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The role of the teacher-student relationship in the innovation of education: Interdisciplinary review of the issue

Abstract. Many contemporary authors addressed digital and online education, competencies, and lifelong learning. However, less is said about the importance of interpersonal relationships, even though they are essential for preserving the sustainability of education. The research aims to examine the field of human relations. To achieve this goal, the theory of organisational and social psychology was used. Relations can only be implemented through interpersonal dialogue. From an environmental perspective, both subjective and objective factors were determined to define the strength of the relationship. It was concluded that the teacher's personality is the key to success at all levels of education. It is justified that the result of curricula's central regulation is that the education of tomorrow's professionals is directed by today's professionals, who often have an interest in providing what is needed now rather than what may be needed in the future. It is proved that it is not enough for students to be aware of the academic mission, nor for the university to be a kind of training site for the labour market. From a socio-psychological perspective, it was disclosed that teaching quality mattered most, but subject to the theory of organisational psychology. The introduced materials can be utilized by universities to work on the nature of graduates' preparation through the advancement of their character. Considering various approaches to the organization of education participants' activities and characteristics of their self-development, the model for the formation of the value system of future teachers will make it possible to provide conditions for the individualization of training paths

Keywords: career planning; instruction; paradigm shift; Industry 4.0; creativity; interpersonal relationships

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INTRODUCTION

Many aspects of life have undergone a paradigm shift as a result of Industry 4.0. The digitalization of industry, which will integrate marketplaces and supply chains, automated systems, interconnected factories, and advanced technologies into combined physical, digital, and biological worlds, has been described using this new paradigm (Bratu *et al.*, 2023). L. Kohnová and N. Salajová (2023) demonstrate a paradigm shift in how suppliers are perceived to be powerful, as well as the strong technological push and primary focus on product innovation in Slovakia. Data has taken over the industrial context of today, driven by the Industry 4.0 paradigm (Sabbatini *et al.*, 2023).

In education, new approaches and learning environments emerged, and initial labour market competencies

were also altered. These days, many creators manage advanced and online schooling, abilities, and deep-rooted learning. S. Perrin and L. Wang (2021) discovered that if universities want to participate by the rules of Industry 4.0, they need to better train their teaching staff for digitalized education. With the emergence of novel concepts and technological advancements, Industry 4.0 presents new education opportunities. One of these is combined learning, which bridges the gap between traditional classroom and online learning (Etom *et al.*, 2021). An online platform that implements distance-based forms of e-learning for specialists is a novel component of the information service in the field of technical training of specialists for Industry 4.0 (Gurjanov *et al.*, 2021).

However, despite their crucial role in ensuring the sustainability of education, interpersonal relationships are less addressed. V. Wibeck *et al.* (2019) demonstrated that interpersonal relationships and sustainability closely correlate, including a sense of belonging. Interpersonal Relationships, Industry-Person Congeniality, Organisational Climate, Working Conditions, and Nature of Work were the five dimensions J.M. Luo *et al.* (2018) used to measure students' attitudes. The proposed measurement scale will assist in determining the sustainability of partnerships between universities and businesses. In higher education, the importance of students having relational bonds with their teachers, faculty, and staff outweighs recent shifts in educational funding, which is why it is advisable to further investigate RQ (Snijders *et al.*, 2018).

The previous role of the teacher is being transformed: they are not a transferer of lexical knowledge and an assessor, but a leader. Teachers' main task is to guide the student in the exponentially growing information labyrinth. A. Bandur (2018) investigated the critical determinants of compelling school-based administration (SBA) for improved teaching–learning conditions and understudy accomplishments by noticing school initiative, school advancement arranging and changing jobs of school pioneers under SBA change. D.W. Shaffer *et al.* (2015) analysed how education is changing in the digital age, how teachers' roles are changing in a technology-rich education system, and how teachers will need to support students' social, emotional, and intellectual development in a digital learning environment. L. Raj (2009) discusses how teachers' roles are evolving into teacher-leadership roles in the developing Indian scenario.

This study examines the role of the teacher-student relationship, which is the basis of education. It aims to determine how the paradigm shift taking place in modern education and innovation are related to the teacher-student relationship developed in traditional education. The objectives are to find means and intervention areas to influence and enhance relationships between students and teachers.

