Abstract

Family and school are the main pillars of the social interactions of the child in his or her environment, [1]. However, one of the important factors is the space in which the child lives. Modern childhood, which carries with it the characteristics of a digital society, where even the educational system encourages significant computerization of the learning and teaching process, does not rarely or insufficiently or superficially respond to the challenges of modernizing and digitizing the school. Primary school work is based on regular forms of teaching and the so-called organization of children's leisure time in school, which is defined as extracurricular activities. Forms of extracurricular activities of children in school, which play the role of recreation, rest, but also development of personality, which represent significant opportunities that foster children's connection with the environment and the child's well-being as a result of interactions, are scientifically proven motivators of environmentally responsible behaviour [2].

In addition to the significant advantages offered by new IC technologies in modernizing educational processes in schools, they have also introduced certain shortcomings, which are reflected not only in the different areas of growth and development of children, learning and teaching, but also in the overall well-being of children and their way of life. One of the significant factors related to these deficiencies is the problem of connectedness (or absence) of children's contacts with nature. The concept of connectedness with nature in the last decade is very topical in the scientific and research sense, especially from the interdisciplinary point of view. One definition of the concept of connectedness with nature is that it represents the enjoyment of nature, empathy towards living beings, a sense of belonging, and responsibility towards nature [3].

Numerous studies confirm that children’s connectedness with nature is related to the quality of children’s leisure time, in the family and school. It has also been confirmed that there is a significant correlation between nature and the use of ICT and the well-being of children as they grow up. It is very important to emphasize that this is not only a problem of family education, but also a significant challenge faced by the educational system, the role of the school, but also teachers and their competences. In this paper, we present a project/research that aims to provide an answer to the question whether it is possible and how to foster a more meaningful connection between children and nature through quality leisure time organization and the use of ICT at school.

Keywords: extracurricular activities, connection with nature, ICT, students, teachers.

1 INTRODUCTION

Brofenbrenner's ecological systems theory, according to [1], describes the importance of contextual factors in the educational formation of the child, with particular emphasis on family and school as the main backbone of social interactions of children in their environment, and parents, teachers, and peers, as well as the space in which children live, as the main activators of educational influence. The term space in this sense can be interpreted on a micro-level – the space of a home or school, and on a macro level – the space in which the child's life takes place: the environment, urban and natural, in which the child lives, grows, goes to school. The natural environment, that is, nature, is part of the child's experience of growing up, so that, in this paper and the forthcoming research, we specifically address this notion.

Children and youth should be encouraged to acquire new knowledge, develop skills, enrich their emotional lives, develop social relationships, and become independent in their leisure time. The educational system can help in this endeavor by developing effective ways and opportunities to spend quality time. As [4] point out, since leisure time is a time of active rest, development, socialization, and creativity, its role, purpose, and task are a challenge to the educational system and its use is a current issue of the school. Leisure time in schools enables students to develop their own potentials and
empowers the person to account for their own development [5]. Consideration should be given to highlighting positive examples of extracurricular activities while encouraging the involvement of parents and associates from the broader community.

Starting from today's generations of pupils and the environment we live in, digital technology plays a significant role in our everyday lives, including in education. Digital technology can help to understand the phenomena in nature, so that the child can learn about the changes and phenomena in nature through various simulations, games, and similar applications, and can recognize, understand, and record them in real contact with nature.

In this paper, we present a research that focuses on examining the index of connectedness to/with nature, children, parents, and teachers and identifying the relationship between connectedness to nature, pupils' organized leisure time in school, and ICT in learning and teaching.

2 CONNECTEDNESS WITH NATURE, CHILDREN, AND SCHOOL

Connectedness to/with nature is a term that has been appearing in numerous studies in recent decades. It is most often based on research into cognitive, emotional, or affective experiences of nature, and is defined accordingly. Terms appearing as similar or with similar features are relatedness to nature, affinity to nature, and are often associated with the term biophilia. Although there are certain differences between the concepts, it is simplest to think of this term as a more specific measure and relationship between man and nature and/or living beings in nature. For the purposes of this paper and research, the term connectedness with nature will be used, whereby it is defined as enjoyment of nature, empathy towards nature/living beings, responsibility towards nature, and awareness of nature [3], [6].

