International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 03, 2020
ISSN: 1475-7192

Digital University, Student 'S Digital Footprint, Digital Education Currency in the System of Modern Higher Education

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Abstract--*The article analyzes the Russian and foreign experience of creating and operating a student's digital portfolio. An overview of e-learning in the United Kingdom, Singapore, Gambia, the European Union, the Republic of Kazakhstan, and Russia. The requirements of the Government's Digital economy program and the Roadmap for the Digital educational ecosystem of the Russian Federation are defined. Criteria for evaluating undergraduate and graduate students are defined. The steps for the transition to a Single digital educational ecosystem in Russia are described. Criteria for evaluating undergraduate and graduate students are defined. The steps for the transition to a Single digital educational ecosystem in Russia are described. The importance of human capital is determined using the example of Singapore. The concepts of digital educational currency, smart contacts, a unified authorization system using biometrics, the significance of a student's cognitive skills, digital mentor, digital HR, etc. are defined. The necessity of transition to mixed education is determined. This article was prepared as part of a research project on the topic "automated intelligent information management system (aisu) of the digital University. I. Digital Department", implemented with the financial support of the Russian state social University.*

Keywords--*digital double, Micro-credentials, smart contract, digital educational currency, learning quality assessment, student's digital portfolio, student's digital footprint.*

I. INTRODUCTION

1.1 Review of the E-Learning System for Foreign Students, Definition of Concepts and Boundaries of Subject Knowledge

In November 2018, Moscow hosted the E-Learning Russia Summit 2018. At the international summit, world Universities discussed e-learning, the use of a student's digital portfolio to track a student's overall academic performance and research interests. The summit conducted a statistical analysis of popular electronic educational content for students. The management of higher education institutions discussed issues of control over the use of a wide range of educational services in various areas of training.

N.P. Morris (Professor, Director of digital learning, University of Leeds, UK) justified the need to transfer the educational system to a digital platform, taking into account the new requirements of UK educational

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DOI: 10.37200/IJPR/V24I3/PR200936
Received: 19 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

standards (Morris, Swinnerton & Coop, 2019b).

Since November 2004, the United Kingdom's higher education quality Agency has introduced new educational standards. The Agency has created a working group that has the right to approve requirements for the quality of education. The main guidelines were: ensuring the variability and flexibility of educational programs, promoting innovation in the educational process, describing the expected qualities and abilities of graduates, in order to form common expectations for qualification standards. The UK education quality Agency has shown its experience, namely:"... our analysis covers an overview of the experience in creating and operating a digital portfolio. in this part, the UK standards offer the following structure: defining principles; the nature and boundaries of the subject; and the subject knowledge, understanding, and skills; teaching, learning, and evaluating knowledge." The assessment of a student (bachelor) in a digital portfolio must reflect the following criteria:

1. Full knowledge of the basic conceptual apparatus;

2. They show a systematic understanding of fundamental principles combined with the ability to apply existing knowledge in solving theoretical and practical problems;

3. Acquire knowledge about a wide range of organic and inorganic materials (for the disciplines of chemistry, nano-metarials, etc.) (Mukhametshin et al., 2019);

4. Can confirm an understanding of common synthesis methods, including separation, purification, and research techniques

5. They develop an understanding of the problems of science (according to the bachelor's classification) that intersect with other disciplines (Faleeva et al., 2017).

To conduct research on the student's academic assessment (how does the student learn and what are the student's learning abilities?), you need to determine the criteria. To this end, the team of authors will conduct research on the generalization of digital portfolio criteria.

II. METHODOLOGICAL FRAMEWORK

2.1. Review of Criteria for Evaluating the Digital Portfolio of Foreign Students

European approaches to assessing the quality of education (2014) can be found on the electronic resource, in research S.I. Nazarova (2014).

Master's Assessment Criteria (educational standard of the United Kingdom of great Britain):

According to the Bologna evaluation system, the criteria should be divided into bachelor's and master's degrees.

