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PEDAGOGICAL SCIENCES

CRITICAL THINKING OF FUTURE TEACHERS AS AN IMPORTANT COMPONENT OF TEACHER PROFESSIONAL CULTURE

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Abstract
This article focuses on the critical thinking of students in vocational training in high school. The author analyzes one of the rapidly developing areas of reform of the system of modern higher education as a focus on the development of critical thinking of the person, which implies the existence of skills of reflection about their own mental activity, the ability to work with concepts, judgments, conclusions, issues, and development of analytical, forecasting activities problematic vision, the search for alternative and innovative forms, means and methods for facilitating management to meet the challenges.

Keywords: critical thinking, forecasting activities, modern higher education.

In modern society, the need for developing individuals capable not only of reproducing existing norms and traditions but also of independently analyzing, evaluating, drawing conclusions, making adequate and objective decisions, and self-developing in personal and professional terms while rejecting their own stereotypes in activities and behavior is becoming increasingly relevant. At the same time, the requirements for professional competencies of specialists and their level of personal responsibility for the professional decisions they make are increasing, which is associated with the trend towards building an open, democratic society characterized by high mobility, creativity, ability to innovate, and criticism.

Every person is capable of thinking, and this is what allows humanity to develop. When we think, we usually process the information we receive based on what we already know and make our judgments. No one can deny that all people go through this process many times a day. We can question the result of our thinking process, that is, our judgments. We often make mistakes in our judgments, and this is where critical thinking can help us.

One of the actively developing directions of reforming the system of modern higher education is the focus on the development of critical thinking of the individual, which implies the presence of skills for reflection on one's own mental activity, the ability to work with concepts, judgments, conclusions, questions, the development of analytical and forecasting abilities, problem vision, the search for alternative and innovative forms, means and methods that contribute to rational decision-making on tasks and problems, as well as the ability to evaluate similar opportunities for others. This makes the development of this type of thinking an important condition for the formation of a competitive personality of a teacher.

Many researchers, such as I.S. Litvinova, O.M. Semenova, M.A. Tarasova, T.V. Kharlampeva, and others, have studied critical thinking and consider it an important component of professional education.

Research has shown that the modern education system should be built on providing students with the opportunity to reflect, formulate, and argue their own point of view based on knowledge of facts, laws, and regularities of science, as well as their own observations and the experience of others.

The development of students' critical thinking, as noted by A.V. Korzhuyev, V.A. Popkov, has a positive influence on the formation of the competence of future specialists and is recognized as a necessity of the modern education system [1; 2].

The presence of a high level of critical thinking skills contributes to the development of competencies necessary for effective educational and professional activities of teachers in universities, such as systemic and interpersonal competencies. Therefore, if the development of critical thinking affects the competence of a teacher, then to enhance this positive influence, the process of developing critical thinking should be based on the specifics of professional activity.

Currently, in higher education pedagogy, the problem of the professional and personal development of university teachers is actively being developed. Works by P.A. Shatskov, G.V. Shchagina, I.A. Romanova and others consider issues of forming value orientations and professionally significant qualities of a teacher.

Some scholars define critical thinking as "social thinking" or "socially-directed thinking", which exists in society and seeks to improve society by rethinking its problems and drawing conclusions about their solutions. Taken together with the above, this provides a basis for believing that the development of this type of

thinking will contribute to the improvement of professional university training of specialists in the pedagogical field.

Implementation of critical thinking by teachers in their educational and professional activities also contributes to rational planning of their own educational and professional activities and prioritization of their functional responsibilities, improving the quality of students' perception and assimilation of educational material. Therefore, it improves the quality of education of future teachers in the process of acquiring specialized knowledge, skills, and abilities, obtaining the most reliable and up-to-date, professionally-oriented information, and developing alternative solutions to educational and professional problems.

An analysis of philosophical and psycho-pedagogical literature has shown that the problem of developing critical thinking in modern science is very interesting and relevant. It has been established that "critical thinking" is, first and foremost, a type of thinking with a specific critical orientation. The category of "thinking" belongs to interdisciplinary concepts and is the subject of study of various sciences such as philosophy, psychology, pedagogy, physiology, sociology, etc., and its examination is carried out in a philosophical, psychological, pedagogical context.

