

DESIGNING A TRANSITION SYSTEM TO PERSONALIZED LEARNING: ANALYSIS OF THE RESULTS OF THE STAKEHOLDER SURVEY

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Abstract

The issue of the transition of schools in Kazakhstan to a personalized format of education using information technology in the context of a global pandemic is relevant and requires careful study. This study aims to identify the factors that contribute to the effective implementation of personalized learning in specialized schools for gifted students. As a method, we chose a real-time survey of stakeholders within the framework of a logical-structured approach. Data processing was carried out using the MS Forms software application. The surveys were aimed at obtaining the views of students, parents and teachers to confirm the real problems of introducing personalized learning in schools. The results of the study made it possible to identify the main five factors contributing to the implementation of software in the educational process of schools and can be taken into account in the process of developing a design system for the transition to personalized learning.

Keywords: design system, information technology, personalized learning, questionnaires, stakeholders, factors

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ДЕРБЕСТЕНДІРІЛГЕН ОҚЫТУҒА КӨШУ ЖҮЙЕСІН ЖОБАЛАУ: МҮДДЕЛІ ТАРАПТАРДЫҢ САУЛНАМА НӘТИЖЕЛЕРІН ТАЛДАУ

Жаһандық пандемия жағдайында Қазақстан мектептерінің ақпараттық технологияларды пайдалана отырып, білім берудің дербестендірілген форматына көшу мәселесі өзекті болып табылады және мұқият зерттеуді қажет етеді. Бұл зерттеу дарынды оқушыларға арналған мамандандырылған мектептерде дербестендірілген оқытуды тиімді жүзеге асыруға ықпал ететін факторларды анықтауға бағытталған. Әдіс ретінде біз логикалық құрылымдық тәсіл шеңберінде мүдделі тараптардың нақты уақыт режиміндегі сауалнамасын таңдадық. Мәліметтерді өңдеу MS Forms бағдарламалық қосымшасының көмегімен жүзеге асырылды. Сауалнамалар мектептерде дербестендірілген оқытуды енгізудің нақты мәселелерін растау үшін оқушылардың, ата-аналар мен мұғалімдердің пікірлерін алуға бағытталған. Зерттеу нәтижелері мектептердің білім беру үдерісінде бағдарламалық қамтамасыз етуді енгізуге ықпал ететін негізгі бес факторды анықтауға мүмкіндік берді және дербестендірілген оқытуға көшудің жобалау жүйесін әзірлеу процесінде ескерілуі мүмкін.

Түйін сөздер: жобалау жүйесі, ақпараттық технологиялар, дербестендірілген оқыту, сауалнамалар, мүдделі тараптар, факторлар.

Аннотация

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ПРОЕКТИРОВАНИЕ СИСТЕМЫ ПЕРЕХОДА НА ПЕРСОНАЛИЗИРОВАННОЕ ОБУЧЕНИЕ: АНАЛИЗ РЕЗУЛЬТАТОВ АНКЕТИРОВАНИЯ ЗАИНТЕРЕСОВАННЫХ СТОРОН

Вопрос перехода школ Казахстана на персонализированный формат обучения с использованием информационных технологии в условиях всемирной пандемии является актуальным и требует тщательного изучения. Данное исследование направлено на определение факторов, способствующих эффективному внедрению персонализированного обучения в специализированных школах для одаренных учащихся.

В качестве метода выбрано анкетирование в режиме реального времени заинтересованных сторон в рамках логико-структурного подхода. Обработка данных осуществлялась с помощью программного приложения MS Forms. Опросы были направлены на получение мнений учащихся, родителей и учителей для подтверждения

реально существующих проблем внедрения персонализированного обучения в школы. Результаты исследования позволили выявить основные пять факторов, способствующих внедрению ПО в образовательный процесс школ и могут быть учтены в процессе разработки системы проектирования перехода на персонализированное обучение.

Ключевые слова: система проектирования, информационные технологии, персонализированное обучение, анкетирование, заинтересованные стороны, факторы.

Introduction

The program of informatization of the education system of Kazakhstan proclaims the creation of a unified information and educational space based on a unified information and educational network. One of the tasks set by this program is the introduction of new information technologies into the education system, which would allow them to be used both for teaching and for managing the educational process [1]. The experience of the education system during the coronavirus pandemic in 2020 showed insufficient development of information technology models to support personalized learning (hereinafter referred to as PL).

