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ФОРМИРОВАНИЕ ФИНАНСОВОЙ ГРАМОТНОСТИ УЧАЩИХСЯ ПРИ РЕШЕНИИ ЗАДАЧ С ФИНАНСОВЫМ СОДЕРЖАНИЕМ С ИСПОЛЬЗОВАНИЕМ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В КОНТЕКСТЕ ПРОФИЛЬНОГО ОБУЧЕНИЯ

FORMATION OF PUPILS' FINANCIAL LITERACY IN SOLVING PROBLEMS WITH FINANCIAL CONTENT VIA THE USE OF INFORMATION TECHNOLOGY IN THE PROFILE EDUCATION CONTEXT

Аннотация. Актуальность математических задач в обучении заключается в применении знаний, необходимых будущей профессии ученика при необходимости практического использования. При решении математических задач ученикам предлагается научиться выбирать будущую профессию, рассматривая пути решения проблем повседневной жизни, с учетом их личности, интересов и потребностей; развитие навыков финансовой грамотности в обучении математике имеет большое значение. В целях повышения финансовой грамотности учащихся одним из актуальных вопросов исследования является решение проблем финансового содержания с помощью информационных компьютерных технологий на курсах математики, углубление их современных экономических знаний и предоставление им возможности грамотно применять полученные финансовые знания в их жизненный опыт.

Abstract. The relevance of mathematical problems in teaching is the application of knowledge necessary for pupils' future profession in the need for practical use. When solving mathematical problems, pupils are encouraged to learn how to choose the future profession by considering the ways of solving the problems of everyday life, taking into account their personality, interests and needs. Therefore, the development of financial literacy skills in teaching mathematics is of great importance. With a view to increasing learners' financial literacy, one of the topical issues of the research is to solve financial content problems with the help of information computer technologies at mathematics courses, deepen their modern economic knowledge and enable them to apply acquired financial knowledge competently in their life experiences.

Ключевые слова: финансовое вычисление, финансовая грамотность, профильное образование, система образования, методология, дифференциальное образование, информационные технологии, процент.

Keywords: financial calculation, financial literacy, profile education, education system, methodology, levels, differential education, information technology, percentage, cell, function.

Introduction. Nowadays, the importance of knowledge is highly estimated and supported for the stability of the country's independence. In the Law "About knowledge" of the Republic of Kazakhstan, by stating that "The main task of the education system and the importance of technologies, new teaching techniques aimed at forming an individual and developing their proficiency competence on the bases of national and general human values and achievements of science and practice in increasing learners' interest in knowledge is the creation of conditions for obtaining knowledge, introduction of innovative teaching technologies and joining universal international communication nets in educating", further development objectives of the education system are focused. The modern society requires teacher to be a specialist informationally competent from the theoretical and methodological, legal, psychological and pedagogical, didactic and methodical viewpoint, with comprehensive mastering of IT opportunities and high information communication competence as well as being deeply educated in his subject.

Since the XXI century is an age of information, humanity needs computer literacy. The main purpose of education system is to improve the efficiency of using various teaching methods and techniques, along with updating the education content. That is, information technology is methods and forms accomplishing the work of specialists in the educational institutions and a teaching tool for children.

Just as the book is important for a generation, so the computer is a natural tool for learners to recognize the world around them. Therefore, conduction of all the lessons by the use of computers is one of today's urgent problems.

In his message "New development opportunities in the condition of the fourth industrial revolution" in 2018, the Head of State N.A. Nazarbayev pointed out ten main tasks and underlined the relevance of the seventh task "Human capital is the basis of modernization" by which he emphasized "the strengthening of teaching qualities of mathematics and natural sciences at all education levels". And he gave emphasis stating that "This is a major challenge for the development of the youth for a new technology" and "The content of teaching must be balanced harmoniously through the support from the modern technical point of view. The work on the development of the digital educational resources, the Internet inclusion and the equipment of schools with video means should be continued" [1].

At the same time in the same message, the Head of State N.A. Nazarbaev declares the year 2019 as "The year of the Youth," and draws comprehensive attention to youth issues since the youth are the pillar of our country. In the economic aspect, the principles of good social life will be implemented from the social point of view if the country's prosperous development strategy is carried out [1].

Solving the contradictions of science and practice, which are closely interconnected has become one of the main problems in the issue of improving pupils' knowledge quality in the education system.

Hence, young people are today's pupils and will become young specialists in the future. The formation a well-educated, intelligent, communicative, market-oriented and financially literate individual who is competent in combining knowledge and science, enthusiastic for acquiring new knowledge and capable of acquiring information technologies comprehensively is the urgent task before our country.