The analysis of the views of philosophers (Bacon, G. Hegel, I. Kant, Plato, Socrates, B. Spinoza, and others) shows that in philosophy, "thinking" is considered as a phenomenon characterized by objectivity and having several forms, the ability to independently comprehend reality, create, solve, and act according to certain rules, a necessary element of knowledge, and an independent essence of nature, not dependent on humans or humanity.

In psychology, thinking is one of the actively developed categories. Different psychological schools approach this phenomenon differently, such as associationists (D. Hartley, E. Darwin, Spencer, and others), representatives of another school (K. Bühler, Marber, J. Watt, and others), behaviorists (E. Gazzaniga, J. Watson, and others), and cognitive psychologists (A. Newell, H. A. Simon, and others).

Existing interpretations of "thinking" reveal various aspects of this concept as a developing ability to solve various tasks and transform reality in a purposeful way, aimed at revealing hidden aspects of reality that are not immediately observable (L. S. Vygotsky, P. Ya. Galperin, A. N. Leontiev, S. L. Rubinstein, D. B. Elkonin, and others).

Thus, in modern psychological science, the category of "thinking" is disclosed in a broad sense as active cognitive activity, as well as an internal process of planning and regulating external activity, and in a narrow sense as a process of solving various tasks or problems.

In many psychological studies, the concept of "thinking" is considered identical to the concept of "intelligence," but intelligence plays a role as a concept that unites an individual's cognitive and creative abilities. Thinking, in turn, accumulates an individual's intellectual abilities to solve various problems and tasks. Therefore, the process and result of an individual's thinking depend on their intellectual abilities, but intelligence develops thanks to the improvement of the quality of cognitive and creative abilities. In other words, the development of thinking is simultaneously the process of developing intelligence.

If psychology studies thinking as a mental process, then pedagogy is interested in thinking as an individual's ability to acquire knowledge and the process of its formation and development. Analysis of pedagogical research on the problem of formation and development of thinking allows us to note that scientists study thinking as a way of solving problems (its basis was laid by A. Distervig, H. Pestalozzi, J.-J. Rousseau and received further development in the theory of problem-based learning); develop ways and methods of forming and developing professionally-oriented types of thinking in the process of preparing future specialists (V. Slastenin, T. Kudryavtsev, V. Medvedev, E. Osipova, and others). Also, pedagogy pays special attention to the formation and development of various types of human thinking with the aim of improving the quality of their social adaptation, assessing various phenomena, solving problems and tasks, acquiring new knowledge, etc. (T. Badanova, D. Bragina, N. Vysotchikina, T. Polyakova, and others).

In the Pedagogical Dictionary, thinking is understood as "mediated reflection of the external world, which is based on impressions from reality and enables a person, depending on the knowledge, skills, and abilities they have acquired, to correctly operate information, successfully build their plans and programs of behavior." Along with the term "thinking," the concepts of "mental development" and "mental upbringing" are often used in pedagogy. Although these two concepts are close in meaning, they have some significant differences. "Mental upbringing" is a process aimed at the subject of upbringing, while "mental development" is a process of changes inherent in the subject of pedagogical influence. At the same time, mental upbringing largely determines mental development, contributes to it, but this happens only if the regularities and possibilities of the mental development of the subject of pedagogical influence are taken into account. Therefore, in pedagogy, great attention is paid to studying the features of the ontogenesis of personality thinking.

The concept of "criticism" is mainly used in two meanings: as a negative attitude towards something and as the expression of an opinion about something based on analysis of facts. In pedagogy, the concept of "criticism" is crucial for the direction of the thinking process and relates to the process of analysis and drawing conclusions. Therefore, in a broad sense, criticism should be regarded as an analysis of the essence, regularities, and results of phenomena with the aim of making an objective judgment.

Developing critical thinking skills in students during their professional training in university is necessary because at this age stage, there is a higher speed of working memory and attention switching, effective solution of verbal-logical problems, making it a favorable period for purposeful development of critical thinking.

In their professional activities, a teacher performs educational, organizational, prognostic, preventive, organizational-communicative, and other functions in such areas of activity as: protecting the human rights proclaimed by the UN Convention to life and healthy development, education and free expression of their views, protection against any kind of discrimination, etc.; establishing normal interpersonal relationships in the team. In order to successfully perform the above functions, a teacher must have a certain level of development of analytical, prognostic, reflective skills.

