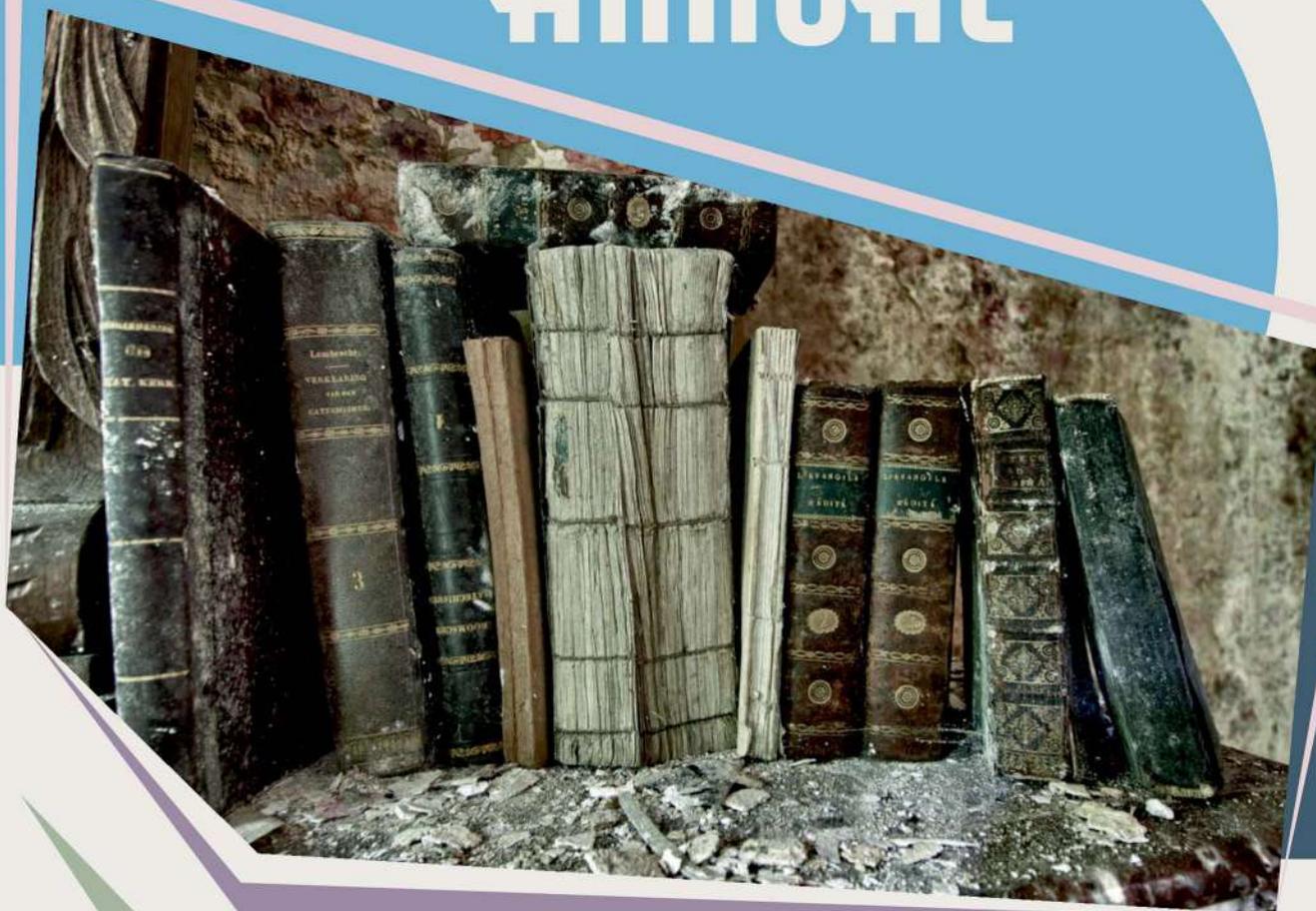


Assen Zlatarov University
Burgas, Bulgaria



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VOLUME LIV, BOOK 2, 2025

SOCIAL SCIENCES

ASSEN ZLATAROV UNIVERSITY
BURGAS, BULGARIA

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MENTAL DEVELOPMENT OF THE PRESCHOOL CHILD

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ABSTRACT

During the preschool period, the child's cognitive activity undergoes dynamic development, alongside emotional growth. Cognitive development encompasses the ability to speak, remember, reason, and fantasize. Emotional maturation is reflected in the child's ability to recognize and express emotions, as well as in the development of empathy. Play is essential in early childhood, as it supports cognitive, emotional, physical, and social development.

Key words: *preschool child, cognitive development, emotion, play*

INTRODUCTION

The mental development of the preschool child is characterized by the active formation of basic mental processes, personal qualities, and social skills. During this stage, children learn about the world through play, which stimulates thinking, speech, memory, attention, and the emotional-volitional sphere.

Cognitive and Emotional Development in Preschool Age

During the preschool period, children continue observing the world around them, and ask numerous questions. They acquire new ways of describing and interpreting their experiences. Their reasoning becomes more logical, and they solve problems by collecting and organizing information, reflecting on it, drawing conclusions, and communicating their findings with others. This process may include the skills of classifying and grouping objects.

Improved verbal abilities enable children to use spatial and positional terms, such as “behind,” “inside,” “in front of,” and “between.” They can follow directions, create and use simple maps, and develop mathematical skills, such as counting to determine quantity, comparing quantities, and performing simple numerical operations. They become more adept at understanding time and how it is measured [1].

Table 1 summarizes the three key aspects of cognitive development in preschool age: cognitive skills, language development, and critical (analytical) thinking.

Preschool children have not yet developed sufficient control over their emotions. As they grow

older, they begin to see the relation between emotional outbursts and their negative consequences. For example, tantrums may lead to a time-out or the removal of a favourite toy. Such experiences help the 4-year-old children understand that tantrums are not an acceptable way to express emotions.

Table 1. Key aspects in cognitive development

Cognitive skills	Language development	Critical (analytical) thinking.
Exploring the surrounding world, which stimulates curiosity	Learning to formulate and express thoughts	Asking questions and seeking answers

By the age of five, children demonstrate significant progress in their emotional development. They become much better at regulating their emotions and easily talk about their feelings [2]. Their family environment plays a key role in the formation of emotional intelligence. If the child is surrounded by individuals who do not accept their emotions or perceive them as a sign of weakness, they may struggle to understand and accept their own feelings. In such cases, children may become withdrawn, experience difficulties in social adaptation, lag behind in their development, and, from a scientific perspective, even be classified as suffering from emotional deficit [3].

Table 2 summarizes the three key components of emotional development in preschool age: emotion recognition, self-regulation, and empathy.

Table 2. Key moments in emotional development

Emotion recognition	Self-regulation	Empathy
Recognizing joy, fear, and sadness	Understanding and regulating emotional responses	Developing empathy and social integration

Play as a key activity

In preschool age, play occupies a central role, provoking significant transformations in children's consciousness. It serves as a means of involving children in adult life, which leads to the development of new social needs and motivations, and new classifications of children's attitudes toward reality [4]. Playing with objects of various shapes and colours helps children to understand how things are similar and how they differ. Through blocks, they can learn about spatial relationships, and through their daily activities, they can learn about the concept of time. Engaging in role play and observing the world around them also has a significant impact on their intellectual development [5].

Learning through play has profound benefits for education. Play is spontaneous and open to the surrounding world, allowing children to actively satisfy their curiosity. It enhances creativity and creates pathways for discovering the benefits of play activities. Play is social and involves active interaction with friends and peers, encouraging team spirit and cooperation. Educational systems, teachers, and parents must recognize the importance of play for children's physical, cognitive, and emotional development, thereby ensuring a balanced approach to learning activities. Teachers play an important role by providing sufficient

time for free play, in line with the principles of early childhood education. Children will learn best if they are given help to adapt scientifically to the school environment. Constructive play is a useful way to adapt to do this, e.g. when a child builds a playhouse using elements from their immediate environment (such as chairs and tables). This fosters a sense of mastery and perfection. In this way, each mistake becomes an opportunity for the child to explore and overcome new challenges [6].

CONCLUSIONS

In addition to age-related psychological characteristics, there is also individual personality development in preschool-aged children with their inherent unique qualities. Heredity, temperament, parenting style, and family atmosphere are factors that directly influence the formation and development of the preschool child's personality.

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NUDGE THEORY APPLIED TO LIFELONG LEARNING, UPSKILLING AND PROFESSIONAL DEVELOPMENT

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ABSTRACT

The topic of nudges is of interest from the perspective of the formulated theory, based on successful experiments and its application in public policies in various spheres. Change management may also rely on nudges by reconciling resistance and encouraging innovation. The purpose of this paper is to briefly present Nudge Theory and its application in the field of education and training, focusing on a number of stakeholders, such as individuals, state and financial institutions, and education centres. Particular attention is paid to the potential of nudging and its extension into areas such as lifelong learning (LLL) and upskilling. The paper briefly represents the application of Nudge Theory to encourage continuous professional development at a time of emerging new professions and population ageing in Europe, which calls for prolonged labour market participation to reduce pressures on economic and pension systems. The main tasks are to highlight the advantages of nudging compared with other existing practices related with LLL; to present the stakeholders involved and make recommendations based upon benchmarking with good practices relevant to Bulgaria.

Key words: Nudge Theory and applications, lifelong learning, human capital development

INTRODUCTION

As a concept derived from behavioural science, nudging offers suggestions and guidance aimed at influencing the behaviour and decision-making of social groups or individuals. Initially, this concept was applied in British and American public policy practice, with specialised bodies created to study and apply nudges at national level (Great Britain, Germany, Japan, and others), and at international level (OECD, World Bank, UN, and EU). In 2008, Sunstein, the concept's author, was appointed in the Obama administration in the USA, while the EU created a Joint Research Centre on Behaviour Prediction and Analysis in 2014, currently known as a Policy Design Unit. Nudge Theory is also used in business management, corporate culture, and human capital development and upskilling.

Scientific theories of human behaviour in relation to education

According to contemporary research, human behaviour is predominantly determined by individual characteristics and desires, while also being influenced by opportunities and threats in the surrounding environment [1]. Adam Smith, a classic author in political economy, writer of *The Wealth of Nations* (1776), also offers a psycho-

logical perspective on individual behaviour in *The Theory of Moral Sentiments* (1779) [2].

The principles of cognitive psychology introduced by Daniel Kahneman and colleagues [3] in the 1960s changed the approaches to decision-making by identifying three key heuristics: anchoring, availability, and representativeness. From the perspective of behavioural interventions, *anchoring* establishes a starting point for an individual's thought process and may be used as a prompt for choice, such as an advertised price of a product or service, participation conditions in a competition, etc. *Availability* refers to individuals' tendency to assess risks based on personal experience (for example, people who have been affected by a natural disaster being more likely to purchase property insurance). *Representativeness* is related to public opinion on a given issue influenced by completely random events, which can lead to misconceptions. For example, in a given locality there are a large number of cases of a previously unknown disease, but the people are looking for patterns and a causal relationship, hence putting pressure on the authorities to take measures and direct resources to address a poorly identified problem.

The concept of *bounded rationality* [4], first developed by Herbert Simon and supplemented by *optimization*, considers decisions as the result

of making an optimal choice based on available information. This concept was later applied by K. Sunstein and R. Thaler [5], the founders of Nudge Theory, who argue that bounded rationality of should be taken into account in choice architectures. Their widely cited proposal is to highlight the benefits of healthy life to increase the likelihood of a personally appropriate choice. Nudges are defined as “any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly altering their economic incentives.” They argue that by influencing decision-making choices, public policymakers can promote behaviour that is desirable in the interests of society as

a whole, based on the dual-system model of cognition, that is automatic and reasoned decision-making.

Nudges generally fall into two categories: restrictive and non-restrictive. Restrictive nudges include regulations, prohibitions, standards, and control measures. Non-restrictive nudges aim to reduce public resistance, for example, when introducing environmental protection measures, while preserving freedom of choice. Such measures are classified as “soft” policy instruments, including economic incentives with a positive or negative sign, persuasion through information provision, moral persuasion, and educational campaigns.

The regulatory framework and the psychological perspective of influence can be understood by from the nudging instruments in Table 1 below.

Table 1. Nudging instruments

	Tough measures		“Soft” measures
Limiting toolkit	Regulation deeply rooted in the culture, faith, life-style of society	Prohibitions Rules Public Behaviour Control Measures	Prohibitions and mandatory rules with low penalties for non-compliance (reason to consider whether compliance “brings benefits”) (Tenbrunsel and Messick, 1999)
Unlimiting toolkit (“soft” measures)	“Clear” nudges	Other nudges	Monetary incentives Non-monetary incentives Persuasion Impact on moral foundations Providing information Other

The point of applying nudging is to make stakeholders, such as employees in companies in the business sector or in government institutions, aware of the importance of the problem and allow them to choose a solution. This also strengthens relationships at the "organizational" level, improves corporate culture and operational efficiency. The problems identified are the low level of individuals’ participation in LLL activities and upskilling in the age of continuous technological progress, AI application and the emerging of new professions.

METHODOLOGY AND FINDINGS

The study is based on a complex research approach, combining theoretical and methodological analysis of the literature on Nudge Theory, applied analysis of good practices of its implementation and modelling possible applications in the field of continuous education in Bulgaria.

Enlightenment and education form the foundation of human rights, reflecting fundamental human needs, and ensuring dignity, equality, respect, freedom and social inclusion. Examples of rights include freedom from discrimination, the right to life, freedom of expression, the right to marriage and family, and the right to education.

The main aspects of implementing change based on nudges include mandatory participation of stakeholders clearly defined for the purpose of the change, then the necessary arguments are presented, and the “choice” element is included so that all participants can participate in the decision to change, considering the options through opinion research and discussion.

After acceptance of the arguments and the nudge for change, obstacles should be promptly addressed to maintain momentum and effectiveness. It is believed that such a model is applicable both to changes in the business sector and other spheres of life as a whole. Problems related to the unpredictability of the future effects of push measures can be overcome by the proposed seven-

step model which includes defining change, stakeholder involvement, justification, choice preservation, obstacle reduction, rapid action, and feedback provision (Fig. 1).

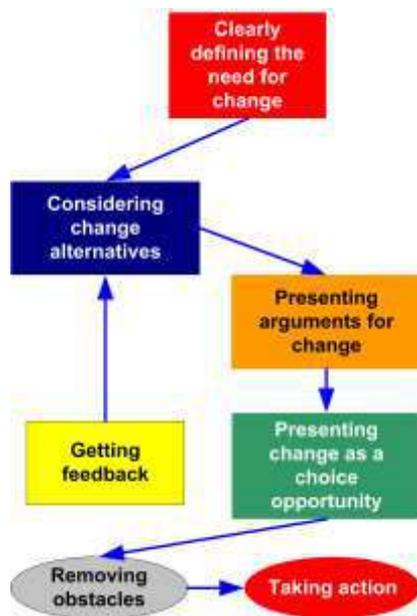


Fig. 1. 7-step model for managing change by incorporating nudges.

Application of the 7-step nudge model to LLL and upskilling

The emergence of new professions is an irreversible trend driven by AI and technological progress. These developments, in turn, are on the increase due to growing physical and social environmental pressures, geopolitical and economic instability, education, healthcare, macroeconomic factors, and green economy.

The active start of the process of strengthening LLL opportunities for upskilling requires a lot of effort, including different nudges: financial, “soft”, created by the social media, etc.

Step one (*clearly defining the need of change*) and **step three** (*presenting arguments for the change*)

The needs identified and the reasons for change management in the field of LLL answering the upskilling necessities are three-fold:

- The trend of emergence of new professions as a result of AI and technological progress, the increasing pressure on the physical and social environment, as well as geopolitical and economic instability. All these create additional requirements to education practices;
- The low level of LLL in Bulgaria, proved in a Eurostat study (EUROSTAT, 2023, 30th January), and the need for improvement. In 2021, our country ranks last in the EU, with only 2% of

adults participating in education and training, lagging behind almost twice compared to Greece, which is penultimate, and 20 times compared to Sweden, which is first (Fig. 2).

