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## Formation of university teaching staff's readiness towards smart technologies usage

Effective overcoming of difficulties with updating hardware and increasing the readiness of teachers to use smart-technologies in educational activities, related to the rapid development of computer technologies, possibility of introducing an auxiliary author's software product, which would provide planning, systematization, and structuring of teachers' activities on the use of smart-technologies in the educational process in the conditions of blended learning. The main purpose of this study is to develop and test the effectiveness of the software product "SMART Assistant", which would contribute to the formation of readiness of teaching staff to effectively use smart technologies in educational activities. The author's software product "SMART Assistant", which organizes the personal educational environment of a teacher in accordance with the identified stages of professional activity of a teacher — design, implementation, analysis, optimizing the interaction of participants of the educational process and systematizing the existing range of Smart-services and tools, was used as a tool to form the readiness of teaching staff to use Smart-technologies. The novelty of this study is to identify the impact of the author's software product "SMART Assistant", introduced in the educational process at the Faculty of Foreign Language of E.A. Buketov Karaganda University, on the level of readiness of teaching staff to the effective use of smart technologies. The results of experimental work on the implementation of the software product "SMART Assistant" confirmed the hypothesis of the study, indicating that its application in the educational process leads to an increase in the level of teachers' readiness for educational activities with the use of smart technologies in the aspect of the identified components of readiness: motivational, cognitive, activity.

*Key words:* smart technologies, digital technologies, smart education, online services, blended learning, teacher readiness, software product "SMART Assistant", personal digital educational environment of a teacher.

### *Introduction*

The modern era of information requires the adoption and integration of smart technologies in education as an important educational trend. However, successful implementation of smart technologies requires modern ICT tools, adequate funding, and a cultural shift in attitudes towards learning with the latest digital and smart technologies [1]. Moreover, the use of smart technologies should be implemented in a way that takes into account the unique cognitive characteristics and skills of learners. The use of smart technology learning can solve this problem by adapting to learners' learning factors and strategies, thereby enhancing learning efficiency and achieving the benefits of e-learning such as interaction, flexibility, and experience [2].

The application of smart technologies should be based on didactically sound educational methodologies aimed at providing a customizable and pedagogically sound learning experience. Smart technologies in learning are evidence of an evolving educational environment where these technologies play a key role in shaping the ways in which knowledge is transmitted and acquired. The success of these classrooms depends on thoughtful integration of technologies that meet the diverse needs and learning styles of learners.

Smart technologies in educational environment are increasingly integrating to improve the quality of learning and address various pedagogical challenges. The implementation of these technologies varies depending on the context and the goals pursued by educational institutions. When talking about the introduction of smart technologies into the educational process, we are talking not only about modern digital services and tools, but also about the creation of entire complexes of smart classes and smart educational environments. In higher education, Smart Educational Environments use a number of tools and procedures to improve learning efficiency, although they often lack mechanisms for analyzing students' knowledge and cognitive characteristics [3].

Besides, "smart" classes, as a kind of smart educational environment, provide an opportunity for students to use modern mobile and digital technologies in order to transform learning activities towards greater adaptability and flexibility of individual educational trajectories with the possibility of learning in the format of "self-paced" (individual pace of passing the curriculum or its parts), as well as to provide greater access to sources of educational information, including through Internet connection [4]. In underserved regions, the sustainable integration of technologies in smart classrooms is influenced by teachers' perceptions of

technology integration, their efforts in the field of educational practices, and the observed positive changes among students [4].

Indeed, we can observe that the implementation of smart technologies in educational environments is multifaceted and aims to create more engaging, effective, and personalized learning experiences. The success of these implementations depends on the thoughtful integration of smart technologies, consideration of the needs of learners and teachers, and the adaptability of educational practices for the effective use of these technologies [4–7].

Smart technologies are currently associated with the latest generation of digital technologies and digital learning equipment with elements of “smart” control. It is important to note that smart technologies are not only smart equipment, such as interactive panels, interactive whiteboards, and modern digital information transfer devices, including through sound and remote control. Smart-technologies are also such information resources, tools and services, which, based on automated processes or artificial intelligence, are developed or can be used to work in the digital educational environment: services to ensure communication and information interaction, organization of joint work in the electronic environment, feedback, development of digital educational content, including educational video lectures, video clips, websites, web-pages, interactive assignments, exercises, etc. Smart technologies also provide the opportunity to use them in the digital educational environment. Smart technologies allow expanding the scope of educational space and updating its content by including them in the design of digital educational environment for both teachers and students. Smart technologies have special characteristics (integration, multiple functions, dynamism), various components (interactive whiteboard, document camera, knowledge control system, 3D visualization, cloud software and game task templates) and important functions (creating an innovative model of the educational process, developing learning skills with different information sources, optimizing learning, expanding the educational environment).

To effectively overcome the difficulties with hardware upgrades and professional development of teachers associated with the rapid development of computer technologies, using operational training of teachers in new knowledge and skills in the use of smart technologies for educational purposes is possible. This training can be conducted through various forms of additional professional education, such as online and offline training, distributed or concentrated training.

