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Nurturing Innovation and Self-Reliance in Children at the Lithuanian National Library

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Annotation. This study examines the DIY makerspace at the National Library of Lithuania through staff interviews and activity observations. The results show that the makerspace supports children's creativity, autonomy, and practical skills through maker-centred, social constructivist learning. Furthermore, it emphasizes fostering children's identities as makers, reinforces family and social bonds through social interactions and embodies the cultural tradition of self-reliance, a heritage of Lithuanian society.

Keywords: *do it yourself (DIY), makerspace, creativity, self-reliance culture, pedagogy, social value, National Library.*

Introduction

New avenues for developing 21st-century skills and knowledge have emerged because of the democratization of digital fabrication technologies such as 3-D printers, the rise of internet-based knowledge-sharing platforms, and the resurgence of the do-it-yourself (DIY) mentality. These developments have been especially evident in the Maker Movement (Medin, 2013).

The Maker Movement was born at the beginning of this century and has grown in popularity throughout the world. The word "making" refers to a mindset of acting on ideas and developing innovative solutions. The Maker Movement includes makers, makerspaces, and making activities, and it encourages both individual and group efforts to produce tangible and digital artefacts (Halverson & Sheridan, 2014; Papert & Harel, 1991). Communities interested in technology-based DIY projects gave rise to the Maker Movement, emphasizing both the process and the product that is manufactured (Dougherty, 2012). Furthermore, the Maker Movement is about sharing access to information and collaborating, where the community is at the centre. The Maker Movement is also about meeting in a physical space and sharing equipment, materials, and knowledge. The goal is to engage in a creative process and to make something new or test novel ideas.

Since the Maker Movement places a strong emphasis on community-building, the making mindset has swiftly expanded to a variety of educational and community-serving organizations (Halverson & Sheridan, 2014). Therefore, schools, libraries, and other public facilities have established makerspaces. Libraries have created makerspaces to stay relevant and serve the community in various ways. The makerspaces also allow access to modern technology for people who may not have the necessary equipment at home. Thus, the makerspaces become an addition to the meaningful activities in which people can engage at libraries. To promote the Maker Movement, libraries began building makerspaces and offering group programs, workshops, and one-on-one sessions. As a result, library makerspaces have increased libraries' knowledge creation roles and library professionals' facilitation duties (Huvila et al., 2020).

The primary goals of the Maker Movement are, in fact, closely aligned with the missions of libraries, which are to provide space, resources, and learning opportunities for community members (Samsuddin et al., 2020). Libraries have extended their commitments to better serve library users' need to belong and community attachment (Koh et al., 2019). Moreover, library makerspaces' user-centred and hands-on practices were influenced by the learner-centred ideologies of the Maker Movement (Andrews, 2017).

This research was undertaken at the Lithuanian National Library, which has been operating a DIY makerspace known as PATS SAU since 2017. It is dedicated to strengthening the nation's existing culture of self-sufficiency. This aligns closely with Lithuania's historical struggle for freedom and independence, as traditional crafts have long represented national identity and remained resilient even during the Soviet occupation, when such cultural expressions could not be suppressed entirely. Furthermore, due to the limited availability and the high cost of market goods during that period, people relied heavily on self-made products, nurturing a strong tradition of maker culture. Consequently, Lithuanian culture has inherently adopted an element of maker-oriented self-reliance (Atkinson, 2006), which younger generations are charged with preserving and developing.

According to the library's website, "The Martynas Mažvydas National Library of Lithuania plays a crucial role in formulating and promoting democratic values. It, moreover, works to equip citizens with the information skills needed to engage with and shape their society" (Martynas Mažvydas National Library of Lithuania, 2023). Crafts and maker activities have contributed significantly to reinforcing the independence and identities of nations striving for freedom. Therefore, maintaining traditional handicrafts and maker practices is a crucial means of safeguarding the unique characteristics and identity of the Lithuanian nation (Eugenijus & Antanas, 2011).

Theoretical Background

What is a Makerspace?

