



S A N D R I T A Š K Ė R I E N Ė

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**UNIVERSITY  
EDUCATIONAL  
ENVIRONMENTS  
ENABLING STUDENTS  
TO DEVELOP THE  
CAPABILITIES OF  
VALUE-BASED  
PROBLEM SOLVING**

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S U M M A R Y O F D O C T O R A L  
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LITHUANIAN SPORTS UNIVERSITY  
VILNIUS UNIVERSITY

SANDRITA ŠKĖRIENĖ

**UNIVERSITY EDUCATIONAL ENVIRONMENTS ENABLING  
STUDENTS TO DEVELOP THE CAPABILITIES OF VALUE-  
BASED PROBLEM SOLVING**

Summary of Doctoral Dissertation  
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2021, Kaunas

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SANDRITA ŠKĖRIENĖ

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## INTRODUCTION

**The relevance of the topic.** For several decades, a special attention has been paid to the development of problem solving capabilities, which are identified as one of the essential competencies of future professionals in the 21<sup>st</sup> century (Organisation for Economic Co-operation and Development (OECD), 2013). In order to develop such capabilities more effectively, researches (Jonassen, 2011; Cho et al., 2015) propose to integrate problem solving into each curriculum. However, so far, the results of formal problem solving training are insufficient (OECD, 2018). Looking at the problem solving as a way of thinking (Binkley et al., 2012), the capability to solve a problem is treated as an intellectual capability, the development of which is primarily associated with the educational enabling of such thinking and its understanding. Therefore, it is necessary to create such educational conditions that the learner would be able to highlight the critical points of the problem solving process that require thinking about values, understand their meaning, and be determined to think in this way.

Higher education, especially in university, is challenged, without waiting for an impetus from the education policies, to help students to understand themselves, their relationships with others, develop the capability to make appropriate moral decisions, and base their behavior on them (Ozoliņš, 2015). According to Barnett (2014), such higher education emphasizes the connection between the development of personal thinking and understanding, the empowerment of a learner to choose and use the necessary forms of reasoning; thus, reasoning which is ethical and determines the ethical behavior (Sternberg, 2009). It is necessary for everyone to strive and take their share of responsibility and contribute to the creation of the world, society and self by making conscious and wise decisions (Mitroff, 2000; Boni, Lozano, 2007; Zsolnai, 2008; Sternberg, 2017). This highlights the need for the development of personalities with *intellectual spirituality* (Alexander, 2003). This education, associated with the education of a free man, offers hope for the development of personalities for whom the freedom to deal with would be inseparable from the value reasoning by raising epistemological and ontological questions for oneself, thus enabling the creation of a life *worth* living. In this life, spirituality manifests itself through the values that a person is able to follow in directing and correcting his/her behavior (Bitinas, 2000). Therefore, the emphasis is on the capabilities development with reference to values (Sen, 1990; Saito, 2003).

Developing the capabilities to solve problems by emphasizing the values requires more ambitious, fully equipped information environments (Funke, 2014). More specifically, environments that encourage a change in learner's thinking (Freire, 2000). Such environments, according to Mezirow (2003), would not only encourage students to think critically, but also facilitate their personal growth and change. Thus, educators need to create educational environments that

would enable students not only to develop knowledge and skills needed for the competitive struggle of organizations (Stukalina, 2010; Korkmaz, Erden, 2012; Jucevičienė, Valinevičienė, 2015), but such educational environments that would enable students to solve the problems of their life and work activities, thinking about values.

**The research of the topic and scientific problem.** An extensive problem solving research in a variety of disciplines reveals problem solving competency or ability training outcomes and less often focuses on highlighting cognitive functions in problem solving (for example, Chua, Tan, Liu, 2016). Problem solving teaching encourages the acquisition of a variety of experiences and the construction of new cognitive strategies (Duch et al., 2001). Therefore, the researchers' focus on how to teach problem solving reflect in a variety of problem solving models (for example, Huit, 1992; Jonassen, 1997; Mayer, Wittrock, 2006; Collins et al., 2016; Sternberg, 2017; and others). Although a number of researchers (Schwartz, 1992; Halstead, 1996; Argandoña, 2003) have highlighted the influence of values on decision-making, only a few problem-solving models identify values possible criteria for evaluating a decision. Problem-solving researchers do not stress logic of thinking that emphasizes how and why the problem solving process needs to take into account the values that guide problem solving. This in particular led to the lack of scientific knowledge explaining the development of value-based problem-solving capabilities.

The concept of lifelong learning (Aspin, Chapman, 2007) and constructivist theory (Hein, 1991) have highlighted that the education system studied by the researchers is merely a project that outlines an ideal picture of the educational process. However, educational practice is usually quite different from this ideal project. Therefore, the emphasis is not only on the educational programs, but also on their real implementation in the chain of educational environments. The field of medicine dominates in the research of educational environments. However, in them, according to Schönrock-Adema et al. (2012), the used instruments are not based on a specific theory.

Meanwhile, the theory of educational and learning environments has already been developed at the KTU School of Educational Sciences (the result of research conducted by professor P. Jucevičienė and doctoral students) and has been applied in the study process of higher education and non-formal education. However, all the research on educational environments that has been carried out did not examine these environments from the value aspect and did not emphasize the development of students' value attitudes, especially in teaching problem solving.

In general, the research on problem solving and educational environments is conducted separately from one other. There is a lack of research on problem solving that integrates values, peculiarities of capabilities development, especially in the spaces of educational environments. Therefore, the question

what educational environments of university enable students to develop capabilities to solve a problem based on values is a **scientific problem** that requires research.

**The object** of this research is the educational environments enabling students to develop capabilities of value-based problem solving (VBPS).

**The aim of the dissertation** is to substantiate the sequence of educational environments enabling students to develop the capabilities of value-based problem solving. The following objectives have been set:

- to theoretically substantiate the sequence of university's educational environments enabling students to develop the capabilities of value-based problem solving;
- to theoretically substantiate the methodology of empirical research;
- to reveal the expression of the sequence of educational environments enabling students to develop the capabilities of value-based problem solving in a specific process of university studies.

#### **The methodology**

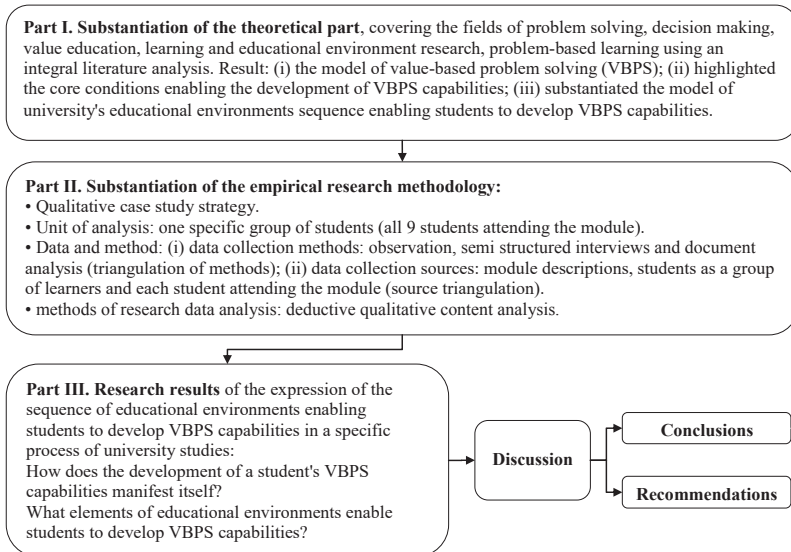
This dissertation research is supported by the following **conceptual positions**: (i) the analysis of the value-based problem solving learning is based on: *social constructivism* (Vygotsky, 1980, 1986), which emphasizes that the basis of cognition is socio-cultural and learning takes place and problems are solved in a particular context; *learning paradigm* (Knowles, 1975; Longworth, 2003), which determines that the educational environments created by the educator are open and the learner's personal learning environments are formed in the interaction of educational and potential learning environments; *ecological theory* (Bronfenbrenner, 1979), which emphasizes the influence of various environments on the individual (including education); *theory of educational and learning environments* (Jucevičienė, 2013), which helps to assess that at a given moment, a learner can form his/her personal learning environment not only from the educational environment, but also from various potential learning environments that are available to him/her; (ii) the integration of values into problem solving and thinking about them is based on *humanistic philosophy and psychology* (Maslow, 2011), emphasizing that an individual is responsible for discovering inner values through critical questioning, honest self-assessment, independent self-discovery, and an open worldview in the constant search for truth.

**The logical structure of the dissertation** reveals the research strategy, methods and corresponds to the research objectives (see **Fig. 1**).

*Part I of this study* is substantiating a sequence of educational environments enabling students to develop the capabilities of VBPS. An integrated literature analysis is applied (Torraco, 2005; Snyder, 2019), i.e., research on different topics is analyzed in order to combine perspectives and



create new theoretical models. The theoretical part is substantiating (i) the VBPS model and (ii) the model of the sequence of educational environments enabling students to develop the capabilities of VBPS.



**Figure 1.** The logical structure of the dissertation

*Part II of this study* is substantiating the methodology of empirical research: strategy-qualitative case study (Merriam, 2009) and research design, ethics. Research design includes the substantiation of empirical research questions, case selection, case boundaries over time, operational aspect, and context setting. The practical implementation of the VBPS model is the case of this empirical study, i.e., the implementation of educational environments sequence model enabling students to develop the capabilities of VBPS. One specific group of students was selected as the unit of analysis (all 9 students attending the module). Given that in this work, the VBPS model emphasizes not the development of specific values, but the development of the capabilities to think about values when solving problems, each student was researched. The reliability and validity of the survey data is ensured by the following triangulation: (i) data are collected in four stages from three data collection sources (triangulation of sources: module study program, specific group of students and each member of this group) by (ii) three data collection methods (triangulation of methods: document analysis, observation, semi structured interview). The information collected from the study participants is analyzed using deductive qualitative content analysis.

*Research ethics* is based on the following principles (Trochim, 2006; Žydžiūnaitė, 2008): research participants participated in the research voluntarily; the essence and probable benefits of the research were revealed to the participants of this research; the research ethics principles were observed; the consents from the research participants were obtained; the confidentiality and anonymity of the information received from the research participants and about them were assured; the respect for the dignity of an individual was considered.