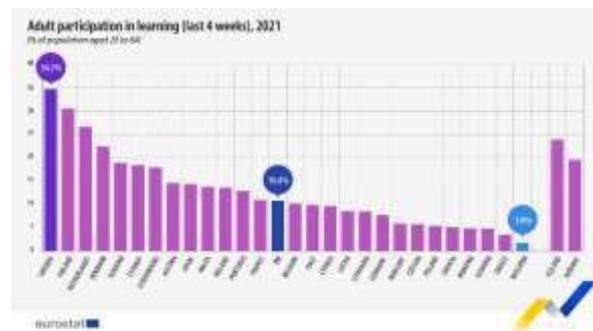


Fig. 2. Partial Information on Adult Participation in LLL, trng_lfse_01

- The process of reduction and ageing of Bulgarian population continues in 2023. According to National Statistics data as of December 31, 2023, the population of Bulgaria represents 2% of the population of the EU, and had decreased by 0.03% compared to 2022. The working-age population in Bulgaria as of the same date is 58.5% of the population of the country, which affects its labour market, pension system, economy, and finances [6].

Step two (*considering change alternatives*) and **step four** (*presenting change as a choice opportunity*):

- At a European level, a Recommendation on the key competences for LLL was approved (Council of EU, 2018), following Eurostat forecasts on ageing of EU population (the number of people aged 15-64 is expected to decrease by 48 million by 2050, and the share of the population over 80 is expected to increase from 4.1 percent in 2005 to 6.3 percent in 2025 and 11.4 percent in 2050) (Eurostat, 2023). The recommendation identifies eight key competences necessary for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship and social inclusion: literacy; multilingualism; mathematical, scientific and engineering competence; digital and technological skills; interpersonal skills and the ability to learn new competences; active citizenship; entrepreneurship; cultural awareness and expression. The Council Recommendation provides a common European reference framework for key competences, aimed at policy-makers, education and training providers, social partners and learners themselves. It also presents successful ways of promoting the acquisition of competences

through innovative learning approaches, assessment methods and support for trainers.

- At national level, the Decision of the Council of Ministers from February 2021 focuses on the adoption of the Strategic Framework for the Development of Education, Training and Learning in the Republic of Bulgaria (2021 – 2030), updated in 2023 (Eurydice, n.d.). Priority Area 8 of the Strategic Framework is assigned to Lifelong Learning. Efforts are aimed at creating attractive and flexible opportunities for acquiring basic skills, new competences, qualification and requalification in the formal education system and in non-formal learning, as well as creating conditions for non-formal learning. Each choice of individual strategies for education, training and learning will be encouraged, supported and developed.

Identifying the stakeholders in the future processes will increase change management and adoption of results. Stakeholders include individuals, state institutions, financial organizations, and education providers, including schools, e.g. universities, centres for excellence and vocational training, etc. The development of LLL and upskilling is crucial for future job opportunities and for economic stability in the EU as a whole. Policies at European and national levels provide sufficient nudges to increase the participants' interest in the various forms of mentoring and training events. Nudges can also advance the work of education providers in their relevant fields.

Steps five (*taking action*), **six** (*removing obstacles*) and **seven** (*providing feedback*) are subject to future activities which, bearing in mind the strong interest of the numerous stakeholders, should be urgently undertaken.

CONCLUSIONS

The application of Nudge Theory in LLL and upskilling of human capital is recommended to overcome irrational decisions through behavioural insights in the field of continuous education. In view of the need for new professions in connection with digitalization and AI, a structured methodology for the development and implementation of nudge tools is required to support continuous skills renewal and sustainable labour market participation.

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THE ROLE OF ELECTRONIC SPORTS IN THE SOCIAL AND ACADEMIC ENGAGEMENT OF UNIVERSITY STUDENTS

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ABSTRACT

This study examines the role of electronic sports (eSports) in the social and academic engagement of university students. Based on surveys and interviews conducted with students from Prof. Dr. Asen Zlatarov University in Burgas, the research explores motivations for participation, social benefits, and potential risks. The findings show that eSports promote teamwork and social interaction but may negatively affect academic performance if not properly balanced. The study advocates for institutional support and responsible integration of eSports into university life.

Key words: eSports, university students

INTRODUCTION

In recent years, electronic sports (eSports) have evolved from a leisure activity into a global industry and a mainstream form of competitive digital entertainment. Among young people, especially university students, eSports are not only a source of entertainment, but also a channel for social interaction, personal development, and sometimes, professional ambition. This paper investigates how eSports influence students' academic and social lives and how educational institutions can harness their potential.

Electronic sports (eSports) and related game-based approaches can have either positive effects or pose challenges to students' academic and social engagement. When integrated responsibly, they can support development and community building.

Impact on Academic Engagement and Achievement

Positive Aspects

- Meaningful games can significantly enhance students' interest and engagement not only in a specific learning module but also in the broader learning process [1].

- eSports and digital games directly aim to develop evolving key competencies essential in the information age, including self-regulation, information literacy, problem-solving strategies, and critical thinking. They stimulate creativity and innovation, contributing to the development of a knowledge-based society [2].

- Game-based learning improves methods for presenting educational content and build skills for

acquiring knowledge through experimentation. For example, the University of Ruse in Bulgaria applies creative and innovative gaming scenarios to enhance learners' creative potential.

- eSports are also an important channel for social interaction and personal development. Studies show that 65% of students participate in eSports primarily for social interaction [3].

- Participation in eSports promotes teamwork and social interaction. Gamification encourages collaboration and group work toward shared goals, developing social skills such as communication, interaction, and negotiation [4].

- Group activities in a gaming context can help students feel a sense of belonging to a group with shared objectives and be more resilient to failure.

- Collaboration allows students with stronger skills to support peers facing difficulties, thereby strengthening academic communities and experience.

- The university network, including digital activities, is a suitable environment for networking, where students can find friends, future colleagues, and business partners.

- A notable example is the University of Roehampton, London, which offers scholarships for students with eSports talent, including new "Women in eSports" scholarships, the first of their kind in Europe focusing on female participation (University of Roehampton, 2025).

Challenges

Organizational and Technological Barriers:

- Insufficient technological infrastructure in universities, including limited access to computer

laboratories, software, hardware, and high-speed internet.

- Difficulties in adapting curricula and schedules to incorporate eSports.
- Need for additional licences for commercial games.

Pedagogical Challenges

- Limited instructor experience in integrating game-based approaches into teaching and understanding of how gaming supports learning.
- Difficulties in assessing learning outcomes from game-based education and aligning them with academic goals.

Risks for Students

- Potential signs of gaming addiction and sleep disturbances [5].
- Risk of overexcitement and reduced concentration, especially during highly entertaining activities.
- Possible frustration and demotivation if games are excessively complex or difficult.
- Visual stimuli, such as bright colours and flashing lights, which may pose challenges for learners with sensory sensitivity or epilepsy.

METHODOLOGY

The study applies a mixed-methods approach, combining quantitative and qualitative research methods. Data were collected through: a survey of 120 students from Burgas State University “Prof. Dr. Asen Zlatarov”, enrolled in various disciplines; semi-structured interviews with 10 active members of eSports clubs; and analysis of secondary data from academic publications and reports related to the gaming industry. This approach ensures a comprehensive view of student behaviours and perceptions related to eSports.

1. Motivations for participating in electronic sports

Students of Burgas State University engage in eSports for various reasons: 82% participate for entertainment and stress relief; 65% for social interaction; 53% to develop skills and satisfy competitive drive; and 18% aspire to a professional eSports career (Fig. 1). These findings reflect the broad appeal of eSports, ranging from psychological relief to strategic aspirations.

2. Impact on academic performance

The academic influence of eSports is mixed: 42% of students report that gaming has no effect on their academic results; 28% indicate negative

effects; and 30% claim increased academic motivation (Fig. 2). These results underline the importance of effective time management and institutional support systems for student gamers.

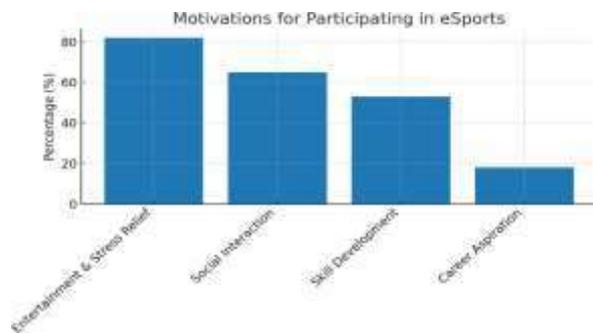


Fig. 1. Students’ motivations for participating in eSports.

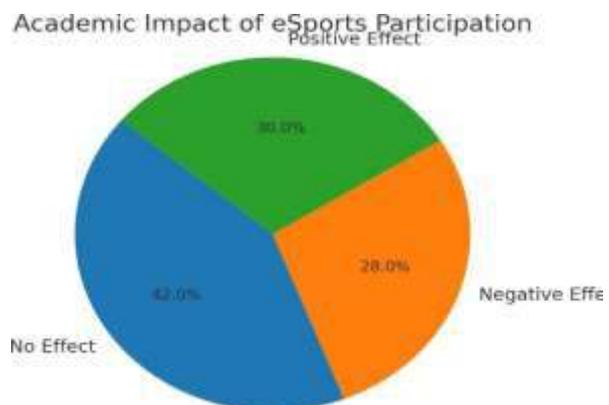


Fig. 2. Academic Impact of eSports participation

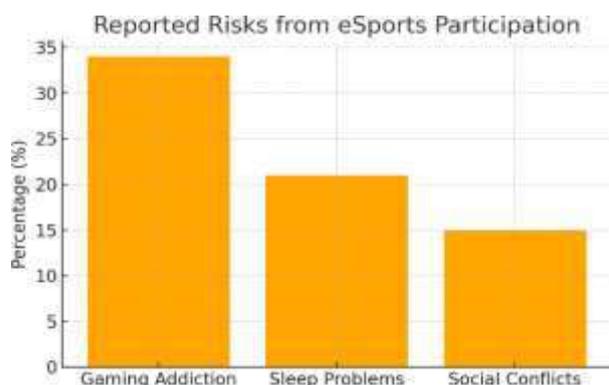


Fig. 3. Reported risks from eSports participation.

3. Risks associated with eSports participation

eSports participation also involves potential risks: -34% of students report signs of gaming addiction; 21% suffer from sleep disturbances; and 15% encounter conflicts with roommates or fam-

ily members (Fig. 3). These results call for institutional strategies that promote balanced and healthy gaming habits.

4. Institutional role and recommendations

Universities play a central role in shaping how eSports are perceived and practised in academic environment. By recognizing the popularity of eSports among students and their potential benefits, institutions can implement proactive measures to both exploit their advantages and mitigate risks. Recommended actions include:

- Establishing and supporting eSports clubs that provide structured environments for participation, competition, and collaboration.
- Providing training in time management, wellness, and digital literacy to help students balance gaming with academic and personal responsibilities.
- Promoting balance between digital engagement and physical activity, and integrating regular exercise programs that mirror physical conditioning of professional eSports teams.
- Encouraging interdisciplinary academic engagement with gaming, linking eSports with computer science, media studies, psychology, and sports science.

Such initiatives can transform eSports from a purely recreational activity into a constructive educational tool that fosters community building, personal growth, and skill development.

CONCLUSIONS

When integrated responsibly, eSports represent a meaningful and dynamic component of student life. They support social interaction, and the development of transferable skills, such as teamwork and strategic thinking, and may enhance academic engagement when balanced effectively. However, without institutional guidance, eSports may contribute to issues such as excessive screen time, poor time management, and reduced physical activity.

Universities should therefore establish clear structures, policies, and support mechanisms to ensure that student engagement in eSports remains sustainable, inclusive, and beneficial. Through targeted initiatives combining education, wellness, and community engagement, institutions can ensure that eSports serve as a positive force in students' academic and social development.

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ESTABLISHING THE LEVEL OF DEVELOPMENT OF SOCIOLINGUISTIC COMPETENCES OF PRIMARY SCHOOL STUDENTS ACCORDING TO THEIR TEACHERS

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ABSTRACT

The article presents the results of a survey conducted among teachers in the primary stage of basic education and aims to assess the level of development of their students' sociolinguistic competences. Based on the collected data, analyses and conclusions are presented after each survey question, followed by a summary of the most significant factors that influence the formation of the aforementioned competences. The study emphasizes the crucial role of the teacher as a leading factor in the effective development of sociolinguistic competences in children. Acting as intermediaries between authors of literary works and young readers, teachers support students in gradually enriching their language and vocabulary, developing their ability to think using verbal-artistic images, and expanding their worldview.

Key words: sociolinguistic competences, primary school teachers, pupils, survey

INTRODUCTION

The formation of communicative language competences is a long process that begins in early childhood and is determined by various communicative factors, as well as by the different social roles that individuals assume throughout their lives [1].

Sociolinguistic competence represents a scientific integration of linguistic and social competence. With regards to the nature of sociolinguistic competence, several opinions that can be distinguished:

1. Sociolinguistic competence is an intermediary competence arising from the scientific integration of linguistic and social competence in order to examine intermediate phenomena such as the sociology of language;
2. Sociolinguistics is an autonomous scientific discipline with its own subject, methods, and research problems;
3. Sociolinguistics is a linguistic discipline that more adequately reflects linguistic reality, as it overcomes the concept of language as an invariant carried by an ideal speaker and perceived by an ideal listener [2].

Sociolinguistic competence refers to the speaker's ability to use language appropriately in different social contexts. This includes understanding individual social norms, rules, and expectations that govern the use of language, as well

as the ability to use it in a way that is most suitable for the respective communicative situation.

Communication with the teacher plays a key role in the comprehensive formation of sociolinguistic competences in children. As intermediaries between authors of literary works and young readers, teachers support students in gradually enriching their language and vocabulary, developing verbal-artistic thinking, learning to apply their skills in appropriately using various linguistic and non-linguistic means in different communicative situations, and broadening their social and cultural horizons.

PRESENTATION OF THE STUDY

The study involved a survey designed to explore teachers' opinions and attitudes regarding the level of development of sociolinguistic competences among students in the early stage of primary education. The research was conducted during the months of November and December 2024, with a total of 200 questionnaires distributed among teachers and 150 valid responses collected. The survey consisted of three main parts.

The first part was introductory and contained a greeting to the respondents, a description of the purpose of the study, assurance of anonymity, and expressions of gratitude to respondents.

The second part included various questions aimed at assessing the level of development of so-

ciolinguistic competences in primary school students, as well as evaluative statements related to their skills to apply them rated on a five-point Likert scale (1 – “I disagree”; 2 – “I mostly disagree”; 3 – “I cannot assess”; 4 – “I mostly agree”; 5 – “I completely agree”).

The third part gathered demographic information about the respondent teachers: place of residence, age, gender, grade they taught, and class size. The surveyed teachers represented schools from the following municipalities: Sofia (137th Angel Kanchev School), Burgas (Dimcho Debelyanov School, Dobri Chintulov School, Bratya Miladinovi Primary School, Alexander Georgiev – Kodzhakafaliya Primary School, Elin Pelin Primary School), the village of Marinka, Burgas region (Ivan Vazov School), Svishtov (Nikolay Katrakov School), Pomorie (Ivan Vazov School).

The teachers surveyed taught in the early stages of primary education, as follows: in the 1st grade 2.6% (4); in the 2nd grade 30% (45); in the 3rd grade 50.6% (76); and in the 4th grade 16.6% (25). The majority taught classes with 19-25 students: 55.3% (83), followed by those with 26-30 students: 20% (30), up to 18 students: 17.3% (26), and over 30 students: 7.3% (11).

The respondents' age was between 25 and 60, with no one under 25 having filled out the questionnaire. Those aged 25-35 were 14% (21), those aged 35-45 were 52% (78), those aged 45-55 were 32% (48), and those over 55 were 2% (3). Obviously, respondents were predominantly aged between 35 and 45 years, indicating substantial pedagogical experience, an encouraging fact for the level of Bulgarian education in the initial stage of primary education.

The largest percentage of teachers who filled out the survey worked in a large regional city: 57.3% (86), followed by those teaching in a small town: 30.6% (46), in the capital city: 9.3% (14), and in a village: 2.6% (4).