Existing research proves that the lack of connectedness between children and space, especially external space, i.e., nature, has an impact on their impaired motor skills, cognitive ability, obesity, anxiety, lack of confidence, increased stress, motivation to learn, and similar health problems [7], [8]. The issue of absenteeism is related to the organization of their leisure time in the family setting and in school [9], [10], and, as has been proven, with subjective well-being as well [6]. Connectedness with nature has been found to be systematically associated with a positive influence on one's self-esteem, personal development, autonomy, and purpose in life, although not with satisfaction with life [11]. In addition, it has been proven that children from urban areas, who spend more time and in direct contact with nature daily, are more resilient to stress and better cope with difficulties in their daily lives [13]. [14] reached similar conclusions when defining the moderator, i.e., “nature as a buffer” of stress and resilience, whereby their research is additionally important because it involved both parents and children. Research also indicates that even temporary connectedness with nature is a partial mediator of positive contributions of spending time in nature [15], [16]. In the context of learning about teaching in school, research carried out by [17] proves “that teaching processes in nature contribute to greater engagement and student activity in the teaching process” [as cited in 18, p 6]. In connection with this research, they also indicate that there is a significant difference in the perceptions and experiences of lower school pupils with respect to age [19]. Experiences, learning about and achieving connectedness of children to/with natural spaces, in nature or in the school environment may be viewed, according to [19] in several categories: as a place for recreation, as a place for rest, as a place for sports, as a place for obligation, as a place of hindrance, as a place for wealth, as a place for beauty, as a place for creativity [19] but also as a place that can unite all these categories in the learning and teaching processes of children in school, through curricular content, research activities, organization of leisure time in school, and also through the use of ICT. [20] identify and describe three basic stages of children's development strategies and children's learning: empathy, research and activism, or social action. The early/middle grade period (ages 7 to 11) is a period of schooling that we focus on in our research. This period in schooling fosters children's participation in research activities in everyday life. We have already addressed this in another paper: “In this regard, we emphasize that research is a prerequisite for contemporary pedagogical work where students are placed in the position of an active participant in the teaching process. The activities themselves reinforce the child, provide him with the competences for independent learning and provide a good foundation for the development of science literacy” as cited in [18, 948].

In this study, we rely on the modified Connection to nature index provided by [6]. These authors applied the modified index to preschool children and found that a greater connectedness with nature contributes to the overall health and psychological health of children. Accordingly, we highlight another important research that forms the theoretical basis of our research – that by [21], who examined the emotional component of connectedness with nature. The authors also identified the correlative relationships of the
construct connectedness with nature and with environmental attitudes, behaviors, and emphasize its testing in previous research [22] and the relationship with situational factors and personality traits.

3 EXTRACURRICULAM ACTIVITIES IN SCHOOL

Access to leisure time, in which a person strives for an overall holistic development, is a feature of the modern concept of leisure time that involves very active and autonomous human activity. Leisure time is extremely suitable for an individual's personal development on an intellectual, socialization and emotional plane. This creates the conditions for the development of preferences and skills, reveals giftedness and talent for a specific area, and is conducive to the development of human qualities. A fact that complements the school as an institution with great potential for impacting pupils' leisure time is that it is a place that can provide great education during leisure time because children meet continuously, exchange ideas and attitudes, and refine their social skills [23]. It is intended for the pupils to acquire the habit of actively using their leisure time so that they can establish a realistic relationship between leisure time for rest and fun and that for personal development.

