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IMPLEMENTING DESIGN THINKING IN TEACHING «HUMAN LIFE SAFETY» TO BUSINESS SCHOOL STUDENTS

Under discussion is the necessity of broadening the teaching methodology and implementing more practically oriented and process oriented methods when teaching the academic discipline of «Human life safety» to business school students, which will provide additional benefits for developing creativity and fostering a safety culture in future managers. The method of design thinking is defined and described in terms of its principles and stages, and the prospects of its classroom application within «Human life safety» are identified. It is pointed out that the methodology would be relevant to business school students due to its effective implementation in business practices and processes.

Keywords: design thinking, problem solving, creativity and innovation, teaching methodology, life safety, professional competencies, business education

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ИСПОЛЬЗОВАНИЕ ДИЗАЙН-МЫШЛЕНИЯ В ПРЕПОДАВАНИИ «БЕЗОПАСНОСТИ ЖИЗНЕДЕЯТЕЛЬНОСТИ ЧЕЛОВЕКА» СТУДЕНТАМ БИЗНЕС-ШКОЛЫ

В статье рассматривается необходимость более широкого использования практико-ориентированных, процессуальных методов обучения в ходе преподавания учебной дисциплины «Безопасность жизнедеятельности человека» в бизнес-школе, что будет способствовать развитию творчества и воспитанию культуры безопасности у будущих менеджеров. Дается определение и описание дизайн-мышления с точки зрения принципов и этапов, а также определяются перспективы применения метода на занятиях по «БЖД». Отмечается, что методология актуальна для студентов бизнес-школ вследствие ее эффективного внедрения в бизнес-практику и бизнес-процессы.
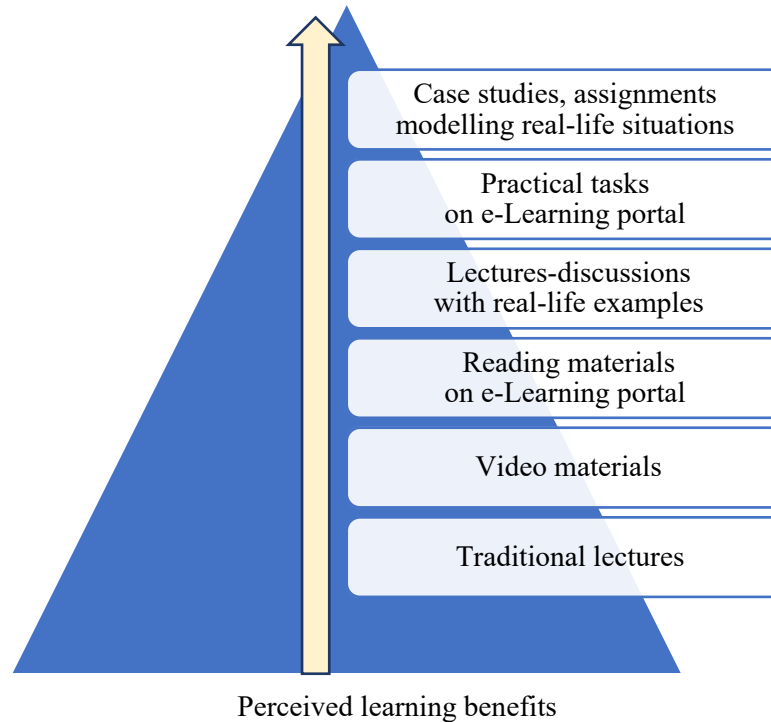
Ключевые слова: дизайн-мышление, решение проблем, творчество и инновации, методика обучения, безопасность жизнедеятельности, профессиональные компетенции, бизнес-образование

Introduction

At the time when the global academic community is discussing the recent development of artificial intelligence and whether it will disrupt education, we need to remember that the system of education has diverse goals, and, overall, the learning path is both result-oriented and process-oriented. Young people get profound knowledge and develop various competencies along the way, and these competencies cannot be substituted by AI-generated essays or course papers.

The system of education is meant to develop creative thinking and creativity, effective collaboration and communication, decision-making, innovation and problem solving. All these competencies are included into the Education 4.0 Learning Taxonomy issues by the World Economic Forum in January 2023 and needed for the transformation of education in order «to prepare young learners for the well-being in the economies of the future» [1]. To keep up-to-date, university courses need to be motivating and though provoking, and university teachers need to diversify the

methodology and add new teaching techniques that are practically oriented and correspond to the natural frameworkof the creative process in professional settings. A student survey of perceived benefits from different learning methods conducted by the authors in autumn 2022 among SB bachelor students illustrates the preference to practical orientation, as is obvious from Figure «Perceived learning benefits», where the perceived benefit increases from the bottom to the top of the pyramid (see Figure).

Case studies, assignments modelling real-life situations

Practical tasks on e-Learning portal

Lectures-discussions with real-life examples

Reading materials on e-Learning portal

Video materials

Traditional lectures

Perceived learning benefits

The academic course of Life Safety aims to foster safety culture in order for students to be safety-conscious and to use safe practices at all times. Taking into account that current business school students will face various hazardous situations in their professional activity, the school needs to get them prepared for coming up with innovative solutions to those challenges. One of the methods having a huge potential to develop creativity is design thinking. Thus, the aim of the work is to have an insight into design thinking as a teaching method and to identify how to implement design thinking into the Life Safety course effectively.