The sample consisted primarily of female teachers: 97% (146) and only 3% male (4), reflecting the gender distribution typical of the initial stage of primary education. This situation is due to the nature of the work, which involves not only teaching and upbringing but also care and attention to young students.

ANALYSIS OF SURVEY RESULTS

In response to the first question of the survey, “What is the teachers' most preferred method for

increasing their students' interest in literary fiction?,” most teachers answered that it was the organization of creative meetings with authors of children's literature: 58.6% (88), followed by celebrating reading-related events, such as Reading Week, International Children's Book Day, etc.: 30.6% (46), organizing contests, quizzes, and competitions related literary works: 10% (15), and involving parents in various events related to discussing literary works with only 0.6% (1).

As “the main difficulty for students when reading books included and not included on the recommended list,” which was the second question in the survey, teachers identified the misunderstanding of the author' language and style of the: 52.6% (79), followed by age-inappropriate content and preferences: 36.6% (55), translated books that are far from our national psychology: 10% (15), and one respondent who could not assess.

How do teachers understand that students have grasped and comprehended the content of the literary works? To assess this, teachers most often relied on illustrations of favourite scenes: (58% (87), discussions and debates: 22% (33), dramatizations, scenes, and sketches based on the content of the works: 13.3% (20), and detailed oral or written retelling: 6.6% (10). Given the age and psychosocial characteristics of students in the initial stage of primary education, these results align with the predominance of visual-imaginative thinking in young students, with the skill and ability to think with verbal-artistic images gradually improving and developing over time with the enrichment of their social, emotional, and reading experiences.

How do teachers motivate students to read more works of fiction? Creative meetings and discussions with authors were again identified as the most effective motivational strategy for encouraging reading: 47.3% (71), followed by organizing various quizzes, competitions, contests, and celebrations: 30.6% (46), events dedicated to books: 16% (24), and using more game-based methods in Bulgarian language and literature lessons: 6%. The use of presentations, the internet, or other digital sources were surprisingly not mentioned, suggesting a strong preference for direct, “face to face” interaction between authors and readers. This is a prerequisite for a “return” to true communication between people, to their need to establish a full-blooded connection with their peers.

Are the family and social environment decisive for the choice of reading material among adolescents? Most respondents answered “yes”:

46.6% (70), with another 27.3% (41) saying “rather yes”, followed by “rather no”: 9.3% (14), a “definite no”: 8.6% (13), and “cannot assess”: 8% (12). The conclusion is that the relationship teacher-parent relationship is essential for enriching the reading and future cultural and experiential life of adolescents, because the family environment is primary in determining the further successful realization of children as successful individuals.

Is it necessary to discuss issues related to independent reading of literary works with the students' parents? 57.3% (86) of the teachers believe that “Yes, it is necessary,” 26.6% (40) answered “Rather yes,” 8.6% (13) indicated “Rather no,” 7.3% (11) answered “No,” and not a single one indicated “Cannot assess.” From this, it can be concluded that the surveyed teachers value maintaining constant contact with the students' parents, and the family and social environment prove their key role in shaping the communicative, speech, and literary competencies of adolescents.

In supporting the development of sociolinguistic competences in their students, the largest percentage of teachers reported using activities such as writing greeting cards, letters, or invitations for specific events or holidays: 45.3% (68), various types of dialogues: 28% (42), writing a retelling or a story based on a series of pictures, descriptions, experiences, or verbal support: 19.3% (29), writing a text under dictation applying studied spelling rules: 3.3% (5), editing their own or someone else's text: 2% (3), and other unspecified methods: 2% (3). It can be concluded that educators are aware of the concept of “sociolinguistic competence” and are able to successfully navigate the use and appropriate application of the corresponding linguistic means in specific communicative situations.

According to 49.3% (74) of the surveyed teachers, their students recognize and identify the parts of speech and their grammatical features (nouns, verbs, personal pronouns, numerals) to a high degree (they rated it 5, “I fully agree,” on a scale from 1 to 5). To “are students able to correctly form the grammatical forms of the studied parts of speech and use them appropriately on the same scale,” the largest percentage of teachers indicated 2, “I rather disagree”: 46.6% (70).

Regarding students' ability to “refer to a dictionary for the meaning of a specific word,” the highest percentage of teachers indicated answer 4, “I mostly agree”: 41.3% (62).

To “whether students can determine the lexical meaning of words to name the surrounding reality

in accordance with the communicative situation,” the majority of teachers responded with 2. “I mostly disagree”: 44% (66). The highest percentage of teachers, 34.6% (52), again answered with 2, “I mostly disagree”, regarding whether their students appropriately use various linguistic and non-linguistic means in different communicative situations.

Regarding the “distinction between literal and figurative meanings of words”, teachers believe that their students have largely mastered this skill: 50% (75) indicated 5, “I completely agree.”

Whether their students manage to “read materials from children's magazines, children's encyclopaedias, and accessible information from the internet comprehensively” was mostly rated with 4, “I somewhat agree”: 54% (81).

According to the surveyed teachers, their students have difficulties with “the ability to form sentences for different purposes and compositions depending on the communicative situation”: 47.3% (71) answered with 2, “I somewhat disagree”.

CONCLUSIONS

The analysis of survey data leads to several key conclusions. Instruction in Bulgarian language and literature plays a central role in developing sociolinguistic competences among students of primary school age by fostering connected oral and written speech, as well as students' skills to communicate with authors of literary works, getting to recognize different styles of speech through the perception and understanding of literary texts [3].

Primary school age students perceive and comprehend a specific literary or folklore work better when they have direct contact with its author, engage in genuine and meaningful communication, and engulf in their creativity.

Teachers are aware of the concept of “sociolinguistic competence” and manage to navigate the use and appropriate application of the relevant linguistic resources in the specific communicative situation. However, they also acknowledge the difficulties students face in forming sentences that differ in purpose and structure based on the specific situation, as well as the need to work towards improving the abilities of adolescents to correctly determine the lexical meanings of words that name the surrounding reality in accordance with the communicative situation.

The role of teachers is extremely important for the development of communicative language

competences in students, particularly sociolinguistic competencies, because it is the teacher who serves as the connecting link, the mediator, between the authors of literary works and young readers, between the vast world of books and the open, unburdened, and pure child's consciousness.

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A STUDY OF THE RELATIONSHIP BETWEEN MUSIC AND MATHEMATICS AS A FACTOR IN THE DEVELOPMENT OF KEY AND PROFESSIONAL COMPETENCES IN PRESERVICE TEACHERS

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ABSTRACT

This study examines the relationship between music and mathematics as a factor in developing key and professional competences among preservice teachers. The main objective is to substantiate the significance of the interdisciplinary approach for increasing the effectiveness of teacher education and the training of future preschool and primary school teachers. The methodology includes a theoretical analysis of academic sources, a comparative approach to tracing good practices, and eliciting preservice teachers' views regarding their perception of integrated forms of instruction. The results indicate that combining musical and mathematical elements stimulates logical and creative thinking, improves communication and collaboration skills, and enhances cultural awareness and adaptability. The novelty of the study lies in arguing for integrated strategies as an effective tool for building professional competences in future teachers and in offering pedagogical guidelines for their practical implementation.

Key words: music, mathematics, interdisciplinary approach, competences, preservice teachers

INTRODUCTION

In contemporary education, the need for interdisciplinary approaches is becoming increasingly evident, particularly in the training of future preschool and primary teachers. European strategic documents emphasize the importance of key competences for lifelong learning, among which logical thinking, creativity, and cultural awareness hold a central place [1].

The integration of music and mathematics provides comprehensive cognitive and emotional development: music cultivates rhythm and aesthetic perception, while mathematics fosters analytical and abstract thinking. Their combination in teacher education prepares future specialists capable of creating connections across disciplines, enriching the learning process and supporting the holistic development of the individual.

This article examines the relationship between music and mathematics as a factor in developing key and professional competences among preservice teachers and presents examples from a developed and tested model.

1. Theoretical Foundations

The relationship between music and mathematics has deep historical roots: from Pythagoras, who viewed numbers as a universal principle manifested in musical harmony, to philosophers

and scholars such as Plato and Kepler, who described music as “audible mathematics.” This idea has been carried into modern education through interdisciplinary methods that combine abstract reasoning with aesthetic experience.

Educational research demonstrates that the integration of music and mathematics increases preservice teachers' confidence and readiness to teach abstract concepts [2], fosters creative and inclusive learning [3], and is positively perceived by students as an inspiring and practice-oriented approach [4]. Expertise in the respective domains also shapes perceptions, with the educational context creating opportunities for developing integrated thinking that encompasses both cognitive and emotional aspects of learning [5].

Thus, integrating music and mathematics emerges as a valuable resource for developing key and professional competences among preservice teachers, providing an innovative and motivating educational approach.

Key and Professional Competences of Educational Specialists

The European and Bulgarian regulatory framework emphasizes the importance of competence-oriented education and integrative approaches in training future teachers in preschool and primary education. The Law on Preschool and School Education [6] and the State Educational Standard [7] highlight key competences such as mathematical,

social and civic, cultural, and learning-to-learn competences, in line with European recommendations [1]. Ordinance No. 15/2019 [8] further complements this framework by defining professional competences related to lesson planning, applying diverse methods, and assessment.

In the academic literature, competences are described as an integration of knowledge, skills, and attitudes that ensure personal development and social realization. In teacher education, the competence-based approach promotes the use of innovative methods and interdisciplinary connections. In this context, the relationship between music and mathematics serves as a valuable resource for building key and professional competences among future teachers.

Competence-Based Approach in Education

Over the past decades, the competence-based approach in education has been established as a model that shifts the focus from knowledge acquisition to the development of integrated skills and attitudes applicable in real social and professional contexts. It is linked to preparing students for a dynamically changing environment through the development of key competences for lifelong learning [1].

In international literature, competences are defined as a combination of knowledge, skills, and social strategies mobilized for effective problem-solving in specific situations [9]. Podgórný emphasizes the focus on critical thinking, creativity, and adaptability [10]. In Bulgarian pedagogical theory, the competence-based approach is associated with the modernization of education through active and interactive methods that create connections between different subject areas.

This approach is normatively embedded in the ZPUO (2016) and Ordinance No. 5/2015, where learning outcomes are measured not only through knowledge but also through skills and attitudes toward learning. Thus, the competence-based approach becomes not merely a methodological concept but a strategic framework for preparing students and future teachers for active and successful participation in contemporary society.

In recent years, this approach has also found practical application in higher education through the “Enhancing the Competences of Lecturers at State Higher Education Institutions Preparing Future Teachers” National Program [11]. The program introduced changes in curricula, created new interdisciplinary courses and modules, and provided opportunities to test different teaching models with the goal of sustainable application. In this

way, national policy ensures conditions for developing a competence-based and interdisciplinary approach, fully aligned with European priorities for modernizing teacher education.

Interdisciplinary Approach

The interdisciplinary approach in education is defined as the integration of knowledge, skills, and methods from different fields in order to achieve a more comprehensive understanding of problems. Its use implies organizing content around themes that transcend the boundaries of individual disciplines [12], thereby fostering critical thinking, creativity, and problem-solving skills [13].

Interdisciplinarity is particularly important in the training of future teachers, who must create a learning environment that stimulates integrated learning. Interdisciplinary practices develop collaboration and adaptability [14]. Integrated activities in early childhood education facilitate the acquisition of abstract concepts through hands-on learning [15]. For preservice teachers, such models provide valuable experience that supports the development of skills for planning and implementing lessons with cross-curricular connections.

2. Music and Mathematics

Theoretical Foundations

The relationship between music and mathematics is multi-layered and has deep historical roots dating back to Ancient Greece, when Pythagoras and his followers regarded harmony as an expression of numerical ratios. Although at first glance music may be perceived as a domain of emotion and art, and mathematics—as one of logic and abstraction, numerous authors emphasize that there is a profound structural connection between the two [16].

The relation among note values (whole, half, quarter, eighth, etc.) is directly linked to fractional arithmetic. Every rhythmic formula can be viewed as a mathematical model through which time is organized in music [17]. A whole note represents a basic unit; a half note is $1/2$ of it, a quarter note is $1/4$, an eighth is $1/8$, and so forth. This proportionality offers learners a natural and concrete way to understand fractions, multiplication, and division. In this sense, musical notation serves not only to fix the musical text but also as a tool for developing mathematical thinking.

Additional mathematical concepts, such as geometric sequences, temporal proportions, and symmetrical structures, can be illustrated through musical examples [18]. Thus, music becomes a

context that links abstract mathematical ideas with concrete and living forms.

Pedagogical Applications

In the training of future teachers, the relationship between music and mathematics can be used as a resource for developing key and professional competences. The analysis of rhythm, meter, tempo, proportions, and geometric visualizations, as well as practices such as body percussion and ensemble music-making, supports the integration of cognitive and emotional learning. In this way, abstract quantitative and temporal relations are “translated” into observable and assessable pedagogical actions that directly enrich the professional instruction of preservice teachers.

This integration aligns with both the requirements of the national regulatory framework and the European vision of key competences for lifelong learning, contributing to the formation of effective, adaptable, and reflective teachers.

3. Fundamentals of Music: Temporal Organization and Metric Structures

Temporal Organization and Mathematical Principles

The temporal organization of musical structure can be viewed as an application of fractional arithmetic and the even division of time units. Meter provides a recurring beat, time signature formalizes the grouping of beats into measures, tempo determines their speed, and rhythm represents the distribution of note durations within the measure. Their interaction forms a mathematically grounded system for “measuring” time in music, which simultaneously facilitates notation and the understanding of rhythmic structures [19,20].

Meter is a fundamental element upon which more complex rhythmic models are built. It manifests as a regularly recurring beat, sensory in perception but subject to mathematical modelling through real numbers and fractions [21]. In this sense, meter combines the intuitive feeling of rhythm with the analytical precision of rational divisions, ensuring a balance between the emotional and cognitive perception of music.

Visual Metaphors and Geometric Representations of Metric Structures

Music, as an abstract art form, can be mediated through geometric figures that facilitate perception and the recognition of patterns and symmetries. Visual metaphors of metric grids combine perceptual and rational components, enabling quick identification of models and accents.

Geometric shapes such as squares and rectangles serve as clear visual representations of metric

organization. According to the law of Prägnanz (“good form”), they automatically group equivalent pulses into uniform units, thereby reducing cognitive load [22]. The square symbolizes regularity, while the rectangle emphasizes the extended structure of temporal segments (Fig. 1).



Fig. 1. Graphic representation of simple meters through geometric figures.

The combination of duple and triple meters enables the construction of more complex metric schemes, known as compound meters. Depending on their structure, they can be classified as symmetrical or asymmetrical.

The use of geometric figures is an effective visualization method: squares represent duple units, while rectangles symbolize triple units. This highlights the recurring metric modules within the cycle, making analysis and learning easier.

The combination of duple and triple simple meters produces an asymmetrical division of the metric cycle, leading to a distinctive distribution of accents. These asymmetrical compound meters are common in Balkan folklore as well as in contemporary classical and jazz music, where they demand higher perceptual and cognitive engagement [19, 23].

Their geometric visualization through squares (duple beats) and rectangles (triple beats) creates clear models, for example: square + rectangle (5/8), square + square + rectangle (7/8), three squares + rectangle (9/8). This graphic representation facilitates the recognition of asymmetry, reduces cognitive load, and supports the development of metric hearing and analytical skills.

Musical Meter

Meter is an invisible sense of pulsation, while musical meter (time signature) is its formalized representation through notation. It is expressed as a fraction: the numerator indicates the number of beats, and the denominator their value (e.g., 4/4 = four quarter notes). Thus, the time signature translates intuitive rhythmic organization into a precise model [19, 20, 24].

Tempo

Tempo defines the speed at which metric events unfold. It determines the dynamics of the structure in real time and is often indicated by BPM or verbal markings. In pedagogical practice,

tempi are conventionally divided into slow, moderate, and fast, as they function as a scalar rather than a fixed parameter [20, 24].

