21] or electronic rating scales [12]. Different countries follow individual approaches to the issue of teacher qualities assessment. In Denmark, for example, a teacher needs to be competitive, as qualified teachers can teach more subjects because people without appropriate qualifications are not hired at all. In other northern Scandinavian countries, the requirements for the employment of teachers are less strict. Moreover, the budgets of these countries include expenditures for further training of teachers and improving their qualifications.

III. Research Method

Design

The research was conducted in four stages. The first stage involved surveying sampled teachers regarding motivation, directions, sources and assessment of self-education results. In the second stage, teachers conducted a self-assessment of competitiveness according to the specified indicators. The third stage provided for ranking indicators of teachers' competitiveness by surveying principals of educational institutions. In the fourth stage, it was studied whether the level of competitiveness of teachers corresponds to the level of requirements of managers of educational institutions for employees by comparing the results obtained at the second and third stages.

Sample

The study involved 427 teachers from 48 institutions of general secondary education located in 12 regions of Ukraine. A total of 37 principals of general secondary education institutions participated in the survey. All 100% of the respondents had at least one diploma of higher pedagogical education. The teachers had an average teaching experience of 17.6 years. The minimum teaching experience was five years, the maximum was 35 years. The average age of the teachers was 42.3 years, and the age range of the interviewees was from 26 to 60 years. Each teacher taught from one to four subjects and had a weekly workload of 13 to 28 hours. They simultaneously taught in several classes of the same year of school entry or several classes of different years of entry (for example, mathematics in two 5th and three 6th grades). Principals of general secondary education institutions held this position for an average of 15.8 years, a minimum of 10 years, a maximum of 25 years.

Methods

The research applied methodologies developed by Daminova [16], Shutov et al. [26] to examine the aspects of motivation, directions, sources, and outcomes of self-education. Additionally, assessment criteria aligned with the framework of competitive competencies were employed to assess and ascertain the level of competitiveness among teachers. These approaches provided valuable insights into understanding and evaluating self-education patterns and competitive competency of educators [9].

Data Collection

In April 2023, the survey participants were sent an e-mail invitation to Google, a form containing 45 closed-ended questions to assess motivation, directions, sources of self-education (with answer options "Yes" or "No"). When studying self-education results,

teachers were offered to carry out a quantitative assessment of the specified parameter for the last academic year. Besides, six criterias for assessing competitiveness had to be evaluated on a 5-point Likert scale (1 - "i don't have it at all",..., 5 - "i do have it"). The principals of educational institutions were sent a Google form with 6 criteria for evaluating teachers' competitiveness to evaluate them on a 5-point Likert scale (1 - "not at all important",..., 5 - "very important"). Their ranking was formed based on the average scores school principals gave for each criterion.

Data Analysis

Data processing and analysis were carried out using Statistica software. Reliability was also assessed using Cronbach's Alpha. Validity was tested using the Kaiser test. The Pearson correlation coefficient determined correlation.

Research Ethics

Participation in the study was anonymous, free of charge, and voluntary. Written consent was obtained from each survey participant. Each of them had the right to stop answering the questions at any point of time, when they thought it was necessary. Incomplete questionnaires were not considered.

IV. Results

The results of teachers' assessment of motivational factors for self-education shows, the survey of teachers found that the main factors motivating self-education are the need to process large volumes of information daily during preparation for classes (59%) and aspiration for creative development (37%). A total of 44% of teachers consider self-education a necessity caused by the rapid development of technical means that must be introduced into the educational process. In 23% of respondents, self-education results from a constant interest in learning new things. The 18% of teachers consider it necessary to engage in self- education to have time to synchronise with societal changes. Only 16% of the surveyed teachers consider competition a motivating factor for self-education. A total of 39% of teachers admit that the opinion of others is essential to them, which is why they constantly engage in self-education. There were 27% of teachers who improved their qualifications to increase their wages.