Analyzing the professional activities of a teacher and their professional and personal qualities shows that the content of a teacher's work is determined by the functions they perform, and the requirements for their professional and personal qualities are based on the fact that they exert a great influence on the personality of the student during their professional activities, and the effectiveness of the development of these qualities significantly affects the success of their professional pedagogical work.

The concept of "critical thinking" originated within formal logic, however, critical thinking has a practical orientation, which allows it to be interpreted as a form of practical logic that is considered within and dependent on the context of reasoning and individual characteristics of the reasoning subject. One of the most important features of critical thinking is that it enables individuals to analyze and construct reasoning based on logic and objectivity, to argue their conclusions, to acquire knowledge that forms the basis of their professional activities, and to reassess their own prejudices and stereotypes in behavior, activities, and thinking. An analysis of the characteristics of critical thinking contained in the definitions of various authors shows that the main ones are purposefulness, organization, rationality, reflexivity, analyticality, and logicality.

Critical thinking of a future teacher aimed at solving problems and pedagogical tasks may contain errors that arise during the analysis of initial data, which can be detected by analyzing the process of critical thinking itself. However, the analytical component of a teacher's critical thinking allows tracking positive and negative changes, as well as identifying errors and inaccuracies in solving professional problems. Logical thinking, which is present at every stage of critical thinking, is responsible for correcting the consequences of errors and taking into account changes in circumstances that arise during a teacher's critical thinking process.

The rationality of a teacher's critical thinking helps prevent subjectivity in making certain decisions within the given task. The organization of a teacher's critical thinking has several features related to the specifics of their professional activity. It should initially take into account the non-static nature of the object of pedagogical influence, which may cause some circumstances to change. When there are multiple factors that are not always amenable to analysis, providing a clear and precise prediction of the final result or the result of a critical thinking stage is challenging.

Reflectiveness, as a characteristic of a teacher's critical thinking, emphasizes the importance of their professional and personal experience in solving the tasks at hand. By reflecting on the problems during the process of critical thinking, the teacher consciously applies their personal experience to draw conclusions regarding the ways to solve them and to gain new experience. Reflection becomes a process of mutual, mirrored reflection between subjects, the content of which is the reproduction and recreation of each other's features. This is also important because while working with students, the teacher not only solves their problems but also teaches them how to solve problems independently. The experience gained by the teacher during the problem-solving process, when perceived reflectively, contributes to an increase in their level of professionalism.

The characteristics of critical thinking in a teacher that have been discussed above are interrelated: dominating at different stages, they reflect the process of critical thinking.

Critical reflection and resolution of professional problem situations is a process that is largely creative, often involving the search for innovative, alternative ways, means, and forms, and therefore cannot be based solely on theoretical knowledge and research and pedagogical technologies acquired by students. Sharing the point of view of A.S. Sharov and I.A. Sharshov on the necessity of complementing the intellectual and creative components for the effective professional and creative self-development of future specialists, it can be stated that critical and creative types of thinking are interrelated: creative problem solving is impossible without understanding its essence, and critical thinking itself is not a way to solve a problem [4;5].

However, critical thinking plays an important role in the process of implementing practically all the main functions of a teacher (organizational, educational, diagnostic, prognostic, organizational-communicative, etc.).

Critical thinking of a teacher is a professionally oriented type of thinking that determines the reflective-analytical position of a specialist. It is manifested in the vision and analysis of problematic aspects of the interaction between the "person-person" and "person-society" systems, in the evaluation of the adequacy of measures taken to perform professionally significant tasks in the field of pedagogical activity, readiness to abandon stereotypes and search for logically-alternative solutions.

Indicators of the development of critical thinking include the ability to plan and organize educational and professional activities, the ability for self-analysis and self-development, the ability to assess and verify the process of solving professionally significant problems, proficiency in working with professional-oriented information and its sources, the ability to solve non-standard professionally-oriented situations, the ability to establish cause-and-effect relationships between different phenomena, and the ability to search for alternative ways to achieve set goals.

The goal of the pedagogical technology for developing critical thinking skills in the process of professional training in university is to create conditions for the formation of a progressive level of critical thinking and its active use in the educational and professional

activities of students. The integrity and interconnection of the characteristics and indicators of the development of a teacher's critical thinking skills ensure a substantive unity, which is achieved through the flexible use of various forms and methods of joint activities between students and teachers.