Rhythm

Rhythm structures relative durations and accents, transforming the temporal flow into recognizable patterns. It emerges from the interaction between meter (pulsation and accents) and grouping (specific configurations). Its relationship with mathematics is twofold: mathematics provides tools for analysis through fractions and proportions, while cognitive processes explain the musical meaningfulness of these structures [19, 25].

4. Play-Based Approaches and Visual-Mathematical Representation of Rhythm

Using play as a method for working with geometric figures expands opportunities for rhythm acquisition by transforming abstract metrical concepts into visually and physically perceptible actions. This approach enhances motivation, concentration, and long-term memory. Studies show that linking musical meters with geometric shapes improves rhythm recognition, while gamification facilitates the learning of complex structures. The inclusion of music-educational games supports not only musical literacy but also creative expression by integrating cognitive, sensory, and social skills.

5. Body Percussion and Visual-Geometric Approaches in Rhythm Education

Body percussion is an accessible and universal practice where rhythms are created through gestures such as clapping, snapping, and tapping. It eliminates the need for instruments, is perceived as play, and develops coordination, rhythmic stability, and bodily awareness [26]. Applied in both traditional pedagogical systems (e.g., Orff Schulwerk) and modern interdisciplinary practices, it stimulates improvisation, collective synchrony, and artistic confidence [27].

In a pedagogical context, body percussion is seen as an innovative tool that combines rhythm, movement, and social interaction, fostering both musical and social competences. Geometric figures (squares, rectangles, circles, and triangles) can serve as symbols of note values and rhythmic models (Figs. 2–4), facilitating recognition and cognitive processing of rhythmic structures.

6. Orchestral Practices and Integration of Music and Mathematics

Participation in a marching band develops both rhythmic accuracy and melodic precision, requir-

ing mastery of metric structures and pitch organization. Such orchestral practices enhance overall musical literacy and cognitive skills such as visuospatial reasoning, which is also fundamental for mathematical understanding. Research shows that involvement in marching ensembles accelerates critical thinking, problem solving, and achievement in mathematics [28]. Furthermore, collective music-making promotes social cohesion, confidence, and emotional well-being [29]. Thus, the marching band emerges as an effective socio-educational instrument.

7. Methodology

This study was conducted in a university setting with the aim of examining the impact of integrating music and mathematics on the development of key and professional competences among preservice teachers.

The research design is qualitative-empirical with elements of an experimental approach. Methods of pedagogical experiment, observation, and interview were combined to ensure both objective and subjective evaluation of the outcomes.

A total of 29 students from preschool and primary education pedagogy programs participated. They engaged in various interdisciplinary activities involving music and mathematics, body percussion, and marching band practice.

Instruments

Learning materials: specially developed exercises and games integrating musical and mathematical elements (e.g., rhythmic structures to illustrate fractions, geometric figures to visualize meters, body percussion, and ensemble practices).

Interviews: to assess students' self-perceptions and attitudes regarding the effectiveness of the integrated approach.

Expert evaluation: to assess participation, motivation, and interaction during classes.

Assessment criteria: aligned with national educational standards for professional competences (lesson planning, application of methods, evaluation).

Procedure

The study was carried out over one semester (15 weeks).

Initial diagnostic phase: assessed students' baseline level of music and mathematics literacy and professional competences.

Experimental intervention: the group participated in a series of integrated lessons (music + mathematics), including:

- using musical rhythms to explain mathematical concepts;

- visualizing metric structures through geometric figures;
- practising body percussion and ensemble exercises to develop rhythmic and logical thinking.

Final evaluation: this included summative assessment, pedagogical observation, and comparative analysis based on indicators such as professional competencies, motivation, creativity, and confidence in teaching.

Data Analysis

Collected data were processed through qualitative analysis (observations, interviews, expert evaluation).

Results were compared with outcomes achieved by students in previous academic years.

8. Work Model: Examples

The work with students included three main types of activities and organizational formats: interdisciplinary game-based situations (music and mathematics), body percussion, and marching band practice.

The interdisciplinary game-based situations were first presented to the students so that they could develop their own variations afterwards. In this way, they enriched their experience and acquired skills for the practical application of their knowledge.

For the purposes of this study, several sample music-mathematics games implemented within the model are presented:

Play and Pass On: Each participant is given a card with a geometric figure. The teacher then sings or plays a rhythm. Students compare their figure with the performed model. The participant whose figure corresponds reproduces the rhythm and then passes their card to the next student, who must create a new rhythm with the new figure.

Rhythmic Chain: Each participant selects a geometric figure and memorizes the rhythm it represents. The teacher performs their chosen figure and rhythm, followed by a student who repeats the

teacher's rhythm and adds their own. Each subsequent participant repeats all previous rhythms and adds a new one, creating a complete rhythmic chain.

Guess the Figure (Fig. 2): the teacher performs a sequence of geometric figures with one missing. The goal for participants is to identify the missing figure using auditory perception. Those who guess correctly can perform the rhythmic model with a musical instrument.



Fig. 2. *Guess the Shape* music and mathematics game

When using such games, the age and abilities of the participants must be taken into account.

Before implementing these activities, a preparatory training module is conducted in which participants are introduced to the conditional symbolism established between musical and mathematical symbols and signs (Figs. 3 and 4).

The second organizational form of working with students is body percussion. Body percussion is most often performed by ensembles of varying size, from small groups to large formation, and can be carried out in two main ways: as an accompaniment to existing music or as an independent artistic performance. In the initial stages of training, the presence of a prepared musical background often serves as support and a guide for maintaining the metric-rhythmic structure, facilitating synchronization among participants. Over time, as musical hearing, rhythmic stability, and coordination skills develop, this dependence on musical accompaniment gradually diminishes due to the advanced musical abilities of the participants.



Fig. 3. Conventional symbols: geometric shapes, notes, values

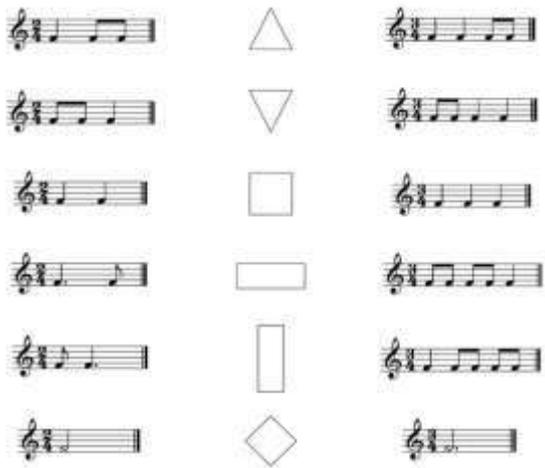


Fig. 4. Geometric representation of rhythmic patterns

In a pedagogical context, body percussion is regarded as an innovative and interactive educational tool that integrates rhythm, movement, and social interaction into a holistic process of experiential learning. It develops not only musical abilities but also essential social competences such as cooperation, coordination, concentration, and adaptability in a group environment (Fig. 5)



Fig. 5. Body percussion performance

Using the third organizational form of student work, the brass band (marching formation), musical literacy is developed and the integrative links

between music and mathematics are reinforced. In addition to performing metric structures, students must also master pitch, combining rhythmic accuracy with melodic precision when reading notation. Participation in such ensembles develops overall musical literacy, from technical performance to analytical perception of musical form, while simultaneously supporting cognitive skills such as visuospatial thinking, which is fundamental to both musical and mathematical understanding (Fig. 6).



Fig. 6. Participation in a brass band

9. Summary

In summary of the theoretical review, the pedagogical arguments, and the practical activities presented, the study highlights the following key conclusions regarding the integration of music and mathematics in the preparation of future teachers:

- Integrating music and mathematics through rhythm, meter, tempo, time signature, fractional ratios, and geometric visualizations transforms abstract temporal and quantitative relations into accessible and tangible structures.
- Mastering these contents helps future teachers develop solid subject-specific and interdisciplinary competences: mathematical literacy (fractions, proportions, and temporal measurements) is directly linked to theoretical music knowledge (metric organization, rhythmic patterns, and note values).

- Geometric figures function as a didactic “translation” between mathematics and music, reducing cognitive load and facilitating the recognition of symmetries and patterns.

- This approach aligns with the requirements of the Bulgarian normative framework (ZPUO; DOS) and the European Reference Framework of Key Competences (2018), which emphasize the need for mathematical competence, learning skills, social and civic competences, initiative, and cultural competence.

- Integrated music-mathematics content supports professional competences such as designing interdisciplinary lessons, reducing cognitive load through visual aids, planning criteria for assessing temporal/rhythmic skills, and making evidence-based selections of teaching tools for different age groups.

- In this way, the objectives of the ZPUO are addressed, namely personal development and improved educational achievement in a competence-based format, in line with European priorities for lifelong learning.

CONCLUSIONS

Practical work with body percussion and participation in a brass band function as “learning laboratories” for developing both professional and key competences. They foster rhythmic coordination, synchronization, ensemble leadership, and time management skills, while also strengthening teamwork, discipline, responsibility, and pedagogical reflection. As a result, future teachers are shaped who can design interdisciplinary lessons, support collaborative learning, and encourage accuracy, creativity, and sustained concentration among their students.

On a broader scale, these practices demonstrate that music can serve as a powerful mediator for building mathematical literacy, while mathematics can be an instrument for understanding musical structure. This integration develops both cognitive and socio-emotional competences, creating a sustainable learning climate. Therefore, the relationship between music and mathematics is not only a didactic resource but also a strategic direction in training future teachers, aligned with the requirements of competence-oriented education.

The study confirms that integrating musical and mathematical elements, particularly through practices such as body percussion and participation in brass bands, supports the development of key and professional competences in student

teachers. Developing rhythmic awareness positively influences logical thinking, creativity, and teamwork skills. The interdisciplinary approach enhances students’ motivation and pedagogical readiness and should be sustainably implemented in the training of future educators.

Practical Implications

The findings of this study highlight the practical value of integrating music and mathematics in teacher education. The proposed activities (rhythm-based games, body percussion, and brass band participation) can be effectively implemented in preschool and primary school pedagogy programs to enhance both cognitive and social competences. Teacher educators can adopt these interdisciplinary strategies to foster flexible thinking, creativity, and collaboration, while also reducing cognitive load through visual and rhythmic supports. In this way, the integration of music and mathematics provides not only subject-specific knowledge but also transferable skills, directly applicable to classroom practice and aligned with national and European educational priorities.

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OPTIMIZING INDIRECT COST ALLOCATION IN LONG-TERM CARE VIA ACTIVITY-BASED COSTING AND LINEAR PROGRAMMING

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ABSTRACT

This paper proposes a theoretical linear programming model to optimize indirect cost allocation in long-term care (LTC) medical facilities using the Activity-Based Costing (ABC) method. Focusing on Bulgaria and the rest of the European Union, the model enhances accuracy and efficiency by minimizing deviations between allocated and expected overheads. Integrating ABC with linear optimization improves transparency, resource utilization, and policy decision-making, offering a data-driven framework for sustainable financial management in LTC systems.

Key words: *Activity-Based Costing (ABC), Linear Programming, Indirect Cost Allocation, Long-Term Care Facilities, Healthcare Management Optimization*

INTRODUCTION

Accurate allocation of indirect (overhead) costs is crucial for managing long-term care (LTC) facilities, which increasingly face budget constraints and quality demands. Traditional cost-accounting methods typically allocate all overhead by crude averages (e.g. per bed-day or per admission), which can obscure true resource usage and lead to distorted service cost estimates. In contrast, Activity-Based Costing (ABC) links costs to specific care activities, aligning expenditures with patient needs rather than organizational structure. Seminal studies in LTC demonstrate feasibility and benefits of ABC: for example, Wodchis has found that an ABC framework “aligns costs (inputs), through activities... to outputs and outcomes” and showed its “feasibility and advantages” in residential care [1]. ABC in LTC helps reveal how overhead (such as administration, maintenance, or nutrition services) is consumed by different patient groups, enabling managers to track costs of care activities more precisely. European experts have similarly noted that healthcare cost-management “can benefit if costs are linked to the care activities where they are incurred,” as opposed to broad averaging [1].

Despite the advantages of ABC, its implementation has challenges. Literature notes that even ABC can be limited by data availability and by static allocation rules. For instance, recent reviews observe that while ABC (and its time-driven variant, TDABC) improve on traditional methods, “traditional cost accounting practices still have

problems for guiding tactical and strategic decisions” in complex networks [2]. Studies point out that fixed allocation (e.g. a single rate per nursing-hour) may still produce suboptimal decisions if workloads or case-mix change. Some researchers have proposed multi-criteria and optimization approaches (including goal programming and linear programming) to calibrate ABC parameters for best fit. In particular, Bravo et al. develop an “optimization-driven framework based on linear programming” for healthcare networks, explicitly noting that traditional overhead allocations can “lead to sub-optimal decisions”. This work motivates the use of mathematical programming to allocate costs more strategically.

Within the European Union and Bulgaria, interest in robust healthcare costing is growing. European cost manuals highlight the limitations of simplistic allocations: for example, the Joint Learning Network notes that many systems use top-down methods (allocating facility costs by department) or crude proxies (such as equally dividing overhead by bed-days) [3]. Such methods (even widely used in EU settings) “allocate indirect costs evenly to all bed-days, regardless of the health services provided,” which can over- or under-cost specific services. In Bulgaria specifically, careful cost data are scarce, but public reports show that the country spends a very low share on LTC (about 0.4% of GDP in 2013, versus 1.6% EU-wide [4]) and that LTC represents only 3% of health expenditures (EU average is 16%) [5]. This underinvestment coexists with the highest level of out-of-pocket payments in the EU (34% of health

spending) [4], suggesting potential efficiency and equity issues. Against this backdrop, an improved cost-allocation model could help Bulgarian LTC managers and policymakers allocate scarce resources wisely and transparently.

Indirect cost allocation methods

Cost accounting in healthcare literature describes several approaches: bottom-up costing (identifying every input per patient) versus top-down (aggregating facility costs) [3]. In top-down approaches, all overhead is first pooled (e.g. at the hospital level) and then allocated to departments and services. In bottom-up (often used with micro-costing), overhead can be allocated using proxies such as weighted service units or bed-days. The choice depends on trade-offs between accuracy and feasibility. The Joint Learning Network notes that bottom-up methods (which can incorporate ABC) tend to be more accurate but data-intensive, while top-down approaches rely on averages. Common simple methods include allocating overhead per bed-day or per time unit. For example, distributing the total indirect cost by total bed-days assumes each day of care consumes the same overhead. These proxies ignore case-mix, so that, for instance, a complex dementia care day incurs the same overhead as a short-stay rehabilitation day in the model. The literature thus calls for more refined allocation rules tailored to actual resource usage [1, 2].

ABC in healthcare and LTC

Research shows that ABC generally yields more precise cost estimates in health settings. In hospitals, ABC has uncovered previously hidden overhead consumption, enabling cost-per-procedure analyses. In the long-term care sector, Wodchis applied ABC to a nursing home and community care, finding that costs aligned with patient needs rather than facility units [1]. The study concluded ABC was feasible in LTC and highlighted advantages such as clearer links between staff time and residents' care activities. More recent works emphasize Time-Driven ABC (TDABC) to handle variable activity times, noting it "supports more accurate, transparent, and resource-sensitive analysis" in health economics [2]. These approaches illustrate the trend toward precision: if an activity (e.g. administering medication) actually takes more time or uses more supplies, a modern ABC/TDABC model captures that extra cost.

However, standard ABC has limitations. It typically assumes fixed driver rates and full allocation of costs once a year, which can misstate costs if operations fluctuate. Some studies recommend

combining ABC with optimization. For instance, the emerging field of healthcare management engineering advocates using operations research (including linear programming) to refine cost allocation rules. Notably, Bravo et al. integrate ABC insights into a network model, using LP to allocate fixed and variable resources across a hospital network for profit optimization. Although this work focuses on hospital services, it underscores that LP can "dissociate from subjective cost allocations" and solve for the least-cost allocation consistent with budget constraints. Such insights inspire our goal: a linear model that maximizes allocation accuracy in LTC by mathematically adjusting ABC assignments.