The essence of design thinking

Design thinking a learning / teaching method and a mind-set based on creative thinking and collaboration, aiming at problem solving [2]. There are quite a number of definitions and more than one way of interpreting design thinking principles, but the essence remains the same. «Design thinking is a human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success», according to Tim Brown, executive chair of IDEO [3].

Design thinking appeared in the 60s of the previous century, when cognitive scientists and practitioners, engineers and industrial designers, joined in to find a way to address creatively and collectively the challenges posed by social change. The idea of design thinking was first mentioned by John E. Arnold in *Creative Engineering* (1959) and by L. Bruce Archer in *The Systematic Method for Designers* (1965).

As a mind-set and an approach, design thinking was specified by cognitive scientist and Nobel-prize laureate Herbert A. Simon in his 1969 book *The Sciences of the Artificial*. Simon worked on his approach during the 70s, developing the principles of this innovative methodology popular today [4].

There are four rules of design thinking, described by Hasso Plattner, Christoph Meinel and Larry Leiferin *Design Thinking* published by Springer in 2011 [5, XV]:

1. All design is human, or social, in nature and aims to provide solutions to human social problems.

2. It is necessary to «preserve ambiguity», keep in mind that every problem is obscure – we are familiar with it within the limitations of our knowledge and abilities.

3. Humans solved problems in the past; in fact, all design is re-designs, which makes it vital to go back in time, study past solutions and estimate future challenges.

4. It is not enough to get conceptual prototypes, but it is important to make them tangible. Tangibility simplifies communication, perception and understanding.

The basic principles are curiosity, constructiveness, creativity and iteration. The design thinking process starts with identifying the problem, involves collecting information, generating a solution or various options, constructing a prototype and testing the chosen solution.

The design thinking process evolved from initial seven stages suggested by Herbert A. Simon in 1969 (1) define; 2) research; 3) ideate; 4) prototype; 5) choose; 6) implement; 7) learn), through three stages suggested by T. Brown in Harvard Business Review in 2008 (1) inspiration; 2) ideation; 3) implementation), to fives tages developed and refined by the Hasso Plattner Institute of Design at Stanford in 2010 (1) empathize; 2) define; 3) ideate; 4) prototype; 5) test) [6, p.67–68]. Most importantly, the process is circular; we can get back to where we started, go back to any stage in order to revise, re-run the process and improve, refine the solution. Most recently, there were other suggestions in relation to the terminology used in scholarly discourse, but the essence of the basic principles and stages is similar or the same.

It is necessary to have a closer look at the five stages suggested by the Institute of Design, or the d. school:

1. Empathize: design thinkers put themselves in the shoes of the users, those who face a challenge and are in need of a solution. This stage is essential as empirical and secondary information is collected about the problem, the situation, the environment, the demands of the use (the customer). At this stage, the user is observed, «shadowed», interviewed. The design thinking team gets the information about the user's preferences, behaviour patterns and possible responses to the solution.

2. Define: after the detailed information has been collected, its processing and analysis begins. The aim of this stage is to define the research question (the most crucial step) and to have a visual presentation of all interrelated information pieces. This visual is similar to a board in the police department with ties or interrelations of crime-related evidence, victims and suspects. Incorrect questions will lead to inacceptable solutions and wasted time.

3. Ideate: this stage aims to generate ideas no matter how unusual they seem. The whole team takes part in brainstorming sessions to come up with possible solutions; all ideas are recorded without criticism. It is equally important to consider possible problems for the user and the environment in case of the idea acceptance. The ideas of most feasible solutions are chosen; in fact,many design-thinking experts single out a separate stage of choosing the feasible idea. Then we move on to the next one.

4. Prototype: the prototypes of the chosen solution are created in a simplified form out of available materials with a view to understand the feasibility of the ideas. A popular option to make a prototype is the use of Lego or similar children's tinker toys.

5. Test: the feedback is received from the user concerning the prototype's meeting the expectations. The user is observed to utilizeor consume the prototype; all the comments, strong and weak points are recorded to take account of in the follow-up stages of the circular process. Some sources define implementation as a separate stage [7], when the solution gets into the market. A lot of designs, however, never reach the real market. For educational purposes, singling out this stage is not necessary.

The benefit of design thinking for business and education

Being a user- or customer-centric approach, design thinking has been applied in a wide range of human activities, business in particular, namely, banking, entertainment, consumables, information and communication technology, travel and lodging, healthcare [4]. In fact, you can use design thinking to not only design and produce tangible, consumable products, but also to streamline business processes in a company, develop effective business models or make predictions.

There are many examples of well-known and successful companies whose activity was revolutionized by the implementation of design thinking; among them are Netflix, Oral B, GE Healthcare, Airbnb and Uber Eats [8].