In his message, the President also emphasized the importance of "supporting young entrepreneurs with opportunities to engage in business through attaining required knowledge".

In this regard, financial and economic literacy of every person requires to form an understanding of the necessity of economic and mathematical knowledge in everyday life in order to successfully select the right direction of socialization and independent professional activity.

For its formation, there are considerable substantial resources in the general education system for mastering relevant elements of financial mathematics (financial calculations), and within its framework it is understood that the use of school mathematics on financial operations will be considered. With a view to increasing learners' financial literacy, one of the topical issues of the research is to solve financial problems with the help of information computer technologies at mathematics courses, to deepen their modern economic knowledge and to enable them to apply acquired financial knowledge competently in their life experiences.

The main part. One of the major challenges facing the modern market economy today is not only the creation of economic, financial, managerial structures, but also the formation of economically-financially competent individuals from the younger generation. In addition, one of the most important goals of modern schools is the formation of a business person with a sense of developed economic thinking, adapted to the real life and economic activities and fully satisfying market relations conditions.

In order to get out of the market economy pressure, every individual in the society tries to find a solution to the key question in his mind, "What can I do to improve my welfare?, What should I do to obtain financial success?". This is a clear proof that everybody wants to develop their financial literacy.

Let's take a closer look at the opinions of several scholars to be financilally literate.

According to the researchers of the Organization for Economic Cooperation and Development (OECD), "As a result of financial market development as well as in the process of economic, demographic and political changes, all of us should acknowledge the vital relevance of the financial literacy." Organization of Economic Economic Cooperation and Development (OECD) [2].

The Organization for Economic Cooperation and Development has formulated the concept of financial literacy as "a combination of knowledge, skills, attitudes and behaviors needed to achieve individual success and to make sound judgment." Organization of Economic Economic Cooperation and Development (OECD) [3].

They also shared their opinion on financial literacy research of foreign scientists in order to build pupils' financial literacy.

In her turn, A.V. Zelenszova describes financial literacy as "the proper managing of personal funds and rational decision making" [4].

"Personal financial literacy is to be financially successful by ensuring personal financial obligations as a result of learning, analyzing and management" [5].

"The basic financial concept is based on the working of interest compounding, the difference between nominal and real values, and the basics of risk diversification" [6]. "Financial literacy is an indication of the basic understanding of financial concepts and processes and the ability and reliability of managing funds through appropriate short-term solutions and reliable long-term financial planning, taking into consideration the realities of life and economic conditions" [7].

Summing up the opinions of these scientists, the most complete and precise definition of the considered concept is the one given by D.V. Moliseev: "Financial literacy is an opportunity of achieving financial stability and taking part in economic life by improving financial knowledge, financial skills and financial structures at various stages" [8].

Hence, any person needs the formation of knowledge and skills in finance in order to be financially literal. Therefore, teaching elements of financial calculations for improving financial literacy at high school contributes to pupils' successful choice of their professional career. At the same time, although today's youth are familiar with socially meaningful terms on consumer, lombard and mortgage loans, life insurance and property insurance, they are quite unaware of the implementation of these processes within the finance calculations. If pupils' knowledge related to practical problems of financial content in everyday life is improved, it will be a great contribution to the development of a young generation with financial literacy.

Therefore, we need to make sure that the financial literacy of the person is formed by solving economic and financial content problems in everyday life, and using the possibilities of information computer technology to find solutions to this problem will surely be beneficial for the comprehensive development of young generation. For this purpose, we decided to teach schoolchildren in the profile classes the introductory course of "Teaching financial calculations using information technology".

As the experience of computer use in domestic, Russian and foreign schools demonstrates, computers are used exclusively as a teaching tool in teaching Informatics, and obtains only episodic character while teaching other subjects. The effectiveness of using information and communication technologies to form certain skills and competences in studying mathematics has been proved in the works of many scientists [9]

The use of ICT in teaching mathematics will be an exact answer to the question about effective teaching [10].

Teaching Mathematics with ICT: improves thinking ability; forms calculating and communicative skills; the calculator and graphic calculator enable pupils to solve mathematical problems with ease and speed and find the exact and precise solution of the problem; working with the databases in the spreadsheet develops pupil's thinking abilities [11].

In modern conditions, the issue of financial management becomes a leading idea, whether in the policy of domestic economy or in the global economy. Today, financial and economic literacy of every person is a

prerequisite for the success in professional activities that require the solution of economic problems in everyday life.

Introduction of certain elements of financial calculations to the didactic materials and their use in mathematical classes was carried out in the works of I.S. Esina [12], V.A. Petrov [13], while the implementation of the need for self-education of general educational institutions pupils in the field of financial and commercial calculations was carried out in the works of G.P. Basharin [14], T.N. Alexandrova [15], Y.F. Vinokurov [16] and others. In the study of V.V. Ojerelev [17], application peculiarities of computer technology in the study of financial mathematics elements in algebra lessons of the basic school were revealed.