In summary, literature on healthcare cost accounting suggests a need for models that merge ABC activity focus with mathematical optimization. No single method is the best for all cases, but linear programming offers a systematic way to handle multiple constraints and objectives. In the EU context, pressure for transparent, accurate costing is growing: the European Commission and OECD emphasize full-cost accounting and data-driven budgeting. Bulgaria's health agencies, influenced by EU reporting standards, also recognize the gap in LTC financing and the importance of precise costing for reform. Our proposed model therefore builds on ABC principles and uses LP to allocate overhead to long-term care services in a way that improves on both accuracy and efficiency.

LINEAR PROGRAMMING MODEL FORMULATION

We formulate a linear programming (LP) model that assigns each category of indirect cost to long-term care services (cost objects) in an optimal way. The model is structured as follows:

- **Cost pools (i):** Let $i = 1, \dots, I$ index distinct overhead cost pools (e.g. facility maintenance, administration, dietary services, etc.) within a LTC facility or system. Each pool i has a total indirect cost C_i to be allocated.

- **Cost objects (j):** Let $j = 1, \dots, J$ index patient-care units or service categories in the LTC setting (for example, nursing care, physical therapy, social services, etc.). In many LTC contexts, services are grouped by patient condition or care program; for modelling, each such unit is a "cost object" consuming activities.

- **Activity drivers (a_{ij}):** For each pool i and cost object j , we define a measure a_{ij} of the usage

of cost pool i by object j . For instance, if pool i is “nursing administration,” a_{ij} might be total nursing hours for service j ; if i is “space maintenance,” a_{ij} could be bed-days for residents of type j . These driver quantities are assumed known from workload data or estimates.

- **Decision variables** (x_{ij}): Let $x_{ij} \geq 0$ denote the amount of cost from pool i allocated to service j . By definition, each x_{ij} is measured in monetary units and represents part of the overhead assigned to cost object j from pool i .

- **Allocation totals:** The total overhead allocated to service j is $y_j = \sum_{i=1}^I x_{ij}$. By construction, $\sum_{j=1}^J y_j = \sum_{i=1}^I C_i$, so all indirect costs are distributed across services.

- **Objective function:** The goal is to allocate costs in a way that best reflects the service underlying resource consumption, hence maximizing accuracy and consistency. Suppose we have target or expected overhead needs O_j for each service j . These could come from historical activity-cost analyses or managerial estimates. We introduce deviation variables $t_j \geq 0$ to capture the absolute difference between allocated overhead and target:

$$y_j - O_j \leq t_j, \quad O_j - y_j \leq t_j \quad (\forall j),$$

so $t_j \geq |y_j - O_j|$. Then we minimize the total deviation

$$\text{Minimize } Z = \sum_{j=1}^J t_j.$$

This objective (a sum of absolute errors) is linearizable and ensures that LP seeks an allocation $\{x_{ij}\}$ that keeps $\sum_j t_j$ as small as possible, i.e. matching actual costs.

- **Constraints:** The model imposes:
- **Full allocation of each pool:** $\sum_{j=1}^J x_{ij} = C_i$ ($\forall i = 1, \dots, I$). This guarantees that each overhead pool cost is entirely allocated to services, as required by full costing.

- **Deviation definitions:** For each service j ,

$$\sum_{i=1}^I x_{ij} - O_j \leq t_j, \quad O_j - \sum_{i=1}^I x_{ij} \leq t_j.$$

These enforce $t_j \geq |y_j - O_j|$ in linear form.

- **Non-negativity:** $x_{ij} \geq 0$ for all i, j , and $t_j \geq 0$ for all j .

- **Interpretation:** This LP finds an allocation x_{ij} that minimizes the total allocation error (the sum of $|y_j - O_j|$), while exhausting all overhead budgets. The target values O_j effectively guide the

model toward allocation proportional to expected usage; if those targets come from ABC cost driver computations, the LP refines them to best fit the budget.

In summary, the LP model consists of decision variables $\{x_{ij}, t_j\}$, a linear objective $\min \sum_j t_j$, and linear constraints ensuring each pool C_i is allocated and deviations t_j capture allocation accuracy. This formulation is akin to a regression or fit problem for cost allocation, but solved via LP. It can be solved efficiently for realistic LTC data sets, yielding explicit overhead shares for each service.

THEORETICAL IMPROVEMENTS OVER TRADITIONAL ABC

The proposed LP-enhanced ABC model improves cost allocation in several key ways. First, by optimizing allocation against known or desired consumption patterns, it enhances accuracy. Traditional ABC typically assigns each pool according to fixed driver rates (e.g. cost per nursing-hour). In practice, if the driver usage data are imprecise or if actual costs deviate from estimates, straightforward ABC may misallocate costs. In contrast, our LP model adjusts the allocations to best fit the full set of overhead costs and usage patterns simultaneously. The objective $\min \sum_j |y_j - O_j|$ ensures the allocation closely matches expected costs across all services. In effect, this is akin to a multi-period or multi-department allocation smoothing, which other industries also achieve through optimization. As Bravo et al. note in a similar context, traditional allocation “confounds resource allocation and network capacity decisions,” whereas an optimization approach can avoid those confounding effects.

Second, the LP approach adds efficiency by systematically balancing competing allocation needs. If one service has more driver units, a naive ABC might allocate proportionally and satisfy its costs exactly, but that could leave an infeasible gap elsewhere. The LP finds a global optimum: for example, if one department overshoots its target, the model may slightly under-allocate to another to preserve overall balance. Thus, costs are distributed in a way that minimizes total distortion. This is an inherently more efficient use of information than independent, local allocations by pool. Because LP solves all constraints together, it inherently respects budget limits and inter-service trade-offs. In operations research terms, the model seeks the best feasible solution under linear

constraints, providing higher fidelity than ad-hoc rules.

Third, the LP formulation is transparent and repeatable, improving on ad-hoc ABC adjustments. In traditional ABC implementations, auditors or managers might manually tweak rates or pools if the raw output looks unreasonable. The LP automates this: given the same data, it will consistently find the same optimal allocation (assuming a unique solution). This mathematical rigor reduces human error and subjectivity. In healthcare networks, earlier work has shown that LP-based models can dissociate from subjective cost allocations by deriving them from first principles. Similarly, our LP-ABC model uses objective minimization to set allocations, which can yield insights (via dual values) about how tight constraints are. For instance, the dual of a pool allocation constraint $\sum_j x_{ij} = C_i$ indicates how much the objective would worsen if a pool's budget changed. Such insights provide managers with efficiency metrics unavailable in static ABC systems.

Finally, the LP model can incorporate additional constraints or objectives if needed. While our base model minimizes absolute errors, it could be extended to multi-objective or weighted formulations. For example, one could add constraints to ensure a minimum allocation to critical services, or weights w_j in the objective to prioritize precision for high-cost departments. This flexibility is a known advantage of linear (and goal) programming in accounting: it can handle multicriteria decision-making systematically. In practice, if an LTC provider wanted to emphasize accuracy in, say, intensive geriatric care units, the LP could weight those services more heavily. By contrast, a fixed ABC model cannot easily reflect such managerial preferences post hoc.

In aggregate, the LP-ABC model combines the granularity of activity-based accounting with the global optimization of operations research. It thereby achieves better precision (by minimizing misallocation) and better efficiency (by finding an allocation that satisfies all pools optimally). These improvements are supported by the literature: as noted, optimization-driven approaches in healthcare have yielded insights that “traditional cost allocation practices... are not suitable for addressing strategic challenges”. Our theoretical model addresses that gap by turning indirect cost allocation into a solvable LP, effectively generalizing and improving upon conventional ABC systems.

POLICY AND MANAGERIAL IMPLICATIONS

Adopting an LP-based ABC model would have important implications for long-term care policy and management in the EU and Bulgaria. At the managerial level, LTC administrators would gain far more accurate cost-per-service estimates. This allows better budgeting and pricing. For example, if the model reveals that rehabilitative therapy actually consumes more overhead (per unit) than previously thought, managers can adjust staffing or outsourcing accordingly. With more precise costs, facility directors can also identify inefficiencies: if a particular service consistently shows a large deviation t_j , it may indicate under- or over-utilization of overhead resources. The optimization yields marginal values (shadow prices) on resources, which could highlight bottlenecks (e.g. a pool whose shadow price is high might be under-resourced). Such analytic feedback is rarely available in standard ABC; as a result, this approach supports ongoing process improvement and investment planning in LTC settings.

For policymakers in Bulgaria and the EU, the model could inform reimbursement and regulation. In Bulgaria, LTC funding is fragmented across social insurance, means-tested services, and out-of-pocket payments. A common criticism (as noted in OECD reporting) is that funding lacks transparency [4]. An accurate costing system could underpin a case-mix or DRG-like tariff system for LTC, ensuring that payments to providers reflect actual resource needs. This could reduce the current reliance on informal fees: for instance, Bulgarian elderly often pay 70% of their pension for institutional care [5], a burden exacerbated by opaque cost structures. If LTC units had a clear ABC-driven cost schedule, co-payments could be set more equitably, and government subsidies targeted more effectively. In the EU context, where many countries face aging populations, a transparent model aligns with the European Pillar of Social Rights and the push for sustainable long-term care systems.

Strategically, the model supports policy goals around efficiency and quality. The EU has highlighted the need to optimize healthcare networks and allocate resources “efficiently” as demographics shift. By offering a data-driven allocation, our LP-ABC framework can be part of policy reforms that, for example, encourage outpatient and home-based care (which may consume different overhead patterns) over costly institutional care. In Bulgaria's 2020s reforms, there is

emphasis on integrating health and social care; an advanced costing model would help measure the impact of integrated services on overhead consumption. Moreover, in EU funding programs for digital health and health management (e.g. the 2021–2027 Multiannual Financial Framework), tools that improve costing precision might attract support, since they promise better value from public investments.

Finally, the managerial uptake requires capacity building. LTC facilities would need to collect detailed driver data (as per ABC) and to acquire or train staff to run LP models (though modern software makes this feasible). The literature notes that resistance and data quality issues often hinder new costing systems [6]. However, the theoretical advantage of our model is that it builds on familiar ABC foundations, simply adding an optimization layer. Policy initiatives (e.g. requiring full-cost accounting in public facilities) could encourage this. Since Bulgaria and other EU countries already report unit cost data (as in the European Healthcare and Social Cost Database [7]), the additional step of optimization seems attainable. Training accountants in LP techniques (or partnering with academic health economists) could thus yield large dividends: more accurate costs lead to better reimbursement rates, more sustainable budgets, and ultimately, higher-quality care for the elderly.

CONCLUSION

This paper proposes a novel linear programming model to allocate indirect costs in long-term care facilities more accurately and efficiently than traditional ABC. By formulating cost allocation as an LP problem, the model ensures that all overhead costs are fully distributed while minimizing deviations from expected usage. The literature supports the approach: Activity-Based Costing offers greater precision than broad averages, and recent studies in healthcare optimization show that linear programming can correct ABC's shortcomings. In the EU and especially in Bulgaria, where LTC resources are limited, such improvements are crucial. Bulgarian health reports highlight a very low share of spending on long-term care and high patient charges. Our model would help LTC managers allocate their scarce budgets in a data-driven way, potentially reducing the need for informal payments and highlighting where efficiency gains are possible.

In operational terms, implementing this model could involve straightforward steps: define cost pools and driver matrices (as in any ABC system),

then solve the LP using standard software. The output – optimal cost-driver rates – could be fed back into the facility's accounting and budgeting processes. Over time, as activity data improve and policies change, the LP can be re-solved regularly, providing a dynamic costing tool.

Future research could extend this framework to multi-facility or system-level cost sharing (for example, allocating a national LTC budget among regions via LP). Moreover, linking cost allocations to health outcomes (aligning with value-based care initiatives) is a promising direction: a similar LP could balance cost accuracy with quality goals. However, even the baseline model presented here marks a substantial step forward. By bridging cost accounting and operations research, it offers LTC providers in Bulgaria and the EU a more robust way to ensure effective financial tracking, now with the benefit of modern optimization.

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THE IMPACT OF RELATIONSHIP MARKETING ON CUSTOMER SATISFACTION

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ABSTRACT

Relationship marketing is a modern concept that places long-term customer relationships based on trust, commitment, and mutual value at the core of business strategies. In the tourism sector, where customers seek not only a product but also a complete experience, relationship marketing plays a crucial role in achieving high levels of satisfaction. The aim of this study is to analyze the impact of relationship marketing on customer satisfaction through a theoretical review and an empirical analysis conducted in BVS Entertainment Ltd. The results demonstrate that implementing strategies focused on personalization, building trust, and loyalty programs leads to higher satisfaction, which in turn becomes a key factor for sustainable development and competitiveness.

Key words: *relationship marketing, customer satisfaction, tourism, tourist animation (entertainment), loyalty*

INTRODUCTION

In recent decades, a clear transformation has been observed in marketing theory and practice – from a product- and sales-oriented approach to one based on customer relationships. Classical marketing focuses mainly on the one-time act of purchase and the attraction of new consumers, whereas modern relationship marketing emphasizes building long-term, sustainable, and mutually beneficial relationships [1–3]. In this sense, the understanding of organizational success has changed: it is no longer measured solely by market share and sales, but by the degree of customer trust, loyalty, and satisfaction [2, 4].

The relevance of the topic concerning the impact of relationship marketing on customer satisfaction arises from the specifics of the modern business environment. In the context of globalization, digitalization, and ever-increasing competition, consumers have more choices and expect not only a quality service but also personalized attention, emotional connection, and consistency in communication [5–7]. Accordingly, customer satisfaction becomes a key indicator of the success of marketing strategies and a foundation for sustainable development [8].

The role of relationship marketing in tourism is particularly significant [1, 3]. In this sector, the customer purchases an intangible product – an experience that cannot be objectively evaluated in advance. Therefore, trust, emotional connection, and positive experience are critical to satisfaction

[9]. Tourist animation, understood here as organized tourist entertainment activities provided by hotels or specialized companies, represents a specific service element that adds unique value to the guests' stay and often becomes a decisive factor in their perception of service quality [10].

Accordingly, the purpose of this study is to examine the influence of relationship marketing on customer satisfaction, with an emphasis on tourism services and, in particular, the activity of BVS Entertainment Ltd. Through theoretical analysis and empirical research, the study aims to show how trust, loyalty, and service personalization can lead to high satisfaction levels and form a basis for sustainable business development.

OBJECT, SUBJECT, AIM, TASKS, AND METHODS OF THE STUDY

The object of the study is the application of relationship marketing in the field of tourism services and its influence on the level of customer satisfaction [1, 11]. Tourism is among the most dynamic sectors of the economy, characterized by high competition, rapidly changing consumer preferences, and strong dependence on service quality [9]. Since tourism services are intangible and difficult to assess before consumption, building trust and long-term relationships with customers becomes essential for achieving satisfaction.

The subject of the study is the influence of the strategies and tools of relationship marketing on building and maintaining customer satisfaction in

the tourism business, with a particular focus on tourist animation [10]. This focus allows for tracing the connection between theoretical relationship marketing concepts and their practical application in an area that directly affects customers' emotional experiences.

The main goal of the study is to demonstrate that the application of relationship marketing leads to higher levels of customer satisfaction [4, 7], which in turn is a key factor for loyalty, repeat visits, and sustainable company development in the tourism sector.

To achieve this goal, the following tasks were formulated:

- To analyze the theoretical foundations of relationship marketing and its connection with customer satisfaction.
- To examine the specific characteristics of tourism services that make satisfaction a critical success indicator.
- To review the role of animation as a key element of the tourism product and a factor for satisfaction.
- To conduct an empirical study within BVS Entertainment Ltd. to determine the real impact of relationship marketing on customer attitudes.
- To evaluate the economic and strategic effects of applying relationship marketing and develop practical recommendations.

METHODOLOGY

To achieve the set objectives and tasks, a complex methodological approach was applied [1, 11]. First, a theoretical analysis of existing scientific literature and established models in the field of relationship marketing and customer satisfaction was conducted [2, 3, 12]. Second, empirical methods were applied, including surveys among tourists, interviews with managers and animators, and an analysis of internal documents and reports of BVS Entertainment Ltd. [10]. Statistical data processing included the calculation of averages, percentage distributions, and correlations between satisfaction levels and factors such as trust, personalization, and loyalty.