The analysis of scientific literature has shown that until now, several issues related to the realization of pedagogical opportunities of smart technologies have not been sufficiently studied. In particular, the issues of training teachers to use digital educational resources, interactive whiteboard and other modern smart technologies in the learning process have not been investigated. However, these issues play an important role in the work of a modern teacher. Due to the insufficient development of didactic conditions for the effective use of smart technologies in the learning process, teachers face difficulties in their application at the stages of planning, implementation, and evaluation of learning outcomes. As a result, pedagogical readiness to use and fully realize the didactic possibilities of smart technologies in the learning process remains insufficient. We are not talking about the development of teachers' readiness to use smart technologies “from zero” positions, but rather about the development and enrichment of already existing experience, which is a good basis for adapting to new requirements. We mean that teachers already have certain knowledge and skills in the field of digital technologies, acquired as part of professional or additional education. This experience is the basis on which to develop teachers' readiness to use smart technologies, considering the new requirements.

In the scientific literature we can identify different interpretations of the concept of “readiness” of a teacher. Thus, according to A.B. Orlov, “readiness for activity acts as a combination of ability and aspiration for independent mastering of knowledge” [8]; V.A. Slastenin [9], V.V. Serikov [10] put forward the position of “readiness” of the teacher [8]; V.A. Slastenin [9], V.V. Serikov [10] put forward the position that “theoretical and practical readiness of a teacher to carry out pedagogical activities also determine his professional competence. The ability to perform independent activity includes the content (basic knowledge) and technical (methods of activity) sides of independence, and the desire for independent activity reflects the motivational side”.

In the context of the present study, we define a teacher's readiness to implement smart technologies as an integrative quality of his personality. This readiness is manifested in the constant motivation to apply smart technologies in the educational process, in the possession of knowledge about what they consist of, how they are organized and how they function, as well as in the ability and skill to use these technologies to achieve educational and developmental goals. The development of motivational, cognitive and activity components of

readiness is reflected in the corresponding criteria for the formation of this property: motivational, cognitive (or knowledge) and operational (or activity).

The main purpose of this study is to develop and test the effectiveness of a software product that would contribute to the formation of readiness of pedagogical staff to the effective use of smart technologies in educational activities.

The object of this study is the readiness of teaching staff educators to the effective use of smart technologies in educational activities, and the subject is the impact of the software product “SMART Assistant” on the level of formation of readiness of teaching staff to the effective use of smart technologies.

As a hypothesis of the study, we put forward the position that the effective formation of teachers' readiness for the effective use of smart technologies in educational activities is possible with the introduction of an auxiliary software product that would provide planning, systematization, and structuring of teachers' activities on the use of smart technologies in the educational process in the conditions of blended learning. This product is the author's development “SMART Assistant”, introduced in the educational process at the Faculty of Foreign Languages of Karaganda Buketov University.

#### *Methods and materials*

As an experimental group of teachers there were 38 teachers of the Faculty of Foreign Languages of Karaganda Buketov University who participated in the approbation of the software product “SMART Assistant” during the fall semester of the 2023 academic year. The use of the product was carried out in a blended learning format, including the work of students with the use of remote access to learning materials.

The authorized software product “SMART Assistant” was a tool to form the readiness of teaching staff to effectively use smart technologies in educational activities in the university environment. The purpose of the implementation of this software product is the organization of personal educational environment of a teacher in accordance with the identified stages of professional activity of a teacher — design, implementation, analysis, allowing to optimize the interaction of participants of the educational process, to structure and diversify the learning and cognitive activities of students through the implementation of the author's software product “SMART-Assistant” in the professional activity of the teacher and the specification and systematization of the essence of the “SMART-Assistant”.

The authorized software product “SMART Assistant” is intended for wide use in the digital educational environment of higher education institution and acts as a structuring component of information and technical support for the design of personal digital environment of the teacher, optimizing his activity on the organization of learning and cognitive activity and learning interaction between the subjects of the educational environment, storage and transfer of digital educational content, diagnostics, correction, evaluation and control of students' learning achievements in the conditions of the educational process.

“SMART Assistant” is a website — an interactive constructor and organizer of educational content for the teacher. It is a tool that integrates ready-made solutions and existing online services for the most effective organization of educational content.

The software product “SMART Assistant” is built according to the stages of the teacher's activity:

- at the projecting stage of the teacher's activity the organization, storage, and transfer of educational content is provided considering the set learning objectives through the SMART Assistant Content Lab section.
- at the implementation stage the organization of independent work of students is carried out through the SMART Trainer Assistant section.
- at the analytical stage of teacher's activity, diagnostics and evaluation are carried out through the section SMART Tester Assistant.

Thus, “SMART Assistant” contains the following sections:

Smart Assistant Content Lab — the construction of thematic sections, which performs the role of an organizer of educational materials and thematic sections on the discipline (Fig. 1).