The methodology of the study differs from the usual samples. Based on an interdisciplinary comparison, an examination of how educational science is seen by scientists from other fields has been conducted. Multidisciplinary, Interdisciplinary, and Convergence Research were

considered as basic elements that build upon one another, with minor but distinct differences. Both interdisciplinary and convergence research are based on multidisciplinary research. In a similar vein, interdisciplinary research has resulted in convergence research, which goes beyond the integration of disciplines to incorporate societal impact into disciplines that have not previously collaborated. First, the broader context of the teacher-student relationship has been considered, focusing primarily on the phenomenon of Industry 4.0 and the future of education.

Among the frontier sciences of pedagogy and educational science, the findings of social psychology have been disclosed. These findings, which correspond to each university's corresponding Areas of Challenge, focus on the significance of social and learning relationships throughout all phases of education, in both formal and informal settings (Official website of the University…, n.d.). They also examine how these relationships affect the effectiveness and retention of practitioners, as well as the quality of children's learning experiences. Research that is cross-disciplinary in its theoretical and methodological approaches is produced when social psychology is applied to teaching, learning, and other educational experiences. This research not only contributes to the generation of knowledge within the academic community but also informs policy and practice.

INDUSTRY 4.0 AS AN INTEGRAL PHENOMENON OF OUR TIMES

The era that marks the integration of ICTs into educational settings to develop instructional, pedagogical, and technological processes is known as Education 4.0 (Atasoy, 2023). It also enhances operational procedures by providing novel approaches to education and instruction, as well as creative solutions to societal issues of the present and future. It also aims to demonstrate management tools and intelligent infrastructure. Emerging technologies like Metaverse and immersive virtual reality (IVR) are creating new directions for education's future (Wei & Yuan, 2023). Societies are undergoing rapid and significant change (OECD, 2018). The environment presents a first obstacle. The depletion of natural resources and climate change necessitates immediate action and adaptation. The economic issue is another obstacle. Social issues are a third obstacle. It is time to develop new institutional, social, and economic models that aim to improve everyone's lives.

Industry 4.0 is an integral phenomenon of our era. It is a scientific and technical revolution in which digitization, robotics, and the ever-closer human-machine relationship play the main role. Machines work with us and for us, decision-making is increasingly being entrusted to algorithms. Going further back in history, the time horizon of certainty expands. In ancient cultures (Egypt, India, China) thousands of years passed without significant changes. It also means that the future is predictable. There was still uncertainty in everyday matters, which is why the soothsayers of Delphi or Dodona, for example, prospered.

Today, the situation has changed radically. One of the reasons for this is the ever-accelerating development of computer technology and technical sciences. The younger the generation, the more it becomes evident that their whole life, including most of their decision-making mechanisms, is woven through the active use of internet technology (Grotte & Magyar, 2023).

In recent years, several studies have been published that stated that today's schools should prepare students for professions that cannot even be foreseen in the future (Digital Marketing Institute, 2014; Belli, 2017; Tencer, 2017). Although their reasoning is logical, the future is not so uncertain (Doxtdator, 2017). The young people of today will themselves be the creators of the professions of the future, so they do not have to learn them "in advance".

Industry 4.0 has brought its achievements to education as well. While previously the relationship between these two areas could be observed primarily in vocational education at the secondary school level, today the relationship between industry and higher education has become much more important. Inhibiting an ecological concept is an effective way of achieving mutualism (Baranyai & Veres, 2020). It is about a coexistence that is mutually beneficial for both parties. Higher education has always been a key driver of economic growth, increasing the skills of the workforce and stimulating innovation. But rapidly changing industry needs, and funding models are transforming the relationship between universities and the private sector. On the one hand, the availability of higher education affects an increasingly wide range of people. Although the "degree mills" phenomenon hurts both the labour market and higher education (Ezell & Bear, 2012), the mass spread of higher education worldwide is driven by the desire for better skills, higher level knowledge, increasing productivity and more effective innovation.