Makerspaces are places in which people can work on creative and technical projects. They are well-suited for group cooperation on cutting-edge technology projects, peer-to-peer learning, and solo work (Schrock, 2014). According to *The Oxford Learners Dictionary* (2023), a makerspace is a "creative and uniquely adaptable learning environment with tools and materials, which can be physical and/or virtual, where students have an opportunity to explore, design, play, think, collaborate, inquire, experiment, solve problems, and invent". It is a place where people who share interests can congregate to work on projects together and exchange ideas, resources, and knowledge, especially those pertaining to computers or technology (The Oxford Learners Dictionary, 2023). It can also be considered a mindset in its most basic form; according to Burke (2014), "Anywhere that making happens is a makerspace" (p. 13).

Makerspaces are growing rapidly in number all over the world, and they are common in schools, libraries, and other public spaces. Given the wide range of venues available, makerspaces are quickly gaining recognition as a phenomenon in the educational field (Burke, 2014). Loertscher et al. (2013) define a makerspace in a school context as a "creative and uniquely adaptable learning environment". Students frequently use digital manufacturing technologies in addition to manual tools and technology in makerspaces (Hawken et al., 2013).

The Lithuanian Do-It-Yourself Makerspace at the National Library

The Martynas Mažvydas National Library of Lithuania was established in 1919. Serving the entire nation, the library operates in integration with a network of other libraries throughout Lithuania. In 2017, the library introduced the PATS SAU makerspace, an open workshop specifically designed for children and adolescents. Centred around the ideology of learning through self-accomplishment, the makerspace encourages visitors to create and learn through hands-on activities. The makerspace

supports idea-development and crafting. In the makerspace, visitors can find advanced digital technology, in addition to a wide range of manual tools and materials. Due to a limited budget, nearly 80% of the makerspace equipment has been sourced through donations and contributions from visitors, staff, and supporters who are aligned with its creative mission (Martynas Mažvydas National Library of Lithuania, 2023).

The Martynas Mažvydas National Library makerspace primarily serves children and youths between the ages of 6 and 18. It is open seven days a week from 12:00 to 20:00. Children younger than the specified age range may attend the makerspace when accompanied by their parents (Martynas Mažvydas National Library of Lithuania, 2023). Additionally, the makerspace provides specialized facilities catering to older participants, including a photography darkroom, electronics laboratory, music creation room, podcast equipment, music recording studio, and a virtual reality studio.

The makerspace features several well-equipped workstations. The tools available in the makerspace include a 3D printer, vinyl cutter, and thermafilm cutter, heat press, mini sublimation printer, robotics and electronics kits, microcomputer kits, preloaded computers (needed programs are already installed), and prototyping materials (Martynas Mažvydas National Library of Lithuania, 2023). The large variety of manual tools and materials is what sets PATS SAU makerspace apart from many other makerspaces. Children can learn how to use these tools with the staff who also support their creativity and innovation.

Partnered with libraries all over Lithuania, the makerspace uses this connection to reach out to children all over Lithuania and engage them according to their contexts. They hope to start summer camps for children who live in rural areas and provide an online-learning support system. The library will offer short introductions for school groups that visit the library, partner with other libraries across Lithuania, and have trips for students who come from villages outside the capital city of Lithuania. These short introductions will allow students to become familiar with new digital technologies and what they have to offer. As students become creative in the makerspace, they will want to return.

Some of the software used in the makerspace to design and create prototypes are Inkscape, Microsoft's 3D builder, TinkerCAD, and Builder. Since some digital technology can be complicated for beginners, staff nudged kids and teenagers to simpler programs at first. Because of a limited budget for material purchases, the library receives donations for materials. This acts as one of the sustainable policies of the makerspace by keeping costs low (Martynas Mažvydas National Library of Lithuania, 2023).