*Part III of this study presents* the results of empirical research: they are analyzed, interpreted, and discussed. The triangulation of the analyzed data was performed following the logic of the model of educational environments sequence enabling students to develop capabilities of VBPS. The conclusions and recommendations are presented.

**The scientific novelty and theoretical significance of the dissertation research** is as follows: (i) a reasonable VBPS model that directs the solver to think in two directions: (a) how to solve the problem and (b) how and when to rely on values in this process; thus, the two stages involve an individual in thinking about values and their impact on the desired outcome of the problem; (ii) highlighting the essential conditions for the development of VBPS capabilities and the creation of sequences of educational environments that enable it, revealing their interrelationships; (iii) substantiated model of the sequence of university educational environments enabling students to develop capabilities of VBPS, revealing the educational structure of the process, i.e., how to enable students to develop VBPS capabilities by emphasizing thinking that combines problem solving and values; (iv) substantiated research methodology that allows to empirically research the practice of university's educational environments enabling students to develop capabilities of VBPS.

**The practical significance of the dissertation research:** (i) the VBPS model can be applied to solve real life problems of various kinds: the VBPS model can be used by (a) teachers to develop students' capability to solve problems based on values, (b) professionals in various fields who seek to improve their problem-solving capabilities, (c) in-service training units of organizations in order to improve the qualification of employees; (ii) the model of educational environments enabling the development of VBPS capabilities allows to achieve the practical development of VBPS capabilities by integrating thinking about values into the problem-solving process. Thus, the first step of students' value education was implemented, without which the second step of such education is not possible, enabling the development and/or change of an individual's values.

**The structure and volume of the dissertation.** The dissertation consists of an introduction, three parts, conclusions, recommendations, and references. The volume of the work is 207 pages. The dissertation contains 15 figures and 12 tables. The list of references contains 409 positions.

## **SHORT REVIEW OF THE CONTENT**

### **1. THEORETICAL BASIS OF UNIVERSITY EDUCATIONAL ENVIRONMENTS ENABLING STUDENTS TO DEVELOP THE CAPABILITIES OF VALUE-BASED PROBLEM SOLVING**

In this part of the dissertation, applying the method of integrated literature analysis, it is examined how the scientific literature proposes to solve problems based on values, what can be the structure of problem solving that integrates thinking about values and what educational environment would enable the development of value-based problem-solving skills.

#### **1.1. Theoretical insight of problem solving integrating values**

##### **1.1.1. Essential aspects of problem solving**

Problem solving models (Jonassen, 1997; O'Loughlin, McFadzean, 1999; Mayer, Wittrock, 2006; Litzinger et al., 2010; Collins et al., 2016; Sternberg, 2017, and others) place more emphasis on the problem naming and development of alternatives. The context is analyzed at different steps during the problem solving. Moreover, the problem solving process does not take into account the assessment of the bias of the solver (Korte, 2003).

The problem solving process should emphasize not only the identification of the problem, but also a thorough analysis of the problem situation and context, formulation of the goal, development of alternatives, and verification of the chosen alternative. However, when analyzing a problem, it needs to be seen in the context of scientific/technical, human/social, existential and systemic/global perspectives (Mitroff, 2000). In the process of problem solving, it is necessary to anticipate the possibilities of reducing cognitive bias, i.e., (i) emphasize an in-depth analysis of the problem; (ii) emphasize the importance of analyzing the context of the problem; (iii) consider the insight of values in the analysis of the problem as a necessity.

##### **1.1.2. Integrity of values in the problem solving process**

Problem solving research (e.g., Huitt, 1992; Basadur et al., 1994; Morton, 1997) pays little attention to the values. Decision-making research emphasizes values (Verplanken, Holland, 2002; Hall et al., 2003; Sheehan, Schmid, 2015) and highlights the possibilities of integrating them into the problem solving (Keeney, 1994, 1996). When formulating the goal of solving a problem, it is necessary to name the values. Values as well need to be taken into account when justifying alternative ways to solve a problem. Research confirms the impact of values in problem solving and decision-making (Verplanken, Holland, 2002;

Kasof et al., 2007; Kirkman, 2017) and emphasizes the relevance of the problem-solving model focus on values.

### **1.1.3. The model of value-based problem solving**

Theoretical provisions of a holistic approach to problem solving based on the values allowed to transform the problem solving structure found in many problem solving models and substantiate the value-based problem solving (VBPS) model (see Fig. 4). This model is disclosed in the Conclusions section (see Conclusion 1.2).

The VBPS model enables the solver to pay attention to when, how, and why it is important to think about values in the problem solving process. In other words, the emphasis is on dual thinking: a) thinking about how to solve a problem and (b) thinking about values, asking the problem solver to highlight the inner values. It is emphasized that in this work, the VBPS model does not aim to develop specific values. A problem solver is encouraged to think, find, accept, reject, compare values, and become responsible for the consequences of choices and future actions based on his/her values.

Most importantly, the steps of the VBPS model provide opportunities to reduce the impact of the cognitive bias of the solver. In contrast to the traditional problem-solving models, the VBPS model is more related to the educational goals. The limitation is that the VBPS model is focused on thinking but not executing. It does not include the fifth stage, which would focus on the execution of the decision how to solve the problem.

## **1.2. The substantiation of the sequence of university educational environments enabling students to develop the capabilities of value-based problem solving**

### **1.2.1. The essence of educational environments**

In the theory of educational and learning environments (Jucevičienė, 2013), the definition of educational environments highlights their essence and core elements of their creation. Educational environment is a dynamic information space of education and training activities, created and influenced by an educator and determined by the educational goal, its corresponding content and forms, methods and tools of education supporting its realization as well as other objects and subjects in the environment that have any impact on the learner (Jucevičienė, 2013). The main goal of an educator is that the learner's personal learning environment is formed from the educational environment. According to Jucevičienė (2013), the aim is to help a learner to recognize the part of his/her potential learning environments that can become a valuable personal learning environment enabling the learner to develop both as a person and as a future professional.

## **1.2.2. Theoretical substantiation of university's educational environments enabling to develop student's capabilities of value-based problem solving**

This section presents the didactic assurance of value-based problem solving capabilities development, highlighting the peculiarities of problem solving and aspects of thinking about values education and revealing the peculiarities of the development of capabilities linked to the values, which enables to define the capabilities of VBPS.

### **1.2.2.1. The dimensions determining the development of value-based problem solving capabilities**

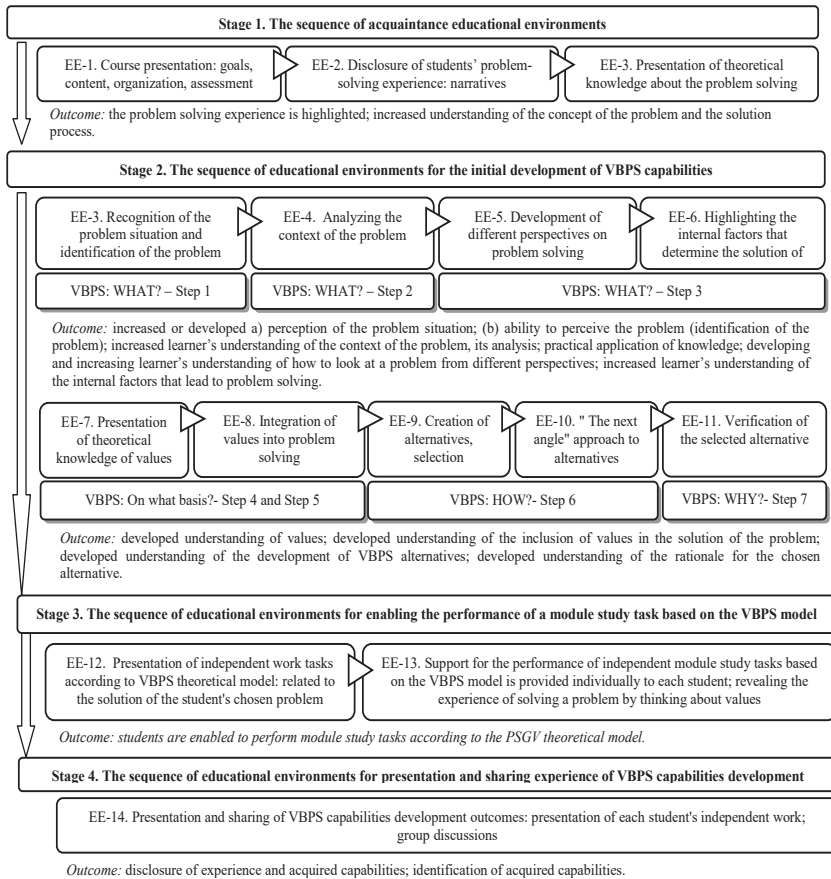
The dimensions determining the development of VBPS capabilities are highlighted by emphasizing: (1) the peculiarities of problem solving teaching: (i) through the acquisition of cognitive skills and the development of thinking processes (Mayer, 1998); (ii) focusing on emotions and motivation (Jonassen, 1997; Mayer, 1998; Damasio, 2003); (iii) applying problem solving training *through* the problem (Stanic, Kilpatrick, 1988, as cited in Schoenfeld, 2016); (2) thinking about values education (Kirschenbaum, 1992; Lepeškieņš, 2000), emphasizing the educator's assistance to the learner in discovering, highlighting, and understanding values and their impact on various life choices; (3) specificity of the development of capabilities linked to the values that stress capabilities as a potential and emphasize learner's self-development (Sen, 1990; Saito, 2003; Stephenson, Yorke, 2013), taking into account such features of values as rationality and virtuality (Argandoña, 2003). Capabilities of VBPS, first of all, are knowledge conceptualized to the understanding that thinking about values is integrated into the process of problem solving as well as the determination to follow this approach and the ability to solve a problem in this way.

### **1.2.2.2. The didactic assurance of the development of value-based problem solving capabilities**

According to Collins (1991), Savery, Duffy (1995), Harland (2003), Brown (2004), Harland (2003), Quintana et al. (2004), Hmelo-Silver (2004; 2006), Hmelo-Silver, Barrows (2006), Hung (2006), Ertmer, Newby (2013), Kirkman (2017) and other researchers allowed to substantiated conditions. These conditions are important not only for the creation of educational environments enabling to develop students' capabilities of VBPS, but also for the formation of their personal learning environments. These conditions include a problem prepared for training, teacher-student interaction, interaction between students, student self-directed learning, expression of tacit knowledge through discussion, questioning and reflection, and teacher's competence.