The school, as an educational institution, shows most of its impact on pupils' leisure time through extracurricular activities. In the school curriculum, extracurricular activities are a special form of educational work with pupils during their organized leisure time, based on the principle of free choice. The school offers a variety of programs and activities in which students may engage based on their personal preference. Organized leisure time in extracurricular activities is not isolated from other developmental areas but is carried out in schools and communities and is influenced by families and peers [24]. Any organizational-structural division of extracurricular activities, regardless which criteria they set out from, is sometimes relative because it faithfully reflects all the dynamism, richness of content, and educational opportunities of these activities. Importance should be given to the strategic coverage of areas of interest in order to harmonize the development of children's interests in different areas. An interdisciplinary design of extracurricular activities, according to the [25] is prescribed in the following educational areas: linguistic-communication, social-humanistic, mathematical-natural scientific, technical-technological, physical-health, artistic, and practical work and design. The focus of this paper is on the activities of the natural sciences in the context of child welfare in connectedness with nature. According to the [26], the definition of these extracurricular activities falls within the scope of environmental protection and healthy lifestyle aimed at exploring the homeland and preserving its environment, learning about environmental protection, acquiring a culture of living in a healthy environment, and positively directing activities in the technical and technological area. [27, 126] find the basis for curriculum development of extracurricular activities in the “outcomes and guidelines of the school curriculum that cover several areas: school effectiveness, the learning and teaching process, school culture, school management, teacher professionalism and their personal development, and the goals and strategies of quality development.” It is important to emphasize that the school is autonomous in organizing and conducting extracurricular activities. According to [29,23], an interesting involvement of pupils in extracurricular activities “is our reality and future that needs to be advocated and systematically embedded in the daily leisure time of children, in the school under the watchful eye of professionals, and in consort with all interested parties within schools, the narrower and broader community.” Today’s reflections on the changes in extracurricular activities, which does not come as a surprise, start with the pupils, their needs, interests, the diversity of everyone, the preferences and abilities of each child. Pupils should be encouraged to express their personal opinions and to identify the skills they possess in order to decide, independently and responsibly, what they will do outside the classroom, what activities they will engage in and take part in, and how they will spend their leisure time. It is important to emphasize the importance of quality leisure time for children, that is, the pupils need to be aware of the need to think carefully about leisure time, which will affect the development of their lifestyle, opinions, and habits. They should be instructed to spend their leisure time usefully, to do the best they can, and to achieve high quality in what they do. “The culture and quality of leisure time, healthy living, and social communication and competence are new horizons for extracurricular and extraschool activities as interconnected parts of the school and the educational system” [30,126]. Teachers’ enthusiasm alone is not enough for effective care and management of extracurricular activities; what is also required is their professional competences, actions, methods of work, and cooperative relationship with the pupils. Teachers’ knowledge, skills, and experience are imposed in informing, orienting, planning, organizing, and performing extracurricular activities with the pupils. The Curriculum [26,13] states that “Extracurricular activities in elementary school imply the teacher’s freedom to create educational work and a sense of creativity, as well as a successful incentive to engage pupils to work beyond regular teaching.” The contents of extracurricular activities are not formally defined, which allows teachers to create new topics, content, forms, and
methods of work, and accomplish targeted tasks. Knowledge of specific program content, which includes professional knowledge and methodological preparation, is crucial for teachers to devise a methodically designed program and make it interesting and educational for the pupils [28]. The pedagogical role of teachers in extracurricular activities is reflected in assisting, initiating, coordinating, advising, teaching, directing students, and educating them for the proper, cultural and rational use of leisure time oriented towards the creative abilities of the pupils [30]. In addition to the teacher, the pupil should be actively involved in collaboration, a conscientious approach to their responsibilities, and sharing of responsibility in the process of collaborative creation. Only when the stated aspirations of teachers and pupils are realized will we be able to speak about the successful implementation of extracurricular activities, good outcomes, and a fulfilled educational and social task of the school. As [29] point out, it is important to start with practical achievements that are (in)visible when considering extracurricular activities, but also to explore and analyze the advantages and disadvantages of conducting activities and to offer a new theoretical framework that can be practically implemented in order to secure the future and perspective of extracurricular activities.