Maker Generated Content in a Maker-Centred Learning Environment

Learning centered around the maker follows students' interests, allowing students to become aware that they have the power to change the world around them. Maker-centered learning is rooted in computer-based design and production. Digital technologies

and artefact-mediated ways of working allow maker-centered learning to encourage creativity (Clapp et al., 2016). Makerspaces also allow for the learning of creativity, designing, and design-thinking, which was described as "an open-ended, nonlinear, and often messy way to generate innovation and creative solutions" (Bowler, 2014, p. 60).

The pedagogy of maker-centred learning aligns with constructionist theories (Marsh et al., 2017; Willett, 2018; Peppler & Hall, 2016). Through collaborative, student-driven activities, maker-centred learning supports a constructionist mindset and provides the opportunity to develop knowledge and skills. In maker-centred environments, students are autonomous through planning and constructing artefacts. Furthermore, discussing their projects with others helps them to better understand the projects and their potential (Sawyer, 2019). For these reasons, maker-centred learning aims to enhance students' capacities for observation, exploration of complexity, identification of opportunities, and meaningful engagement with the world around them (Clapp et al., 2016).

Studies have shown the importance of well-structured teaching to nurture creativity within makerspaces (Bower et al., 2020; Trahan et al., 2019). Studies examining the ideation processes in makerspaces show improvement in students' capacity to innovate (Glenn et al., 2020; Juškevičienė et al., 2021; Thorsteinsson, 2012). However, learning also occurs informally through self-motivated, playful activities outside structured classroom settings. Watkins and Marsick (1992) state that informal learning refers to "learning from experience that takes place outside formally structured, institutionally sponsored, classroom-based activities" (p. 288).

Advocates of constructionism argue that meaningful learning occurs when students engage in creating, tinkering, and ideation activities (Ackermann, 1996), whether in formal or informal contexts. Constructionism holds that students construct knowledge most effectively when creating personally meaningful artefacts as demonstrations of their learning (Kolodner et al., 2003; Papert, 1980; Edwards, 2001). Additionally, constructionism includes a social dimension, as knowledge-building often occurs collaboratively when students create and share artefacts within makerspaces (Papert & Harel, 1991).

Korhonen et al. (2022) define maker-centered learning as "invention pedagogy". It focuses on inclusive education, collaborative designing, creative problem-solving, and allowing students to learn how to create knowledge through inventing. Invention pedagogy includes the study of STEM (science, technology, engineering, mathematics) and the arts. Instructors and learners approach inventions with the mindset that everyone is an innovator. Students learn how to solve real-world problems and make artefacts using the advanced tools and technologies available to them (Korhonen et al., 2022). Research has shown that the culture of makerspaces allows students to become more self-confident, creative, and innovative. A positive self-awareness leads to a strong sense of community in makerspaces (Carbonell et al., 2019).

According to Clapp et al. (2016), teachers in maker-centred classrooms should primarily be facilitators. Their roles include being mentors, advising, correcting behaviour, and direct instruction (Smarason et al., 2021). Central to maker-centred education is the idea that students themselves should form their own learning experiences. Ogar and Awhen (2015) recommend that educators design tasks that support collaboration and open-ended tasks. Makerspace pedagogy relies on different pedagogical models (Heinze, 2008; Bonk & Cunningham, 1998) that emphasise a shift from traditional, teacher-centred roles to the teacher being a facilitator.

Using different kind of materials supports students' creativity and ideation. A new materialist perspective suggests that using different materials can foster diverse and experimental learning paths for children (Taguchi, 2009, 2011; Odegard, 2012; Pacini-Ketchabaw et al., 2016). Studies indicate a gap between makers' expressed sustainability values and real practices (Kohtala & Sampsa, 2015; Klemichen & Roeder, 2018). However, makerspaces have the potential to promote the creation of sustainable products and support environmental sustainability (Unterfrauner et al., 2019).

Studies suggest that makerspace experiences boost children's creativity, cognitive capabilities, and design-thinking (Timotheou & Ioannou, 2021; Taheri et al., 2020; Hatzigianni et al., 2021). Moreover, maker-based projects stimulate collective creativity and co-creation (Lille & Romero, 2017). Digital manufacturing tools, such as 3D printers, support student innovation (Saorín et al., 2017) and the creation of sustainable and practical artefacts (Chekurov et al., 2020).