### 1.2.2.3. The model of university educational environments enabling the development of students' value-based problem solving capabilities

The conditions for the didactic assurance of the development of VBPS capabilities allowed to substantiate the model of the sequence of university educational environments enabling students to develop capabilities of VBPS (see Fig. 2). This model is disclosed in the Conclusions section (see Conclusion 1.4).



**Figure 2.** The model of educational environments sequence enabling VBPS capabilities development

The development of VBPS capabilities at university is an educational innovation. Thus, a model for its implementation in practice has been developed. Assessing that students already have some problem solving experience, the first

step of the above mentioned model is to determine this, after they are provided with the theoretical knowledge of the problem solving process. In the next stage, students are enabled to solve problems based on the values. The learning by doing process emphasizes individual learning and encourages engagement in group discussions. Such theoretical-practical enablement grounds students for self-directed learning. In the third stage, students are given a module study task. Individual support through coaching is offered to promote student's self-learning. In the last stage, students share their experience and results revealing how they developed the capabilities of VBPS.

The expression of the model of educational environments enabling to develop the capabilities of VBPS in practice is the basis of the empirical research of this work.

## **2. SUBSTANTIATION OF EMPIRICAL RESEARCH METHODOLOGY**

The methodological approach is based on a qualitative case study strategy (Merriam, 2009). The design includes: (i) a case selection: the practical implementation of the VBPS model is a case of this dissertation, i.e., the implementation of educational environments enabling to develop students the capabilities of VBPS; (ii) the case is integrated into the already existing module of the X university study program (a three-level selection was performed); (iii) learners from one specific group are selected as a unit of analysis, i.e., all students attending the module. Given that in this work the VBPS model emphasizes not the development of specific values, but the development of the capabilities to think about values when solving problems, each student was researched; (iv) the boundaries of the case in time, activity, and context were established; (v) a descriptive case study was selected. A sound methodology for this empirical study is provided in the Summary section Conclusions (see Conclusion 2).

## **3. EXPRESSION OF STUDENTS VALUE-BASED PROBLEM SOLVING CAPABILITIES DEVELOPMENT IN UNIVERSITY EDUCATIONAL ENVIRONMENTS**

### **3.1. Research context**

*Educational context.* The research was carried out by researching one module of the X University Master's study program in Education ("Learning in the Knowledge and Information Society"). A case was integrated in this module. The integration aimed to ensure that the development of VBPS capabilities naturally fits into the overall content of the module. The teacher of this module is a professor with many years of scientific and pedagogical experience.

*Task contexts.* In the course of mentioned module, students perform several assignments provided in the study program of the module. In the case of

the study, these tasks are based on the VBPS theoretical model. The educational problematic situation is prepared according to the features of the problem for teaching purposes. Although the independent study task of the module is based on the VBPS model, the problems to be solved were chosen by the students themselves. The aim is to promote student motivation and involvement in self-directed learning. *The sociocultural context* includes the personal contexts of study participants and students as a group.

### **3.2. Research results and discussion**

Empirical research revealed a consistent process of developing students' VBPS capabilities and highlighted the sequence of educational environments, specifically their personal factors and those of students, which encouraged and, in some cases, inhibited the development. This study revealed that students do not know how to identify a problem. Little research on problem solving emphasizes this (e.g., Walinga, 2010). The reason for this may be that in most research, students get to deal with pre-prepared situations where the problem is easy to see and solve, or a creative solution to a problem that is easily highlighted is requested. Teaching to solve a problem pays little attention to the complexity of identifying the problem in a problematic situation.

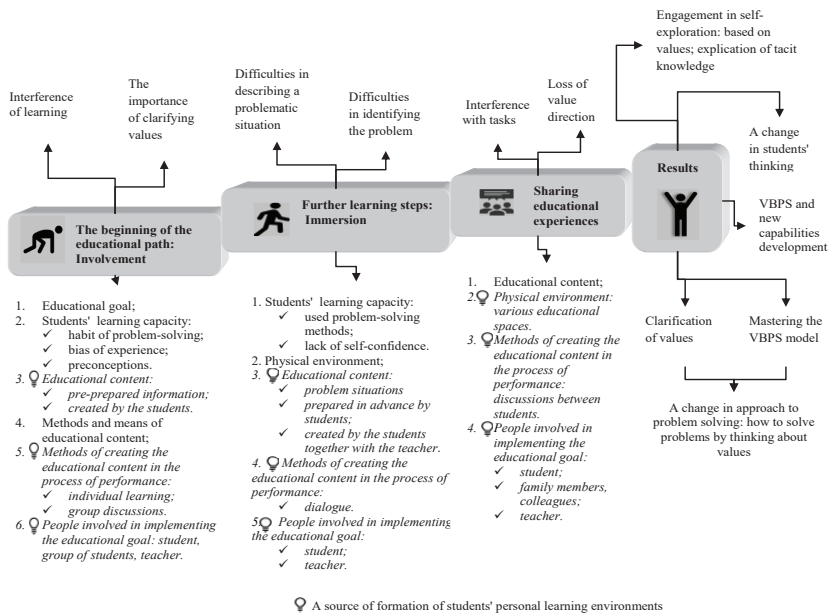
The development of VBPS capabilities reveals the path of students' education and learning (see **Fig. 3**). Although certain elements of educational environments appeared in each sequence, several moments were identified. First, the coherence of sequences of educational environments was significant for the students. However, each student selected only the moments he/she needed at that time from a particular educational environment. The selective nature of educational environments was discovered by Tautkevičienė (2005). Acting in educational environments enabling to develop the capabilities of VBPS, students selectively emphasized individual elements of these educational environments. These elements were the source of students' personal learning environments formation, which determined the development of VBPS capabilities.

The methods of creating educational content in students' activities show that individual learning supplemented by group learning is important. However, paying attention to the person's individual education highlights the significance of the student-teacher discussion. Therefore, the main people who needed to achieve the educational goal included a student himself/herself, students as a group of learners and a teacher. As the educational environments for VBPS capabilities development were diverse, they as well included other people that needed to achieve the educational goal as students' relatives.

Educational content is another important element of educational environments that has become a source of personal environments. The latter is especially relevant at the beginning of the students' VBPS capabilities development path. Pre-prepared information, which engages in lengthy



discussions and evokes various emotions, has as well become an educational content developed by students themselves. This empirical study identified the elements of educational environments that (i) were accepted by most students as a source for the formation of their personal learning environments and (ii) conditioned the individuality of personal learning environments.

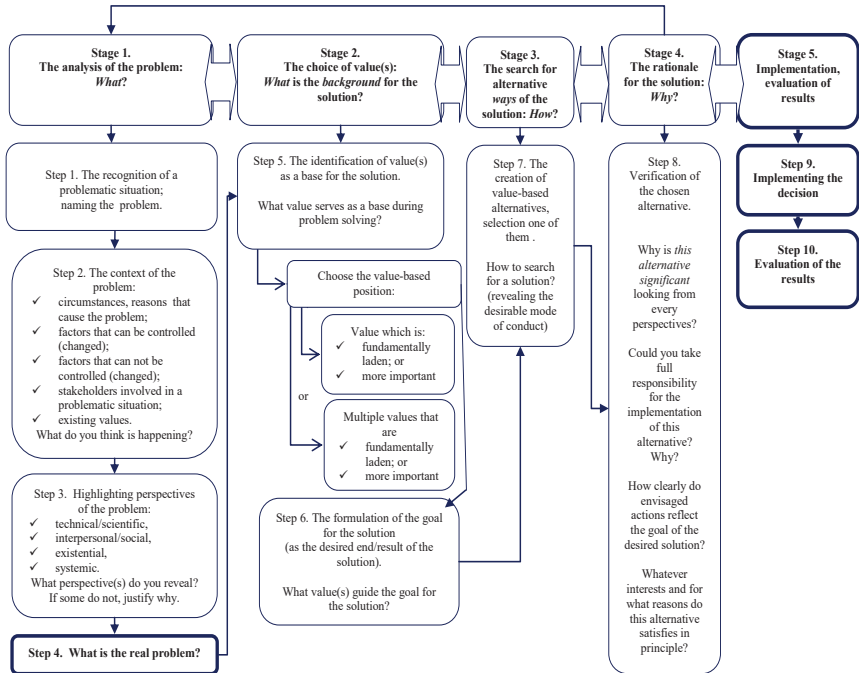


**Figure 3.** Expression of the sequence of educational environments in the path of students' VBPS capabilities development

Students' problem solving experience, used techniques to solve a problem, biased prior hypotheses, and focus on limited targets reveal that at the beginning of the educational path, their personal learning environments were narrower than the educational environments implemented at that time. This corresponds to the research of Jucevičienė, Tautkevičienė (2004). In this case, as many personal learning environments as there were study participants had been formed. Yet, this was difficult to detect, as the study participants themselves did not clearly understand these environments and could not explain them; the researcher could only judge about them from the reactions of the students. The integrity of learning environments was revealed as well (Jucevičienė, 2013): participants deliberately used different environments that affected them at different times for

their consistent learning. This allows agreeing with Harland (2003) that each student had multiple rather than one zone of proximal development.

The results of the empirical study allowed to supplement the VBPS model (see Fig. 4). Considering the fact that the VBPS model promotes a change in the structure of students' thinking, it is expedient to supplement its first stage "What? - Problem analysis" with a new step, i.e., "What is the real problem?" In this case, this stage consists of four steps: recognizing the problem situation and identifying the problem in this situation (Step 1), analyzing the context of the problem (Step 2), analyzing the problem from different perspectives affecting the whole problem solving process (Step 3), and "What is the real problem?" (Step 4).



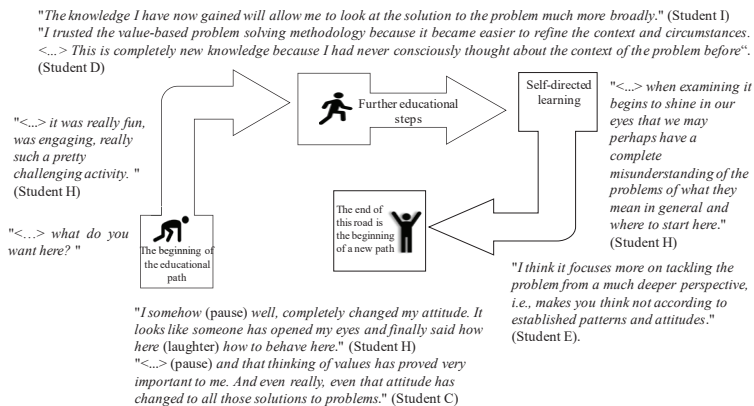
**Figure 4.** The supplemented VBPS model (new steps and stage marked in bold)

In order for the VBPS model to emphasize the implementation of the problem solution in life and work practice, it is expedient to supplement this model with another, the last fifth stage: "Implementation of the solution and evaluation of results", distinguishing its two steps: "Step 9. Implementing the Decision" and "Step 10. Evaluation of the results".