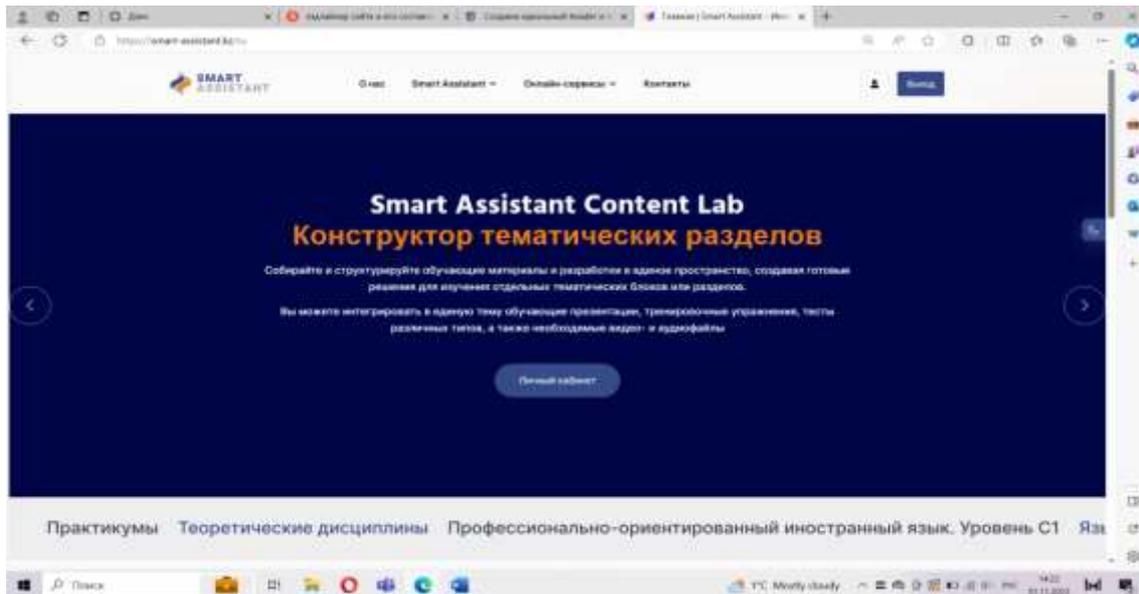


Figure 1. Interface of the Smart Assistant Content Lab designer

To create a topic, click the “Create Topic” command in the Smart Assistant Content Lab section. Then enter the topic name, select the appropriate category for the topic, and attach a photo and tags (optional).

After creating a topic, you can add existing learning materials from the Smart Trainer Assistant sections, tests from the Smart Tester Assistant section, as well as additional materials from your PC, such as presentations, documents, audio and video files, and links to external resources (via the “Add link” option). The builder allows you to collect and structure learning materials and developments into a single space, creating ready-made solutions for studying separate thematic blocks or sections. Using Smart Assistant Content Lab, a teacher can integrate educational presentations, training exercises, tests of various types, as well as necessary video and audio files into a single topic (Fig. 2).

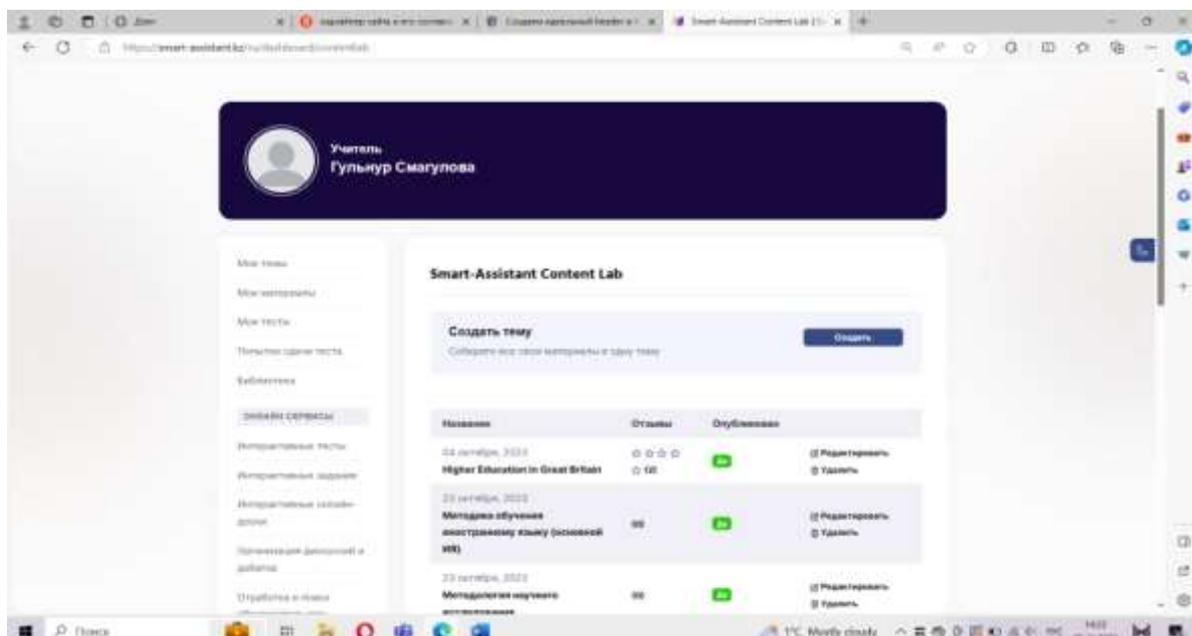


Figure 2. Adding a topic section in the Smart Assistant Content Lab designer.

Smart Trainer Assistant acts as a constructor of supporting and training learning materials and includes the content of “My Materials” sections in the personal cabinet. This section offers templates of ready-made presentations (slides) and templates of handout tasks. Templates are universal; to fill them with author's

content, you need to download the template to your PC, fill it with appropriate material and attach the ready-made development to the Smart Trainer Assistant section. The author's development will be automatically saved in the "My Materials" section. Author's presentations and exercises based on the proposed universal templates of slides and handouts can be added to the topic of your choice, thus creating a unique training thematic block (Fig. 3).