In conclusion, it is important to emphasize that critical thinking skills are necessary for everyone. We must be aware of our own shortcomings, biases, prejudices, as well as the sources of our worldview, paradigms, and information channels that we use when processing new information. Critical thinking is not an instant action, it requires effort and courage to admit our own mistakes. Teaching critical thinking is also not an instant process. State and non-state educational institutions should strive to develop critical thinking skills among students, and such a desire may require us to change our approach to teaching. It is very important that we, acting for the benefit of all humanity, take the necessary steps to increase the number of people in the world who think critically.

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PSYCHOLOGICAL SCIENCES

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"ADAPTIVE INTELLIGENCE": HEURISTIC POTENTIAL OF THE CONCEPT

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Abstract
In the face of rapid change and uncertainty, a person is looking for the ways to keep unchanged what is important to him. Among other means, the productive combination of intelligence and adaptation is discussed. The purpose of this paper is to explore the importance of "adaptive intelligence" concept, the possibilities and ways of working with it. The need for the empirical study of everyday ideas concerning "adaptive intelligence" concept is shown, the design and expected results of the research are described.

Keywords: intelligence; adaptation; adaptive intelligence; coping; psychosemantic research.

The issue of adaptation nowadays is widely represented in philosophical, psychological, and sociological scientific papers as well as in media sphere. According to A.G. Asmolov, *discussion of unpredictability, adaptation, and non-adaptation is becoming "intellectual fashion"* (Asmolov, Shekhter, Tchernorizov, 2108, 50). The books about challenging unpredictability, e.g. "Antifragility" by N.N. Taleb, are sold in big numbers. There are new problematic terms in scientific discourse: starting with a familiar "socio-psychological adaptation", and adding "personal adaptive potential" (Maklakov), "non-adaptive activity" (Pertrovskiy), and "pre-adaptation" (Asmolov).

Russian Public Opinion Research Center reports that the end of February 2022, as well as the spring of 2020, were characterized by the rise of anxiety, irritability, and disorientation levels among Russian citizens (Lvov, 2022). Increased due to covid-19 pandemic and the events in Ukraine in February 2022, ambiguity in social sphere lead to the growth of interest to the topics of uncertainty and adaptation not only among scientists but also among population of the country in general.

"A strange world; the world of exploded unpredictability has already come" (Asmolov, Shekhter, Tchernorizov, 2108, 50), in such circumstances the need to describe and analyze adaptive potential seems especially important. *How satisfying are the existing models for adaptation assessment and adaption training techniques? Is it possible to single out a specific range of adaptive abilities that could be assessed, measured, and developed as well as cognitive abilities and intelligence?*

Is the idea of "adaptive intelligence" a possible basis for future research and effective practical training or is it a possible source of more ambiguity in the semantic field of varied kinds of intelligence? The research, the idea of which is described herein, seeks to find the answers to such questions. **The aim** of the research on the adaptive intelligence is to define its value, possibilities and ways to work with it, and determine possible directions of further knowledge development and scientific research on adaptive intelligence.

J. Piaget was one of the first researches to write about the connection between intelligence and adaptation: *"for us, intelligence is a certain destination, but its beginning lies within sensomotor adaptation in general as well as within the lowest forms of biological adaptation"* (Piaget, 2004, 11). The scientist, in fact, defines intelligence through the adaptive processes of assimilation and accommodation. The level of "intellectuality" of behavior, according to Piaget, can be defined through the complexity and variability of influence trajectories that a subject uses towards objects. Modern authors develop this idea defining the adaptation as the main task of intelligence: search for the decisions in problematic situations and successful acquisition of various activities (Kholodnaya 2022).

For several decades there has been developing the discussion on a common factor of intelligence in general and separate intellectual abilities. However, a certain answer to the question "how many kinds of intelligences are there", has yet not been found (Kholodnaya 2002, 23). The issue has started to expand beyond the field of knowledge of cognitive psychology. In addition to "psychometric" intelligence, H. Eysenck mentions "biological" and "social" intelligence; H. Gardner describes the wide range of independent types of intelligence in his theory of "multiple intelligences" such as musical-rhythmic, linguistic-verbal, logical-mathematical, visual-spatial, bodily-kinesthetic, interpersonal, and intrapersonal ones (Kholodnaya 2002).