Additionally, a comparative analysis with international practices in the sector was conducted, allowing the results to be viewed in a broader context. To ensure data reliability, the study covers a multi-year period, identifying not only temporary trends but also long-term patterns.

THEORETICAL FRAMEWORK

Relationship marketing is a concept focused on building long-term customer relationships, aiming not merely at one-time sales but at creating sustainable mutual value [1, 3]. Classical marketing authors such as Kotler, Christopher, Payne, and Ballantyne emphasize that modern business success is measured not only by market share but by the degree of satisfaction, trust, and loyalty achieved among customers [2, 3].

Customer satisfaction is defined as the degree to which customer expectations correspond to the service actually received [3, 12]. When the experience exceeds expectations, satisfaction is high, leading to repeat consumption and positive recommendations [4]. Conversely, unmet expectations result in dissatisfaction, which may lead to customer loss and reputational damage.

Relationship marketing views satisfaction not as an isolated result of a specific service but as a long-term process of building a positive emotional connection between the company and the customer. This connection is achieved through service personalization, consistent quality, open communication, and systematic feedback.

The SERVQUAL model (Parasuraman, Zeithaml & Berry, 1988) is among the most widely used tools for measuring customer satisfaction [12]. It includes five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. In the context of relationship marketing, these dimensions are complemented by elements such as trust, emotional connection, and customer engagement [7].

Another key contribution is Reichheld's theory of "The Loyalty Effect" (1996), which posits that satisfied customers are more likely to become loyal and support the company in the long term [4]. The relationship is clear: satisfied customers become loyal customers, and loyal customers provide stability and competitive advantage [4, 7].

In tourism, satisfaction is even more significant because customers purchase a "promise of experience." High-quality service, attention to detail, and personalized approaches are decisive for perceived value. Tourist animation is an example of a service that directly influences satisfaction. When the tourist feels engaged, excited, and cared for, the entire stay is perceived as higher quality and more fulfilling.

At the theoretical level, it can be concluded that relationship marketing and customer satisfaction are interdependent. Relationship marketing provides the tools, such as trust, personalization, and communication, that lead to satisfaction, while satisfaction strengthens loyalty and creates conditions for sustainable development.

APPLICATION IN TOURISM AND TOURIST ANIMATION

Tourism is one of the sectors where the relationship between relationship marketing and customer satisfaction manifests most clearly [1, 3]. Unlike tangible products, tourism services are intangible and cannot be evaluated or tested before consumption [9]. Consequently, customers form perceptions mainly based on trust, reputation, and prior experience. In this context, relationship marketing becomes a key tool for managing satisfaction.

Animation occupies a special place within the tourism product, as it creates added value beyond basic services such as accommodation and food [10]. Animation programs provide emotional experiences, social interaction, and a sense of community, directly influencing tourists' satisfaction. When customers participate in well-organized, diverse, and professionally delivered animation activities, they not only enjoy their stay but also form an emotional connection with the hotel or tour operator brand [10].

Relationship marketing in this context manifests in several main directions:

- Service personalization – adapting animation programs to different age groups, cultural backgrounds, and individual preferences [1, 7].
- Building trust – through consistency in quality, safety in activity organization, and professional conduct of animators [3, 6].
- Stimulating loyalty – through repeat-visit programs, special privileges for regular guests, and systematic feedback collection [4, 7].

A practical example is the activity of BVS Entertainment Ltd., a leading company in the field of tourist animation. Its experience shows that through the strategic application of relationship marketing, a higher level of satisfaction is achieved, as customers perceive animation not merely as entertainment but as an essential component of the overall tourism experience [10].

In addition, tourist animation can mitigate potential negative impressions arising from other elements of the stay (for example, accommodation or dining issues). This makes it a key instrument

for customer retention and for forming a positive overall service evaluation.

Therefore, in the tourism sector, relationship marketing implemented through animation programs proves to be a strategic mechanism for increasing customer satisfaction [1, 5, 10]. It not only ensures a better customer experience but also guarantees competitive advantage for the company.

RESULTS OF THE STUDY

The empirical study conducted within BVS Entertainment Ltd. aimed to determine how the application of relationship marketing affects customer satisfaction and to what extent trust, personalization, and loyalty shape positive customer attitudes. The company was chosen due to its leading position in tourist animation in Bulgaria and its extensive experience in applying relationship marketing strategies [10].

Surveys among tourists indicate that 87% of respondents rated the animation programs as “very good” or “excellent” [10]. The main factors leading to satisfaction were:

- the diversity of activities;
- the high level of professionalism among animators;
- the personalized approach that made clients feel special and cared for.

Interestingly, a significant share of tourists (approximately 65%) stated that the animation program was the decisive factor in their hotel choice. This confirms the strategic role of animation as a tool for building satisfaction and loyalty.

The results indicate that 80% of surveyed clients had a high level of trust in the company, perceiving its services as consistent and reliable. Trust was strengthened by positive experiences and open communication with staff. Furthermore, 58% stated they would return specifically to hotels where BVS Entertainment operates [10]. This is a clear indicator of a high level of loyalty resulting from satisfaction with the experience.

Interviews with employees revealed that customer satisfaction is closely linked to internal motivation and the organizational culture of the company [11]. When animators feel valued and supported, they transmit their positive energy to tourists, increasing their satisfaction. Thus, a cycle is established: satisfied employees create satisfied customers, and satisfied customers enhance the company's image and competitiveness.

Financial data of BVS Entertainment for the period 2014–2024 show steady revenue growth,

mainly due to high customer satisfaction [10]. Repeat clients and word-of-mouth recommendations were the major sources of new contracts and partnerships with hotels.

The results clearly demonstrate that satisfaction is a direct outcome of relationship marketing implementation. Personalization, trust, and loyalty are key factors that not only increase customer satisfaction but also create preconditions for sustainable company development.

DISCUSSION

The findings confirm that trust and loyalty are crucial for the success of relationship marketing and sustainable company development [1, 4, 5]. These findings align with established theoretical models, including Reichheld's assertion that even a small increase in loyalty levels can lead to a significant financial effect [4, 7].

The analysis reveals that trust serves as the foundation upon which all subsequent stages of the client–company relationship are built. In tourism, trust is particularly fragile, as the client purchases an intangible product, a promise of emotion and experience [11]. Its violation may have serious consequences not only for the company's image but also for the reputation of the destination. Therefore, companies must maintain consistency in quality, transparency in communication, and proactive management of customer expectations [1].

Data from BVS Entertainment show that customer loyalty manifests in three main forms: repeat visits, recommendations, and positive online reviews [10]. This multidimensional loyalty is far more valuable than a single purchase because it ensures long-term revenue and builds a “community” around the brand [7]. At the same time, it reduces advertising and marketing costs, as loyal customers become active promoters.

In international literature, trust and loyalty are also regarded as strategic resources. For instance, according to the Peppers and Rogers model (2004) [4], companies that succeed in building high levels of trust create conditions for customers to move to the highest level of the relationship: brand advocacy. A comparison between the practices of BVS Entertainment and leading global tourism companies shows that the Bulgarian firm applies many of these approaches: personalized animation programs, active feedback collection, and investments in staff training [4, 10].

Despite the positive results, the study also highlights certain challenges [7, 8]. First, trust and

loyalty are dynamic categories that can be influenced by external factors such as economic crises, global pandemics, or changes in consumer attitudes. Hence, companies must continuously adapt their strategies [1, 5]. Second, technological innovations, including online booking systems and social media, can both strengthen and threaten trust, depending on how they are managed.

The discussion shows that trust and loyalty should not be viewed merely as “outcomes” of the marketing strategy but as assets that can and should be managed. This management includes implementing systems for regular measurement of satisfaction, developing loyalty programs, and training staff to build emotional connections with clients [5].

In conclusion, the discussion confirms that trust and loyalty are core elements of relationship marketing and key instruments for the sustainable development of tourism companies. They should be placed at the centre of strategic management and regarded not only as marketing goals but also as organizational values.

CONCLUSION

The study confirms the leading thesis of relationship marketing, namely that sustainable relationships with customers are the main factor for achieving high satisfaction [10]. This corresponds with established international models and reveals several key aspects for discussion.

The data show that trust, personalization, and attention to individual customer needs form a high level of satisfaction. These findings coincide with the concept of Parasuraman, Zeithaml, and Berry (1988) [4, 11], according to which, reliability, security, and empathy are decisive for the perception of service quality. In the case of BVS Entertainment, the personalized approach of the animators and attention to detail create a foundation of trust that automatically enhances customer satisfaction.

In international practice, leading hotel chains, such as Hilton, Marriott, and Club Med, implement loyalty and personalization programs aimed not merely at meeting customer needs but at exceeding expectations. The comparison shows that BVS Entertainment successfully applies similar mechanisms in animation: e.g., regular feedback collection, program adaptation to audience preferences, and staff training investments. This places the company on par with good international practices, even though it operates on a much smaller scale.

The data show a clear relationship between satisfaction and loyalty – most clients not only express willingness to return but also recommend the services to friends. This confirms Reichheld's model (1996), according to which, satisfied customers are the main driver of long-term loyalty [7]. Practically, this means companies should treat satisfaction not as a final result but as a strategic investment in future loyalty.

Despite positive results, the study also highlights certain challenges. First, satisfaction is a dynamic category: customer expectations evolve under the influence of new technologies, social trends, and global events. This requires constant innovation in animation programs and marketing approaches. Second, negative online reviews can quickly undermine trust and reduce satisfaction, even when they stem from isolated incidents. This calls for an active digital reputation management policy.

The analysis shows that to achieve high satisfaction, companies must build a comprehensive relationship management system [7, 10] which includes:

- constant monitoring of satisfaction through surveys and online feedback;
- staff training with a focus on emotional intelligence and communication skills;
- creation of loyalty programs that enhance the positive customer experience.

In conclusion, the discussion confirms that relationship marketing is not merely a customer retention approach but a strategic tool for increasing customer satisfaction. In tourist animation, this is even more important, as the experience itself is at the core of the service, and satisfaction determines whether the client becomes a loyal partner.

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CUSTOMER RELATIONSHIP MANAGEMENT: GOOD PRACTICES AND STRATEGIES

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ABSTRACT

Customer Relationship Management (CRM) represents a comprehensive approach that integrates marketing, management, and technology to achieve long-term and profitable relationships with customers. In today's highly competitive business environment, particularly in the tourism industry, the ability of companies to develop personalized services, establish emotional connections, and respond quickly to changing customer needs has become a decisive factor for sustainable growth. The present article analyzes good practices and effective strategies in the application of CRM, with particular emphasis on the tourism sector and the case of BVS Entertainment Ltd., a company specializing in hotel animation services. The research combines theoretical insights from relationship marketing with empirical findings derived from surveys and interviews, which highlight the importance of loyalty programs, digital communication tools, and customer feedback mechanisms. The results indicate that companies implementing integrated CRM systems are able not only to retain existing clients but also to attract new ones through positive reputation and word-of-mouth marketing. Moreover, CRM contributes to higher levels of trust, customer satisfaction, and organizational efficiency, thereby strengthening competitiveness in both national and international markets. Ultimately, the study demonstrates that customer relationship management should be perceived not merely as a technological solution but as a holistic business philosophy, capable of transforming service quality and ensuring long-term success.

Key words: Customer Relationship Management (CRM), relationship marketing, tourism, customer satisfaction, loyalty, strategies

INTRODUCTION

In today's economic environment, characterized by high dynamism, global competition, and continuous digital transformation, organizations face the need to develop sustainable business models based on building stable and long-term customer relationships. Traditional marketing approaches, focused mainly on attracting new clients, are gradually giving way to concepts that emphasize retaining existing customers, deepening relationships with them, and transforming them into loyal business partners [1, 2]. In this context, Customer Relationship Management (CRM) becomes not just a tool but a comprehensive business philosophy aimed at creating mutual value for both organizations and consumers [3].

The importance of CRM is particularly evident in the service sector, especially in tourism, where customers seek not only a standard product but a complete experience that includes quality, personalized attention, and emotional engagement. Tourism companies that successfully adapt their services to individual customer needs, offer personalized solutions, and maintain effective two-

way communication achieve higher levels of satisfaction and a more sustainable market presence [1, 4]. Consequently, CRM practices are increasingly perceived as a strategic factor for competitiveness and long-term sustainability.

In recent years, under the influence of technological innovations, CRM has acquired new dimensions. The implementation of digital platforms, social networks, mobile applications, and big data analytics systems enables companies to better understand customer behaviour, anticipate expectations, and respond promptly to market changes [5, 6]. These developments transform CRM from an operational data management tool into a strategic approach that supports the creation of sustainable relationships based on trust and mutual value [7, 8].

The aim of this article is to explore best practices and strategies related to customer relationship management, with a particular focus on the tourism sector and the practical application of CRM at BVS Entertainment Ltd. By combining theoretical research and empirical data, the study presents a comprehensive picture of the impact of

CRM on customer satisfaction, loyalty, and sustainable business development [9].

OBJECT, SUBJECT, AIM, TASKS, AND METHODS OF THE STUDY

The object of the study is Customer Relationship Management (CRM) as a strategic element of contemporary business practice. It includes all processes and activities related to building, maintaining, and developing relationships between organizations and customers, including methods for collecting information, analyzing consumer behaviour, personalizing services, and integrating digital technologies into relationship management [1, 2]. Special emphasis is placed on the tourism sector, where service quality and emotional experience play a crucial role in customer satisfaction and loyalty [4, 10].

The subject of the study is the specific impact of CRM practices on the sustainable development and competitiveness of tourism companies, with a focus on BVS Entertainment Ltd., a company specializing in hotel animation services (here, “animation” is used to mean tourist entertainment). Within this framework, the company’s strategies for creating added value through personalized services, effective communication channels, loyalty programs, and systematic customer feedback collection are examined [9].

The main aim of the study is to demonstrate that customer relationship management represents an effective tool for increasing customer satisfaction and loyalty, thereby contributing to the sustainable development of tourism enterprises. Special emphasis is placed on CRM as not only a technological solution but also a comprehensive business strategy integrating organizational culture, marketing approaches, and managerial practices [1, 3, 5].

The tasks of the study are as follows:

1. To conduct an in-depth theoretical review of the CRM concept and its evolution in the context of relationship marketing [1, 2].
2. To analyze best practices and strategies for managing customer relationships in the tourism sector, with an emphasis on personalization, digitalization, and loyalty programs [4, 5].
3. To conduct empirical research on the activities of BVS Entertainment Ltd., revealing the application and outcomes of CRM practices [9].
4. To formulate practical recommendations for improving CRM practices that may serve as a model for other tourism enterprises [6].

The research methodology is based on a combination of qualitative and quantitative methods. Comparative analysis was used to identify best practices in both international and national contexts. Surveys among clients and employees of BVS Entertainment Ltd. were conducted to measure satisfaction, loyalty, and trust levels [9]. Statistical analysis was applied to process the results and establish relationships between implemented CRM practices and business outcomes [6]. Additionally, a descriptive method was used to present the organizational experience of the company and summarize the main trends in customer relationship management within tourism [1, 2].

THEORETICAL PART

The concept of Customer Relationship Management (CRM) has emerged as an evolutionary continuation of classical marketing and relationship marketing [1, 2]. While traditional marketing focuses on market shares, advertising, and short-term sales, CRM emphasizes the development of long-term relationships based on trust, commitment, and mutual value [1, 3]. This shift reflects increasing competition, economic digitalization, and the need for companies to create sustainable competitive advantages through customer retention [1, 5].

A fundamental premise of CRM is that loyal customers generate more value to the organization than newly acquired ones. According to Reichheld [7], just a 5% increase in customer retention can lead to a profit growth between 25% and 95%, demonstrating that strategies aimed at retaining customers and deepening relationships are economically more significant than mass campaigns to attract new users [7].

Modern CRM theory emphasizes the integration of three key elements: organizational culture, business processes, and technology. On one hand, organizational culture should be customer-oriented and encourage personalized service. On the other, business processes should facilitate customer interaction and offer flexible solutions. Technology provides the necessary tools to collect, process, and analyze customer data, enabling a comprehensive understanding of preferences and behaviour and [1, 2, 5].