Futurology is still almost as exact today as it was in ancient Greece. The article by Power is noteworthy (Power, 2022). According to the study, by 2026, machines will be better at writing school essays, and by 2050, algorithms will be writing bestsellers. Therefore, sooner or later, machines will be better than people in everything. They could also decide our fate and existence (Cameron, 1985). However, there is one human quality that will never belong to machines: the ability to make decisions based on emotions and instincts. These can be linked to areas still unknown to science, such as the limbic system or the collective unconscious (Durant, 1985; Plutchik & Kellerman, 2013). Therefore, the compilation and teaching of learning content could be entrusted to machines, but then the education equation could be simplified by omitting a very important factor: the factor of human relationships.

THE ENVIRONMENT AND ELEMENTS OF THE TEACHER-STUDENT RELATIONSHIP

The teacher's role has been transformed; the reading–questioning method was replaced by the concept of the assistant-leader-support teacher. This is not new either, this is how Virgil taught Dante (Alighieri, 1320/2005) or Adam taught Lucifer (Madách, 1861).

It is worth contemplating how a professor would approach an evaluation of their teaching portfolio. Presumably, they would describe the course or subject and the level of instruction: whether it is primary school, secondary school teacher, or university lecturer. Taking time for a minor psychological tactic utilizing rating the following answer to the above question from one to five (1 = strongly disagree, ... 5 = strongly agree): "I teach students", the hope remaining for the future of pedagogy will be a linear function of the assigned score. The higher the assigned score is, the more hope remains for the future of pedagogy. This is the baseline for the other questions raised.

In recent years, partly as a result of the forced closures due to COVID-19, the focus of the literature and decision-makers has increasingly been directed towards digital education. Studies and methodological guides have been published on the topic (Dringó-Horváth *et al.*, 2020; Malatyinszki, 2022b; Farkas *et al.*, 2021;). Studies and books, such as the attention-grabbing works of D. Watson (2009; 2014), explain that authority on English higher education is less and less prominent. The author of these laid down the "laws of the academic jungle". Although these laws are rather humorous, they address the importance of the role played by personality in higher education. The authors of this study add to this by noting that the teacher's personality is the key to success at all levels of education. Watson also provided a conceptual impression of the relationship between industry and higher education. He stated that in the early 21st century, just as universities tried to be similar to workplaces, workplaces were increasingly trying to look like universities.

In almost all universities, the curriculum is regulated by professional bodies or the government. The result is that the education of tomorrow's professionals is directed by today's professionals, who often have an interest in providing what is needed now rather than what may be needed in the future.

Nevertheless, let us take a look at what students necessitate. It is not enough for them to be aware of the academic mission, nor for the university to be a kind of training place and preparation for the labour market. Universities should be places where students are helped to acquire sound and usable interdisciplinary knowledge and the ability to learn independently. At least three parties are involved in the issue: universities, the labour market, and students. Universities as institutions are changing. The labour market is changing at an accelerating pace. But perhaps most importantly, the students themselves are active actors in this change. They want more hands-on experience to dive into their first career after graduation. They want assignments that outline a real business problem for a real company and find out why the problem exists and how to solve it. Such tasks require two types of knowledge. One is academic, lexical knowledge (English pedagogical slang calls this book smart), but life experience (street smarts) is also required. Neither form of knowledge is new.

Schools have been teaching for a long time, but it is also an old truth that life teaches life.

One of the possibilities of a long life is personal example, which also establishes the quality of the teacher-student relationship. The most important characteristic of a personal example is that it is always an adequate reaction to the given circumstances. Within the ancient walls of an English college, real success can be achieved by treating students as peers and arousing their interest in the subject (Weir, 1989) – if institutional adherence to traditional principles does not prevent this. Students in secondary school who do not like to study can be motivated by success in another activity (Carter, 2005). Even vulnerable children can be positively influenced (Radler, 1999). Early Childhood Education and Care (ECEC) for refugee children have the potential to improve outcomes for them, but the majority of the research is from high-income nations (Stevens *et al.*, 2023). Survey research methods may be used to study vulnerable and stigmatized groups because of a purely academic interest in human behaviour and its motivations, a concern about these groups' safety and well-being, or a concern about the risks these groups may pose for other people (Berry & Gunn, 2014). In terms of vulnerability, there is a multitude of different scenarios. Higher education's response to similar events in the future can be guided by an understanding of the impact of change on vulnerable students (Horner *et al.*, 2022). Weak understudies need direction in adapting abilities to oversee emotional well-being chances when they are away from family and naturally encouraging groups of people.