Do it Yourself (DIY)

The phrase "do it yourself" refers to the process of creating, altering, or fixing items on one's own without the assistance of experts or specialists in the field. Individuals use raw and semi-raw materials and parts to produce, transform, or reconstruct material possessions, including those drawn from the natural environment (e.g., landscaping), which is how academic research has defined DIY activities (Wolf & Mcquitty, 2011). The marketplace – which includes economic benefits, lack of product availability, lack of product quality, and need for customization – and identity enhancement – which embodies craftsmanship, empowerment, community-seeking, and uniqueness – are two categories of motivations that have been identified as causing DIY behaviour (Wolf & Mcquitty, 2011).

Consumers have associated the DIY abbreviation with house maintenance and renovation tasks since at least 1912 (Gelber, 1997), and by the 1950s, DIY was a widely used term (McKellar & Sparke, 2004). In reference to the growing trend of people using small-scale crafts, construction, and home improvement projects as a creative, recreational, and economical pastime, the term DIY has since expanded to encompass a variety of skill levels. DIY refers to the process of designing, making, customizing, and repairing objects or other items without the need for specialized expertise. People

now share ideas, plans, techniques, processes, and completed products with one another online or in person, turning DIY into a social notion (McKellar & Sparke, 2004).

DIY, a cultural response to increasing academic and economic specialization in modern technological society, narrows the focus area within a larger context, positioning DIY as a venue for holistic engagement. The DIY ethic is the principle of self-sufficiency that involves completing tasks without the assistance of a paid expert. The DIY movement promotes that anyone can do various tasks rather than hiring someone to do it for you (McKellar & Sparke, 2004).

Social Innovation and Self-Reliance Culture

Various social, political, and cultural contexts shape education theory and practice (Guofang, 2012). The enhancement of children's and youths' competencies and skills in social innovation is a top priority for educational policymakers in Europe (European Union, 2015). The Martynas Mažvydas National Library can be described as an institution that strives to instil values in the nation to foster social innovation (Martynas Mažvydas, 2023). The National Library seeks to understand how the world is changing and reinvent itself to fulfil the social needs and create value for the Lithuanian people by using new technology. The library is a knowledge institution with facilities where various, instructive, and innovative events are presented. The library is accessible to everyone and can be used to allow people to gain cultural self-awareness and inspire social communication and innovation (Martynas Mažvydas National Library of Lithuania, 2023).

Social innovation involves creating and applying new ideas and products to improve the quality of life for individuals and communities. With a policy framework, public, non-profit, and private actors can co-create and implement socially innovative solutions to address socio-economic issues, build territorial resilience, and better respond to future shocks (OECD, 2023).

European policymakers have prioritized children's and youth's social innovation and entrepreneurial abilities within education. Some European projects recommend using makerspaces and practical approaches to foster social innovation and entrepreneurial capacities amongst children and youth. Social innovations are positive for society as they enhance the capacity to act on different challenges (Murray et al., 2010; Thorsteinsson, 2012). A makerspace encourages users to be innovative while helping them build persistence. Furthermore, by using a makerspace, students can build connections between their learning and real-world situations, which can also improve their self-awareness.

Research in Terms of Running Makerspaces in Libraries

Researchers have examined how makerspaces enhance the acquisition of diverse skills – including technical competencies, collaborative abilities, and cognitive development –

through hands-on activities (Gershenfeld, 2005; Martin, 2015). In their investigation of 14 library makerspaces in Denmark, Einarsson and Hertzum (2020) categorized library makerspace activities into formal, non-formal, and informal learning activities. This paper focuses specifically on informal learning activities, which are characterized by their discretionary nature, lack of formal planning, and user-defined objectives. Informal activities offer participants the opportunity to pursue personal projects, interact with peers, exchange ideas, and build interpersonal relationships.