The following criteria should be reflected in the assessment of the student (master) in the digital portfolio:

1. TRAINING in RESEARCH SKILLS, namely: Acquisition of skills of design and experimental work; Assessment of existing (applied) scientific literature; Planning, including assessment of possible hazards and environmental impact; Preparation of oral reports, written reports, including critical thinking; Participation in

DOI: 10.37200/IJPR/V24I3/PR200936
Received: 19 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

colloquiums, seminars, conferences, classification of master's research areas.

2. RESEARCH PROJECT, Namely: conducting planned experiments; Recording data and their critical analysis; Dissertation; Potentially published research results.

3. TRAINING at an ADVANCED LEVEL, namely: in the field of specialization to continue research on a selected topic; Additional training outside the field of specialization, but related to it

4. PROFESSIONAL TRAINING namely: ethics and social responsibility; ImpactSuper-professional skills of masters (classification of master's abilities):

Classification of masters ' abilities:

1. INDEPENDENCE - problem-solving skills, the ability to show independence and an original approach;

2. SOCIABILITY - the ability to communicate and interact with professionals working in other scientific disciplines;

3. INITIATIVE and RESPONSIBILITY - the ability to show initiative and personal responsibility;

4. DECISIVENESS - the ability to make decisions in difficult and unpredictable situations.

Bachelor's Assessment Criteria (educational standard of the United Kingdom of great Britain):

Classification of bachelor's abilities: cognitive, practical, laboratory and data management skills, General competencies (common in nature or applicable to the context). Classification of bachelor's abilities: cognitive, practical, laboratory and data management skills, General competencies (common in nature or applicable to the context).

The assessment of a student (bachelor) in a digital portfolio should reflect the following criteria: General competencies for bachelor's qualifications:

1. Communication skills that include oral and written communication;

2. problem-solving skills related to quantitative and qualitative information, arithmetic and mathematical skills, including analysis of errors and errors, estimation of the order of quantitative values, correct use of units of measurement and methods of data presentation;

3. Skills for collecting information (from primary and secondary sources), including collecting information using Internet search engines;

4. Skills in the use of information technology;

5. Interpersonal skills related to the ability to interact with other people and work in a team

6. Organizational skills and time management skills, confirmed by the ability to plan and implement effective and effective forms of work in practice

7. Skills required for further professional training in the future.

The digital portfolio of a high school student in England has the following sections: title page, my impressions, my achievements, autobiography, Additional education (table), Social activities (separator),

DOI: 10.37200/IJPR/V24I3/PR200936
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Preparatory courses (table), Personal data (table), Life plans, Olympiads (table), Reviews and wishes, Official documents (separator), About me, Design and research activities; RESUME (download), CREATIVITY, participation in EVENTS, content (TABLE), BLANK SHEET.

In the process of applying Digital platforms, the University of Leeds highlights the re-evaluation of values, namely "the Impact of values on the implementation of e-learning". Features":

1. SPEED - We develop and test the advanced technology implementation model (VETA) - 5G (Rapidly developing services based on the Internet of things, virtual and augmented reality require fundamentally new mobile data transfer speeds and force vendors around the world to actively develop next-generation communication technologies. Today, Russian operators are testing and demonstrating the capabilities of 5G. The standard is expected to be Approved in 2020, and experts expect mass implementation of fifth-generation networks in the period from 2022 to 2025).
2. ACCESSIBILITY - we empirically demonstrate that the model is partially applicable to the implementation of e-learning in both the Gambia and the UK.
3. We are partially testing the UTAUT2 (The unified theory of technology adoption and use (UTAUT) is a model of technology adoption formulated by Venkatesh and others in the work "adoption by information technology users: towards a unified view". UTAUT seeks to explain the user's intent to use the information system and subsequent behavior when using it. The theory States that there are four key constructs: 1) expected productivity, 2) duration of effort, 3) social influence, and 4) facilitating conditions).
4. Model in the Gambia.
5. We show that the value of achievement indirectly influenced the student's intention to use e-learning through adoption factor