A SOCIAL PSYCHOLOGICAL APPROACH TO THE TEACHER-STUDENT RELATIONSHIP

A good teacher-student relationship has a positive effect on the teacher as well. Teachers who consider it important to maintain positive, personal relationships with students (Spilt *et al.*, 2011) are not only more satisfied with their work (Admiraal *et al.*, 2019), but also have greater self-efficacy (Mashburn *et al.*, 2006) and are emotionally more stable (Milatz *et al.*, 2015). Recent studies also confirm that experiencing the teacher-student relationship as "belonging to a community" results in more effective teaching practice on the part of the teacher (van der Lans *et al.*, 2020). Interestingly, in the literature, even though many authors deal with the issue of the teacher-student relationship, there are hardly any studies of van der Lans or others on how positive relationships can be linked to the quality of teaching practice.

The question is dealt with by the science of organisational psychology, which examines the impact of positive relationships on the performance of adults. One of the theories dealing with this issue is the leader-member exchange theory (LMX). In the jargon of the theory, the teacher corresponds to the leader and the student to the follower (Dulebohn *et al.*, 2012). According to this, the relationship of managers with all their subordinates is not the same. They develop strong relationships based on trust, emotion, and

respect with some members of the team, but not with others (Bauer & Erdogan, 2015). On the other hand, subordinates' attitudes and behaviour towards work depend on how their manager treats them (Rockstuhl *et al.*, 2012). According to the research results of C.R. Gerstner and D.V. Day (1997), a more positive relationship among followers results in better performance, greater satisfaction with the leader and greater commitment to the organisation. At the same time, leaders judge such followers more positively and typically set positive expectations towards them. Interestingly, the literature on the theory is quite broad, but to the authors, the theory seems rather as tautology, since in the authors' opinion, it is a well-known fact that a better interpersonal relationship leads to better performance and better evaluations. Studying the literature, the authors made sure they were not alone in their opinions (House & Aditya, 1997; Gottfredson *et al.*, 2020).

Another social psychological theory is transactional management, which, operating with reward and withdrawal, effectively motivates followers mainly in the short term by breaking processes into independent parts (Hargis *et al.*, 2011). The theory of X and Y dates back much earlier (McGregor, 2006). The former describes the command-driven, pressure-operated management style, and the latter the cooperative-communicative management. D. McGregor sees the latter approach as more effective because it unlocks the potential of human capital. Famous for his hierarchy of needs theory (Maslow, 1969), the theory was expanded with behaviour Z, which approaches the issue from the point of view of morality. However, the picture is not black or white; other authors (Lawrence & Lorsch, 1986) have shown that approach X is more effective than others in certain organisational conditions. M. Ahmad *et al.* (2021) implement the same idea into librarianship. As an example, the hierarchical and highly performance-oriented system of the military can be mentioned (Vassiliou *et al.*, 2014). Therefore, X and Y are not two opposite ends of a continuum, but two different approaches. For the majority of organisations, success is achieved with an ideal combination of these. Over the last few decades, many changes in higher education and training formats have been witnessed. The most significant change occurred in adult education and the appearance and credibility of online degrees.

THE RELATIONSHIP BETWEEN TEACHERS AND STUDENTS AS A CENTRAL COMPONENT OF THE EDUCATIONAL PROCESS

The value of all science is fundamentally determined by its usability (Szelei & Malatyinszki, 2017). The practice test is one of the most important filters. In education, the teacher-student relationship is positively influenced by playing together. Not only small children are playful, but even "serious" adults enjoy relaxation. A relaxed state has been proven to enhance performance (Denny, 1971; Stern *et al.*, 2022). E. Demerouti (2023) evidenced that working or studying is an effective way of maintaining high levels of well-being