Students' first developed knowledge conceptualized it to the understanding that thinking about values is integrated into the problem solving.

The analysis by Litzinger et al. (2010) revealed that students reflect on problems by identifying causal relationships between previous knowledge and problem-solving steps and developing a conceptual understanding of the problem and its solution. The desire to apply the VBPS model in the future shows the students' willingness to take the view that the problem needs to be addressed by integrating thinking about values and the ability to address the problem in this way. The results of this empirical study led to find out that students have developed the capabilities of VBPS. It was found that some students acquired new capabilities that were necessary for a particular student at that time to perform an independent study task of the module.

In the case of this study, students immersed themselves in self-directed learning, in which, by addressing a chosen problem and thinking about values, they engaged in self-exploration, reflecting on their own learning. According to Mezirow (1997), by engaging in problem solving, an objective transformation of thinking structures takes place by critically reflecting the assumptions. In this VBPS learning, (i) the clarification of values and (ii) constructing a new understanding of problem solving have led to (iii) a change in students' attitudes to problem solving and (iv) the formation of a new thinking structure that integrates value thinking into the problem solving (see Fig. 5).



**Figure 5.** The change of students' thinking on the path of VBPS capabilities development

The step-by-step education allowed a student to cope with the learning problem (this was enabled by the sequence of realized educational environments). During such education, theoretical knowledge was applied in practice, and the group discussed individually obtained results. Such educational tactic, which is used, is in response to a study by Revell, Wainwright (2009), in

which students emphasized that a logical structure was crucial to their learning because it revealed the major path.

The right of students to choose a problem to be solved to self-directed learning attracted the search of personal meaning (Burford, Pettit, 2018). Following this approach, it has enriched the whole VBPS educational process. Research (Mayer, 1998; Yee, Bostic, 2014) shows that students who have experienced a multifaceted problem solving process, especially by emphasizing a problem that is important to an individual, had better problem solving outcomes than those who experienced only pre-prepared problem-based learning. The participants of the empirical study of this work became active self-directed learners rather than passive recipients of knowledge. The motivation of students to solve a problem that is relevant to them has become the goal of their self-directed learning.

## CONCLUSIONS

1. The theoretical substantiation of the sequence of university educational environments enabling students to develop the capabilities of VBPS consists in proving a model of problem solving based on values and forming a logical structure of educational environments suitable for its assimilation.

1.1. The integral analysis of scientific sources allowed to take a new, holistic view to problem solving, linking it with thinking about values, and formulate these theoretical provisions:

- The problem solving process should emphasize the development of problem solving alternatives as well as a detailed analysis of the problem situation, assessment of its context, and looking at it from different perspectives.
- When analyzing a problem, it needs to be seen in the context of scientific/technical, human/social, existential, and systemic/global perspectives. When thinking about a problem in this way, it inevitably begins to be associated with the way it will be solved, and the values naturally emerge in this thinking, although they have not been clearly highlighted yet.
- The Values need to be highlighted, i.e., articulated when the problem-solving goal is formulated as the desired outcome. In this way, a problem solver is asked consciously to take responsibility for the values-based choice of the goal/desired result.
- Values as well need to be taken into account when justifying alternative ways of solving a problem where different stakeholders may emerge. When creating alternative paths, a problem solver inevitably conveys the desired, but not unilaterally desired, behavior that allows to achieve the goal based on the chosen value. Thus, the value approach included in the decision path consideration process a priori increases the problem solver's responsibility for developing these alternatives.

- The problem solver’s attitude and experience, especially tacit knowledge, influence the cognitive bias, which can be a disruption to the problem solving based on the highlighted values. In the process of solving a problem, it is necessary to anticipate the possibilities of reducing this disturbance, i.e., (i) emphasize a detailed analysis of the problem, (ii) emphasize the importance of analyzing the context of the problem, (iii) consider insight of values as a necessity in analyzing the problem.

1.2. The theoretical provisions of a holistic approach to value-based problem solving make it possible to transform the problem solving structure found in most problem solving models and substantiate a value-based problem solving (VBPS) model that encompasses these stages:

Stage 1. *“The analysis of the problem: What?”* It consists of recognizing a problem situation and identifying the problem in that situation (Step 1), analyzing the context of the problem (Step 2), and investigating the problem from a variety of perspectives that affect the entire problem-solving process (Step 3).

Stage 2. *“The choice of value(s): What is the background for the solution”* At this stage, values that are important for solving a specific problem are highlighted (Step 4). If several values are identified, their hierarchy is determined in the same step, and the most important value is selected. Based on the chosen value, the goal of the problem solution needs to be formulated, which reflects the desired result of the solution (Step 5).

Stage 3. *“The search for alternative ways of the solution: How?”* At this stage, problem-solving alternatives are developed based on, but not limited to, the analysis of the context and the problem. Each of the alternatives should be planned taking into account the value approach, i.e., conveying the desirable, but not unilaterally desired, behavior of the judge. After a thorough examination of each alternative under consideration and its implementation plan, a problem solver chooses one of them (Step 6).

Stage 4. *“The rationale for the solution: Why?”* At this stage, the aim is to verify the relevance of the alternative path chosen for the problem (Step 7).

1.3. The analysis of the theory of educational and learning environments, the concept of self-directed learning and problem-based learning allowed to substantiate the essential conditions for the development of VBPS capabilities and enabling educational environments:

1.3.1. Didactic provision of the VBPS capabilities development emphasizes these conditions, which are important not only for the creation of educational environments enabling students to develop the capabilities of VBPS, but also for the formation of students’ personal learning environments:

- Educational content: (i) as the teacher provides pre-prepared information for developing students’ VBPS capabilities, emphasizing each step of the VBPS

- model; (ii) as a result of the application of the teacher's initiated method of group activity, when students create educational content in their activities; they delve into the VBPS model in group discussions; (iii) as a provided module study task, in which students create their own educational content.
- The interaction between a teacher and the students is emphasized: (i) in the initial educational environments enabling the development of VBPS capabilities by solving the problematic situation prepared for VBPS teaching, when discussing, deepening students' understanding of VBPS model, and expressing tacit knowledge; (ii) at the beginning of students' self-directed learning when they need scaffolding; the latter is no longer needed when students are involved in self-directed learning; (iii) sharing experiences of VBPS capabilities development.
  - Students' interaction: (i) in solving a problematic situation prepared for VBPS teaching, when they discuss by deepening individual and group's understanding of VBPS model and provide support to each other; (ii) when discussing mutual issues in the course of the module study task; (iii) sharing experiences of VBPS capabilities development.
  - A learning problem prepared as a case or problem situation must be: (i) authentic, i.e., match the students' professional environment (if they work) or be related to their future career plans and include a detailed description of the context; (ii) focused on the zone of proximal development of students; (iii) provoking students to think; (iv) encouraging students' motivation.
  - The teacher's competence should be suitable for creating and operating in educational environments enabling to develop the capabilities of VBPS. Therefore, he/she should have an excellent knowledge of the subject he/she is teaching, which includes the development of VBPS capabilities, and be able to help students to master them. The teacher should have theoretical knowledge of educational and learning environments, be able to create educational environments. Such teacher should be able to apply individual learning and group learning methods, promote self-directed learning, and be an enabler of such learning.
  - Students' self-directed learning involves responsible organization and assessment of one's own learning activities to achieve specific learning goals. During this learning, students engage in self-exploration and have to ask themselves what they are doing, what they can do, what they do not understand, what they could do better, i.e., reflects on their learning.
  - The expression of tacit knowledge requires the application of methods that enable students to think about what and how they are doing and explain it to others. The methods that encourage students to express their tacit and learning knowledge include questioning, discussion, and, in particular, reflection.

1.3.2. Enabling students to solve problems based on values is a learning process, which starts from teaching combined with learning and is gradually moving to self-directed learning. This is a four-stage process implemented in sequences of educational environments: (a) an introductory phase aimed at identifying students' problem solving experience; (b) a key phase aimed at helping students to understand how problems are addressed in reference to values; (c) a self-directed learning phase, in which students complete a module study task based on the VBPS model. Students are given the opportunity to choose issues that are significant for them. Thus, encouraging their motivation arising from the exploration of personal experience, solving them by managing their learning, taking responsibility for it, and constantly reflecting on it; (d) a final phase aimed at helping students to identify what VBPS capabilities they have acquired and encourage them to reflect again on the process of self-directed learning.

1.4. The essential conditions to develop the capabilities of VBPS and the development of the educational environments that determine it allowed substantiating the model of university educational environments enabling students to develop the capabilities of VBPS. This model consists of the following sequences of educational environments, in which educational activities are implemented:

*Stage 1. The sequence of acquaintance educational environments.* In this stage: (a) a teacher introduces the module to students; (b) students are asked to share their problem-solving experiences; (c) a teacher presents the most widely reflected essence of problems in scientific sources and their solution process, which allows students to understand the concept of the problem, types of problems, the process of solving wicked problems; unfortunately, these sources do not emphasize value-based problem solving; (d) based on this knowledge and analyzing students' written/oral narratives, students are helped to understand the extent to which they have followed the theoretical knowledge rules presented in step (c) in the problems they have solved.

*Stage 2. The sequence of educational environments for the initial development of the VBPS capabilities.* The goal is to help students to understand how to solve problems based on values: (i) VBPS model is introduced and explained to students; (ii) a training problem is presented; (iii) students are offered to solve the given learning problem according to the steps of the VBPS model; (iv) students delve into the learning problem individually; (v) before delving into each step of the VBPS, the teacher recalls the theoretical knowledge of a particular step; (vi) after individual learning at each step, returning to the activities in the group of students, when each student expresses the learning outcome of the completed step, i.e., the answer; when questions arise, there is a discussion between the students and a teacher.