2.2 The Impact of Individual-Level Values on the Implementation of E-learning by Employees in the Gambia and the UK

In his abstract N.P. Morris, B. Swinnerton and T. Coop writes (2019a): "As technology continues to permeate our lives, the impact of culture on technology adoption is of considerable interest to researchers. However, culture, as a construct at the group level, may not produce significant results for adoption at the individual level. Although culture has been integrated into technology adoption models, values represent the representation of culture at the individual level and are more appropriate for inclusion in technology adoption models. There have been several studies on the impact of values on adoption models, and none of them have been conducted in the field of digital education with technology adoption models and apply a new conceptual model in the context of digital education. In this study, we examine the impact of individual-level values on the implementation of e-learning by employees in the Gambia and the UK. Using the unified theory of technology adoption and use (UTAUT2) as the basic model for e-learning by employees in the Gambia and the UK. Empirical results demonstrated the impact of self-improvement values in the model through social influence, price, and expected performance. The basic UTAUT2 model has been partially tested due to the fact that expected performance, price, and habit in General, we integrate values related to maintaining the status quo and

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self-improvement from the Schwartz theory of human values. Using this approach, we develop and implement the advanced technology implementation model (VETA. We tested the VETA implementation model and influenced the employee's intention to use e-learning" (Speech by Professor Neil Morris at the link,2018).

Neil Morris is head of the Department of educational technology, innovation and change at the school of education and Dean of digital education at the University of Leeds, reporting directly to the Deputy Vice-Chancellor for student education, he defines the need to maintain " Lecture notes to support learning: contested spaces between students and teachers. Highlights the following features:

1. Students use lecture notes during the semester for training, as well as for preparing for exams and reviewing exams.
2. Students ask for more recorded lectures and more rapid access to records
3. Attendance of students when recording lectures is significantly lower
4. Employees have mixed views on the effectiveness of recording lectures to support learning 5. Staff's perception of the value of lecture notes changes over time.

Neil Morris States that " Research has shown that mixed learning offers students at least equivalent learning outcomes and Universities around the world are increasingly offering students a mixed learning approach to support on-campus learning. In mixed learning, the student uses a wide range of educational courses to increase flexibility, inclusivity, engagement, and motivation.

The digital portfolio in Singapore is built in such a way that the student's portfolio data can be analyzed by neurobots or robots. This is due to the fact that one of the features of training is a clear division into streams, where each person is invited to study those disciplines that best fit their abilities. The government of Singapore is developing a flexible and diverse education system. The main goal is to provide the student with as many readable disciplines as possible, taking into account the satisfaction of the student's various interests and different ways of learning (source Ministry of Education, Singapore). The experience of developing education in Singapore has shown a high level of efficiency and global recognition. In the publication of domestic authors T.B. Alishev and A.H. Gilmutdinov (2010), page 227- "the experience of Singapore: creating a world-class educational system", the assessment of national educational standards using common criteria is given. as the authors write" according to the PIRLS (Progress in International literature Study), the level of functional literacy in Singapore is one of the highest...Singapore students show the best results in the world in comparative international tests of mathematics and science (TIMSS)... Singapore's educational system is best adapted to the requirements of the global economy."

2.3 Review of Criteria for Evaluating the Digital Portfolio of Russian Students

Digital portfolio is a modern type of document that contributes to the development and recruitment of personnel in the era of the Digital economy. Among the leading Russian e-Universities in Russia, we can consider approaches to filling out digital content on the platform of the "E-University Of the government of the

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Ryazan region" (www.eu62.ru).

Sections of the digital portfolio of the E-University Of the government of the Ryazan region are presented in the form: History of education; Employment; availability of certificates and awards; videos, photos, and multi-media data.

The developers of the digital portfolio of the Russian student note that working on the portfolio is very time-consuming, requiring the development of new knowledge to form an open personality. The presence of an electronic portfolio, as a digital document, helps to reduce the time to search for information on the candidate. The main task of an electronic portfolio is to show the versatility of a person. Monitoring the quality of pedagogical education is presented in I.V. Sokolova's (2012) research «Monitoring the quality of pedagogical education: scientific report on research (intermediate for 2011)».