Library practitioners particularly emphasize the importance of fostering social connections among users, highlighting interactions between children and parents. Experienced makers will often take on mentoring roles and assist others; however, studies have shown that experienced makers will also create exclusive communities (Taylor et al., 2016). In informal contexts, makers commonly focus on supporting others technical problem-solving in open-ended creative projects, rather than providing instructions aimed at certain learning outcomes.

Nevertheless, public libraries are increasingly emphasizing structured learning and instructional methods. According to Willett's (2018) study of nine libraries in the United States, librarians primarily adopt constructionism as the pedagogical framework within makerspaces. Librarians described makerspace activities as playful, exploratory, and experiential and introduced varied strategies to foster creativity and enhance learning outcomes. Consequently, makerspaces are increasingly viewed as learning environments rather than recreational venues that support extracurricular activities. Structured, school-like activities may restrain creativity and children's exploration that is fundamental to the maker mindset (Willett, 2018). Traditionally, schools tend to work in a linear manner from idea to final product, emphasizing final product evaluation (Skaland et al., 2020). This can be a hinder for playful experimentation in the makerspaces.

How makerspace activities are structured, influences motivation. Motivation is essential for creativity and innovation in makerspaces. Heredia and Fisher (2022) suggest that teachers trained in makerspace pedagogies have higher levels of motivation and greater confidence in engaging their students. Furthermore, Fleming (2015) claims that participation in unstructured, play-oriented makerspace activities can transform students from passive consumers of knowledge into active, motivated creators. Experiential learning within makerspaces increases student engagement and motivation, giving them different opportunities from traditional classroom settings. According to Bosse et al. (2019), providing access to makerspaces for underrepresented communities offers new experiences, contributes to social equality, and improves daily life.

Makerspaces in libraries can be an arena for family bonding. According to Valdemoros et al. (2007), meaningful family time and interactions are being challenged by the use of digital technologies. Participating in family activities in makerspaces can support good values and well-being (Thomas et al., 2017). Children's excessive use of

digital devices can negatively affect family relationships and the development of good values (Carvalho et al., 2015; Jago et al., 2013). Dienlin and Johannes (2020) further highlight both the positive and negative impacts of the use of technology in education. Positive impacts include better communication skills, gaining information efficiently, and learning how to use technology, while negative impacts involve increased mental stress, challenges with time management, and distractions.

Lastly, the different approaches to facilitating makerspace activities in libraries relate directly to their broader social values and benefits. Sustainability is frequently emphasized (Unterfrauner et al., 2019), and makerspaces have a great potential to promote sustainable design practices (Klemichen et al., 2022; McLennan, 2004; Braungart & McDonough, 2013). All design decisions influence sustainability, which involves addressing present needs without limiting future generations (McLennan, 2004). However, studies on German makers indicate that, despite theoretical awareness of sustainability and environmentally friendly practices, there is still a gap in the practical application and integration of these principles (Klemichen & Roeder, 2018).

Research methods

The aim of this study was to examine the DIY makerspace activities at the Martynas Mažvydas National Library of Lithuania in the social and pedagogical context. The research was guided by the following research questions:

1. What are the defining characteristics of the Martynas Mažvydas National Library Makerspace?
2. What pedagogical approaches are used to support children's engagement within the Martynas Mažvydas National Library Makerspace?
3. What societal benefits are associated with the operation of the Martynas Mažvydas National Library Makerspace?

To address these questions, four semi-structured interviews were conducted with makerspace staff members in October 2023. Additionally, activities were observed firsthand on visits to the makerspace. Interviews lasted between 25 and 60 minutes, allowing researchers to explore emergent topics through open-ended follow-up questions (Cohen et al., 2007).