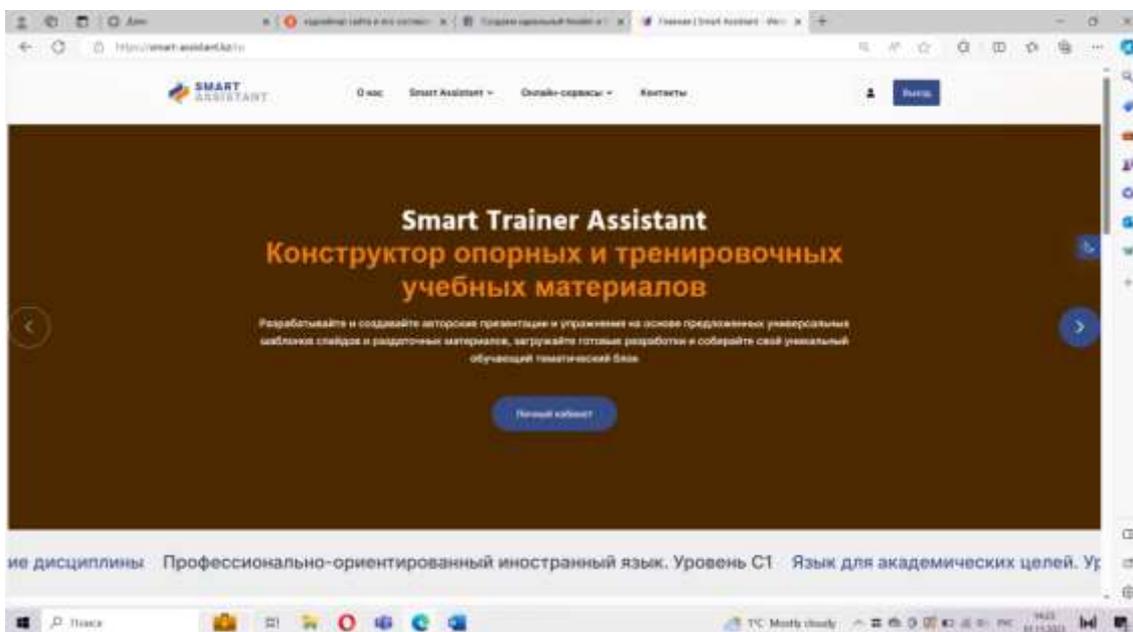


Figure 3. Interface of the Smart Trainer Assistant Designer

Smart Trainer Assistant allows the teacher to develop and create author's presentations and exercises based on the proposed universal templates of slides and handouts, download ready-made developments and assemble their own unique training thematic unit (Fig. 4).

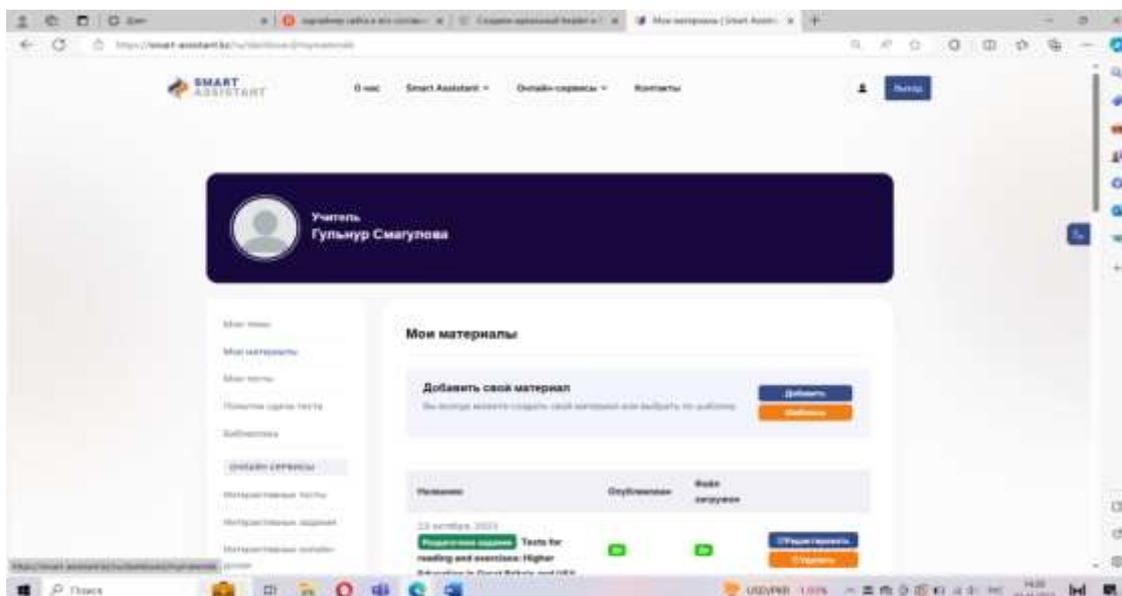


Figure 4. Adding Materials in the Smart Trainer Assistant Designer

Smart Tester Assistant is a constructor in which you can create up to 10 types of test tasks to form your own bank of assessment tasks using the suggested formats (Fig. 5).