The results of a survey of teachers regarding the directions from which teachers most often carry out self-education show that 56% of teachers improve the teaching method by independently searching for and mastering new methods regardless of the considerable teaching experience. A total of 49% of teachers improve their level of knowledge in the subject they teach during self-education. There was 41% of teachers improved their skills in working with digital technologies. Moreover, 32% of teachers try to ensure a comfortable emotional climate in the classroom, so they supplement their knowledge of psychology. A total of 27% of teachers strive to teach in a competent language so they independently enrich their knowledge of their native language. In general, 14% of teachers monitor preserving their health and students' health during the learning process; 11% supplement their existing pedagogy knowledge. Finally, 8% of the surveyed teachers improved their knowledge of a foreign language and improved their foreign language competence, while 6% and 3% of teachers are interested in history and law, respectively.

At the same time, the teachers chose the following sources of self-education: postgraduate education programmes and advanced training courses - 62%, articles in newspapers and magazines - 28%, academic, methodical and fiction literature 31%, internet - 83%, social networks - 69%, seminars and conferences - 24%, workshops and other events for the exchange of experience - 17%, excursions, theatres, exhibitions, museums - 19%. Teachers' self-assessment of self-education results showed the dependence of self-education on motivation, sources, and directions as seen in Tables 1 and 2.

Table 1. Teacher self-assessment: correlation with student learning quality and self-education factors

Correlation

Results of self-education	M	SD	Teacher's motivation for self-education	Directions of self-education	Sources of self-education
Students' academic performance	6.9 (max=12)	1.8	0.539	0.492	0.613
Significant results of students in contests, competitions (number of achievements per year)	4.1	1.2	0.387	0.365	0.394
Significant results of students in subject contests (number of students who obtained diplomas of I-III degrees)	5.3	1.7	0.526	0.601	0.592

As Table 1 shows, students' academic performance directly depends on the self-education of their teachers. The research found that teachers interested in learning themselves have a creative approach to teaching, and their students have higher academic performance. Students taught by teachers who chose material incentives as a motivation for self-education had worse academic performance than all others. The competition of teachers and the opinion of others is related to the success of their students in contests and competitions. The direction of self-education also had an impact on students' academic performance. So, teacher's addition of new teaching methods and the skilful use of digital technologies, updating the subject's content with current information and creating a comfortable psycho-emotional climate in the classroom enabled students to achieve higher academic results. The more diverse the sources of self-education, the wider the field of teacher's activity and the involvement of students in contests and competitions are.

Table 2. The results of teachers' self-assessment of the results of self-education and the correlation between the results of self-education and motivation, sources and directions of self-education

Results of self-education	Average number per teacher per year	SD	Correlation Teacher's motivation for self-education	Directions of self-education	Sources of self-education
Development and publication of study guides, academic articles, textbooks	2.9	0.8	0.318	0.302	0.298
Development and introduction of new forms, methods, and techniques of learning into the educational process	4.3	1.5	0.376	0.351	0.319
Active participation in research and methodological conferences	5.1	0.9	0.228	0.217	0.231
Preparation of educational materials and study guides	26	5.7	0.345	0.321	0.312
Development of recommended methods for the introduction of digital technologies into the educational process	3.4	1.6	0.419	0.396	0.405
Development and implementation of innovative pedagogical technologies	0.9	0.4	0.184	0.110	0.127
Development of sets of educational materials	7.4	1.5	0.256	0.284	0.232

Active participation in trainings, seminars, conferences, workshops, exchange of pedagogical experience	6.2	1.9	0.305	0.318	0.346

It was determined by mathematical methods that the variance d, caused by the heterogeneity of the sample and related to the study being conducted in different general secondary education institutions with a different academic load of teachers, different staffing of classes, and different resources, acquired values from 124 to 453. The root-mean-square deviation from the average for the same research parameter in different educational institutions of the sample was different. The Pearson correlation coefficient was used to determine the correlation between the results of self-education and motivation, sources and directions of self-education.