At this stage of the development of the education system in an unstable external environment, PL is an alternative to traditional education, which is applied to all students regardless of their learning style, personal qualities and priorities. [2-5] Traditional education is carried out according to a unified educational strategy that applies to all members of the relevant group without exception. In turn, the software is based on the opinion that the entire educational process, its methods and styles should be aimed at the learner and adapted to their needs. [6-9] Such an approach of training is also required by programs with updated educational content introduced in schools of the Republic of Kazakhstan since 2017. [10] Therefore, the development of a PL transition design system is an urgent issue in today's realities.

A project planned properly and aimed at the real needs of students cannot be created without a full and thorough analysis of the current situation. To develop an effective software implementation project, it is necessary to analyze the opinions of stakeholders at the first stage. Within the framework of this study, the stakeholders are high school students, their parents and teachers.

The purpose of the study is to determine the factors influencing the implementation of PL in the educational process of schools.

Research methodology

The study is based on a logical-structural method that allows a detailed analysis of the current situation. [11] The situation should be presented in the light of the interests and actions of various stakeholders, who often see it differently. There are different ways to analyze the situation. In this study, the questionnaire method was used as an effective method of processing statistical data. Data processing was carried out using a specialized MS Forms software application. The validity and reliability of the questionnaire questions was checked in advance through testing of 17 respondents of the Nazarbayev Intellectual School of Ust-Kamenogorsk. The analysis of alpha results by the Kronbach method showed a sufficient level of reliability (0.73).

The study was conducted in the 2020-2021 academic year. The survey covered the network of intellectual schools of Kazakhstan in all regions, in which only 324 respondents took part.

Research results

Initially, the survey was conducted among high school students and their parents (grades 10-12), 123 and 101 responses were received, respectively.

The authors were surprised by the fact that more than 93% of high school students and their parents were able to easily find the correct definition of the concept of "personalized learning", which is a confirmation of the respondents' correct understanding of the priorities of this type of education. Turning to the questions aimed at studying the information support of the transition to software, we note that first of all, it was important for the authors of the study to clarify what benefits students will receive when switching to this type of training. Students and their parents were presented with a number of statements among which it was necessary to choose 3 more priority ones. The results of the survey showed that the main benefits for students are: the opportunity to observe their own pace of learning, the opportunity to study the content of the subject more deeply, the opportunity to study at a convenient time for the student. Also, it should be noted that 49% of respondents consider it a priority to plan their training with software (Fig. 1).

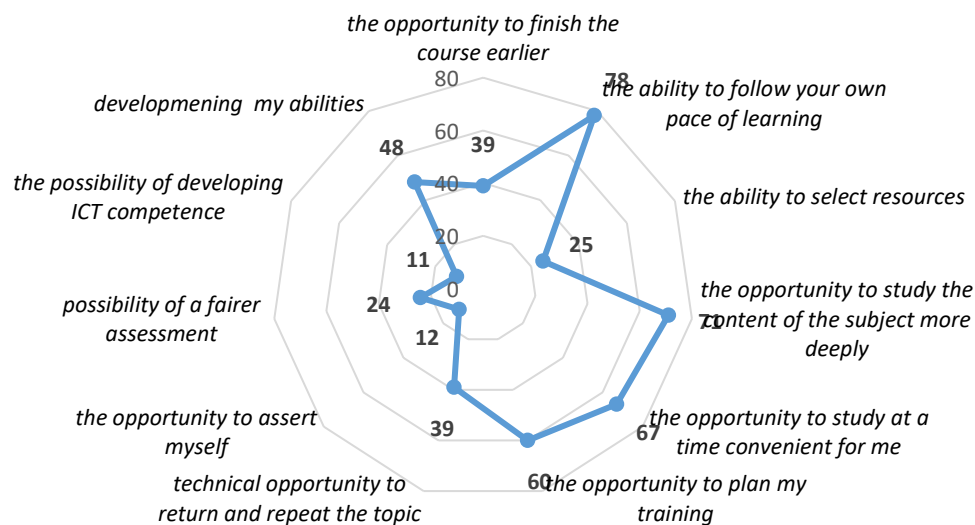


Fig. 1. The answer to the question "In your opinion, what will be the benefit for you while studying in a personalized learning format? Choose the most appropriate 3 answers" (%)