Data analysis involved verbatim transcription and thematic coding using the qualitative analysis software NVivo. The researchers reviewed the transcripts multiple times to identify recurring themes and structures. The coding procedure was performed in two phases, supported by analytical memoranda as recommended by Miles et al. (2014). Initially, both deductive and inductive coding techniques were applied, resulting in six emergent codes that were added to an initial set of 12 pre-defined codes. In the subsequent phase, coding was refined into two primary categories, each comprising five selected codes. These final categories – pedagogy and social values – directly address the research questions and inform the study's findings.

Results and Discussion

Pedagogy

Pedagogical studies focus on the methods of teaching, learning, and social interactions in the classroom. Educational theory and practice are shaped by social, political, and cultural contexts (Guofang, 2012). In makerspaces, teaching and learning are usually associated with social constructivist theories (Marsh et al., 2017). Although the staff at the Martynas Mažvydas National Library Makerspace indicated that they did not consciously follow any specific theoretical frameworks, their pedagogical approaches appear to correspond with social constructivist principles (Willett, 2018). One staff member stated, "We are aware of theories, but knowledge is everywhere, and you learn through making and by touching and building".

The activities in the makerspace were not formally structured or curriculum-based but aimed to support children's individual ideation and creativity. The staff acted as mentors and facilitators, helping children to actualize their projects rather than giving them tasks and telling them what to do. Ackermann (1996) stated that learning occurs when students engage actively in creation, experimentation, and idea generation. Constructivists argue that learning arises when students work on projects that are meaningful to them (Kolodner et al., 2003; Papert, 1980).

The Mažvydas Library makerspace is a place for children to be creative and construct their own knowledge and skills with help of the staff (Peppler & Hall, 2016). Although the children usually worked independently, dialogue with staff and interaction with other children were essential for improving their ideas and projects. Constructionism highlights the importance of social interaction, sharing, and discussing ideas. This is emphasized in makerspaces where students discuss their projects with others (Papert & Harel, 1991). The staff encouraged independence and exploration, while providing support when necessary to support independence. One staff member said, "The most difficult part is to let them be in their own space. Our main job is to encourage the children to do what they are doing... and we see that they are getting more independent". Studies have shown that makerspaces support creativity, problem-solving and cognition (Timotheou & Ioannou, 2021; Taheri et al., 2020; Hatzigianni et al., 2021).

This study highlighted the role of the tutors as both facilitators and traditional instructors. The staff supported the children by helping them to solve technical issues and guiding their projects as facilitators rather than through direct instruction. According to Little (1991), autonomous learners take responsibility for their own learning and that of others in a group setting. Little described autonomous learning as "…the capacity for detachment, critical reflection, decision-making, and independent action" (1991, p. 4). Schwienhorst (2009) also stated that the concept "contains the idea that

learning essentially arises from supported performance" (p. 18). Furthermore, Dam (1990) described how self-directed learning supported social responsibility.

Makerspaces also provide an environment that allows participants to learn from mistakes. This supports resilience and openness to new ideas. Children entered the Mažvydas makerspace with ideas, which they developed through experimentation with materials and the support of the makerspace staff. The director of the Mažvydas makerspace highlighted, "It's a good platform to fail fast, and it's a safe one because no one told you what to do. No one told you how it's going to have to look". Knowledge, according to the staff, lies in the work, and the children learn from their makings (Timotheou & Loannou, 2021; Taheri et al., 2020; Hatzigianni et al., 2021). According to social constructivist theory (Edwards, 2001), students create new knowledge by actively integrating their existing knowledge with what they are learning and observing. Social constructivists look at how people change their lives and how they see themselves through social activities (Marsh et al., 2017; Shotter, 1993). Consequently, they become active members of society who contribute to the change of their environment (Edwards, 2001).

The support of the staff was essential in fostering creativity within the makerspace (Bower et al., 2020; Trahan et al., 2019). The children had to begin with their own original ideas that were rooted in their own environment (Thorsteinsson, 2012; Murray et al., 2010). The children were not allowed to use downloaded files, drawings, or physical materials without applying some changes. This was done to emphasize the importance of being creative in all aspects of their work. The goal was to produce prototypes or other artefacts with support from the staff throughout the ideation and creation process.