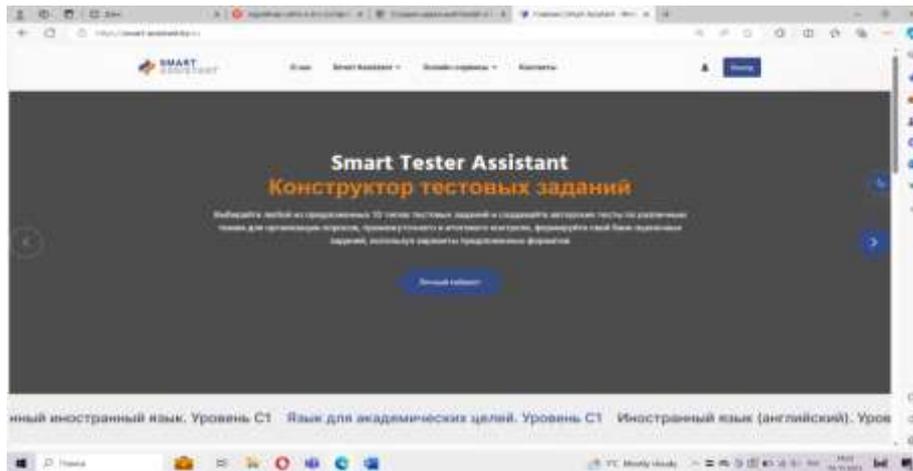


Figure 5. Interface of the Smart Tester Assistant Designer

Tests are automatically saved in the “My Tests” section and are available for adding to selected topics. Tests are interactive: students can take the test and familiarize themselves with the test results. The instructor will be notified when a student takes the test and receives the results (Fig. 6).

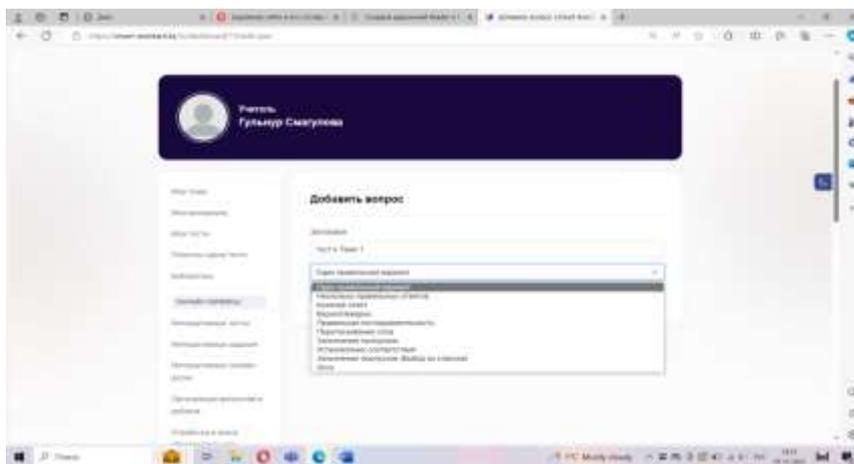


Figure 6. Adding tests in the Smart Tester Assistant designer

The builder offers the following types of test tasks: closed-type test with one correct answer choice; closed-type test with several correct answer choices; open-type test with one short answer choice; true/false test task; correct sequence task; open-type test task for filling in gaps; drag-and-drop words; matching; closed-type test task for filling in gaps by selecting an answer from a drop-down list; written test; and closed-type test task for filling in gaps by selecting an answer from a drop-down list. Smart Tester Assistant allows you to create test tasks and conduct surveys, midterm and final control, and form your own bank of assessment tasks using variants of the suggested formats.

The software product “SMART Assistant” combines the possibilities of using existing online educational tools and services and the developed interactive system “SMART-Assistant”, which provides optimization of the teacher's activity on the organization of learning activities, support for interaction between the subjects of the educational environment by placing links to relevant online services according to the functionality at each stage of the teacher's activity. This solution allows the teacher to choose the appropriate tool from the available list to solve his didactic tasks without the cost of searching for the appropriate tool.

The digital tools integrated into the software product include the following links to online services and reflect the system of Smart services, including:

1) Tools for organizing educational interaction, as well as for searching and working out educational content: interactive whiteboards, services for organizing online discussions and debates, services for working out and searching educational content, services for creating presentations, and systems for organizing educational information interaction.

- 2) Systems for creating interactive tasks.
- 3) Systems for testing and diagnostics.