As Table 2 shows, there is a relationship, for example, between the sources of self-education and such results as the development and publication of academic articles, study guides, and textbooks. The study found that teacher who chose articles in newspapers and magazines, academic and methodical literature, and participation in conferences and seminars as sources of self-education had more academic and methodical publications than other teachers in the sample. However, the relationship between the directions of self-education and the development and introduction of innovative pedagogical technologies is less pronounced than others. This study showed that more than supplementing knowledge of information and communication technology (ICT) and the subject taught by the teacher is required for developing recommended methods for introducing digital technologies in teaching the subject. The number of developed sets of educational materials was influenced by the active supplementing of teacher's knowledge of the subject taught, the number of subjects taught by one teacher and the number of different classes in which he/she taught. It was found that the teacher had to achieve sufficient professional skills for active participation in trainings, seminars, conferences, workshops and exchange of pedagogical experience. Such teachers occupied a particular age category, mostly 45-55 years, and had sufficient teaching experience of 22 years on average, in the range of 17-28 years. Table 3 presents the results of the self-assessment of teachers' competitiveness.

Table 3. Results of self-assessment of teacher qualities according to the framework of competitive co mpetencies and their correlation with motivation, directions, sources, and results of self-education

Qualities	M	SD	Correlation Teacher's motivation for self-education	Directions of self-education	Sources of self-education	Results of self-education
Pedagogical ethics	4.1	0.7	0.219	0.237	0.284	0.261
Teaching level	3.9	0.6	0.385	0.343	0.356	0.319
The ability to educate	3.7	1.2	0.281	0.279	0.245	0.290
Self-education	3.8	0.9	-	-	-	-
Reflection	3.4	1.3	0.314	0.327	0.362	0.348
Cooperation	3.2	1.5	0.209	0.198	0.212	0.236

As Table 3 shows, there is a relationship between the factors motivating teachers for self-education and their pedagogical ethics. The study found that the opinion of others played a significant role in the observance of pedagogical ethics by the teacher. The level of teaching was influenced by the creative approach to teaching and the constant work of the teacher to update the content of education and master scientific, technical and pedagogical innovations. Competition, as a motivation factor, harmed teachers' cooperation. Such directions of self-education as the expansion of knowledge in psychology and pedagogy and health protection had the most significant impact on the development of pedagogical ethics and the ability to educate. The levels of teaching were mainly affected by knowledge of the taught subject and its teaching methods, as well as the ability to use digital technologies

effectively. Regardless of the direction of self-education, the self-learning process was constantly accompanied by reflection and self-analysis of the results achieved by teachers. Self-organization to raise teachers' professional level requires them to cooperate with colleagues from the same educational institution where they work and others. Among the sources of self-education, postgraduate education programmes, professional development courses, and social networks had the broadest range of action for building teachers' competitiveness. Table 4 presents the ranking of teachers' qualities according to the framework of competitive competencies, which are taken into account by school principals when evaluating the competitiveness of teachers.

Table 4. Rating of teacher qualities according to the framework of competitive competencies based on the results of a survey of school principals

No. in ranking	Qualities	M	SD
1	Teaching level	4.0	0.8
2	The ability to educate	3.8	0.9
3	Self-education	3.1	0.8
4	Pedagogical ethics	2.7	1.1
5	Cooperation	2.4	1.2
6	Reflection	2.1	1.1

Comparing the results of self-assessment of qualities according to the framework of competitive competencies carried out by teachers as seen in Table 3 and school principals as seen in Table 4, we found that the level of teachers' professional qualities differs from the expectations of school principals. The teachers singled out pedagogical ethics as the best-developed component of their professional competence. At the same time, school principals rated it 2.7 points in importance and placed it on the fourth of six steps in ranking teachers' competitiveness criteria. Teachers self-assessed the level of teaching at 3.9 points, while principals considered this parameter the most important and ranked it first. According to the level of self-assessment and the rating created by the principals, self-education ranks third - 3.8 and 3.1 average points, respectively. Reflection and cooperation occupy the last two places (5th and 6th in Table 3 and 6th and 5th in Table 4). The reliability and validity of the study exceeded 0.7, so it was considered acceptable as can be seen in Table 5.