Special attention should be payed to the term "emotional intelligence", which was first mentioned in psychological papers in 1960s, and gained popularity in the end of 1990s – the beginning of 2000s due to journalist Daniel Goleman's works. The most widespread theory of emotional intelligence belongs to Mayer, Salovey, and Caruso, who define emotional intelligence as a type of social intelligence, which includes the ability to notice one's own and other people's emotions, differentiate those emotions, and use gathered data to guide one's thoughts and decisions (Salovey, Mayer 1990).

Can we consider it reasonable to include "adaptive intelligence" into the already overwhelmed semantic

field of other "intelligences"? *If any intelligence is responsible for adaptation as well as other functions, then the term "adaptive intelligence" seems abundant. Nevertheless, it is possible to assume there are certain specific abilities to adapt, which spread beyond cognitive features as well as emotional and social intelligence, and are worth to be studied and described separately from aforementioned.*

The notion "intelligence" is much wider than just adaptive skills. It can also include factors, which do not influence adaptive processes directly, but are connected with cognitive activity. Intelligence is not always equal to adaptation, e.g. one can acquire, understand and effectively use knowledge about M. Vrubel's frescos, but, in most cases, this knowledge will not contribute to their adaptive skills. Knowledge can have such influence only if the environment requires it for one's survival. Differences between these notions lead to their symbiosis: adaptive intelligence (AI). We hope AI will help to study coping mechanisms from a novel point of view.

It is important to study the term "adaptation" in socio-humanitarian disciplines. This merely biological term at first then has acquired additional meanings in psychology. Some scientists understand *adaptation as the emergence of behavioral models and strategies, which are suitable to existing circumstances; moreover, it is balanced relationship with the environment including social and cultural ones* (Georgievskiy 1989). The most suitable to our research is the term "*individual adaptive potential*" stated by A.G. Maklakov. He gives it the following definition: "an integrative feature, which includes steady combination of individual psychological and personal qualities contributing to effective adaptation" (Maklakov, Sidorova, 2011, 41). As the components of the adaptive potential, the scientist recognized *neuro-psychological stability, one's self-esteem, feeling of social support, one's proneness to conflicts, and experience of social communication*.

Psychological adaptation assessment is based on analyzing such factors as life satisfaction, subjective well-being, and the ability to solve problematic issues in social communication (Melnikova 2004). Some

modern Russian researches state the issue of the connection between socio-psychological adaptation and intelligence, but they do not go any further than eliciting and analyzing correlations between the two.

The exact term *"adaptive intelligence"* can be found in the works of R. Sternberg. He defines this notion as the cognitive activity targeted to task-oriented adaptation, choice and formation of the environment; this activity includes the set of skills, attitudes and behaviors based on *creative analytical and practice-oriented thinking and wisdom* (Sternberg, 2021).

It is crucial to further explore the interrelation between semantic fields of the notions "intelligence" and "adaptation" as well as clarify the structure of the skills comprising adaptive intelligence.

We have conducted **the phenomenological analysis** aiming to elicit typical ideas and create a psycho-semantic model of real world, which is in fact underlies the term "adaptive intelligence".

We have devised the following stages of the research:

a) to gather semantic base necessary to articulate the notion "adaptive intelligence";

b) to base the research on the empirically extracted data, namely, associations given by several hundreds of respondents, the bearers of commonplace consciousness;

c) use this data instead of the opinions stated by a limited number of researches who offer only their intuitive ideas to discuss the issue in question.

Study process:

1. Primary collection of phenomena, i.e. stories mentioning AI cases in real context. The search is conducted on social media and with the help of offline surveys.

2. Expertise method is used for eliciting particular stories with all necessary features.

3. Comprising relevant AI thesaurus through Google Forms questionnaire.

4. Content analysis of the data received. Frequency analysis.

5. Designing target AI notions using empirical results.

Results.