Consider academic mobility in the Republic of Kazakhstan. In Kazakhstan, a system has been developed that allows any student to study or conduct research for a certain academic period in another higher education institution with the mandatory transfer of completed educational programs in the form of loans in their own University or to continue their studies in another University. In Kazakhstan, the European credit transfer and accumulation system (ECTS) is used as a method of assigning credit units to components of educational programs, which are used to compare and re – set the subjects mastered by students when changing the educational trajectory, the educational institution and the country of study Academic mobility program in Kazakhstan (Kuef.kz, 2020).

In Russia, the transition to the Digital economy is spelled out in the Roadmap for converting the analog economy to digital form. The Roadmap of the unified digital educational ecosystem (UTSOP) introduces the main concepts:

1. Digital double – (from the English. digital twin) a digital copy of all the physiological and biological characteristics of a person, their actions, digitized in real time.
2. MOOC – (from the English. Massive open online courses) a training course with mass interactive participation with the use of e-learning technologies and open access via the Internet, one of the forms of distance education.
3. Open Micro-Learning is a short training material (often in interactive audio or video format) that requires no more than 5 minutes to study it.
4. Micro-credentials – a small award / distinction / certificate received for completing part of the course. Motivates the student to continue learning without stopping.
5. Smart contract – (English. smart contract is a computer algorithm designed to enter into and maintain commercial contracts in the blockchain technology.
6. Blockchain – (eng. blockchain or block chain) a continuous sequential chain of blocks (a connected list) containing information built according to certain rules. Most often, copies of block chains are stored on many

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different computers independently of each other.

The concept of "unified digital educational ecosystem" strategically defines the steps of the path in the new educational environment: three STEPS on the WAY to a NEW DIGITAL EDUCATIONAL ENVIRONMENT (The concept of the government of the Russian Federation, 2019):

Step 1.1 Reducing the significance of the OGE / use 1.1. Reduce the share of state final certification in the total student portfolio to 75-85%. The remaining 15-25% can be attributed to other achievements.

Step 1.2. Create an ecosystem for recording and analyzing all achievements. Develop a technology for evaluating a person's achievements in the form of an individual rating.

"An applicant must enter an educational organization not only according to the OGE/use scores and the results of Olympiads. Its rating should be differentiated. For example, such successes as "3 months of successful practice in Sberbank", "creating a scientific and technical startup that managed to earn more than 1 million rubles on the market", "solving 5 intellectual tasks published by Yandex" or "creating a video that has gained 5 million views on YouTube" should be taken into account when enrolling for training. Now the state can only ensure transparency of OGE/use scores and Olympiads. With global digitalization, it is already possible to significantly expand the list of human achievements that can be reliably confirmed through modern technologies. The creation of such differentiation will allow creating conditions for a person to develop on an individual educational trajectory and receive competencies that are more important for the country's economy."The implementation of this step will seriously change the system of training at school – instead of preparing for tests, students will be motivated to receive additional points for other achievements. However, this does not motivate universities to work on improving the quality of training – applicants will still come to them to study for human budget money, which can be reliably confirmed through modern technologies.

Step 2. Creating a digital educational currency

Step 2.1 Create a state exchange of digital educational currency. The digital educational currency must be equivalent to the basic unit of tuition for one student at one University in the country and indexed by the state according to the current economic situation. Only legal entities can purchase the currency. And only individuals can spend currency and only for training in a certified organize

Expand opportunities for obtaining and using digital educational currency, and connect all interested parties to the system: educational organizations, students, and employers. Example: let's say any employer can organize their own Olympiad and award winners with digital educational currency. Thus, the employer will identify itself in the labor market, and applicants, taking part in various activities, will receive additional currency.

Step 2.3. Funding for educational organizations must be fully transferred to the digital educational currency using smart contracts between the student and the educational organization. State bodies (the Ministry, the Federal Treasury) will control this process. Thus, all educational organizations will fight for applicants to come to them.

Step 3. Creating an ecosystem of educational services

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Step 3.1 Maximize the importance of a single authorization system using biometrics for all participants in the education system.