The ability to move from the website “SMART-Assistant” to external resources through links integrated into the system provides an opportunity for teachers to expand their didactic materials and interactive tasks and exercises to deepen and expand the knowledge of students. The “Online Services” subsection redirects the user to the tab with the name of categories of links to the existing online tools for organizing learning interaction and creating learning materials (Fig. 7):

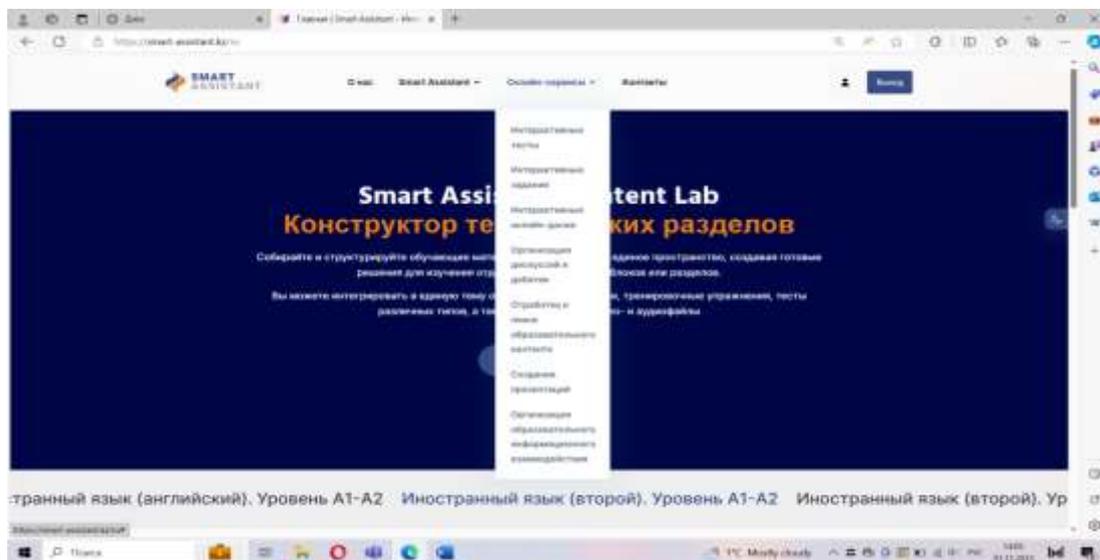


Figure 7. Online Services subsection of the SMART-Assistant software product

The work on the website is organized through the user account —personal cabinet. It organizes management, structures, and reflects the content of developed materials, and provides access to their creation, correction, and distribution. To effectively use smart technologies, a teacher must have several design skills in the field of designing and developing digital multimedia educational content (educational video lectures, videos, websites, web pages, interactive presentations, interactive tasks, exercises, tests, etc.).

To identify the level of readiness of teachers to apply smart technologies in educational activities, the following criteria were defined:

- 1) motivational;
- 2) cognitive (or knowledge);
- 3) operational (or activity).

According to each criterion, the corresponding indicators were identified (Table 1).

Table 1

**Description of teachers' readiness criteria for the use of smart technologies**

<i>№</i>	<i>Component</i>	<i>Criteria</i>	<i>Indicators (characteristics)</i>
1	Motivational component of readiness	Motivational criterion	Focus and persistent interest in mastering smart technologies, awareness of the significance and prospects of smart technologies application in personal, social, and professional aspects.
2	Cognitive component of readiness	Cognitive (knowledge) criterion	The formed system of knowledge about the essence and possibilities of smart technologies, about the features, methods, and principles of their implementation in the educational process, their importance for the development of their professional activity and optimization of the educational process as a whole; knowledge of the basics of working with services and programs for creating author's digital content and the principles of their selection.
3	Activity component of readiness	Operational (activity) criterion	Practical skills and abilities to apply and integrate smart technologies in the educational process, select and search for appropriate digital tools to solve a particular didactic task, develop digital educational products.

At the initial stage of the work, we determined the level indicators that allowed us to assess the degree of readiness of pedagogical staff to use smart technologies in the educational process. The following levels of teachers' readiness to use smart technologies were identified: very low (less than 50%), low (50%–69%), medium (70%–89%), high (90% and above).

At the same time, the implementation of the author's software product provided a number of components that ensure the comprehensive development of teachers' readiness to use smart technologies: the methodological component of readiness involves mastering the principles and methods of creating digital educational products and resources and is realized through instructions for using the product, intuitive interface, as well as the sequence of stages of its application from planning to evaluation of students' results; the content component includes the software product toolkit itself and its capabilities, as well as integrated through links to digital tools and online services for the development of digital educational content; the procedural component involves the process of using the “SMART-Assistant” website, as well as the use of these services to develop author's content and integrate it into the educational process; the reflexive component allows you to assess the level of readiness to implement smart technologies in your profession.

### *Results and discussion*

The external reflection of the forming readiness of teaching staff to the implementation of smart technologies in the educational process as a result of using the software product “SMART-Assistant” is a number of professionally important competencies of the teacher, which are reflected in Table 2.

Table 2

#### **A set of professionally important competences of a teacher in the context of their application of smart technologies**

№	Competence	Description
1	Knowledge of pedagogical and methodological regularities and principles of using modern digital and smart technologies in education	Understanding the methodological principles of using digital educational products and online services to ensure information and communication interaction of participants of the educational process, organization of their joint learning and search activities, inclusion of digital multimedia educational materials in the learning process. Understanding the methodological, didactic principles and technical aspects of creating interactive presentations, exercises and test tasks. Understanding the methodological validity and use of these products in a specific pedagogical situation to solve the set didactic goals.
2	Development of interactive digital educational content	Searching and selecting software technical tools for teaching practices and digital content creation; Possession of practical skills of working with digital educational resources; Mastery of skills of pedagogical design and development of digital educational through online services (to develop interactive presentations, assignments and tests) or specially object-oriented programs.
3	Applying smart technologies for learning	The critical selection of appropriate smart technologies for use in the learning process. Building personalized learning trajectories based on information about the progress and characteristics of each student in a blended learning environment. Applying a critical approach to finding relevant information in the digital environment and integrating online services and smart technologies into the learning process.