Categories of everyday consciousness	WEIGHT – frequency
Creativity	317
Positive peer feedback	314
Improvisation, resourcefulness	199
Skills	175
Coping with the pressure from the objective reality	142
Self-control	139
Intelligence	138
Pro-active attitude	137
Energy-efficient distribution of resources	137
Communicative qualities	115
Time control	109
Powerful influence	100
Belief in oneself	94
Analysis of the situation	84
Mastery, fine execution	78
Ability to relate and compromise	70
Positive results, winning	67
Luck	65
Metaphors, similes	44

Figure 1. Discovered categories ranged according to frequency decrease (semantic weight)

Special attention should be paid to coping potential:

- coping with the pressure from the objective reality;
- self-control;
- pro-active attitude;
- energy-efficient distribution of resources;
- belief in oneself;
- positive results, winning.

Mentioned points mean that a bearer of well-developed adaptive intelligence with higher probability can overcome stress pressure.

As for main goal of the research described, discovered constructs can be used for creating needed notions. First drafts of such notions are presented further.

Scientific definition:

Adaptive intelligence (AI) is the ability to take the best possible decisions in the context of inward and outward limitations. Thus, to assess efficacy of a decision it is necessary to understand the subjective reality of a person making this decision.

For educators:

Adaptive intelligence (AI) is the individual ability to go out and beyond any limitations, either personal or cognitive. One should be fitting in existing society and flexible, and yet showing their individuality.

For recipients:

Adaptive intelligence is the ability to find a solution in any situation where no one else has managed to find it.

Characteristics of model setting: 1) relevance of linguistic intuition (being understandable), 2) psycho-technical potential (persuasiveness), 3) rich operationalization (practical usage).

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SOCIAL SCIENCES

DEVELOPMENT OF DIGITAL LEARNING WITHIN HIGHER EDUCATION SECTOR

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Abstract
In recent years, the higher education sector has seen a dramatic shift towards digital learning, providing students with more options for their educational pursuits. This article will explore the benefits of digital learning in higher education, the challenges universities face when implementing digital learning, and strategies for maximizing digital learning within the higher education sector.

Keywords: online teaching, digital learning, higher education

The digital age has revolutionized the way we learn, transforming traditional education systems and giving rise to new methods of learning. In this essay, I will explore the history of digital learning, starting with the evolution of digital learning technologies, their impact on education systems, and their adoption by institutions and organizations. By examining the development of digital learning, we can better understand the implications for modern education. The COVID-19 pandemic has accelerated the adoption of digital learning within higher education, with many institutions shifting to fully online or hybrid teaching models. This has required instructors to adapt their teaching methods and use new technologies to support student learning. Digital learning refers to the use of digital technologies, such as online platforms and digital resources, to support teaching and learning.

One key development has been the growth of Massive Open Online Courses (MOOCs), which offer free online courses to anyone with an internet connection. MOOCs have enabled learners from all over the world to access high-quality education from top universities.

Another trend has been the adoption of learning management systems (LMS) such as Blackboard, Canvas, and Moodle, which allow instructors to create and manage online course materials, assessments, and discussions. These systems provide a centralized platform for course content, grading, and communication, making it easier for instructors to manage their courses and for students to access course materials.

The evolution of digital learning technologies has been a topic of much research and discussion in recent years. Recently, Lau, Yen, Li, and Wah conducted a study in 2014 to examine the current trends in digital learning technologies. The study showed that digital learning technologies have become increasingly popular and widely used in the past few years. It also revealed that the use of digital learning technologies is growing rapidly, with an estimated 80% of students worldwide having some form of access to digital learning technologies. The study found that digital learning technologies allow students to access educational materials at their own pace and from any location, which can improve both the quality and quantity of learning. Furthermore, the study concluded that digital learning technologies can also reduce the cost of education and make it more accessible to those who may not have had the opportunity to learn in traditional settings. The study concluded that digital learning technologies are here to stay, and that they will continue to play an increasingly important role in education today and in the future.

Digital learning has had a profound impact on education systems around the world. According to A. Al-Adwan and J. Smedley (2012) , digital learning is changing the way students learn, interact with instructors, and receive content. It has allowed instructors to provide students with access to a range of resources, content, and activities that would have been previously unavailable. Furthermore, digital learning has enabled instructors to create personalized learning experiences for each student, allowing them to tailor course content to the individual student's needs. As a result, digital learning has had a positive impact on the way education systems are designed and operate. Digital learning has allowed for the development of more effective teaching strategies, as well as the creation of more engaging and interactive educational experiences for students. Additionally, it has allowed for more efficient use of resources and a more cost-effective approach to providing access to educational content. This has allowed educators to provide students with access to a wider range of resources, which in turn has helped to improve the quality of education and the level of student engagement. Ultimately, digital learning has had a significant impact on the way educational systems are designed and operated, helping to improve the quality of education and create more engaging and interactive educational experiences for students.