The children talked about being motivated by working on their own projects. The director stated, "The children come out of curiosity because we have something that they won't find elsewhere. We are different from fab labs [digital fabrication laboratories]. … Teachers envy us because we are working with very motivated kids". The children were also sometimes influenced by their peers' ideas, but many were independent in the ideation phase. Studies indicate that engagement in makerspaces enhances participants' independence, creativity, and innovative capacities (Glenn et al., 2020; Juškevičienė et al., 2021). At the Mažvydas makerspace, a diverse selection of materials was available, promoting material experimentation. Sometimes, the children created objects from waste or reused materials, which supported their understanding of sustainability. Material interaction contributed to student understanding, which supported creativity, innovation and a new perspective on creative learning (Taguchi, 2009, 2011; Odegard, 2012; Pacini-Ketchabaw et al., 2016).

The makerspace emphasized the use of sustainable materials and recycling practices, with the object of fostering environmental awareness in children. Although makers theoretically adopt sustainability, its practical application frequently falls short (Unterfrauner et al., 2019; Kohtala & Sampsa, 2015; Klemichen & Roeder, 2018). Sustainable

designs within makerspaces promote innovative application of renewable materials, thereby striving to mitigate environmental consequences (McLennan, 2004; Braungart & McDonough, 2013).

Social values

The Mažvydas Makerspace is located within the Lithuanian National Library and functions autonomously from formal educational institutions and curricula, offering informal, learner-driven educational opportunities (Skaland et al., 2020). According to the makerspace staff, parents encourage children to participate in the makerspace activities, thereby providing them with an alternative to the use of digital devices and supporting family interaction and value development. A staff member said that "the makerspace is social and a good place for families to bond. However, sometimes the kids are more relaxed on their own". Studies show negative consequences of intensive digital engagement, including weakened family interactions and reduced value formation (Carvalho et al., 2015; Jago et al., 2013). Dienlin and Johannes (2020) claim that technology impacts education, mental health, personal development, and social relationships. Technology can improve communication and the flow of information, but it also has its challenges such as stress and distraction (Ellis, 2019).

Moreover, the Mažvydas makerspace aims to support children with few opportunities elsewhere. Children visited the makerspace primarily to work on their own creative ideas and experiment with digital technologies in an environment offering autonomy. Makerspaces, according to Fleming (2015), have been shown to increase student engagement and achievement by providing students with hands-on learning experiences that are not accessible in a traditional classroom setting. Makerspaces promote equity and life quality by providing all groups access to creative, innovative, and experiential learning opportunities (Bosse et al., 2019).

The staff viewed sustainable design as essential for environmental responsibility and emphasized sustainability and recycling as important components of daily life. Braungart and McDonough (2013) state that the core issue facing humanity is not pollution per se, but rather a deficiency in design. Sustainable design necessitates a cautious selection and application of materials alongside the incorporation of recycling principles throughout the design and production phases. Furthermore, teaching sustainable practices influence students' ideation and supports informed decision making, thus enabling environmentally friendly design. The decisions made in the design process affect sustainable development and environmental health (McLennan, 2004).

The Mažvydas makerspace supports a DIY culture with the objective of developing children's problem-solving skills and self-reliance. This mirrors Lithuania's historical culture of resourcefulness, which emerged during the Soviet period. The director said, "There was a time where we were lacking everything, so people had to make what they needed. Perhaps that is also where our background is". Furthermore, engagement in

makerspace activities enables children to be participants in social innovation (OECD, 2023). Unlike traditional, structured learning, the makerspace encourages autonomy, creativity, and problem-solving skills that serve different individuals and learning styles (Lynch, 2017; Martynas Mažvydas National Library of Lithuania, 2023).

Conclusion

The Mažvydas DIY Makerspace is for children aged 6–18 and does not rely on the national curriculum or work directly with schools. Instead, the makerspace emphasizes the development of ideation skills and creativity through design thinking and hands-on making activities. Digital technology is used when necessary to create artefacts.