Step 3.2 Create a system for evaluating the quality of education, which will determine the rating of all educational organizations and their certification. Grades will be given by both students and employers who received a recent graduate. The evaluation system will be publicly available, and everyone will be able to read reviews of courses and see the rating of the educational organization and the achievements of its graduates when choosing.

Step 3.3 Create a personal educational portfolio based on blockchain technology, which will replace all documents on education and training in digital form.

Step 3.4. Create a system for evaluating people's cognitive skills.

Step 3.5. Develop a digital mentor – a special service that builds a personal development trajectory based on professional orientation, using personal portfolio data and identifying hidden talents. Offers and recommends training courses, practices, Olympiads, internships, grants, etc.

Step 3.6.Develop a digital HR-special service that will offer the student development in the direction required for the employer, using the data of the student's personal portfolio. The service will help employers at an early stage to support the formation of the educational and personal trajectory of certain children: from invitations to their own courses to incentives in the form of digital educational currency for specific external courses or educational programs.

In the results research Chapter we will summarize the experience of developing the digital educational world of foreign countries and Russian.

III. RESULTS

From the analysis of scientists ' works, we can draw conclusions about why Singapore achieved such results: in order to raise the country, it was decided to develop human capital.

1. The task was to raise a technically educated and competent workforce.
2. The shift of ethnic educational programs towards the use of a single language (English), since the ethnic groups of the Chinese and Asian majority opposed the optimization of education and bringing it to a single standard, since English is a means of communication in international business.
3. in the early years, Singapore's education sector was fully funded from the budget.
4. Raising the share of qualified teachers
5. transition from a League of countries with labor-intensive industries to a group of countries with predominantly capital-intensive production.
6. improving the social status of teachers and teachers
7. introduction of continuous and systematic professional development for teachers and TOP managers.

DOI: 10.37200/IJPR/V24I3/PR200936
Received: 19 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020

8. an Institute of technical education is being created from disparate vocational education institutions based on the campus system.
9. requirements for admission to technical higher education institutions have increased
10. the salary of qualified technical personnel has increased (700-1200 SGD)
11. there is a tendency to attract girls to technical UNIVERSITIES;
12. the Ministry of education of Singapore has focused on the educational competence of students, the cancellation of streaming classes, changing the focus of training in the event of changes in the academic mobility of the student.
13. creating an incentive environment (grants, endowment, exchange of students for academic mobility programs, coaching, etc.)

If we draw a conclusion from the publication of authors T.B. Alishev and A.H. Gilmutdinov (2010), we can say that Singapore has developed a dynamic IMAGE-educational system in the education system, which operates with minimal costs, with high discipline of citizens in their studies and work.

Many universities around the world (including Australia, the US, Canada, Singapore, Qatar, and all of Europe) have adopted lecture capture as a means of supporting a mixed approach to learning. Students have a strong positive view of the value of recording lectures to enhance their learning and support their education. However, research shows that teaching staff tend to be less positive about the value of capturing lectures. Considering that this reduces the value of the live lecture experience, reduces learning and encourages students to skip lectures. In this study, we used mixed methods and cross-sectional data collection to investigate the use and value of lecture recordings from the perspective of students and faculty on a large campus, using a mixed learning approach. Our data shows that students make extensive use of lecture recordings throughout the academic session and attach great importance to recordings for taking notes, better understanding or explanation, and preparing for assessment. As a result, students have high hopes for the availability and quality of records. The teaching staff reported a number of reservations about the value of lecture recordings, including its impact on teaching style, and strong concerns about the negative impact of lecture recordings on student learning and attendance. Our data shows that more than 80% of students attended recorded lectures, but lectures that were not recorded had significantly higher attendance.

Educational standards of the European Union The publication of S.I. Nazarova (2014) "Trends in the development of European education: structure, standards, quality assessment", electronic scientific and practical journal" Modern scientific research and innovation "describes approaches to assessing the quality of modern European education and some trends in its modernization. The author writes". European register for quality assurance of higher education. The Standing Committee on Higher Education and Research (HERSC) monitors compliance with the quality of higher education. The Bologna process working group (BFUG) and the European center for the development of professional education(CEDEFOP) follow the process of implementing uniform requirements and recommendations in the educational systems of national higher education structures)

The results of monitoring the quality of education on the relevant indicators were reflected in the report of

DOI: 10.37200/IJPR/V24I3/PR200936
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the European, H.M. Ivanov (2011), Report of the European Commission "Progress in achieving pan-European standards in education and training (2011), Standards and directives for quality assurance agencies in higher education in Europe (2015) and European approaches to assessing the quality of education (2014).