CRM best practices are particularly relevant in tourism, where service quality and experience are central. Tourism companies applying CRM generally focus on the following strategies:

- Service personalization – developing individual offers and packages tailored to customer preferences [1, 4].

- Loyalty programs – introducing reward systems, bonuses, and discounts that encourage repeat visits [6, 7].

- Digital communication channels – systematic communication via mobile apps, social networks, and online platforms to maintain constant contact with clients [5, 6].

- Feedback systems – collecting and analyzing customer opinions to improve service quality [1, 2].

An example of successful CRM practice is the implementation of integrated relationship management systems that allow hotels and tourism companies to monitor the entire “customer lifecycle,” from the first contact to repeat purchases. This creates conditions for building trust, improving customer satisfaction, and establishing long-term partnerships [9].

From a theoretical perspective, CRM can also be viewed as a tool for sustainable development, because it is not limited to a technological solution but represents a strategic model in which companies seek balance between economic benefits and social responsibility [1, 11]. Tourism, as a people-oriented sector, offers substantial opportunities for effective CRM implementation, particularly through the creation of unique customer experiences and responsiveness to growing global competition [4, 6].

RESEARCH RESULTS

To assess the practical application of CRM in tourism, an empirical study was conducted at BVS Entertainment Ltd., a leading Bulgarian company specializing in hotel and resort animation services. The study covers the period 2014–2024 and is based on client surveys, employee interviews, and analysis of company documents [9].

The results clearly show that the implementation of CRM strategies increased customer satisfaction and strengthened loyalty. Over 70% of surveyed clients reported willingness to reuse the company’s services due to personalized attention, tailored approaches, and strong emotional engagement [9]. This confirms that CRM practices in tourist animation positively affect repeat consumption and word-of-mouth recommendations, a key channel for attracting new clients [6, 7].

Another significant result is related to the implementation of loyalty programs and specialized packages aimed at regular customers. Analysis shows that these programs resulted in an approximate 20% increase in repeat visits and service revenue during the same period [9], demonstrating

the direct financial impact of systematic CRM application [6, 7].

The integration of digital technologies at BVS Entertainment Ltd. represents another important outcome. During the study period, the company actively used social networks and online platforms for customer communication, promotion, feedback collection, and offer personalization. Surveys show that nearly 60% of clients reported learning about the company through online channels, highlighting the significance of digital CRM [5, 9].

Internal studies also reveal the positive impact of CRM on organizational culture. Employees reported that policies encouraging active staff participation in building customer relationships increased motivation and job satisfaction [9]. CRM thus has a dual effect: improving customer experience and boosting employee engagement and organizational resilience [12].

Comparative analysis with other tourism companies shows that a systematic approach to CRM places BVS Entertainment in a more favourable competitive position. The company delivers high-quality services exceeding standard animation programs and including personalized activities adapted to age, cultural preferences, and customer interests. This is perceived by clients as a key satisfaction factor and a foundation for sustainable development [4, 9].

In summary, CRM practices at BVS Entertainment Ltd. positively influence three main aspects:

1. Increased customer satisfaction through personalized services and active engagement [9].

2. Strengthened customer loyalty and repeat visits, generating direct economic impact [6, 7, 9].

3. Improved internal organizational culture through staff involvement in building customer relationships [9, 12].

DISCUSSION

The findings from BVS Entertainment Ltd. confirm the importance of CRM as a strategic instrument for improving customer satisfaction and achieving sustainable competitive advantages in tourism. While theory emphasizes the value of long-term relationships [3, 7], empirical evidence shows that successful CRM implementation requires both technological support and cultural transformation [1, 12].

Personalization is a key discussion point. Theory emphasizes the need for an individual approach to each client [8], and the study shows that personalized animation services are highly valued

by the customers of BVS Entertainment Ltd. This confirms that personalization is both a competitive advantage and a trust-building factor [4, 9].

Digitalization is another critical factor. The literature highlights the importance of online platforms and social media for maintaining two-way communication with customers [5]. For BVS Entertainment, the use of digital technology improved customer reach and created an online community, enhancing loyalty and generating marketing benefits through recommendations [9].

The economic benefits of CRM are also evident. Theoretical models [7, 8] suggest that customer retention is more profitable than acquisition. Empirical data confirm this: loyalty programs and personalized packages increased repeat visits by about 20% [9], showing the direct economic impact of CRM.

The dual effect of CRM, on customers and internal culture, is also obvious. Employee participation in CRM increased motivation and the sense of belonging, which is consistent with the views of Christopher, Payne & Ballantyne [12].

In conclusion, CRM is a multifaceted concept that includes:

1. Service personalization and emotional customer engagement [4, 9].
2. Integration of digital technologies and communication channels for effective contact [5, 9].
3. Economic impact through repeat purchases and reduced acquisition costs [6, 7, 9].
4. Enhanced internal organizational culture through active staff participation [9, 12].

These findings emphasize that CRM should be considered as a strategic framework combining managerial, marketing, and technological elements, and as a key factor for sustainable development in tourism [1, 4, 5].

CONCLUSION

The study confirms that Customer Relationship Management (CRM) is a key tool for achieving high levels of customer satisfaction, trust, and loyalty. In tourism, where the product is complex and often intangible, CRM allows companies to build long-term relationships with consumers by combining personalized services, active use of digital channels, and effective loyalty programs [1, 4, 5].

The case of BVS Entertainment Ltd. demonstrates that systematic CRM implementation leads to tangible economic benefits: increased repeat visits, higher revenue from regular customers, and

stronger market positions. CRM also positively affects internal organizational culture by boosting employee motivation and engagement. This demonstrates that CRM should be viewed not only as a technological solution but as a comprehensive business philosophy integrating all organizational units around the central role of the customer [9, 12].

In conclusion, CRM represents an integrated approach combining strategic management, marketing, and technology. In the tourism sector, it constitutes an essential foundation for sustainable development, ensuring high customer satisfaction and lasting competitive advantages at both national and international levels [1, 4, 5].

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A CONCEPTUAL KPI FRAMEWORK FOR AI-DRIVEN RESOURCE OPTIMIZATION AND QUALITY OF CARE IN BULGARIAN HOSPICE MANAGEMENT

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ABSTRACT

Bulgarian geriatric hospice care faces mounting pressure from an aging population and limited palliative infrastructure. To ensure sustainable service delivery, hospice administrators (often with business rather than medical training) require clear performance metrics that reflect both operational efficiency and quality of care. This paper develops a Key Performance Indicator (KPI) framework for Bulgarian hospices, explicitly addressing the impact of modern AI-based administrative tools. First, the paper contextualizes hospice care and digital health challenges in Bulgaria, highlighting the lack of formal palliative policy and underdeveloped IT systems. Next, it reviews AI innovations and illustrates how Microsoft Azure's compliance-certified platform and built-in medical knowledge base enable tasks such as automated triage, scheduling, and documentation. The paper then proposes two KPI categories: Resource Optimization KPIs and Quality of Care Improvement KPIs, and, finally, discusses the expected improvements resulting from AI adoption.

Key words: Resource optimization, quality of care, hospice, performance indicators, AI

INTRODUCTION

Hospice and palliative care aim to provide comprehensive support for patients with terminal or life-limiting illness, emphasizing comfort and quality of life. In Bulgaria, demand for geriatric palliative services is growing rapidly due to population aging, with over 20% of citizens now aged 65 or over [5]. However, national infrastructure remains limited: a recent review found that Bulgaria has “no palliative care standard, clinical guideline or strategy”, and that only about 50 registered hospices exist, primarily concentrated in urban centres [1]. Many regions lack hospice services entirely, and general practitioners receive little training in palliative care [1]. Consequently, Bulgarian hospices operate under strain: serving aging patients with complex needs, while facing staff aging and constrained resources.

At the same time, Bulgaria's digital health transformation has lagged behind. Despite EU-wide initiatives, Bulgaria “still falls behind” in establishing a modern, interoperable medical information system. A 2023 analysis noted that Bulgarian health ICT lacks standardization, comprehensive electronic health record (HER) adoption, and supportive legislation [2]. These deficiencies hinder data-driven management. Nevertheless, healthcare professionals increasingly recognize

the potential of digital health: worldwide, advanced countries are integrating AI to improve efficiency and care quality [3]. In this context, Bulgarian hospice administrators must navigate resource constraints while ensuring high-quality care. This paper addresses their needs by proposing a KPI framework tailored to hospice management and designed to guide the adoption of AI-driven administrative tools, with a particular focus on Microsoft Azure cloud services and the Azure Health Bot that can optimize operations.

HOSPICE CARE AND AI IN THE BULGARIAN CONTEXT

Bulgarian Hospice Care Challenges

Eastern Europe in general, and Bulgaria in particular, is experiencing a “*silver tsunami*” of aging patients requiring palliative support. By 2060, nearly half of all deaths globally are expected to involve severe suffering without adequate palliative care [1]. In Bulgaria, palliative infrastructure is especially underdeveloped. Despotova-Toleva and Toleva-Nowak (2021) report that, as of 2019, only 50 hospices were registered nationwide [1], with 10 out of 28 regions having none. Those that exist are unevenly distributed, with 30% located in Sofia. The authors conclude that Bulgarian hospice care is “isolated” (Group 3a in international palliative care indices), and relying heavily on a

narrow clinical pathway for late-stage cancer patients.

In practice, many Bulgarian hospices face chronic staff shortages and inadequate training, despite the growing elderly population. The average age of Bulgarian physicians is approximately 60, and many general practitioners lack palliative care experience. Without electronic records or predictive analytics, resource planning is largely manual. Administrative burdens, such as paperwork and scheduling, consume a lot of staff time, reducing direct patient care. Meanwhile, quality of care varies: pain and symptom management are critical but hard to measure. Although national health strategy documents (e.g., *Healthcare Strategy 2021–2030*) emphasize the expansion of palliative care, concrete KPIs and operational data for this sector remain scarce. Thus, hospice administrators have little data-driven guidance.

AI in Healthcare Administration

Worldwide, AI is viewed as a solution to healthcare efficiency and quality challenges [3]. Techniques, such as machine learning and natural language processing, can analyze large datasets, optimize logistics, and even support clinical decision-making. For hospices, AI can be particularly valuable in automating administrative tasks that traditionally burden clinical staff. For example, as Athenahealth.com notes, AI “alleviate[s] [the] burden by automating redundant tasks, improving data accuracy, and streamlining workflows” [4]. Automated scheduling, billing, and documentation can recapture hours for patient care. Chatbots and virtual assistants are another trend: an Azure-based health bot can handle routine patient inquiries, symptom checks, and appointment reminders, freeing human staff to focus on direct care [7].

In the palliative care context, AI has been used for patient-centred coordination and planning. For example, a UK group called Dynamic Health Systems deployed a cloud-based palliative care-planning platform, achieving dramatic results: a 46% reduction in total healthcare contacts, an 83% decrease in hospital admissions, and a 56% reduction in costs after implementation [7]. An Australian hospice provider reported a tenfold reduction in e-prescribing time (from 20 seconds to 2 seconds) after integrating an AI engine [9]. While these examples are drawn from outside Bulgaria, they illustrate the potential scale of improvements that can be achieved by using AI-enabled administrative systems.

Microsoft Azure and the Health Bot in Hospice Care

Microsoft Azure has become a prominent platform in healthcare, offering scalable data storage, analytics, and AI services, all within a HIPAA- and GDPR-compliant environments. Of particular relevance is the *Azure Health Bot*, which “empowers healthcare organizations to build and deploy an AI-powered, compliant, conversational healthcare experience at scale”. The Health Bot incorporates built-in medical intelligence: it provides credible symptom triage, integrates information on conditions and medications, and understands medical terminology [7]. It can manage conversational flows (e.g. for intake interviews, FAQs, or basic triage) and plug into a provider’s backend systems. For hospices, a health bot could, for instance, pre-screen incoming patients, answer common family questions, collect patient-reported symptoms, or send reminders about medication.

Azure’s broader ecosystem also includes analytics and dashboard tools such as Power BI and Azure ML, which can transform hospice administrative data into actionable insights. For example, a hospice can use Azure ML to predict changes in patient census (based on historical patterns) and adjust staffing accordingly. The Azure Cloud for Healthcare solution integrates patient data (FHIR records) and offers secure communication channels. By hosting on Azure, Bulgarian hospices gain enterprise-level security and support; for example, all Health Bot data are encrypted at rest and in transit [7]. These technical features help allay privacy and reliability concerns, enabling administrators to trust the data behind the proposed KPIs.

To sum up, Bulgarian hospice managers now have the opportunity to leverage cloud AI to improve operations. To guide this transition, we propose a suite of KPIs in two domains: resource optimization and care quality, that align with AI-enabled processes. The following sections detail these KPIs, each justified in terms of operational impact and the specific benefits of AI tools such as Microsoft Azure and its Health Bot.

DEVELOPING THE KPI FRAMEWORK

Key Performance Indicators (KPIs) translate organizational goals into measurable outcomes. In hospice administration, KPIs help management set targets, monitor performance, and make data-driven decisions. For non-clinical professional, such as business-trained managers, KPIs must be expressed in clear operational terms, e.g. average

turnaround time, cost per patient day, and patient satisfaction score. An effective framework aligns KPIs with strategic objectives: for example, improving efficiency (resource use) and enhancing patient/family experience (quality of care). Because hospices serve vulnerable patients, both dimensions are critical.

The proposed framework adopts a balanced approach, dividing KPIs into two categories:

- **Resource Optimization KPIs:** These are indicators of efficiency, productivity, and cost control in hospice operations.

- **Quality of Care Improvement KPIs:** These are indicators of patient and family experience, clinical outcomes, and care effectiveness.

Each KPI is selected for relevance to hospice management and sensitivity to AI-driven improvements. They are listed and justified below.

Resource Optimization KPIs: These metrics reflect how efficiently hospice resources are used. AI tools can directly influence many of them: for example, intelligent scheduling reduces overtime costs [3], and automated documentation saves clinician time [8]. Here is how AI can help improve each KPI:

1. Bed Occupancy Rate (%). Percentage of available inpatient hospice beds in use over a period. High occupancy indicates effective use of capacity; low occupancy signals underutilization or mismatched capacity. For hospices with limited beds, maximizing occupancy is key to spreading fixed costs. AI-driven predictive analytics can forecast patient admissions and discharges (e.g. anticipating when a patient will be discharged or pass away) to fill beds promptly. An AI scheduling system can notify staff to prepare for incoming patients, reducing vacancy time. Furthermore, a chatbot can pre-screen referrals and schedule admissions swiftly, boosting occupancy. With a well-used metric, occupancy rate is likely to rise as AI improves admission workflow.

2. Average Turnaround Time (Admission Processing). Average time (in days or hours) from receipt of a hospice referral or eligibility assessment to the start of hospice services. This measures the efficiency of the admissions process. Long delays can frustrate families and worsen patient outcomes; faster admissions can increase patient satisfaction. AI tools can accelerate this KPI in two ways. First, an AI chatbot or call-assistant can collect intake information from referring clinicians or families automatically, reducing manual triage steps. Second, backend algorithms can check eligibility criteria against records and flag

missing data in real time. For example, automating aspects of eligibility verification could cut days from the admissions process. We expect that using Azure Health Bot to handle initial screening and scheduling could reduce this KPI substantially. Athenahealth.com notes that streamlining intake and forms via AI reduces physician administrative burden [4], implying similar gains for admittance paperwork.

3. Staff Productivity (Hours per Patient). Ratio of clinical staff labour hours worked to the number of patients served (e.g. nurse hours per patient per week). Alternately, the inverse productivity percentage as described by Alora (actual vs. budgeted hours) [6]. Efficient staffing ensures quality care without unnecessary overtime. AI scheduling can align staff shifts to predicted workload, improving this metric. For example, machine-learning models can predict which days will have higher patient census or acute needs, enabling managers to allocate nurses proactively rather than reactively. This reduces wasted hours and prevents burnout. The Health Bot can also triage non-urgent patient queries, so nurses spend more hours on direct care rather than phone calls. Ultimately, better scheduling and task-offloading via AI should decrease hours per patient while maintaining care levels. Notably, Maleki and Forouzanfar (2024) emphasize that AI in healthcare “optimizes logistics and resource management, enhancing efficiency” [3].