*Stage 3. The sequence of educational environments for enabling the performance of a module study task based on the VBPS model*, in which: (i) students are presented with a module assignment when they are offered to choose to solve a problem relevant to them; in order to solve this problem, it is necessary to apply the VBPS model and keep a learning diary, which would help students to reflect the acquired capabilities of VBPS and knowledge (including tacit ones) by reflecting on their own learning; (ii) individual support is provided to help students to understand the performance of the module study task and enable students' self-directed learning.

*Stage 4. The sequence of educational environments for presentation and sharing experience of VBPS capabilities development*, which aims to help students to record what capabilities of VBPS they have acquired and encourage them to reflect once again on the process of self-directed learning. As a result of this learning, students present a problem report and a learning diary. Students present the results of VBPS capabilities development to the whole group or personally only to the teacher (if the problem and its solution are very individual). Through discussion, feedback, and questions, students are empowered to share their learning experiences.

2. A sound methodology of empirical research provides an opportunity to delve into the practice of implementing university educational environments enabling students to develop the capabilities of VBPS. A qualitative case study strategy is appropriate for the empirical study. The logic of the empirical research is similar to the model of realization of educational environments enabling students to develop the capabilities of VBPS. The data are collected in four stages from three data collection sources (module study program, specific group of students and each member of this group) by three data collection methods: document analysis, observation, semi-structured interview. The obtained research data are triangulated in order to reveal the expression of educational environments enabling students to develop the capabilities of VBPS in a specific university study process. The expression of sequences of educational environments is determined by observing the teacher's activity and its context based on the elements of educational environments. Personal learning environments are detected by identifying specific elements of educational environments that become the source of a particular student's personal learning environment formation. The result of each student's VBPS capabilities development is determined by analyzing the result of his/her activity: a report of the solution of an individually selected problem based on values and a learning diary. The information collected from the study participants is analyzed using deductive qualitative content analysis.



3. Based on the empirical research that revealed the expression of educational environments enabling students to develop the capabilities of VBPS in a specific process of university studies, the findings are as follows:

3.1. Empirical research shows that a theoretically based sequence model of educational environments enables the development of students' capabilities of VBPS in a specific module of university studies and allows achieving a positive result of this education.

3.2. The model of educational environments enabling students to develop the capabilities of VBPS was implemented by analyzing a specific case of university studies, in which didactic conditions for VBPS capabilities development were ensured. The teacher had the necessary competence for the implementation of this model; the study program of the module was favorable for the development of students' VBPS capabilities. Implementation of this model in other contexts, especially in technology and science studies, requires further research.

3.3. The essential results of students' VBPS capabilities development: first, they developed knowledge, conceptualized it to the understanding that problem solving integrates value thinking, showed determination to follow this approach in solving problems, and proved the ability to solve a problem in this way. Thus, the first step of students' value education was implemented; without this step, a second step is not possible, i.e., enabling the development and/or change of an individual's specific values.

3.4. Considering the fact that the VBPS model promotes a change in the structure of students' thinking, it is expedient to supplement its first stage "What? - Problem analysis" with a new step "What is the real problem?" In order for the VBPS model to emphasize the implementation of the problem solution in life and work practice, it is expedient to supplement this model with the fifth stage: "Implementation of the solution and evaluation of results", distinguishing its two steps: "Implementing the decision" and "Evaluation of the results".

3.5. The peculiarities of the implementation of the sequence of educational environments: although the sequence of educational environments corresponded to their theoretical model, it was difficult to follow the planned time regime of their realization, because the curriculum required a new way of thinking, which required additional teaching time and effort.

3.6. The peculiarities of students' VBPS capabilities development activities in the sequences of educational environments:

- In stage 1, sharing students' experience of problem solving, it was found that students' thinking in solving problems after naming a problem was more fixed in search for solution ways (alternatives) rather than detailed analysis of a problem;

- In stage 2, the education of most students to the VBPS model was inhibited by their prior hypotheses and focusing on limited targets, driven by bias. Although students perceived the importance of values in solving problems, their value choice manifested itself in an intuitive “bad–good” feeling, without naming what values it was based on. By discussing various examples provided by a teacher, students understood personal biases and their impact on their education. The elimination of biases enabled students to succeed in further education and created conditions for the formation of changes in thinking about the problem solving.
- In stage 3, the students immersed themselves in self-directed learning, in which, by addressing a chosen problem and thinking about values in this process, they engaged in self-exploration, reflecting on their own learning. In this learning, (i) the clarification of values and (ii) constructing a new understanding of problem solving have led to (iii) a change in students’ attitudes to problem solving and (iv) the formation of a new thinking structure that integrates value thinking into problem solving.
- In stage 4, the students, presenting the results of their VBPS capabilities development, became convinced of the meaningfulness, applicability, and effectiveness of the VBPS model when integrating thinking about values in solving various types of problems.

3.7. Acting in educational environments enabled students to develop the capabilities of VBPS; thus, the students selectively emphasized individual elements of these educational environments, i.e., the source of the formation of their personal learning environments, which determined the development of VBPS capabilities.

3.7.1. The following elements of educational environments were identified, which were accepted by most students as a source for the formation of their personal learning environments and led to a certain similarity in their personal learning environments:

- the educational content is presented as pre-prepared information for the development of students’ VBPS capabilities, emphasizing each step of the VBPS model. This element is initially quite formally accepted by students until they test the VBPS model in their activities; only then, the students form an understanding of the value of VBPS model, accompanied by positive emotions;
- the methods used in the development of educational content in students’ activities such as (i) individual learning, supplemented by group learning; (ii) teacher-student discussions promoting student’s self-directed learning;
- the people’s need to achieve the educational goal included: (i) a student himself/herself, (ii) students as a group of learners, (iii) a teacher.

3.7.2. The following elements of educational environments were identified, which determined the individuality of personal learning environments and thus their difference:

- educational content is provided to students as pre-prepared information for the development of students' VBPS capabilities: (i) emphasizing the information of Step 4 on the VBPS model: "Value(s) important for finding a solution to the problem". In this case, the information about values and the chosen video, which reveals the essence of the problem solution and the significance of the value choice, acted differently for several students and enabled them to understand values and led to changes in existing thinking structures; (ii) an independent module study task presented by the teacher, which motivated the students for individual self-directed learning;
- the educational content developed by a particular student with a teacher during coaching acted differently for each student because: (i) it led to a deeper understanding of the problem at hand; (ii) helped to understand how to write a problematic situation; (iii) helped to understand the difference between declared and internal values; (iv) helped to bring together the individual details of the gained knowledge and inspired a change in their thinking;
- the method of creating educational content in students' activities like the interaction of students as well affected some students differently and conditioned the provision of support for each other and cooperation;
- people needed to achieve the educational goal: students, being self-directed learners, involved other people in solving their problems. This means that other people have emerged in students' personal learning environments, i.e., students' relatives, co-workers who (i) helped to gather information about the values; (ii) discussed with the students the issues they had during the decision; (iii) helped to overcome certain steps of the VBPS model; (iv) encouraged and motivated to complete the module study task. These features made students' personal learning environments even more unique.

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|--|--|
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## REZIUMĖ

Gausūs problemas sprendimo tyrimai įvairiose disciplinose atskleidžia tyrėjų siekį išsiaiškinti, kaip galima mokyti spręsti problemas. Šiuose tyrimuose, kaip rezultatas, pateiktos įvairios problemas sprendimo modelių konfigūracijos (Huitt, 1992; Basadur, Ellspermann, Evans, 1994; Morton, 1997; Jonassen, 1997; O'Loughlin, McFadzean, 1999; Mayer, Wittrock, 2006; Litzinger et al., 2010; Collins, Sibthorp, Gookin, 2016; Sternberg, 2017 ir kiti).

Atsižvelgiant į tai, kad vertybės, aprėpdamos etinių sprendimų aspektus, lemia asmens elgesį (Schwartz, 1992; 2012; Verplanken & Holland, 2002; Roccas, Sagiv ir Navon, 2017), sprendimų priėmimo tyrimuose akcentuojami etiniai, moraliniai aspektai (Keeney, 1994; Verplanken & Holland, 2002; Hall & Davis, 2007; Sheehan ir Schmidt, 2015). Tačiau šiuose tyrimuose į sprendimo priėmimą žvelgiama kaip į *vienkartinį aktą*, bet ne į problemas sprendimo *svarstymo procesą*. Šiame tyrime problemas sprendimo priėmimas nagrinėjamas kaip problemas sprendimo svarstymo procesas, įvairiuose jo etapuose atsižvelgiant į vertybes. Tačiau iki šiol trūksta išsamaus modelio, perteikiančio, kaip spręsti problemas įtraukiant mąstymą apie vertybes.

Problemos sprendimas, atsižvelgiant į vertybes, reikalauja ambicingesnės, visapusiškai aprūpintos informacija aplinkos, siekiant problemas sprendimo platesnių galimybių (Funke, 2014). Todėl edukatoriai susiduria su iššūkiu sukurti edukacines aplinkas, kurios įgalintų studentus ne vien ugdytis organizacijų konkurencinei kovai reikalingas žinias ir gebėjimus (Stukalina, 2010; Korkmaz, Erden, 2012; Avdeeva, Omarova, Taratuhina, 2015; Jucevičienė, Valinevičienė, 2015). Išryškėja edukacinių aplinkų, kurios edukacinėmis priemonėmis įgalintų studentus spręsti kylančias jų gyvenimo ir veiklos problemas, poreikis (Jucevičienė, 2007; 2008; 2013).

Iš esmės problemas sprendimo ir edukacinių aplinkų tyrimai vykdomi atsietai vieni nuo kitų. Pasigendama tyrimų, nagrinėjančių problemas sprendimo, integruojančio vertybes, gebėjimų ugdymosi ypatumus, ypač edukacinių aplinkų erdvėje. Todėl klausimas – *kokios universiteto edukacinės aplinkos įgalina studentus ugdytis problemas sprendimo, grįsto vertybėmis, gebėjimus?* – yra tyrimo reikalaujanti mokslinė problema.

**Disertacijos tikslas** – pagrįsti edukacinių aplinkų seką, įgalinančią studentus ugdytis problemas sprendimo, grįsto vertybėmis (PSGV), gebėjimus.