4 INFORMATION COMMUNICATION TECHNOLOGY (ICT)/DIGITAL TECHNOLOGY AND SCHOOL

In order to prepare a strategy for the implementation of computerization of teaching and business processes in Croatia, in 2015, CARNet’s E-School pilot project was launched [31]. The integration of modern teaching and learning methods into the educational process with the help of digital technologies has included the creation of digital educational content, teaching scenarios, and E-lab [32] – a central place for research, testing, and selection of digital tools that can be used in teaching. In addition to this project, the project “School for Life” was launched as a major part of a curricular reform, in which the curricular approach and the change of classical teaching methods in strives to stimulate critical thinking and develop problem solving competences in the pupils [33]. One of the cross-curricular topics that has been implemented since this school year is “Use of information and communication technology”, which makes technology a tool in the educational context. The ability to apply this topic across all subject curricula, as well as its emphasis on linking different areas, subjects, and topics, provides an additional developmental opportunity for all children [34]. The application and use of ICT in teaching further enhances pupils’ intellectual activity because it stimulates the dynamic of teaching, and thus has a positive effect on increasing the motivation to learn. The use of digital devices in teaching and extracurricular activities encourages creativity in teaching, and through continuous interaction and rapid feedback, makes teaching content more attractive and engaging for the pupils. Digital applications allow pupils to express themselves creatively, create mind maps, interactive works, drawings and posters, soundtracks, animations, and films to represent themselves and the world around them. Through technology, pupils can show their creativity and innovation by presenting their ideas and creating new content and express their originality by combining and rearranging their existing knowledge and content. Technology also enables them to develop communication skills and collaborative competences in researching and managing information.

5 ROLES OF EXTRACURRICULAR ACTIVITIES AND ICT IN PROMOTING CONNECTEDNESS WITH NATURE

The Curriculum for Primary School and the National Curriculum Framework in Croatia defines extracurricular activities as "the most effective way of preventing socially unacceptable behavior, and as extremely stimulating for pupils’ self-actualization and independent learning," whereby the areas comprised therein are natural scientific-mathematical, sports, health-recreational, activities related to preserving national and cultural heritage, environmental protection, promotion of a healthy lifestyle, social-humanistic projects, pupil creativity, and technical creativity. The organization of children's leisure time in the nature or forms of extracurricular activities have the role of learning, but also of recreation, rest, and encouraging the overall development of personality. "Quality leisure time and play are a healthy stimulation, which is crucial for the child's intellectual, emotional, and social development. Experiences are like brain food; they stimulate the senses, which has a positive effect on brain development. As a child grows, so do his or her interests as well as the leisure time" [35, 23] Pupils’ extracurricular activities can represent significant opportunities that foster children's connectedness with the environment/nature and children’s well-being. Connectedness with nature has been found to be related to the subjective well-being of children, but also to be a motivator of environmentally responsible behavior [13].
The new National curricula in the Croatian school, launched as part of the so-called Wholesome curricular reform in schools, especially highlight the pupil as an active participant in the learning and teaching process. In the subject curriculum of the subject Nature and Society, the research approach is emphasized as being dominant in the content that promotes pupils' scientific literacy. The basic tenets of a wholesome curricular reform [34] are, among other things, based on the development of lifelong learning competences, increasing the level of pupils' functional literacy, but also the connection between education with the pupils' interests, needs, life experiences, and opportunities. In this regard, the areas of this research that include the connectedness of children with nature, indicators of child well-being and leisure time of school-aged children are significantly related to the areas of full-time and extracurricular work in primary schools, but also to the lives of children in families. ICT is also one of the essential components of the new curriculum and is especially described in the multimedia document in classroom teaching. Therefore, the relation of ICT as a possible facilitator of positive experiences of children in nature is also a variable that is explored in this research, despite numerous studies suggesting a negative impact of ICT technology on child growth and development [36]. Accordingly, we emphasize the importance of incorporating ICT in school curricula: “A flexible hybrid curriculum will have ICT at its core, developing an awareness of the nature of science as a discourse, as a culture, as a social practice” [37,193]. It is very important that pupils learn about the advantages and disadvantages of using digital technology and understand how it affects people's personal and social development, their health, and the environment.

6 METHODOLOGY OF FUTURE RESEARCH

6.1 Aims, tasks and hypothesis

The aim of the research is to determine the degree, that is, index of children's connectedness with nature, with a special emphasis on the well-being of children and the organization of children's leisure time in family and school. This research will explain the connectedness and examine the relationship between these constructs, as well as the implications for teachers’ work, the need for competence development, and professional development (PD) focused on the areas of Education for Sustainable Development (ESD), well-being, and leisure time in early school-age children.