IV. DISCUSSION

Speech by Russian President Vladimir Putin (2019) approved a national strategy for the development of artificial intelligence until 2030. “In order to accelerate the development of artificial intelligence in the Russian Federation, conduct scientific research in the field of artificial intelligence, increase the availability of information and computing resources for users, improve the training system in this area, it is necessary to apply a national strategy for the development of artificial intelligence until 2030,” - the document says. «Artificial intelligence in a strategy refers to technological solutions that allow you to simulate the cognitive functions of a person and get results when performing certain tasks that are comparable, at least, with the results of intellectual human activity. Artificial intelligence includes IT infrastructure, software (including that using machine learning methods), as well as processes and services for processing data and finding solutions, the strategy says. Countries with the development of artificial intelligence will receive advantages not comparable to nuclear weapons, Russia has every chance of succeeding in this, said Russian President Vladimir Putin earlier» V.V. Putin approved the development strategy of artificial intelligence until 2030.

In the study, we analyzed the work of the Luciano SASO research team at the Estars (2018) plenary session " Luciano SASO (Prof. Luciano Saso (luciano.saso@uniroma1.it) is author of more than 200 original scientific articles published in peer reviewed international journals with impact factor (H-index Google Scholar = 45, H-index SCOPUS = 37, Total Impact Factor >500) mainly in the field of oxidative stress and antioxidants)

1. Plenary session (Estars, 2018):
2. Luciano SASO working group (Estars, 2018)
3. The materials of the conference (Materials of the conference of the higher school of Economics Proceedings of the International Conference, 2018).

Additionally, a publication on self-regulated online learning is of interest (Jeltsen, 2017). The P. Jeltsen (2017) report aims to provide an evidence-based overview and understanding of self-regulatory learning (SRL).

V. CONCLUSION

In conclusion, our study demonstrates the contested space between staff and students regarding the use and value of lecture recordings, a contested space that will need to be discussed and resolved as universities expand the use of blended learning (Makarova et al., 2019). This study makes a significant contribution to this global debate, as it uses a wide range of additional data sets to further deepen and provide a more detailed view of this space, but lectures that were not recorded had significantly higher attendance, the team of authors agrees with the professor N.P. Morris, B. Swinnerton and T. Coop (2019b).

By the end of 2019, the Digital economy of the Russian Federation program aims to create a format for individual profiles of citizens ' competencies and trajectories of their development, including a record of their

DOI: 10.37200/IJPR/V24I3/PR200936
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educational and work activities and results. Source: Order of the Government of the Russian Federation No. 1632-R of July 28, 2017 "on approval of the program" Digital economy of the Russian Federation» (Decree of the President of the Russian Federation, 2019).

Russian state social University conducts research on the internal grant "Digital University". This article was prepared as part of a research project on the topic “Automated Intelligent Information Management System (AIISU) of a Digital University. I. Digital Department”, implemented with financial support from the Russian State Social University.

The analysis of Russian and foreign experience in creating and operating a digital portfolio was based on the works of foreign authors: N.P. Morris, B. Swinnerton and T. Coop (2019a, 2019b), P. Jeltsen (2017), T.B. Alishev and A.H. Gilmutdinov (2010), S.I. Nazarova (2014), E.A. Khitskov et al. (2017), S.V. Veretekhina et al. (2018a), S.V. Veretekhina et al. (2018b), speech by Russian President Vladimir Putin (2019), Speech by Professor Neil Morris at the link (2018), and the concept of the government of the Russian Federation (2019).

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DOI: 10.37200/IJPR/V24I3/PR200936
Received: 19 Jan 2020 | Revised: 06 Feb 2020 | Accepted: 12 Feb 2020