The adoption of digital learning by institutions and organizations has become an increasingly important part of the educational landscape. As technology continues to evolve, the need for digital learning solutions has become more evident. According to Jan, Lu, and Chou, authors of the 2012 article "The Adoption of Digital Learning by Institutions and Organizations," the primary factors driving the adoption of digital learning are the cost-effectiveness of online instruction, the convenience of online learning, and the flexibility and scalability of online learning environments (Jan, Lu, & Chou, 2012). As such, institutions and organizations are increasingly turning to digital learning solutions to

provide effective and efficient training and development. The authors note that the success of digital learning adoption is highly dependent on the institution's or organization's capacity to effectively manage and implement the technology. Organizations must have the proper infrastructure, resources, and staffing in place in order to effectively utilize digital learning tools (Jan, Lu, & Chou, 2012). Furthermore, organizations must create comprehensive policies and procedures for online instruction and ensure that there is adequate technical and instructional support for online learners. By taking these steps, organizations can ensure that their digital learning initiatives are successful.

The history of digital learning has evolved significantly over time, from early adopters of technology to a more comprehensive approach that utilizes the best technologies available. Nowadays, digital learning is an invaluable tool for educators, students, and businesses alike. It facilitates collaboration, streamlines educational processes, and enhances communication which all help to engender learning through more engaging, interactive, and effective means. As digital learning continues to evolve and improve, educational institutions, teachers, and students stand to benefit from its continued incorporation into the educational experience.

There are several theories that can help explain digital learning, including:

1. Constructivism: This theory posits that learners construct their own understanding of the world through their experiences and interactions with their environment. In the context of digital learning, this means that learners are actively engaged in constructing their own knowledge through interactions with digital resources and activities.

2. Connectivism: This theory emphasizes the importance of networks and connections in learning. In the context of digital learning, this means that learners are able to tap into a vast network of resources and connect with other learners and experts from around the world.

3. Social learning theory: This theory emphasizes the importance of social interaction in learning. In the context of digital learning, this means that learners can engage in collaborative activities and discussions with their peers, instructors, and other experts to enhance their learning.

4. Cognitive load theory: This theory suggests that learners have a limited capacity for processing information, and that instructional materials should be designed to minimize extraneous cognitive load and maximize germane cognitive load. In the context of digital learning, this means that instructional designers should focus on creating clear, concise, and engaging materials that help learners focus on the most important information.

5. Self-determination theory: This theory emphasizes the importance of intrinsic motivation in learning. In the context of digital learning, this means that learners are more likely to be motivated and engaged when they have a sense of autonomy, competence, and relatedness in their learning activities.

Digital learning has become increasingly popular in higher education over the past few decades due to its numerous advantages. According to Arkorful and Abaidoo, authors of "Analysis of Instructional Technology and Distance Learning", digital learning can be used to create greater access to higher education for those who would otherwise not be able to attend traditional universities. For example, digital learning can enable students to take classes from their own homes or remote locations, eliminating the need to travel to a physical campus. Additionally, digital learning can also provide a more cost-effective way of obtaining a degree, as students may not need to purchase certain educational materials such as textbooks. Furthermore, digital learning also offers students more flexibility in their learning, enabling them to complete courses at their own pace and convenience. This flexibility is especially beneficial for those students who may have to balance their studies with a job or other commitments. In addition, digital learning can also provide an opportunity for students to interact with instructors and peers in an online environment, allowing them to benefit from each other's knowledge and experiences. All of these benefits of digital learning make it an attractive option for those seeking to pursue higher education.