Tyrimas grindžiamas šiomis **konceptualiomis pozicijomis**: (i) nagrinėjant problemas sprendimo, grįsto vertybėmis, mokymąsi, remiamasi: *socialinio konstruktyvizmo filosofine prieiga* (Vygotsky, 1980; 1986), *mokymosi paradigma* (Knowles, 1975; Longworth, 2003); *ekologine teorija* (Bronfenbrenner, 1979); *edukacinių ir mokymosi aplinkų teorija* (Jucevičienė, 2013); (ii) vertybių integravimas į problemas sprendimą ir mąstymas apie jas grindžiamas *humanistine filosofija ir psichologija* (Rogers, 1995; Maslow, 1968, 2011).



**Darbo struktūra ir apimtis.** Įvade pateikiamas tyrimo aktualumas ir temos iširtumas, mokslinė problema, objektas, tikslas ir keliami uždaviniai, disertacijos loginė struktūra, darbo mokslinis naujumas, teorinis ir praktinis reikšmingumas. Darbą sudaro trys skyriai. *Pirmame skyriuje* pateikiamas problemos sprendimo, grįsto vertybėmis (PSGV), modelio loginis pagrindimas. Taip pat šiame skyriuje pagrįstas universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelis. *Antras skyrius* skirtas empirinio tyrimo metodologijai pagrįsti. Tyrimui pasirinkta *kokybinės atvejo studijos strategija* (Merriam, 1998; 2009). X universiteto edukologijos magistro studijų vieno iš modulių dėstytojas į savo dėstomą kursą įtraukė universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelį. Todėl tyrinėtas šio modelio realizavimo atvejis. Duomenys rinkti keturiais etapais iš trijų duomenų rinkimo šaltinių (modulio aprašai, konkrečių grupę sudarantys studentai ir kiekvienas studentas – iš viso jų buvo 9) trimis duomenų rinkimo metodais (stebėjimas, iš dalies struktūruotas interviu, dokumentų analizė). Iš tyrimo dalyvių surinkta informacija analizuota taikant dedukcinę kokybinę turinio analizę. *Trečiame skyriuje* empirinio tyrimo rezultatai analizuojami, interpretuojami ir diskutuojami. Išanalizuotų duomenų trianguliacija buvo vykdoma vadovaujantis edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelio logika. Pateikiamos išvados ir rekomendacijos. Darbo apimtis – 207 p., duomenys pateikti 12 lentelių, 15 paveikslų, 6 prieduose, panaudota 409 literatūros šaltinių.

Disertacinio tyrimo **mokslinis naujumas ir teorinis reikšmingumas:**

- pagrįstas PSGV modelis, kuris kreipia sprendėją mąstyti dvejopa linkme: (i) kaip spręsti problemą ir (ii) kaip bei kada šiame procese remtis vertybėmis; taip du etapai įtraukia individą mąstyti apie vertybes ir jų poveikį pageidautino problemos sprendimo rezultatui;
- išryškintos esminės PSGV gebėjimų ugdymąsi ir jį įgalinančių edukacinių aplinkų kūrimą užtikrinančios sąlygos, atskleidžiant jų tarpusavio sąsajas;
- pagrįstas universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelis, atskleidžiantis edukacinę proceso seką, t. y. kaip įgalinti studentus ugdytis PSGV gebėjimus, šio proceso eigoje akcentuojant mąstymą, jungiantį problemos sprendimą ir vertybes;
- pagrįsta tyrimo metodologija, kuri leidžia empiriškai tyrinėti universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, praktiką.

Disertacinio tyrimo **praktinis reikšmingumas:**

- PSGV modelį galima taikyti sprendžiant realias įvairaus pobūdžio problemas. PSGV modelį gali naudoti: (i) dėstytojai, siekdami ugdyti studentų gebėjimus spręsti problemas remiantis vertybėmis; (ii) įvairių sričių profesionalai, kurie siekia tobulinti savuosius problemos sprendimo

gebėjimus; (iii) organizacijų kvalifikacijų kėlimo skyriai, siekdami kelti darbuotojų kvalifikaciją;

- PSGV gebėjimų ugdymąsi įgalinančių edukacinių aplinkų modelis leidžia praktiškai pasiekti studentų PSGV gebėjimų ugdymosi integruojant į problemos sprendimo procesą mąstymą apie vertybes. Taip įgyvendintas pirmasis studentų vertybinio ugdymo žingsnis, be kurio neįmanomas antrasis ugdymo žingsnis – individo konkrečių vertybių ugdymosi ir (ar) kaitos įgalinimas.

## IŠVADOS

1. Universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, teorinį sekos pagrindimą sudaro problemos sprendimo, grįsto vertybėmis, modelio įrodymas ir jam įsisavinti tinkamos edukacinių aplinkų loginės struktūros suformavimas.

1.1. Integrali mokslinių šaltinių analizė leido naujai, holistiškai pažvelgti į problemos sprendimą, susiejant jį su mąstymu apie vertybes, ir formuluoti šias teorines nuostatas:

- problemos sprendimo procesas turi pabrėžti ne tik problemos sprendimo alternatyvų kūrimą, bet ir išsamią probleminės situacijos analizę, apimant ne tik įtampą keliančią situaciją, jos konteksto įvertinimą bei pažvelgimą į problemą iš skirtingų perspektyvų;
- analizuojant problemą, į ją reikia žvelgti skirtingais pjūviais, konkrečiai – atsižvelgiant į mokslinės / techninės, žmogiškosios / socialinės, egzistencinės ir sisteminės / globalios perspektyvų kontekstą. Taip mąstant apie problemą, ji neišvengiamai pradedama sieti su jos sprendimo keliu, o šiame mąstyme natūraliai atsiranda vertybės, nors dar aiškiai ir neišryškinamos;
- vertybes būtina išryškinti, t. y., įvardyti tada, kai problemos sprendimo tikslas formuluojamas kaip pageidautinas rezultatas, kuris turi būti šiomis vertybėmis aiškiai grindžiamas. Taip sprendėjas kreipiamas sąmoningai prisiimti atsakomybę už vertybėmis grindžiamą siekiamo tikslo / pageidautino rezultato pasirinkimą;
- į vertybes taip pat reikia atsižvelgti pagrindžiant alternatyvius problemos sprendimo kelius, kuriuose gali išryškėti skirtingi suinteresuotieji. Kurdamas alternatyvius kelius, sprendėjas neišvengiamai perteikia pageidautiną, tačiau ne vienašališkai norimą elgseną, leidžiančią siekti pasirinkta vertybe grindžiamo tikslo. Šitai į sprendimo kelio pasirinkimo svarstymo procesą įtraukiamas vertybinis požiūris *a priori* padidina sprendėjo atsakingumą už šių alternatyvų kūrimą;
- sprendėjo požiūriai, patirtis, ypač slypinčiosios žinios, daro įtaką kognityviniam šališkumui, kuris gali būti problemos sprendimo, grįsto

išryškintomis vertybėmis, trikdžius. Sprendžiant problemą būtina numatyti šio trikdžio mažinimo galimybes, t. y. (i) akcentuoti nuodugnią problemos analizę; (ii) pabrėžti problemos konteksto analizavimo svarbą; (iii) vertybių įžvelgimą problemos analizės metu laikyti būtinybe.

1.2. Holistinio požiūrio į problemos sprendimą, kuris grindžiamas vertybėmis, teorinės nuostatos įgalina transformuoti problemos sprendimo struktūrą, sutinkamą daugelyje problemos sprendimo modelių, ir pagrįsti problemos sprendimo, grįsto vertybėmis (PSGV), modelį, kuris apima šiuos etapus:

1 etapas. „KAS? – Problemos analizavimas“. Jį sudaro probleminės situacijos pripažinimas ir problemos identifikavimas šioje situacijoje (1 žingsnis), problemos konteksto analizė (2 žingsnis) ir problemos išvalga iš įvairių perspektyvų, turinčių įtakos visam problemos sprendimo procesui (3 žingsnis). Siekiant sumažinti sprendėjo šališkumą, sprendėjas skatinamas surinkti kuo daugiau informacijos apie problemą (2 žingsnis) ir išnagrinėti įvairius požiūrius (2 ir 3 žingsniai).

2 etapas. „KUO remiantis? – Vertybinis pasirinkimas“. Šiame etape išryškinama (-os) vertybė(-ės), svarbi (-ios) konkrečios problemos sprendimui (4 žingsnis). Jeigu identifikuojamos kelios vertybės, tai tame pačiame žingsnyje nustatoma jų hierarchija ir pasirenkama svarbiausia vertybė. Remiantis pasirinkta vertybe, formuluojamas problemos sprendimo tikslas, kuris atspindi pageidaujamą sprendimo rezultatą (5 žingsnis).

3 etapas. „KAIP? – Alternatyvų paieška“. Šiame etape kuriamos problemos sprendimo kelio alternatyvos remiantis, bet neapsiribojant, atlikta konteksto ir problemos analizė. Siekiant išvengti sprendėjo šališkumo ir noro iš karto formuluoti vieną problemos sprendimo kelią, sprendėjas primygtinai skatinamas pasirinkti kiek įmanoma platesnį problemos sprendimo kelių spektrą. Kiekvienas iš jų turi būti planuojamas įvertinant vertybinį požiūrį, t. y. perteikiant sprendėjo pageidautiną, tačiau ne vienašališkai norimą elgseną, kuri padės siekti pasirinkta vertybe suformuluoto grindžiamo tikslo. Išsamiai išnagrinėjęs kiekvieną svarstomą alternatyvą ir jos įgyvendinimo planą, sprendėjas pasirenka vieną iš jų (6 žingsnis).

4 etapas. „KODĖL? – Pasirinktos alternatyvos patikrinimas“. Šiame etape siekiama dar kartą įsitikinti pasirinkto problemos sprendimo alternatyvaus kelio prasmingumu (7 žingsnis). Šis etapas reikalingas tam, kad sprendėjas dar kartą įvertintų pasirinktą problemos sprendimo kelio alternatyvą: (i) žvelgdamas į ją iš skirtingų perspektyvų; (ii) identifikuodamas suinteresuotuosius; (iii) suvokdamas ir įvardydamas, kokio lygmens atsakomybę už problemos sprendimą ir jo rezultatą sprendėjas prisiima.