The research main framework is presented in the following figure 1.

The research tasks and hypotheses were set in line with the research aim.

The descriptive level of research (descriptive data) includes:

- determination of acceptable measurement characteristics of the instruments used;
• determination of the mean values of the index of parents’, children’s and teachers’ connectedness with the nature, measurement of the structure of organized leisure time in the family and school; and

• high values of the need for competence development and teacher professional development.

Significant statistical correlations of the results using correlation calculations are expected:

• index of connectedness with nature and well-being of children;

• index of connectedness with nature and structure/organization of children's leisure time in family and school;

• index of connectedness with nature, organization of children's leisure time in school and the need for competence development and teachers’ professional development.

Multivariate statistics is expected to confirm the following hypotheses:

• index of connectedness with the nature will prove to be a significant mediator/moderator of child well-being; and in the sample of parents, the index will prove to be a mediator/moderator of the structure of children's leisure time at home

• in the sample of teachers, the index contributes to the index of children's connectedness with nature and represents a mediator/moderator of the structure of children's leisure time in school, and will be confirmed as a predictor of the need for competence development and teachers’ professional development.

• the structure of the organization of children's leisure time at home and in school is expected to prove to be a significant predictor of the index of children's connectedness with nature.

6.2 Sample and Participants

Based on the research draft, the research sample comprises a cluster, phased, i.e., it includes an appropriate random selection of primary schools in the county and selection of classes pertaining to grades two through four of primary school. The sample consists of 200 children/pupils enrolled in grades two through four of primary school, their parents, and teachers in about 10 classes. The research process involves obtaining consent and approval. The survey is conducted in primary schools with parents completing questionnaires at home and children and teachers at school. Prior to the research, the teachers are introduced to the purpose of the research and how the survey will be conducted, which is ultimately done with the assistance of the researcher. The procedure involves that each parent receives a separate envelope (closed) with a questionnaire, which they then hand in to the teacher upon completion. After completing and collecting the data, we begin with the processing and statistical analysis.

6.3 Measures and Instruments

To measure the index of connectedness with nature, the measuring instrument is adapted and modified [38], [6] and applied to the Croatian sample, whereby the copyright was obtained from [6]. The indicated instrument will measure the index of connectedness with nature in parents, children, and teachers. In addition, the pupils’, parents’, and teachers’ attitudes toward organized leisure time in school – in extracurricular activities, use of ICT in school, and leisure time as well as teachers’ competences will be determined. New measuring instruments will be constructed for research purposes. Measuring instruments for the examination of extracurricular activities of children, the organization of children's leisure time in family and school, and the application of ICT in family and school will be constructed based on past knowledge and applied research.

7 CONCLUSIONS

The primary objective of the project idea presented in this paper is to find the answer to the key question: how to foster a significant connectedness of children with nature through the quality organization of children's leisure time and the use of ICT in school?

Based on the outlined theoretical knowledge and research framework, research will be conducted to produce relevant results, and new instruments will be developed. Scientific research of this kind will
contribute to a new understanding and new scientific knowledge about the importance of connectedness with nature, the quality of children’s leisure time, and ICT technologies.

This research emphasizes collaboration that is based on connecting families, children, teachers, and schools, as well as the Education and Teacher Training Agency from other institutions (and country Republic of Slovenia), with the aim of improving the health and well-being of children, quality of life, and sustainable development. The research will have a significant impact on school practice and teacher education and professional development and will particularly foster collaboration with the Agency.

The purpose of this paper was to present a future project/research based on which, guidelines and pedagogical strategies will be proposed, that can be applied in family, school practice, as well as in initial education and professional development of teachers. The purpose of future research is focused not only on fostering a more direct connection with nature, but also on holistic, optimal, and healthy growth and development of lower school age children.

Ultimately, based on the results of this research, two overall recommendations/key results are expected:

- first, to enhance the knowledge of parents and teachers in emphasizing the importance of connectedness with nature as a significant predictor of the overall well-being of children and their quality of life, both at family and in school,
- second and finally, to improve the quality of life of the families themselves and the practice of schoolwork and the sustainable development of the whole community.

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