The authors were also interested in finding out the opinions and wishes of respondents on the transition to PL. To the question "Would you like the service to contain gamification elements? (for example: the bonus system, the transition to a higher level when performing intermediate tests, tasks in the form of a game, etc.)" 76% of respondents answered in the affirmative, while 15% of respondents believe that gamification will distract from the content. Students and their parents also openly talk about the problems of the traditional learning format: "There are few interesting and instructional video resources, and with their help it would be easier and more exciting (H.K.)" "Often very boring and monotonous topics on which you barely sit and force yourself to understand, even though you are not interested in it at all (E.S.)" "A large volume of tasks that are given to us at school are useless and take time for me. I think that teachers should reconsider their choice of tasks that they give to students. There is no significant benefit from many tasks (A.B.)" "There is no individual approach to all students, which leads to stagnation in the training of individual students (M.E.)", "All the resources proposed in the example are used in traditional teaching, however, unfortunately, in some cases there is not enough time to finish any task or vice versa is ahead of the bulk, which causes problems such as low interest (A.M.)" "There is a lot of material, it is unclear and does not particularly involve in the process. (A.A.)", "Sometimes evaluation can be subjective, especially in subjects where open written answers with an opinion are needed (M.S.)" I was also struck by the opinions of respondents of the format "Too much dependence on the teacher". Of course, such answers confirm the urgent need to develop a methodology for the transition to PL are 3 main points on which students and parents focus their attention: the unstructured nature of the resources offered, the subjectivity of the assessment, the lack of consideration of the interests of students.

The next stage of the study was to conduct a survey among the teaching staff of schools for gifted students in Kazakhstan. A total of 102 middle and high school teachers took part in the survey. Almost all respondents (99%) believe that PL is learning on an individual trajectory, when personal needs and abilities of the student are taken into account. And in our opinion, this answer most clearly reflects the characteristics of personalized learning, which proves that teachers are aware of this issue. It was important for us to get the opinion of teachers about what obstacles exist when implementing PL in schools. From the ranked list, it was proposed to identify the main three positions. As can be seen from Figure 2, respondents consider the lack of a single electronic platform to be the main obstacles – 45%, problems with assessing the educational achievements of students at PL - 35%. Further, the third position is shared by the opinions that there are certain stereotypes among parents about learning in the classroom - 27%, and the absence or insufficiency of a resource base for learning is also 27%. Discussion of the results of the survey with a working group of

teachers revealed the fact that personalized learning, unlike traditional training, requires more thorough preparation from the teacher, taking into account the individual needs of the student and the selection of resources, more time spent on preparing for the lesson. Therefore, teachers note the lack of motivation of teachers (including material) as one of the important obstacles in the implementation of PL in Kazakhstan.