1.3. PSGV gebėjimų ugdymosi edukacinės aplinkos kuriamos akcentuojant studentų įgalinimą savarankiškai spręsti vertybėmis grindžiamas problemas, vadovaujantis PSGV modeliu. Įsigilinimas į edukacinių ir mokymosi

aplinkų teoriją, savivaldaus mokymosi koncepciją ir probleminę mokymąsi leido pagrįsti esmines PSGV gebėjimų ugdymosi ir jų įgalinančių edukacinių aplinkų kūrimo sąlygas:

1.3.1. PSGV gebėjimų ugdymosi didaktinis užtikrinimas pabrėžia šias sąlygas, kurios svarbios ne tik studentų PSGV gebėjimų ugdymą įgalinančių edukacinių aplinkų kūrimui, bet ir studentų asmeninių mokymosi aplinkų susiformavimui:

- *Ugdymo / ugdymosi turinys*: (i) kaip dėstytojo pateikiama iš anksto parengta informacija studentų PSGV gebėjimams ugdyti, akcentuojant kiekvieną PSGV modelio žingsnį; (ii) kaip dėstytojo inicijuoto grupinės veiklos metodo taikymo rezultatas, kai studentai kuria ugdymosi turinį savo veikloje – grupėje diskutuodami gilinasi į PSGV modelį; (iii) kaip dėstytojo pateikta modulio studijų užduotis, kurią savarankiškai atlikdami studentai kuria savo ugdymosi turinį.
- *Dėstytojo ir studentų sąveika* akcentuojama: (i) pradinėse PSGV gebėjimų ugdymą įgalinančiose edukacinėse aplinkose sprendžiant PSGV mokymui parengtą probleminę situaciją, kai diskutuojama, studentams gilinant PSGV modelio supratimą ir išreiškiant slypinčiasias žinias; (ii) studentų savivaldaus mokymosi pradžioje, kai jiems prireikia ugdymo konsultavimo; pastarojo nebereikia studentams įsitraukus į savivaldų mokymąsi; (iii) dalinantis PSGV gebėjimų ugdymosi patirtimi.
- *Studentų sąveika*: (i) sprendžiant PSGV mokymui parengtą probleminę situaciją, kai jie diskutuoja gilindami individualų ir grupės PSGV modelio supratimą bei teikia paramą vieni kitiems; (ii) kai tarpusavyje diskutuoja atliekant modulio studijų užduotį kilusiais klausimais; (iii) dalijantis PSGV gebėjimų ugdymosi patirtimi.
- *Mokomoji problema*, parengta kaip atvejis arba probleminė situacija, turi būti: (i) autentiška, t. y. atitikti studentų profesinę aplinką (jeigu jie dirba) arba susijusi su jų ateities karjeros planais ir aprėpti išsamų konteksto apibūdinimą; (ii) nei pernelyg lengva, nei pernelyg sunki, t. y. orientuota į studentų artimiausio vystymosi zoną; (iii) provokuojanti studentus mąstyti; (iv) skatinanti studentų motyvaciją ją spręsti.
- *Dėstytojo kompetencija* turi būti tinkama kurti PSGV gebėjimus ugdančias edukacines aplinkas ir jose veikti. Todėl jis turi turėti puikių savo dėstomo dalyko, į kurį įtraukia PSGV gebėjimų ugdymą, žinių ir mokėti padėti studentams jas įsisavinti. Dėstytojas turi turėti edukacinių ir teorinių mokymosi aplinkų žinių, gebėti kurti edukacines aplinkas. Toks dėstytojas turi gebėti taikyti individualaus mokymosi ir mokymosi grupėje metodus, skatinti savivaldų mokymąsi ir būti tokio mokymosi įgalintojas.
- *Studentų savivaldus mokymasis* apima atsakingą savo mokymosi veiklos organizavimą ir vertinimą, siekiant konkrečių mokymosi tikslų. Šio

mokymosi metu studentai įsitraukia į savęs tyrinėjimą ir turi savęs klausinėti, ką jie daro, ką jie geba daryti, ko nesupranta, ką galėtų padaryti geriau, t. y. reflektuoja savo mokymąsi.

- *Slypinčių žinių išreiškimas* reikalauja taikyti tokius metodus, kurie įgalintų studentus mąstyti apie tai, ką ir kaip jie daro, ir kitiems paaiškinti. Studentų turimų slypinčių ir mokymosi metu įgytų žinių išreiškimą skatinantys metodai yra klausinėjimas, diskusijos ir ypač refleksija.

1.3.2. Studentų įgalinimas spręsti problemas, atsižvelgiant į vertybes, yra studijų procesas, kuriame nuo mokymo, derinamo su mokymusi, palaipsniui pereinama prie studentų savivaldžios veiklos. Tai – edukacinių aplinkų sekomis realizuojamas keturių etapų procesas: (a) įvadinis etapas, kurio tikslas – nustatyti studentų turimą problemų sprendimo patirtį; (b) pagrindinis etapas, kurio tikslas – padėti studentams suprasti, kaip sprendžiamos problemos atsižvelgiant į vertybes; (c) savivaldaus mokymosi etapas, kuriame studentai atlieka modulio studijų užduotį, grindžiamą PSGV modeliu. Studentams suteikiama galimybė pasirinkti jiems reikšmingas problemas (taip skatinama jų motyvacija, kylanti iš asmeninės patirties tyrinėjimo), jas spręsti valdant savo mokymąsi, prisiimant atsakomybę už jį ir nuolat reflektuojant; (d) baigiamasis etapas, kurio tikslas – padėti studentams fiksuoti, kokius PSGV gebėjimus jie įgijo, ir paskatinti dar kartą reflektuoti savivaldaus mokymosi procesą.

1.4. Esminės PSGV gebėjimų ugdymosi ir jį sąlygojančių edukacinių aplinkų kūrimo sąlygos leido pagrįsti universiteto edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelį. Šis modelį sudaro šios edukacinių aplinkų sekos, kuriose realizuojama ugdymo ir ugdymosi veikla:

*1 etapas – susipažinimo edukacinių aplinkų seka*, kurios tikslas – nustatyti studentų turimą problemų sprendimo patirtį. Šioje sekoje: (a) dėstytojas supažindina studentus su modulių; (b) studentų paprašoma pasidalyti savąja problemų sprendimo patirtimi; (c) dėstytojas pristato moksliniuose šaltiniuose plačiausiai atspindimą problemų ir jų sprendimo proceso esmę, kuri leidžia studentams suprasti problemos sąvoką, problemų tipus, sunkiai struktūruojamų problemų sprendimo procesą; deja, šie šaltiniai neakcentuoja problemų sprendimo, atsižvelgiant į vertybes; (d) remiantis šiomis žiniomis ir analizuojant studentų rašytinius / žodinius naratyvus, studentams padedama suprasti, kiek jie spręstose problemose laikėsi (c) žingsnyje pristatytų teorinėmis žiniomis užfiksuotų taisyklių.

*2 etapas – pradinio PSGV gebėjimų ugdymosi įgalinimo edukacinių aplinkų seka*, kurios tikslas – padėti studentams suprasti, kaip sprendžiamos problemos atsižvelgiant į vertybes: (i) studentams pateikiamas ir išaiškinamas PSGV modelis; (ii) pateikiama mokomoji problema; (iii) studentams siūloma spręsti pateiktą mokomąją problemą pagal PSGV modelio žingsnius; (iv) studentai individualiai gilinasi į mokomąją problemą; (v) prieš studentų įsigilinimą į kiekvieną PSGV žingsnį dėstytojas primena teorines konkrečiau

žingsnio žinias; (vi) po individualaus mokymosi kiekviename žingsnyje grįžtama į veiklą studentų grupėje, kai kiekvienas studentas išsako atlikto žingsnio mokymosi rezultatą – atsakymą; iškilus klausimams, vyksta studentų ir dėstytojo diskusija, siekiant supratimo.

3 etapas – *PSGV modelių grįstos modulio studijų užduoties atlikimo įgalinimo edukacinių aplinkų seka*, kurioje: (i) studentams pateikiama modulio studijų užduotis, kai siūloma pasirinkti spręsti jiems aktualią reikšmingą problemą; sprendžiant šią problemą reikia taikyti PSGV modelį ir vesti mokymosi dienoraštį, kuris padėtų studentams, reflektuojant savo mokymąsi, išryškinti įgyjamus / plėtojamus PSGV gebėjimus, žinias (tarp jų – ir slypinčiąsias); (ii) siekiant studentams padėti suprasti modulio studijų užduoties atlikimą ir įgalinant studentų savivaldų mokymąsi, teikiama individuali konsultacinė parama.

4 etapas – *PSGV gebėjimų ugdymosi rezultatų pristatymo ir dalinimosi edukacinių aplinkų seka*, kurios tikslas – padėti studentams fiksuoti, kokius PSGV gebėjimus jie įgijo ir paskatinti dar kartą reflektuoti savivaldaus mokymosi procesą. Studentai, kaip šio mokymosi rezultata, pristato problemos analizės ir jos sprendimo ataskaitą bei mokymosi dienoraštį. PSGV gebėjimų ugdymosi rezultatus studentai pristato visai grupei arba asmeniškai tik dėstytojui (jeigu problema ir jos sprendimas itin individualus). Diskusija, grįžtamasis ryšys, klausimai padeda studentams dalytis įgyta mokymosi patirtimi.

2. Pagrįsta empirinio tyrimo metodologija suteikia galimybę gilintis į universiteto edukacinių aplinkų, įgalinančių studentų PSGV gebėjimų ugdymosi, įgyvendinimo praktiką. Empiriniam tyrimui atlikti tinka kokybinė atvejo studijos strategija. Empirinio tyrimo atlikimo logika yra panaši į PSGV gebėjimų ugdymąsi įgalinančių edukacinių aplinkų realizavimo modelį. Duomenys renkami keturiais etapais iš trijų duomenų rinkimo šaltinių (modulio studijų programa, konkreti studentų grupė ir kiekvienas šios grupės narys) trimis duomenų rinkimo metodais, atitinkamai, dokumentų analize, stebėjimu, iš dalies struktūruotu interviu. Iš tyrimo dalyvių surinkta informacija analizuojama taikant dedukcinę kokybinę turinio analizę. Naudojami šie duomenų analizės vienetai: modulio studijų programa, lauko užrašai, iš dalies struktūruoto interviu įrašai ir studentų mokymosi procese sukurti artefaktai: mokomosios problemos sprendimo studentų užrašai, individualiai pasirinktos problemos sprendimo, grįsto vertybėmis, ataskaita ir mokymosi dienoraštis. Gauti tyrimo duomenys trianguliuojami, siekiant atskleisti edukacinių aplinkų, įgalinančių studentus ugdyti PSGV gebėjimus, raišką konkrečiame universitetinių studijų procese. Edukacinių aplinkų sekų raiška nustatoma stebint dėstytojo veiklą ir jos kontekstą remiantis edukacinių aplinkų elementais. Asmeninės mokymosi aplinkos aptinkamos nustatant konkrečius edukacinių aplinkų elementus, kurie tampa konkretaus studento asmeninės mokymosi aplinkos susiformavimo šaltiniu. Šiuo atveju analizuojami lauko užrašai, iš dalies struktūruoto interviu

įrašai ir mokymosi dienoraščiai. Studentų PSGV gebėjimų ugdymosi raiška nustatoma analizuojant lauko užrašus, iš dalies struktūruoto interviu įrašus, mokymosi dienoraščius, refleksiją raštu. Kiekvieno studento PSGV gebėjimų ugdymosi rezultatas nustatomas analizuojant jo veiklos rezultatą – individualiai pasirinktos problemos sprendimo, grįsto vertybėmis, ataskaitą ir mokymosi dienoraštį.