It should be noted that today's youth associates financial resources with the formation of competent management skills in relation to practical tasks in terms of consumer, lombard and mortgage loans, life and property insurance.

At the mathematics course, the ability to solve financial problems using information technology means the formation of financial literacy in the process of deepening modern economic knowledge and literal use in life experiences. Taking into consideration the requirements for introducing the introduction course of financial mathematics at the top stages of general education, we have chosen the multi-level criterion, which is gradually complicated by the A, B, C scheme and characterized corresponding to the variable levels of A-B, B-C.

Level A is intended for the acquisition of knowledge and skills gained in life, for pupils who want to satisfy their cognitive interests in the subject area considered.

Level B aims at gaining knowledge and skills for the use in practice and studying considered subject area in higher education institution.

Level C aims at obtaining knowledge and skills oriented towards the direct use in professional activities and to successfully master specialization disciplines in higher education institutions [18].

This contributes much to increasing students' interest in a subject through the differentiated learning criteria, the choice of future profession and the solution of financial problems in their life experiences.

Methodology of teaching financial calculations using information technology.

In the market economy era, daily life-cycle loans, human life insurance, lombard services, banking services and deposit systems are calculated on the interest rate basis.

Let us consider to interest calculation by the simple interest rate method.

Simple interest rate increase is the rate the calculation basis of which remains constant.

For an illustration, let's take the following example.

One businessman decided to invest 4 800 000 tenge in the bank to raise his capital. The bank offered an annual interest rate of 7%. How much money will the client receive from the bank two years later?

The solution:

Hence, if the interest rate is simple interest, each interest rate growth is approximately calculated by the initial value, i.e. 4,800,000 tg.

The annual interest rate is equal to 4,800,000 * 0,07=336,000 tenge. Under the simple interest rate, the interest for the 2nd year will be 336,000 tenge. So the interest growth for the three years is 2 * 336000 = 672 000 tenge.

Three-Year income of the businessman is

4 800 000+4 800 000*0,07*2= 4 800 000(1+2*0,07) =5 472 800 tenge.

We translate the final expression into a mathematical language. P is the starting amount, i_0-is the simple interest rate, S is the final amount of interest, n is the calculated time-stream. Then our numerical expression is as follows.

$$P + P \cdot i_n \cdot n = P(1 + \mathrm{n} i_n) = \mathrm{S}$$

$$a_n = P, d = P i_n, n = \frac{t}{K}$$

The obtained formula is $S = P(1 + n i_n) = P(1 + \frac{t}{K} i_n)$ (1)

It is called the sum growth formula by the interest rate.

In solving this example, it is possible to use the information technology opportunity to find the solution. To do this, we load an Excel system from the computer. The financial functions of MS Excel are designed to calculate the baseline values required for complex calculations [19].

In order to use the financial functions of MS Excel, the following steps are taken:

1. Enter the values of the main arguments of a function on the workspace in the special slots.

2. Using the financial function embedded in MS Excel, we navigate to the slot where the formula is inserted.

3. Through the command of **Insertion** → **Function** → Category **Financial**, we select the financial function that we need from the list via the master functions.

We enter the data given in the problem task to column A, their measurement units in column B and their values in column C. To cell C6, we enter the formula C3 * C4. And by entering = C3 * (1 + C5 * C4) in cell C7, we get the solution of the problem.

Example 2. If the loan in the amount of 1000000 000 tenge is given for a period of 5 years with 12% interest, and if there is a possibility of repayment of the principal payment in the fourth year, what amount of money is to be paid?

The solution.

The following function is used in MS Excel for basic payments, which are repayable on the loan basis by the beginning or end of each reporting interval:

OSPLT (Rate, Period, Kper, Ps, Bc). The following formula is inserted into D8 slot: = OSPLT (D5, D6, D4, D3).

Example 3. The initial amount of 3,000,000 tenge with an annual interest rate of i = 12% per year was invested in a bank with a nominal interest rate for a period of March 18, 2017 and October 20, 2017. Let us consider the overpayment of this amount according to different calculations.

1) The number of calendar days in the German practice is C = 360 days,

t = 14 (March) + 6 * 30 (April, May, June, July, August, September) - +20 (October) - 1 (Days when the account is opened and closed are considered as 1 day) = 213 days.