Table 5. Reliability and validity of the study

Values of the parameter		
Cronbach's Alpha		Kaiser test
Teacher's motivation for self-education	0.76	0.72
Directions of self-education	0.79	0.81
Sources of self-education	0.83	0.78
Results of self-education	0.71	0.74
Teachers' competitiveness	0.75	0.73

V. Discussion

Research conducted by the Massachusetts Institute of Technology showed that the brain activity of a sleeping student is higher than that of a student listening to a lecture [1]. Therefore, there is an urgent need for teaching methods that are more effective than traditional lectures. This requires teachers to master new methods and technologies constantly, that is, to engage in self-education throughout their professional lives.

All teachers who participated in this study regularly engaged in self-education. The Letter of the Ministry of Education and Culture No. 1-9-683, on the professional development and certification of teaching staff, of November 04, 2019, establishes the minimum requirements for the number of hours of advanced training of teaching staff of public secondary education institutions in the amount of 30 hours per year in all public secondary education institutions [27]. This study showed that about 60% of the interviewed teachers regularly process new information to update the content of their teaching subjects. More than 40% consider it necessary to get acquainted with the latest science and technology. More

than 35% of teachers engage in self- education, striving for creative organization and conducting lessons. A slightly larger number of teachers are driven in self-education by the opinion of others. A study of teachers' abilities for creative self-development conducted by Oliinyk et al. [28] revealed that 32% of teachers do not regularly engage in self-development, 52% actively work on self-development, and 17% have ceased self-development. The study by Shynhof [22] showed that 53% of teachers have internal motivation for self-education. At the same time, 37% of respondents need external motivation.

The study established that school principals value teachers' teaching level the most, while the ability to educate students is less. The third most important is teacher's ability to engage in self-education, followed by pedagogical ethics, the ability to cooperate and reflect. A study conducted by Wu and Zhang [9] showed that more than 80% of respondents consider the ethics of teachers working there important when evaluating an educational institution. About 90% appreciate the ability of teachers to teach, 80% to educate, and 80% to develop students. Previous study [3] has shown that the course ranking is most influenced by the results that can be achieved by mastering the course content. Teacher's ranking is less important. According to other researchers [3], [29], [30], the essential skills in teachers' work are the ability to explain the material and train the necessary skills in students. A total of 93% of teachers consider it necessary to engage in self- education to be competitive. Self-development is associated with lifelong education in 21% of respondents [22]. Building students' 21st century skills require the cooperation of teachers of different subjects. Competition between teachers is a particular obstacle to such cooperation [1], [31]. In this study, the cooperation of teachers was one of the components of their competitiveness, and competition was one of the motivational factors for self-education.

VI. Conclusion

The education system should provide students with relevant knowledge, skills, and abilities. This is why the issue of training a competitive teaching staff is urgent. Self-education is one of the main tools in solving this issue. As this study showed, these motivational factors of self-education, such as the occupational necessity of working with information, the rapid development of science and technology, a creative approach to the teaching process, and interest in learning, have the most significant impact on the pedagogical ethics, raising the level of teaching, and improving the ability to educate. Improving teachers' competitiveness is influenced by supplementing their knowledge with current information on the subject, new teaching methods, improving skills and abilities in digital technologies and creating a comfortable psycho-emotional climate in the classroom. It was established that teachers used various sources to improve their professional level (postgraduate education programmes and advanced training courses, academic and methodical literature, social networks and other means of exchange of professional experience).

The results of this study have theoretical and practical significance, as they complement the existing knowledge and methods of determining the role of self-education in improving teachers' competitiveness. Further research should be conducted to monitor the qualities necessary for professional pedagogical activity by changes in the requirements and standards that teachers must meet and to find and develop appropriate forms and methods for their development. This study only focused on examining the impact of self-education on the competitiveness of teachers in general secondary education institutions. The issue still needs to be addressed for educators in other educational institutions, such as preschools, vocational schools, and higher education institutions. The problems of self-education for teachers in preschool, vocational, and higher education institutions, as well as their competitiveness, require different research methods and may be the subject of separate scientific works.

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