A modified questionnaire according to the method of O.A. Surova [11] containing 18 questions divided into three parts (six questions each) according to the identified criteria: motivational, cognitive, and operational. Surova [11], containing 18 questions, which are divided into three parts (six questions each) in accordance with the identified criteria: motivational, cognitive, and operational. The questionnaire was conducted twice, before and after the teachers used the software product “SMART Assistant”. The questionnaire data are presented in the corresponding Tables 3–5 below.

Table 3

**Results of the dynamics of levels of motivational component of teachers' readiness to use smart technologies before and after using the software product “SMART Assistant”, in %**

The levels of formation of the motivational component of readiness	1 level (very low)		2 level (low)		3 level (average)		4 level (high)	
	On the diagnostic stage	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment
(38 participants)	0	0	63,5 %	38 %	27 %	46%	9,5%	16%

The study of the data presented in Table 3 allows us to draw the following conclusions. At the beginning of the experiment, most teachers had a low level of learning motivation (63.5%), while 36.5% of participants were at the medium and high levels of motivation. More specifically, 27% of the trainees were at the third level of motivation and 9.5% were at the high level. However, by the end of the experiment, the percentage of teachers with low motivation decreased to 38%, while 62% of the trainees were at medium and high levels of motivation. In particular, 46% of teachers reached the third level of motivation, and 16% — the fourth level. It is important to note that the pedagogical effect (the difference between the percentage of participants with a low level of formation of the motivational component at the diagnostic (initial) and control (final) stages of the experiment is equal to 25.5% and is due to the increase in the number of participants with the third level of formation of learning motivation: from 27% to 46% as a result of using the software product “SMART Assistant”.

According to the presented data, the use of the software product “SMART Assistant” positively affects the development of teachers' motivation to work with smart technologies.

Table 4

**Results of the dynamics of cognitive component of teachers' readiness to use smart technologies before and after using the software product “SMART Assistant”, in %**

Levels of formation of the cognitive component of readiness	1 level (very low)		2 level (low)		3 level (average)		4 level (high)	
	On the diagnostic stage	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment
(38 participants)	0 %	0 %	56 %	19 %	34 %	64 %	10 %	17 %

According to the data of Table 4, we can establish a significant increase in the average level of formation of the cognitive component of teachers' readiness (from 34% to 64%) and a decrease in the number of participants with a low level (from 56% to 19%). According to the results of using the software product “SMART Assistant”, the percentage of participants with a high level of the cognitive component of readiness increased by 7%. The data indicate that the formation of the cognitive component of readiness to use smart technologies is formed more effectively than the motivational component, where the pedagogical effect is noticeably lower.

Table 5

**Dynamics of formation levels of the activity component of teachers' readiness before and after using the software product "SMART Assistant", in %**

Formation levels of the activity component of readiness	1 level (very low)		2 level (low)		3 level (average)		4 level (high)	
	On the diagnostic stage	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment	On the diagnostic stage of the experiment	At the control stage of the experiment	At the diagnostic stage of the experiment	At the control stage of the experiment
(38 participants)	0 %	0 %	63 %	24%	25 %	58 %	12 %	28 %

The analysis of Table 5 shows that the initial level of teachers' skills to create digital content was 63%, and the average and high level was 37%. By the end of the experiment, the proportion of teachers with a low level of skills decreased to 24%, and with an average and high level was 86% (58% at the third level and 28% at the fourth level). The pedagogical effect reached the value of 39%.

According to the data, the level of development of digital content creation skills of the trainees — the activity component — grows faster compared to the motivational component. This is explained by the fact that before the beginning of the experimental implementation of the software product, teachers already had a certain experience in the use of smart technologies, and had relevant knowledge and skills; in addition, in the framework of using the software product "SMART Assistant" the main attention is paid to the development of practical skills.

#### *Conclusion*

Overall, it was established that the issue of using smart technologies to create educational content arouses great interest among teachers. Most teachers (82%) actively use the software product "SMART Assistant" to develop educational content. 53% of teachers regularly use links to external resources to create interactive educational content, and 19% use these links once or up to three times. Most teachers (89%) use the collection of presentation templates, assignments, and tests available on the SMART Assistant website to develop author's digital educational content for students. In addition, 96% emphasize the functionality and usefulness of the built-in designers of the authoring product "SMART Assistant" the designer of educational sessions Smart Assistant Content Lab and the designer of test assignments Smart Tester Assistant (69%).

The data obtained because of the experimental work, to a certain extent, correlate with previous studies undertaken by foreign authors to study the impact of software products and tools on the productivity of the learning process and pedagogical activities when using digital and smart technologies. Thus, in the study by J. Petty on the results of 2022, it was noted the effectiveness and positive impact on the training of medical personnel when teachers use elements of virtual reality and immersive technologies [1]. In another study conducted by P. Davar, G. Nishantha [5] also reveals the successful implementation of a model of distance learning using modern digital and smart technologies, the integration of which largely contributed to solving the problems of distance learning and inclusion of students in various professionally related activities. Nevertheless, these studies were conducted within the framework of studying the assessment of students' learning achievements, rather than pedagogical readiness to carry out professional activities with the use of the mentioned smart tools, the use of which itself determines the readiness of teachers to implement them. A number of such studies confirm not only the effectiveness of using modern smart technologies in educational activities, but also the urgent need and demand for improving the readiness of teaching staff to use them.