Then $S = P(1 + \frac{t}{K} i_n) = 3000000 * (1 + 0.12 * \frac{213}{360}) = 3213000.00$ tenge

2) According to the French practice, C is 360 days,

t = 14 (March) +30 (April) +31 (May) +30 (June) +31 (July) +31 (August) + 30 (September) + 20 (October) -1 (days when the account is opened and closed are considered as 1 day) = 216 days.

$S = P(1 + \frac{t}{K} i_n) = 3000000 * (1 + 0.12 * \frac{216}{360}) = 3216000.00$ tenge

2) In the English practice, C is 360 days, t=216 days, $S = P(1 + \frac{t}{K} i_n) = 3000000 * (1 + 0.12 * \frac{216}{365}) = 3213041.10$ tenge

The spreadsheet solution of this example:

The given dat are inserted to column A, the measurement units to column B, the English, French and German calculations to columns C, D, E.

Through the insertion of the C6-C5 formula to cell C9 and 360 DAYS (C5; C6) +1 to cell D 9, we calculate the over-interest. The formulae: $ C $ 3 * $ C $ 4 / C10 * C9 are inserted to cell C11, $ C $ 3 * $ C $ 4 / D10 * D9 to cell D11, $ C $ 3 * $ C $ 4 / E10 * E9 to cell E11.

We insert the formula C11 + $ C $ 3 to cell C12 and get the final result. It is possible to see the final result by moving this formula to cells D12, E12 [20; 21].

Ways of forming financial literacy through teaching the fundamentals of financial calculations using information technology.

The use of interactive methods for forming creative activities in increasing pupils' interest in subjects is of paramount importance.

In addition, adapting school mathematical curricula to financial calculations by adapting pupils to professional specialties through profile disciplines will not only allow pupils to deeply comprehend the theoretical knowledge required, but also gain valuable experience related to their use in the practice. This, in turn, is the natural cause of the expansion of mathematical knowledge used to solve financial issues that arise in practice and in the real world.

Therefore, financial literacy can be formed by using active teaching methods to increase pupils' motivation in teaching financial calculations with the help of information technology. If we teach pupils to obtain the solution of any financial calculations using the active teaching methods, if every problem is explained in relation to real life situations, it will be quickly kept in pupils' mind and contributes much to their right career choice and financial knowledge improvement. If every lesson is based on gaming technology, role-playing games, discussions, trainings for the discipline acquisition, cognitive activity of the pupil increases and his financial and economic literacy on the subject begins to develop. At the same time, the case study method, one of the interactive methods, can also be used in teaching the fundamentals of financial calculations.

While teaching pupils, the case study method can be linked to differentiated teaching method. Through such methods, learners get an opportunity to self-development and quickly find solutions to life-problematic situations through the knowledge gained from financial calculations.

Conclusion. There are many opportunities for enhancement of the mathematics content with applications in the field of financial calculation in the context of profile teaching, which allows teachers to prepare pupils for simple financial calculations related to various payments, taxes, credit, insurance and other financial transactions. It is difficult to overestimate the necessity of implementing these opportunities in school mathematical uses, as financial and economic literacy of every person is one of the competencies of his professional activity in modern conditions.

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ПЕДАГОГИЧЕСКОЕ ОБРАЗОВАНИЕ КАК ФАКТОР ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОЙ КАРЬЕРЫ

PEDAGOGICAL EDUCATION AS A FACTOR OF FORMATION OF A PROFESSIONAL CAREER

Аннотация. В статье рассматриваются возможности и пути карьерного роста в сфере образования, начиная с этапа профессионально-педагогического образования.

Abstract. The article describes the opportunities and career paths in the field of education, starting from the stage of professional and pedagogical education.

Ключевые слова: педагогическая карьера; карьерный рост; карьерная траектория; горизонтальная карьера.

Keywords: teaching career; career; career path; horizontal career.

Проблема развития профессиональной карьеры относится к различным сферам деятельности человека, в том числе к педагогической. Введение Президентом РФ на заседании Государственного совета по вопросам совершенствования системы общего образования (23 декабря 2015 г.) национальной системы учительского роста предполагает выстраивание профессиональной карьеры педагогических работников.

Деловая карьера начинается с формирования осознанных представлений работника о своих карьерных целях и трудовом будущем. В связи с этим, важнейшим фактором для формирования профессиональной карьеры педагога является этап профессиональной подготовки [1, с. 35]. Согласно подходу А.Я. Кибанова, учеба в школе и профессиональное образование являются предварительным этапом развития деловой карьеры и длятся примерно до 25 лет [2, с. 443].

Именно на этом этапе осуществляется карьероориентированное развитие студента, происходит осознание соответствия своих способностей и возможностей выбранной специальности, планируется будущая профессиональная деятельность. Именно в этот период осуществляется формирование личностно-профессиональных качеств, необходимых для успешного