The makerspace at the Martynas Mažvydas National Library is supported by the Lithuanian government, recognizing the importance of craft-based activities for cultivating 21st-century skills. Furthermore, it highlights the value of a self-reliance culture that is an integrated part of Lithuania's culture and influences individual practices. By establishing the DIY makerspace, the Lithuanian National Library highlights the importance of nurturing innovation among children and contributing to a maker culture within an increasingly digital society.

The Lithuanian National Library prioritizes having competent staff that can support children's creativity and innovation through exploration. It integrates new technologies into projects of social significance, thereby supporting both individuals and society (Martynas Mažvydas National Library of Lithuania, 2023).

Maker-centred pedagogy at the Mažvydas makerspace is characterized by social constructivist activities that focus on building on the individual's prior knowledge and experience. The staff facilitated autonomy and gave students the possibility to take responsibility for their own learning. Students were encouraged to develop their creative ideas and were not allowed to take ideas or use materials directly without making some modifications. By engaging in maker activities children created knowledge, ideas and practical skills. Consequently, they became active creators and contributors to society rather than passive recipients.

The Mažvydas makerspace offers a range of manual- and electric tools in addition to different materials that support children's creativity and innovation. The staff members emphasized that learning occurs when children are supported to combine existing knowledge with new experience, particularly by learning from mistakes. Furthermore, by focusing on recycling materials, children learn about sustainability and economy.

To strengthen family ties, parents were encouraged to engage in maker activities with their children during weekends. This helps parents to form good habits and values with their children, and how to be responsible citizens who contribute to society. Additionally,

the makerspace aims to support children who may have limited opportunities for maker activities within traditional educational settings.

The activities at the Mažvydas makerspace focus on the needs of the individual and society and cultivating self-sufficiency. Lithuania's historical self-reliance culture, which is derived from the Soviet occupation, prepares children to contribute to society. At the Mažvydas makerspace, children are engaged in meaningful activities that support practical skills through the making of innovative artefacts, giving them important competencies for life in the 21st century.

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Vaikų novatoriškumo ir savarankiškumo ugdymas Lietuvos nacionalinėje bibliotekoje

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Santrauka

2017 m. Lietuvos nacionalinėje Martyno Mažvydo bibliotekoje įkurta kūrybinė erdvė PATS SAU. Ji skirta vaikams iki 18 metų. Pagrindinis šios erdvės tikslas – ugdyti vaikų gebėjimus generuoti idėjas, skatinti jų kūrybiškumą, padėti jiems idėjas paversti realiais, praktiškais produktais. Šio tyrimo tikslas – ištirti PATS SAU kūrybinę erdvę: kaip organizuojama jos veikla, kokie ideologiniai pagrindai, kokią įtaką daro vaiko asmenybės ir socialinei raidai, kokios pedagoginės priemonės taikomos vaikų novatoriškumui skatinti ir praktiniams įgūdžiams ugdyti. Tyrime naudoti kokybiniai metodai, įskaitant interviu su kūrybinės erdvės darbuotojais ir stebint jų veiklas šioje erdvėje. Iš tyrimo rezultatų matyti, kad ši erdvė skatina vaikų individualų vystymąsi, ugdydama jų gebėjimą generuoti idėjas ir kurti naujas žinias per praktines veiklas, taikant tinkamus pedagoginius metodus. Kartu formuojama vaikų kaip kūrėjų tapatybė, o per socialines sąveikas stiprinami šeimos bei socialiniai ryšiai. Be to, kūrybinės erdvės PATS SAU veiklos įtraukia ir nepriklausomybės tradiciją, taip parodomas Lietuvos visuomenės išgyventas sovietinės okupacijos laikotarpis.

Esminiai žodžiai: *PATS SAU (angl. do it yourself (DIY) – liet. daryk pats), kūrybinė erdvė, kūrybiškumas, pasitikėjimo savimi kultūra, pedagogika, socialinė vertė, Nacionalinė biblioteka.*

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