3. Remiantis empirinio tyrimo, atskleidusio edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, raišką konkrečiame universitetinių studijų procese, nustatyta:

3.1. empirinis tyrimas leido įsitikinti, kad teoriškai pagrįstas edukacinių aplinkų sekos modelis įgalina studentų PSGV gebėjimų ugdymąsi konkrečiame universitetinių studijų modulyje ir leidžia pasiekti teigiamą šio ugdymosi rezultatą;

3.2. edukacinių aplinkų, įgalinančių studentus ugdytis PSGV gebėjimus, modelis įgyvendintas analizuojant konkretų universitetinių studijų atvejį, kuriame buvo užtikrintos didaktinės PSGV gebėjimų ugdymosi sąlygos. Dėstytojas turėjo šiam modeliui įgyvendinti reikiamą kompetenciją, modulio studijų programa buvo palanki studentų PSGV gebėjimų ugdymuisi. Šį modelį įgyvendinant kituose kontekstuose, ypač technologijos ir gamtos mokslų studijose, reikia papildomų tyrimų;

3.3. studentų PSGV gebėjimų ugdymosi esminiai rezultatai: pirmiausia išsiugdė žinias, jas konceptualizavo iki supratimo, jog į problemos sprendimą integruojamas mąstymas apie vertybes, parodė pasiryžimą šio požiūrio laikytis ateityje sprendžiant problemas ir įrodė mokėjimą šitaip spręsti problemą. Taip įgyvendintas pirmasis studentų vertybinio ugdymo žingsnis, be kurio neįmanomas antrasis ugdymo žingsnis – individo konkrečių vertybių ugdymo ir (ar) kaitos įgalinimas;

3.4. įvertinant tai, kad PSGV modelis skatina studentų mąstymo struktūros kaitą, tikslinga jo *pirmąjį etapą „Kas?– Problemos analizavimas“ papildyti nauju žingsniu – „Kokia tikroji problema?“*. Tokiu atveju šis etapas yra sudarytas iš keturių žingsnių: probleminės situacijos pripažinimo ir problemos identifikavimo šioje situacijoje (1 žingsnis), problemos konteksto analizės (2 žingsnis) ir problemos analizės iš įvairių perspektyvų, turinčių įtakos visam problemos sprendimo procesui (3 žingsnis), *Kokia tikroji problema?* (4 žingsnis). Siekiant, kad PSGV modelis akcentuotų ir problemos sprendimo realizavimą gyvenimo bei darbo praktikoje, tikslinga šį modelį papildyti dar vienu, paskutiniu, penktu, etapu: „Sprendimo įgyvendinimas ir rezultatų vertinimas“, išskiriant du jo žingsnius – „8 žingsnis. Sprendimo įgyvendinimas“ ir „9 žingsnis. Rezultatų vertinimas“. PSGV modelio taikymas profesionalų veikloje reikalauja papildomų, tarpdisciplininių tyrimų, integruojant edukologijos ir vadybos mokslo kryptis;

3.5. edukacinių aplinkų sekos įgyvendinimo ypatumai: nors edukacinių aplinkų seka atitiko jų teorinį modelį, tačiau buvo sudėtinga laikytis numatyto jų realizavimo laiko režimo, nes ugdymo turinys pareikalavo naujos mąstymo struktūros, kuriai susiformuoti reikėjo papildomų ugdymo / ugdymosi laiko ir pastangų;

3.6. studentų PSGV gebėjimų ugdymosi veiklos edukacinių aplinkų sekose ypatumai:

1 etape studentams dalinantis problemos sprendimo patirtimi nustatyta, kad studentų mąstymas, sprendžiant problemas, įvardinus problemą, labiau buvo fiksuotas sprendimo kelių (alternatyvų) paieškai nei išsamiai problemos supratimo analizei;

2 etape daugumos studentų gilinimasi į PSGV modelį stabdė jų išankstinės hipotezės ir susitelkimas į ribotus tikslus, sąlygoti šališkumo. Nors studentai suvokė vertybių svarbą sprendžiant problemas, jų vertybinis pasirinkimas reiškėsi intuityviai blogai – gerai pajauta, neįsivardijant, kokiomis vertybėmis tai grindžiama. Diskutuodami apie įvairius dėstytojo pateiktus pavyzdžius, studentai suprato asmeninį šališkumą ir jo poveikį savo ugdymuisi. Šališkumą eliminavimas įgalino studentus sėkmingam tolimesniam ugdymuisi ir sudarė sąlygas formuoti mąstymo apie problemos sprendimą pokyčius;

3 etape studentai paniro į savivaldų mokymąsi, kuriame, sprenddami pasirinktą problemą ir šiame procese mąstydami apie vertybes, įsitraukė į savęs tyrinėjimą reflektuodami savo mokymąsi. Šio mokymosi metu (i) vertybių išgryninimas ir (ii) naujo supratimo apie problemos sprendimą konstravimas lėmė (iii) studentų požiūrio į problemos sprendimą kaitą bei (iv) naujos mąstymo struktūros susiformavimą, kai sprendžiant problemą integruojamas mąstymas apie vertybes;

4 etape studentai, pristatydami savo PSGV gebėjimų ugdymosi rezultatus, įsitikino PSGV modelio prasmingumu, pritaikomumu ir veiksmingumu, kai sprendžiant įvairaus pobūdžio problemas integruojamas mąstymas apie vertybes;

3.7. Veikdami PSGV gebėjimų ugdymąsi įgalinančiose edukacinėse aplinkose studentai atrankiniu būdu akcentavo atskirus šių edukacinių aplinkų elementus – savo asmeninių mokymosi aplinkų, kurios sąlygojo PSGV gebėjimų ugdymąsi, formavimosi šaltinį.

3.7.1. nustatyti šie edukacinių aplinkų elementai, kurie daugumos studentų buvo priimti, kaip jų asmeninių mokymosi aplinkų formavimosi šaltinis, taigi, lėmė jų asmeninių mokymosi aplinkų tam tikrą panašumą:

- edukacinis turinys pateikiamas kaip iš anksto parengta informacija studentų PSGV gebėjimų ugdymui, akcentuojant PSGV modelio kiekvieną žingsnį. Šis elementas pradžioje gana formaliai studentų priimamas tol, kol savo veikloje jie neišbando PSGV modelio, – tik tada studentai susiformuoja PSGV modelio vertės supratimą, lydimą teigiamų emocijų;



- edukacinio turinio kūrimo studentų veikloje taikomi šie metodai: (i) individualus mokymasis / ugdymasis, papildomas mokymusi grupėje; (ii) dėstytojo ir studento diskusijos, skatinant studentų savivaldų mokymąsi;
- edukacinio tikslo įgyvendinimui reikalingi žmonės – tai (i) pats studentas; (ii) studentai, kaip besimokančių grupė; (iii) dėstytojas.

3.7.2. nustatyti šie edukacinių aplinkų elementai, sąlygoję asmeninių mokymosi aplinkų individualumą, taigi ir skirtingumą:

- edukacinis turinys pateikiamas studentams kaip iš anksto parengta informacija studentų PSGV gebėjimams ugdyti: (i) akcentuojanti PSGV modelio 4 žingsnio „Vertybė (-s) svarbi (-ios) problemos sprendimo paieškai“ informaciją. Šiuo atveju informacija apie vertybes ir parinkta videoilustracija, atskleidžianti problemos sprendimo esmę bei vertybinio pasirinkimo reikšmingumą, kelis studentus veikė skirtingai ir įgalino suprasti vertybes bei paskatino turėtų mąstymo struktūrų kaitą; (ii) dėstytojo pateikta savarankiška modulio studijų užduotis, kuri motyvavo studentus individualiam savivaldžiam mokymuisi;
- edukacinis turinys, kuriamas konkretaus studento kartu su dėstytoju ugdomojo konsultavimo metu, skirtingai veikė kiekvieną studentą, nes: (i) paskatino įsigilinti į sprendžiamą problemą; (ii) padėjo suprasti, kaip rašoma probleminė situacija; (iii) padėjo suprasti skirtumą tarp deklaruojamų ir vidinių vertybių; (iv) padėjo sujungti į visumą atskiras įgytų žinių detales ir inspiravo jų mąstymo kaitą;
- edukacinio turinio kūrimo studentų veikloje metodas, pasireiškęs studentų sąveika, taip pat veikė kai kuriuos studentus skirtingai ir sąlygojo paramos vieni kitiems teikimą bei tarpusavio bendradarbiavimą, aiškinantis jiems iškilusius klausimus;
- edukaciniam tikslui įgyvendinti reikalingi žmonės: studentai, būdami savivaldūs besimokantieji, į savo problemų sprendimą įtraukė ir kitus žmones. Vadinasi, studentų asmeninėse mokymosi aplinkose atsirado ir kitų žmonių – studentų artimųjų, bendradarbių, kurie (i) padėjo surinkti informaciją apie vertybes; (ii) diskutavo su studentais jiems sprendimo metu kilusiais klausimais; (iii) padėjo įveikti tam tikrus PSGV modelio žingsnius; (iv) paskatino ir motyvavo atlikti modulio studijų užduotį. Šie ypatumai studentų asmenines mokymosi aplinkas darė dar unikašnes.

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