Thus, the results of experimental work on the implementation of the software product "SMART Assistant", confirmed the hypothesis of the study, indicating that the use of this auxiliary software product that provides planning, systematization, and structuring of teachers' activities on the use of smart technologies in the educational process in the conditions of blended learning leads to an increase in the level of their readiness for educational activities with the use of smart technologies.

Prospects for further research in this direction may include the development of organizational and didactic mechanisms for the implementation of smart technologies in the educational process, the possibility of using smart technologies for inclusive education, as well as the study of the problems of formation of teachers' readiness for the implementation of smart technologies at different levels of education.

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Г.Ж. Смагулова, С.С. Касымов

## Жоғары оқу орындарында профессорлық-оқытушылық құрамының смарт-технологияларды пайдалануға дайындығын қалыптастыру

Аппараттық құралдарды жанартудағы қиындықтарды тиімді жеңу және мұғалімдердің компьютерлік технологиялардың жылдам дамуымен байланысты білім беру қызметінде смарт-технологияларды қолдануға дайындығын арттыру, аралас оқыту жағдайында оқу процесінде смарт-технологияларды пайдалану бойынша мұғалімдердің қызметін жоспарлауды, жүйелеуді және құрылымдауды қамтамасыз ететін қосалқы авторлық бағдарламалық өнімді енгізуге болады. Зерттеудің негізгі мақсаты білім беру қызметінде смарт-технологияларды тиімді пайдалануға педагог кадрлардың дайындығын қалыптастыруға ықпал ететін «SMART Assistant» бағдарламалық өнімінің тиімділігін әзірлеу және тексеру. Педагог кадрлардың смарт-технологияларды пайдалануға дайындығын қалыптастыру құралы ретінде «SMART Assistant» авторлық бағдарламалық өнімі болды, яғни ол сайт мұғалім үшін интерактивті конструктор және білім беру мазмұнын ұйымдастырушы. Бұл білім беру мазмұнын тиімді ұйымдастыру үшін дайын шешімдер мен қолданыстағы онлайн қызметтерді біріктіретін құрал. Осы зерттеудің жаңалығы академик Е.А. Бөкетов атындағы Қарағанды университеті шет тілдері факультетінде оқу процесіне енгізілген «SMART Assistant» авторлық бағдарламалық өнімді педагог кадрлардың смарт-технологияларды тиімді қолдануға дайындығының қалыптасу деңгейіне әсерін анықтау. «SMART Assistant» бағдарламалық өнімін енгізу бойынша тәжірибелік-эксперименттік жұмыстың нәтижелері зерттеу гипотезасын растап, оны оқу процесінде пайдаланудың компоненттері, яғни мотивациялық, когнитивтік, белсенділік аспектісінде смарт-технологияларды қолдана отырып, оқытушылардың білім беру қызметіне дайындық деңгейінің өсуіне әкелетінін көрсетті.

*Кілт сөздер:* смарт-технологиялар, цифрлық технологиялар, смарт білім беру, онлайн сервистер, аралас оқыту, оқытушының дайындығы, «SMART Assistant» бағдарламалық құралы, оқытушының жеке цифрлық білім беру ортасы.

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## Формирование готовности педагогических кадров вуза к использованию смарт-технологий

Эффективное преодоление трудностей с обновлением аппаратного обеспечения и повышением готовности педагогов к использованию смарт-технологий в образовательной деятельности, связанных с быстрым развитием компьютерных технологий, возможно при внедрении вспомогательного авторского программного продукта, который бы обеспечивал планирование, систематизацию и структуризацию деятельности педагогов по использованию смарт-технологий в учебном процессе в условиях смешанного обучения. Основная цель данного исследования заключается в разработке и проверке эффективности программного продукта «SMART Assistant», который способствовал бы формированию готовности педагогических кадров к эффективному использованию смарт-технологий в образовательной деятельности. В качестве инструмента формирования готовности педагогических кадров к использованию смарт-технологий выступил авторский программный продукт «SMART Assistant», который представляет собой сайт — интерактивный конструктор и органайзер образовательного контента для педагога. Это инструмент, интегрирующий готовые решения и существующие онлайн-сервисы для наиболее эффективной организации образовательного контента. Новизна настоящего исследования заключается в выявлении влияния авторского программного продукта «SMART Assistant», внедрённого в учебный процесс на факультете иностранного языка Карагандинского университета имени академика Е.А. Букегова, на уровень сформированности готовности педагогических кадров к эффективному применению смарт-технологий. Результаты опытно-экспериментальной работы по внедрению программного продукта «SMART Assistant» подтвердили гипотезу исследования, указывая на то, что его использование в учебном процессе приводит к росту уровня готовности педагогов к образовательной деятельности с применением смарт-технологий в аспекте выделенных компонентов готовности: мотивационного, когнитивного, деятельностного.

*Ключевые слова:* смарт-технологии, цифровые технологии, смарт-образование, онлайн-сервисы, смешанное обучение, готовность педагога, программный продукт «SMART Assistant», персональная цифровая образовательная среда педагога.

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