and performance. R.M. Mohamed and M.A.M. Ali (2023) support on-campus students to alleviate their feelings and relax due to the demonstrated positive effects on students' mental well-being of napping, meditation, relaxation, sharing feelings and experiences, which may increase the brain's capacity for learning, which is relevant to a student's level of education. The role of games in education is now analysed by a separate discipline, referred to as gamification. Web-based gaming is a well-known type of recreational action among people, with a few explanations behind its prevalence, for example, giving a way to stretch help, rivalry, and unwinding (Kannan *et al.*, 2023). Simulation games help solve real-world problems, such as StockTrak, a stock market simulation used in economics education that teaches practical investment skills (stocktrak.com). The play-acting nature of learning is highlighted by the script theory (Tomkins, 1987; Fischer *et al.*, 2013; Demetriadis, 2013). As such, human behaviour consists of analogue activities similar to a written script, which provide an appropriate program of action for a given situation. The theory is also applied to the digital trends characteristic of education in our time to develop artificial intelligence (AI). A script is a structured representation that describes a stereotypical sequence of events in a given context. Scripts are used in systems that understand natural language to organize a knowledge base, based on the situations that the system needs to understand (Schank, 2008). Since ready-made scripts are often long, they are non-flexible. Therefore, in this case, it is broken down into smaller units, so-called memory organisation packages, which the AI can freely combine.

It is, indeed, much easier for the teacher to stand on the podium and repeat the text, prepared in advance over years and decades every year, perhaps illustrating it with an old presentation. But this only results in a lack of interest in today's students and absenteeism from lectures. Gaining positive feedback from students is much more difficult and time-consuming: finding ways to incorporate interactive, challenging – and fun – learning opportunities into every lesson. Although this teaching and learning approach is gaining ground, it is of course not yet a standard operating procedure in higher education. In most colleges and universities around the world, students know what to expect in many courses: they sign into a classroom or lecture hall and sit passively while their instructor talks for an hour or more. This happened even when the COVID-19 pandemic forced education into the digital space. It turned out that although the authors had tools for online education, they did not use their possibilities. Traditional reading instruction may have been an effective strategy in the 14th century when books were still made by hand and speech was the best way to convey information. But given Gen Z's total immersion in interactive technology – and the shift to distance learning, forced by the COVID-19 pandemic – this cycle of listening to lectures, taking notes, and passing exams is rather downright outdated. At the same time, conversation as an educational method should not be underestimated. Considering Raffaello's 1511 fresco, the Athenian

school depicts the school of the future. Plato is teaching his favourite student, Aristotle, in the middle of the picture, and to their left, Socrates is teaching a small group – they are all talking, debating, and arguing. The word "dialogue" is of Greek origin and indicates the role of reasoning in the conversation, since *dialegoma* also means in Greek: I argue (this word is also the basis of the term "dialectic").

In education, the analysis and investigation of interpersonal relationships rarely cover their role in career building. However, a good teacher helps students not only in the present but also after the end of the joint activities. One way to provide this assistance is to help students find the right career. Career planning courses are available. Here, students learn to write a resume, and cover letter, networking, personal development, and many other practical skills.

Presentations are made around these to make students aware of opportunities to improve their employability during their studies, such as volunteering, part-time jobs, work placements, involvement in clubs and societies, and pathways through training programs and training at the end, such as degree and non-degree careers, self-employment, or further study. Scientists, staff specialists, former university students, and current postgraduate students are invited to the lectures, so practical experience can also be transferred. Each lecture builds on students' understanding of the available opportunities and how to achieve them.

Dual education also plays an important role in shaping personal relationships. This not only adds practical and real-world experience to the theoretical knowledge that can be obtained at the university but is also an excellent opportunity for group building. It creates a feeling of belonging to the profession and the professional community, and the students also experience how learning can be useful in something authentic. The sense of community has additional benefits. Marketing research shows that shopping recommendations are more effective when they come from a source other than the brand. This is the basis of the transmission of knowledge through oral tradition. Although the process is very old, it is still one of the most effective ways of learning today. Its distant historical origins are indicated by the fact that Homer's epics, for example, originally taught everyday knowledge and history with the power of fairy tales. The audio method was later supplemented by visual education, which is also not an invention of the modern age. The frescoes of medieval churches, or the Bible, which creatively applied book printing to those who could not read (Pfister, 1462), also served this purpose.

A comparison of the relationship between teachers and students with other scholars' findings in the labour market shows similarity in the concept. Since psychological capital plays a mediatory role in the relationship between an employer and employee, Riemenschneider *et al.* (2023) suggest that businesses create a supportive environment that values innovation, high-quality services, diversity, and collaboration. T.L. Akpey-Mensah's (2020) study focussing on two Technical Universities in Ghana had the idea that innovation in social capital can build academic staff's human

resources, making them more committed to their jobs and eager to stay on board, and found that making advancement in human resources improvement using social capital can guarantee staff responsibility and maintenance. This idea is also backed by the finding of Sz. Malatyinszki (2018) in the corporate environment.