One of the main challenges faced by universities in implementing digital learning is the lack of awareness among faculty and students about the importance of online learning. This is a problem that can be seen in many countries, as reported by Kibuku et al. (2020) in their study on the implementation of e-learning in universities in Uganda. They found that many faculty members and students are not aware of the potential benefits of digital learning and its applications. Furthermore, the study found that faculty members often lack the skills or knowledge necessary to use the necessary technologies and make effective use of the digital tools available to them. Additionally, the study highlighted the lack of access to digital devices, such as computers and mobile phones, which can limit the effectiveness of digital learning. Moreover, the study pointed out the lack of institutional support in terms of providing technical and pedagogical training for faculty members, which can further impede the successful implementation of digital learning. These findings highlight the need for universities to focus on raising awareness about the importance of digital learning and providing adequate training for faculty members and students in order to effectively implement digital learning.

In the article "E-Learning and Digital Media: Opportunities and Challenges", Islam, Sarker, and Zaman discuss strategies for maximizing digital learning in higher education (Islam et al., 2022). They begin by noting that digital learning can provide many advantages, such as increased access and affordability, student engagement, and improved learning outcomes. In order to maximize these benefits, they suggest that educators should be open to new learning methods and technologies and should create engaging content that is tailored to the needs of the students. They also emphasize the importance of developing effective instructional strategies, designing engaging activities, and

providing supportive feedback. In addition, they suggest that teachers should consider the use of virtual reality and augmented reality technologies to create more interactive learning experiences and should also take advantage of the opportunities that digital learning provides for collaboration between students and teachers. Finally, they emphasize the importance of providing adequate technical support and training to ensure the success of digital learning initiatives. By following these strategies, educators can create engaging, effective, and successful digital learning experiences in higher education.

There are many examples of successful cases of digital learning at universities, the best cases are following:

1. Harvard University's online course on "Justice": This course, taught by Professor Michael Sandel, has been offered online for free through edX since 2013. It has reached millions of learners from around the world and has been widely praised for its engaging and interactive format.

2. Arizona State University's adaptive learning program: Arizona State University has developed an adaptive learning program called ASU Adaptive that uses artificial intelligence to personalize the learning experience for each student. The program has been shown to improve student outcomes and retention rates.

3. Georgia Institute of Technology's online master's degree in computer science: This program, offered through Udacity, has been successful in attracting learners from around the world who are looking for a flexible and affordable way to earn a master's degree in computer science. The program has been praised for its rigorous curriculum and strong student support.

4. University of Michigan's online courses on Coursera: The University of Michigan has developed a number of popular online courses on Coursera, including courses on programming, data science, and business. These courses have reached millions of learners from around the world and have been praised for their high-quality content and engaging format.

5. University of Edinburgh's digital education initiatives: The University of Edinburgh has been a leader in digital education, developing a number of successful initiatives such as the Edinburgh Model for Online Teaching and Learning (EMOTL) and the Digital Education Futures Initiative. These initiatives have helped to transform the university's approach to teaching and learning and have been widely recognized as innovative and effective.

The development of digital learning within higher education has enabled educators to provide students with greater flexibility and more accessible educational resources. Furthermore, digital learning has allowed students more freedom to design a learning approach that fits their individual needs, allowing them to get the most out of their educational experience. Digital learning is thus not only beneficial for students, but for institutions, as it simplifies and expedites the distribution of educational content. Higher education has embraced the advancement of digital education and continues to grow in order to ensure students have access to improved digital learning solutions. In addition, the use of digital resources such as online textbooks, videos, and interactive simulations has become increasingly common in higher education. These resources can supplement traditional classroom instruction, provide more flexibility for students, and enhance the learning experience.

Overall, the development of digital learning within higher education has the potential to make education more accessible and flexible, to enhance the learning experience, and to provide new opportunities for collaboration and engagement. However, it is important to ensure that digital learning is designed in a way that promotes effective teaching and learning, and that it does not exacerbate existing inequalities in access to education.

In conclusion, institutions and organizations are increasingly turning to digital learning solutions to provide effective and efficient training and development. In order for these initiatives to be successful, organizations must have the proper infrastructure, resources, and staffing in place and must create comprehensive policies and procedures for online instruction. With the right strategies in place, digital learning can revolutionize the way that institutions and organizations deliver training and development. Digital learning has become increasingly important in the higher education sector, with more universities and colleges offering online courses and resources to students. This has allowed for greater access to education, as well as more flexibility in how students learn. Digital learning has also enabled universities to provide more personalized learning experiences, as well as improved collaboration between students and faculty.

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