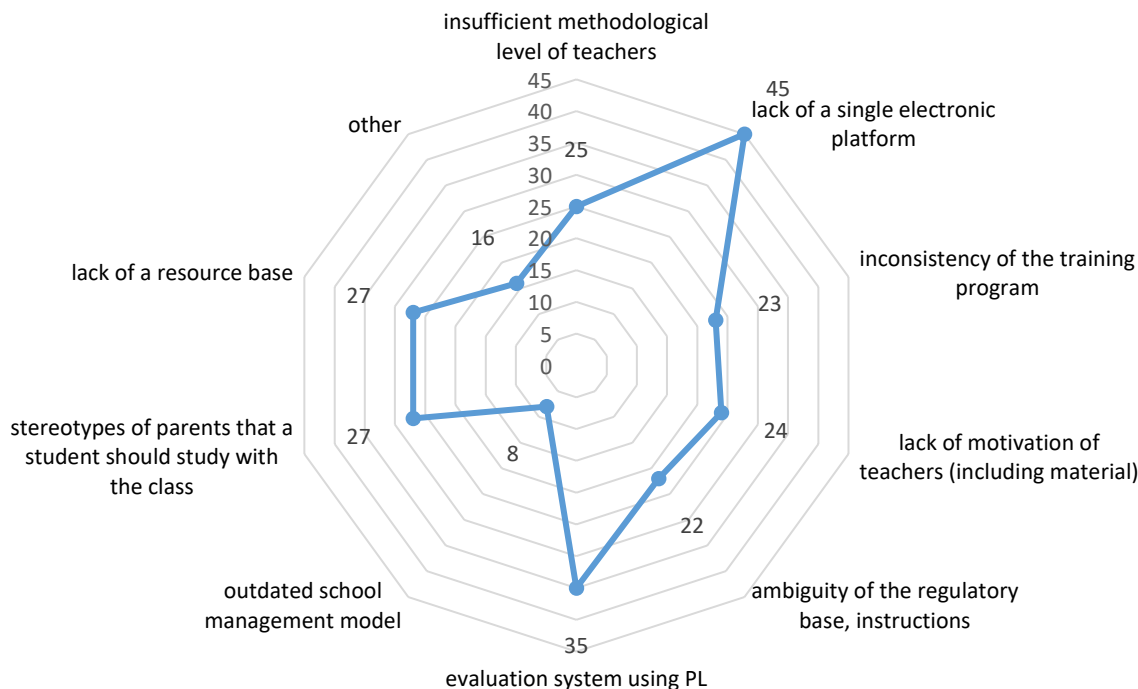


Fig. 2. The answer to the question "In your opinion, what are the main obstacles to the introduction of software at school? (highlight the main 3)" (%)

Respondents also express their opinions regarding the information support of the PL. Among the most frequent responses are the following: "The division of educational material into modules, with the provision of all resources and evaluation", "Smart" diagnostics of the student before the PL, which will help to identify not only individual goals, but also gaps of the student", "The use of a lot of content if it is not competently structured". The respondents also gave recommendations on the technical parameters of the platform: "It should be an adaptive multiplatform application", "consider the technical capabilities of the coursera platform", "provide different resources for visual demonstration of virtual experiments", "consider the technical capabilities of proctoring and intermediate control based on the platform, I do not use other resources". These data are also important and will be taken into account when developing a PL transition design system.

The conducted research allows us to conclude that students of intellectual schools who are savvy in the distance learning format during the pandemic, have a strong interest in knowledge and possess self-management skills are ready to switch to a personalized learning format. So, according to the results of the survey, 76.4% of students and their legal representatives said that they would like to try to study PL. Also, more than 80% of teachers are ready for the challenges of the time and want to test the effectiveness of personalized learning.

Summarizing the results of the questionnaire survey, as factors contributing to the introduction of PL into the educational process of secondary schools:

- development of a unified educational platform, including the ability to track the progress of each student with an effective assessment system of academic achievements and a proctoring procedure;

- development of an algorithm for taking into account the individual needs, interests and socio-cultural background of the student in the formation of educational materials;
- development of a mixed learning model with the selection and structuring of training materials for synchronous and asynchronous learning;
- creating an attractive interface with gamification elements;
- development of a system of professional development and motivation of teachers.

Discussion

The problems voiced by the respondents take place. The issue of developing a unified educational platform, including the ability to track the progress of each student with an effective system for evaluating educational achievements, is particularly acute. It is no secret that the educational system of Kazakhstan during the Covid-19 pandemic felt the full range of problems due to the lack of a single educational platform. In a very short time, many educational patents were developed and supplemented with resources. Each educational organization, by virtue of its capabilities, chose electronic educational platforms. [12] Among the existing educational platforms are: iMektep.kz, Bilimland.kz, Twig-bilim.kz Zhastar.org, Audiokitap.kz, Open.kz, Academia.kz and others. In the online mode, social networks and TV broadcasts of lessons were used. The ZOOM and Microsoft Teams learning platforms were recognized as leaders in use. [13] Nevertheless, for the mass implementation of PL, scientific study of implementation issues, development of a methodology for switching to a personalized training format are necessary. Research on the development of information technology to create personalized learning paths, especially for gifted students and students with special educational needs, also require comprehensive study.

Conclusion

The development of a system for designing the transition to personalized learning in Kazakhstan is an important direction for the development of innovations both in the field of information technology and in the field of education. Creating a model of information technology to support personalized learning, it is necessary to focus on the real problems and difficulties experienced by schools.

The conducted research made it possible to identify the main factors contributing to the implementation of PL and take them into account in the process of developing a personalized learning design system for decision-making at various stages of the innovation lifecycle.

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