Education is also a sphere where teachers, students and administrators apply this methodology, with design thinking used at all levels of education, from pre-school to higher education. Teachers use the method to design a course effectively, to plan a lecture or a practical, to engage students into the learning process and encourage open-mindedness and free-from-fear communication. School administrators use design thinking to implement positive changes into school settings.

Implementing design thinking in Life Safety

The course of Life Safety is included into the educational standards for all specialties of the first stage of higher education (bachelor programmes). Thecourse content is information-rich and comprises a wide range of topics related to hazards and risk assessment, protection against emergencies, radiation safety, occupational health and safety, energy efficiency, environmental protection. In our view, practical classes and seminars in most topics can be taught with the application of design thinking. From students' perspective, the topics of most interest and benefit are connected with the future professional activity and safe living overall.

Moreover, as business school students get qualified in the field of economics and management, one of the main goals is to train managers with a broad innovative potential, creativity and innovative thinking, a holistic view on the activities of any business entity [9, p. 576]. Thus, it is only logical to use the teaching method of design thinking, focused on creativity and innovation.

The application of design thinking in teaching Life Safety is appropriate and highly beneficial, as it develops skills and values, relevant to the course content and its objectives. This is made obvious from Table «Attitudes, skills and values relevant to life safety and design thinking» based on Education 4.0 Learning Taxonomy» [1, p. 18–24]. This relevance can be accounted for by the social nature of the design thinking method, based on empathy, and the course itself.

Attitudes, skills and values relevant to life safety and design thinking

Level 1	Level 2	Level 3
Abilities and skills	Cognitive	Creativity
		Critical thinking
		Problem-solving
	Social (inter-personal)	Collaboration
		Communication
		Negotiation
		Socio-emotional awareness
Attitudes and values	Self-regulatory (intra-personal)	Adaptability
		Conscientiousness

Level 1	Level 2	Level 3
		Curiosity
		Grit
		Growth mindset
		Initiative
Attitudes and values	Societal (extra-personal)	Civic responsibility
		Environmental stewardship
		Empathy and kindness
Knowledge and information	Disciplinary knowledge	Domain-specific skills

The implementation of design thinking into the Life Safety course can be realized by student teams during a number of practical classes or self-study classes with the final presentation at the end-of-course credit session. When designing the course materials, the teacher can identify the modules within which the methodology can be applied and develop a map or a flowchart of design thinking stages for specific classes. Depending on the topic, the workload can be specified.

The preliminary stage to in-class activities can be the consideration of possible topics to focus on, compiling a list of challenges in demand of solutions; obviously, challenges relevant to life safety are endless. There are two options to choose a focus question: firstly, at a brainstorming session where students come up with the challenges they are most concerned with; secondly, providing students with the ready-made list to choose from. Challenges can be formulated in the form of open-end questions; examples are as follows:

– How to solve the waste disposal problem and get everyone to recycle?

– How to stop wasting energy in a classroom?

– How to encourage students to use less of bottled water?

– How to improve energy efficiency of homes and organizations?

– How to avoid slips, trips and falls on a rainy and snowy day when there is water or slush on the floor?

– What ergonomic solutions are necessary for a classroom with students of different height and body shape?

– How to prevent eye problems in office computer users?

– How to prevent cumulative disorders in jobs of a repetitive nature?

Let us consider how design thinking works practically in a Life Safety class. Unlike business settings where teams include representatives of various professions, student teams are homogenous and students themselves decide on their role in the team. They choose a challenge and receive the task to observe actual situations / users and record their observations. This stage may have certain limitations in a classroom; professional environment is not easy to get access to for observations. It is possible for students to watch videos demonstrating relevant situations and/or interview family and friends who have experience and are familiar with the challenge in question.

The second and the third stages are effectively applied; as teaching experience proves, business-school students like to engage in the information-gathering and idea-generating process. Besides, they get additional motivation when the situation is related to their professional field and is their own choice. The solutions most often suggested by students include designing a poster or making a socially

oriented or promotional video to encourage safety culture, healthy lifestyle, sustainable consumption, sustainable use of resources. In case of such solutions, the stage of prototyping and testing is feasible and can be organized during a practical class or as an out-of class task.

Appropriate feedback is significant when using design thinking. What's more, students may even follow up by implementing their solutions in university life through the student union or creative union, e. g. solutions to create a green classroom. As a result, we see increased motivation and initiative.

Conclusion

To sum up, design thinking as a methodology and a mind-set has been used successfully in business and education for a few decades, and it is necessity to encourage its wider application into business education settings in this country.

The implementation of the design thinking methodology into teaching the course of Life Safety to business school students has obvious advantages as it develops empathy, creativity and innovation, teamwork and collaboration, effective problem solving, communication and critical thinking, the hard and soft skills and competencies in demand for building an effective business, safe living and a sustainable future.

Many topics related to life safety will pose obvious challenges to preserving a safety culture in an organization and in an employee's professional and personal life. Thus, arming a future manager and citizen with the methodology of finding appropriate solutions with the help of a user-centred approach will save human and other resources and result in a sustainable environment.

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