Innovation has several inputs, only one of which is the relationship between stakeholders. Skills and knowledge transfer are key figures in themselves, too. Skilled workers are crucial to the growth of the economy and innovation in the knowledge economy (Castro-Silva & Lima, 2023) According to V. Simeunović *et al.* (2022), both innovation and higher education have an equal effect on the prosperity of the economy, based on results gained from Bosnia and Herzegovina.

However, even though Industry 4.0 has led to a paradigm shift in many areas of life, in particular, new methods and educational spaces have appeared in education, the input competencies of the labour market have been modified, the role of interpersonal relationships between a teacher and a student will remain an important factor in successful education at all its levels.

CONCLUSIONS

The study examined the role of the personal teacher-student relationship in today's transforming, increasingly digitized and online education from only a few aspects. Although independent and lifelong learning is becoming more and more important, they cannot let go of the student's hand in any way.

The basic finding of the study is the fact that this interpersonal relationship is crucial in the modernization of education. A good teacher is no longer a lone worker. They take part in the development of the learning content himself, if necessary, consult with experts in the field. It uses all the advantages of modern platforms and aims to arouse and maintain the interest of students. The main goal is the effective transfer of knowledge and a love of learning, which essentially require interactivity, personal advice, guidance, and personal contact in general. Pedagogues and instructors are more than just teachers but also role models in the eyes of their students, and personal contacts shall be established with them accordingly. This is what the authors intended to draw attention to in the current digitising, mechanized world.

The fact that the research is a progressive development of the didactic component of the university educational system in terms of the formation of the communicative competence of future teachers is what makes it novel and original. It utilizes an integrative way to deal with knowledge perception, which permits the most top-to-bottom way to deal with the issues of collaboration in the public and cultural context. The set goal to scrupulously examine the field of human relations in higher education has undoubtedly been achieved; however, the lack of an independent sample might make all efforts questionable to the public at this point. A meticulous mind map about the interconnectedness of the teacher-student relationship will boost the effectiveness of describing the findings, and, naturally, a questionnaire survey about students' perception of teachers' attentiveness, cooperation, and future orientation in bachelor's programmes is also yet to come in the following years.

These results are to be put into effective use in the innovative development of future educational content and methods.

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CONFLICT OF INTEREST

The authors declare that they did not have any competing financial, professional, or personal interests from other parties.

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Роль взаємин між викладачем і студентом в інноваційній освіті: міждисциплінарний огляд питання

Анотація. Сьогодні багато авторів займаються цифровою та онлайн-освітою, компетенціями та навчанням протягом життя. Проте менше говорять про роль міжособистісних стосунків, навіть якщо вони важливі для збереження сталості освіти. Мета статті – дослідити сферу людських відносин. Для досягнення поставленої мети була використано теорію організаційної та соціальної психології: відносини можуть бути реалізовані лише через міжособистісний діалог. З погляду навколишнього середовища виявлено, що як суб'єктивні, так і об'єктивні чинники визначають близькість стосунків. Зроблено висновок, що особистість учителя – запорука успіху на всіх рівнях освіти. Обґрунтовано, що результат центрального регулювання навчальних програм такий, що освітою майбутніх фахівців керують сучасні професіонали, які часто зацікавлені забезпечити те, що потрібно зараз, а не те, що може знадобитися в майбутньому. Доведено, що недостатньо лише, аби студенти усвідомлювали академічну місію, а також того, щоб університет був своєрідним місцем навчання та підготовки до ринку праці. Із соціально-психологічного погляду показано, що якість викладання має найбільше значення, але з урахуванням теорії організаційної психології. Представлені матеріали можуть використати університети для роботи над підготовкою випускників шляхом роботи над удосконаленням характеру. Враховуючи різноманітні підходи до організації діяльності учасників навчання та особливості їхнього саморозвитку, модель формування системи цінностей майбутнього вчителя дасть змогу забезпечити умови для індивідуалізації траєкторії навчання

Ключові слова: планування кар'єри; інструкція; зсув парадигми; Індустрія 4.0; креативність; міжособистісні стосунки