4. Staff Overtime and Turnover Rates. Overtime hours as a percentage of regular hours; and the percentage of employees leaving per year. Excessive overtime is costly and indicates understaffing or poor scheduling. High turnover disrupts care continuity and raises recruitment costs. AI-driven resource planning can significantly reduce both. By predicting staff needs more accurately, AI schedulers can allocate shifts without over-reliance on overtime. Additionally, reducing administrative burden (documentation, phone calls) by using AI improves job satisfaction, which can in turn reduce turnover. For instance, an AI scribe that handles note-taking has already been shown to save physicians thousands of hours of clerical work [8], improving work-life balance. We anticipate that implementing such tools could lower overtime by a substantial margin (e.g. as much as the 15–40% cost reductions seen in scheduling studies), and modestly decrease turnover by improving staff satisfaction [3].

5. Average Length of Stay (ALOS). The average duration (in days) that patients remain under hospice care. ALOS reveals how hospices serve

patients across their end-of-life trajectory. Too-short stays might indicate late referrals, while very long stays could point to inefficiencies (though longer stays may also reflect good service). AI can indirectly influence ALOS by enabling earlier identification of patients who need hospice (via predictive analytics on chronic disease progression) and by improving coordination of transitions. For example, if an AI analysis of clinical data signals imminent decline in a cancer patient, outreach can occur earlier. Shorter delays in admission (see KPI 2) naturally raise ALOS. Moreover, AI-enabled symptom monitoring (wearables or regular health-bot check-ins) could reduce acute crises, allowing patients to stay in hospice rather than to be transferred to hospital, effectively managing length of service. Administrators should track ALOS trends alongside median stay, as Alora suggests [6], since AI might alter the distribution (fewer very late referrals).

6. Referral Conversion Rate. Percentage of referral contacts that result in actual hospice admissions. This reflects how well the admissions team (and related processes) capture potential patients. Low conversion can indicate process bottlenecks or missed opportunities. An AI-driven health bot can improve conversion by handling initial inquiries 24/7 and answering questions promptly. For example, a family might engage the Health Bot on a website or phone to ask about services; if the bot provides fast, accurate information and even schedules a follow-up call, the chance of a completed admission increases. Similarly, backend AI tools can flag high-priority referrals automatically to staff. A boost in this KPI from AI adoption would manifest as fewer lost referrals and a more consistent admissions funnel.

7. Supply and Medication Cost per Patient Day. Average expenditures on medical supplies and pharmaceuticals per patient-day. Cost containment is essential, especially under tight budgets. While hospice focus is not profit, managing supply costs affects viability. AI inventory management (via Azure data analytics) can track usage patterns and predict needs (avoiding both shortages and waste). For instance, an AI system might note that increased admissions are raising opioid usage and automatically reorder before stockouts occur. Azure analytics can also identify unusually high-use outliers (e.g. a patient with unexpectedly high medication cost) for review. Over time, better demand forecasting and streamlined order processes (some potentially automated) can reduce per-patient costs. This also ties into the

Cost per Patient Day concept introduced by hospice KPI guides, which AI can help minimize by reducing inefficiencies.

8. Administrative Cycle Time. Average time to complete key administrative tasks (e.g. time to finalize billing claim, time to generate care plan, time to process death certificates). Many routine processes that consume staff time remain hidden in a hospice. AI and automation can drastically shorten cycle times. For example, using Microsoft Power Automate or AI workflows, generating a routine care plan or billing submission can be automated based on collected data, rather than filled manually. This means that bills go out faster and reimbursement is received sooner (a financial KPI), and care plans reflect patient changes more quickly. The Athenahealth.com analysis emphasizes that AI's "greatest strength [is] reducing administrative complexity" [4]. Hospice teams should track reductions in these cycle times post-AI adoption; even a 15–30% improvement would represent a significant efficiency.

9. IT Utilization and AI Adoption Rate. Percentage of staff and processes actively using the new AI tools (e.g. percentage of patient communications handled by the health bot, or percentage of documentation completed via voice AI). To realize ROI, hospice must ensure AI is actually used. Measuring adoption rates is a KPI itself. For instance, we might measure "bot-handled calls per month" or "% of physician notes drafted by AI-scribe." These rates indicate how deeply AI is embedded in operations. Management can target higher adoption (through training) to amplify gains. In early stages, these numbers help gauge ROI: e.g., if 50% of routine patient queries are offloaded to the Health Bot, staff free time increases accordingly (as seen in virtual nurse studies). Thus, monitoring IT utilization keeps implementation on track.

10. Overtime and Costs Saved (AI-Linked). Quantifiable hours or expenses saved due to AI automation (e.g. reduction in overtime pay, or in external vendor costs) compared to a baseline period. While somewhat derivative, having a KPI that directly ties to the value of AI investment is powerful. For example, after deploying an AI scribe or chat assistant, managers could measure reduction in weekly overtime hours (perhaps 15–40% less) or simply track dollar savings. In one health system, AI scribes yielded "the equivalent of 1,794 working days" of physician time saved in a year [8]. Translating such gains to hospice, tracking total clinician-hours saved monthly

would demonstrate how AI impacts labour efficiency. This KPI should be included to justify continued investment: it directly captures the operational effectiveness of AI tools.

These ten resource KPIs are not exhaustive but cover key areas of staffing, capacity, time, and cost. Each indicator is supposed to have a clear target or trend direction; for example, administrators might aim to reduce “Admission Turnaround Time” by 30% within a year of Health Bot deployment. Importantly, many AI benefits can be seen even in relative improvements: if current average turnaround is 5 days, cutting it to 3 days is a clear gain.

Quality of Care Improvement KPIs

While operational efficiency keeps the hospice functioning, the ultimate mission is quality of patient care. We therefore propose 12 KPIs focused on care outcomes and satisfaction. AI can contribute here indirectly by allowing staff to focus more on patients (via reduced admin burden) and directly by enabling better symptom management and communication.

1. Patient Satisfaction Score. Aggregate score from periodic surveys (e.g. standardized patient/family satisfaction questionnaires). This metric directly reflects the patient/family experience of care. AI tools enhance satisfaction by making services more responsive. Empirical studies show AI can improve patient-reported experiences: the Kaiser Permanente study found AI scribes improved physician-patient communication and satisfaction [8]. In a hospice context, higher satisfaction might mean patients feel heard, pain is well-managed, and staff appear attentive. We expect that as AI frees up clinician time and streamlines processes, overall satisfaction scores should trend upward.

2. Family/Carer Satisfaction. Survey or feedback scores from family members and caregivers (often via bereavement surveys). Hospice care inherently involves families. Their satisfaction is a key quality marker. AI aids families by improving access to information and support. Tracking family satisfaction separately from patient satisfaction will show whether AI systems are delivering understandable, timely support to those who need it.

3. Pain and Symptom Control Index. Proportion of patients whose reported pain or other key symptoms are maintained below a target level (e.g. <4 on a 0–10 scale) on most days of hospice stay. Effective symptom relief is central to hospice quality. While clinical actions (e.g. analgesic use) determine outcomes, AI can help in monitoring and prediction. For instance, patients could report

pain levels via an app or chatbot each day; an AI system could alert staff if a patient’s pain spikes unexpectedly. This early warning allows timely intervention, improving the index. Azure analytics can detect patterns (e.g. predicting which patients are at risk of pain crisis) and recommend preventative measures. The KPI quantifies whether hospice care plans are successful in controlling suffering. By reducing response delays and optimizing treatment plans with decision support, AI could help raise this score.

4. Emergency Transfers and Hospital Readmissions. Rate of unplanned hospital or ER transfers among hospice patients (per 100 hospice discharges or per month). Ideally, hospice care keeps patients comfortable in their chosen setting. Unplanned hospitalizations often indicate care failures (e.g. uncontrolled symptoms or inadequate end-of-life planning). AI can lower this KPI. Predictive models can identify patients at high risk of decompensation (e.g. congestive heart failure patients likely to flare) and trigger pre-emptive home visits or med adjustments, preventing ER visits. The Dynamic Health example showed that AI care-planning cut acute admissions by 83% [7], a promising analogue. Monitoring this KPI will capture improvements in preventing avoidable hospital use.

5. Timely Visits in Final Week. Percentage of patients receiving a specified minimum number of hospice visits (nursing or aide visits) in their last week of life. Frequent contact near end-of-life is considered a quality indicator in hospice. It demonstrates responsive, compassionate care. While staffing limits apply, AI scheduling can prioritize last-week visits for patients flagged as imminently dying. For example, integrating an alert from the patient’s EHR (e.g. a marker in the care plan) with an AI calendar can ensure extra visits are scheduled automatically as needed. Ensuring strong performance on this KPI aligns with best practices in hospice care and can be improved by using AI-powered planning to allocate clinician time dynamically.

6. Advance Care Plans Completed (%). Percentage of patients with a documented advance care plan (including advance directives and documented wishes) upon or during hospice admission. Hospice emphasizes respecting patient wishes. A high completion rate for advance care planning shows a culture of thorough intake and patient engagement. AI chatbots can guide families through questions about preferences early in the process, making it easier to capture this information. For example, before clinician staff even

meet, the Health Bot could elicit goals of care or do-not-hospitalize preferences, which are then verified and formalized by staff. Tracking this KPI encourages managers to use AI tools to prompt and record this sensitive information systematically.

7. Compliance with Pain-Management Protocols. Audit-based measure of how consistently hospice staff follow established clinical protocols (e.g. timely titration of opioids, regular reassessment). Strict compliance with palliative guidelines ensures uniform quality. Although the management team is non-clinical, ensuring guidelines are followed can be included as a KPI to hold clinical staff accountable. AI can support compliance by sending reminders or flags. For instance, an AI system could review patient records daily and alert a nurse if no pain reassessment has been logged in 48 hours, or if scheduled meds were missed. This KPI thus tracks whether AI decision-support is effectively used to enforce standards.

8. Patient and Family Education Engagement. Percentage of patients/families receiving standardized education (via video, brochure, or conversation) about hospice services, symptom management, and bereavement resources. Well-informed patients and families tend to have better outcomes and satisfaction. AI chatbots or patient portals can deliver educational content efficiently (e.g., links to video explanations after intake conversations). A KPI could measure how many families accessed these resources (tracked via the Health Bot's user logs or portal analytics). The more families that engage with educational materials, the better equipped they are to handle care at home. An increase in this KPI after AI deployment would indicate successful digital engagement.

9. Clinician Response Time. Average time it takes for hospice staff to respond to patient/family requests (for nurse visit, doctor call, medication refills) from the moment of request. Responsiveness is crucial in hospice. AI chatbots can handle many routine requests instantly (e.g. answering simple questions, scheduling routine calls), effectively reducing response time to near zero for those items. Even for requests requiring a human, AI triage can prioritize them so staff respond more quickly. We recommend tracking this KPI before and after AI implementation; a significant drop (e.g. from hours to minutes for bot-eligible requests) will demonstrate improved service speed.

10. Bereavement Follow-Up Completion Rate. Percentage of families who receive sched-

uled bereavement outreach (calls or support sessions) within a standard interval after patient death. Follow-up after loss is a hospice hallmark. Tracking this ensures no family is overlooked. AI can schedule and remind staff to make these calls (for example, an automated scheduling tool can flag the four-week follow-up). Chatbots could also provide automated check-ins or resource links to families later on. This KPI ensures that the quality of care extends beyond the patient's life into the grieving period, and AI tools make the administrative coordination of this easier to execute.

11. Data Quality and Reporting Timeliness. Measure of how current and complete key patient data fields are in the EHR, or how quickly quality reports are generated (e.g. days to compile quarterly quality metrics). While somewhat administrative, reliable data is the backbone of quality initiatives. AI and automation can improve data entry accuracy (e.g. through voice dictation) and generate reports with minimal manual effort. This KPI ensures that as new AI tools are used, information systems are well-maintained. For example, an AI may automatically log patient symptom scores, increasing data completeness. Managers should see improved data quality (and faster report turnaround) with robust AI adoption.

12. Palliative Care Utilization Rate. Percentage of eligible geriatric inpatients or community cases who receive hospice referral/consultation. This broader health system KPI gauges how well the hospice program is integrated into overall care. Although partly beyond the direct control of the hospice, AI can help by identifying appropriate patients (through predictive analytics on hospital data) and prompting referrals. If usage rises (e.g. more eligible cancer or heart failure patients are served), it indicates both outreach success and systemic quality. For example, an AI could scan inpatient data for patients meeting palliative triggers and alert social workers or doctors to consider hospice. Tracking this ties the hospice performance to its impact on the larger healthcare ecosystem.

Each quality KPI should be backed by data collection processes (surveys, EHR audits, or logs). In some cases, such as satisfaction scores, hospitals may use standardized tools (e.g. HCAHPS-style surveys) and managers can benchmark against regional data. Others (such as response time or follow-ups) can be calculated from system logs. The introduction of AI should include planning on how to capture these metrics (e.g. instrumenting the health bot to log inquiries handled).

EXPECTED IMPROVEMENT AS A RESULT OF AI ADOPTION

Adopting AI-driven tools such as Azure Health Bot and associated analytics is expected to yield substantial gains in both resource efficiency and care quality. Based on analogous experiences and the KPI definitions above, we can outline projected improvements:

- **Operational Efficiency:** Studies have shown that AI scheduling algorithms can cut combined waiting times and overtime costs by roughly 15–40% [3]. If Bulgarian hospices implement an intelligent scheduler for nursing shifts and patient appointments, we anticipate similar double-digit percent improvements in overtime usage (KPI 4) and reduced patient wait times (KPI 2). In practice, this might translate to a possible reduction of average admission processing from 5 to 3 days. Likewise, automating document processing (KPI 8) and communications (KPI 9) will save staff-hours. A large health group reported that AI scribes saved physicians the equivalent of 1,794 *workdays* per year [8]. Even a fraction of that in hospice nursing time – enabled by voice-to-text notes and automated reminders – could free dozens of hours per month.

- **Cost Reductions:** The above efficiencies directly yield cost savings. For example, a UK palliative care case saw a 56% drop in acute care costs [9]. In a smaller hospice, we can be more modest: perhaps a 20–30% reduction in variable costs (overtime pay, agency staff, emergency transport) over 1–2 years as AI systems mature. These savings will lower the Cost per Patient Day (Resource KPI 7) and improve financial sustainability.

- **Patient Experience Gains:** By offloading routine inquiries to the Azure Health Bot, clinical staff have more time for empathetic care. This should raise patient and family satisfaction (Quality KPIs 1–2). Although we lack specific hospice benchmarks for Bulgarian scores, U.S. providers regularly see satisfaction in the 80–90% range. A realistic target might be improving survey scores by 10–20% after AI rollout. Similarly, predictive monitoring (AI) is expected to reduce crises, which should be seen as a drop in unplanned transfers (Quality KPI 4).

- **Care Quality:** With better information flow and more timely interventions (enabled by AI alerts), we expect improvements in clinical metrics. For instance, if currently 70% of patients have adequate pain control, we might project

moving to 85–90% after implementing AI-assisted symptom monitoring (Quality KPI 3). At a minimum, consistent data collection via AI (e.g. daily symptom check-ins) will provide better visibility into each patient’s status.

To sum up, while precise gains will vary by hospice, the combination of case studies and theoretical analyses suggests **significant, measurable improvements**. We conservatively estimate on the order of *tens of percent* improvement in key operational KPIs and meaningful uplifts in quality indicators. For example, reducing average patient wait time by 30%, cutting staff overtime by 25%, and achieving 80%+ patient satisfaction would already constitute major wins. These targets, of course, should be refined based on each hospice’s baseline data. The KPI framework allows managers to quantify these improvements over time.

IMPLEMENTATION AND DISCUSSION

To realize these benefits, hospices must not only deploy AI tools but also integrate KPI monitoring in their management routine. Key steps include:

- **Leadership buy-in and training:** Hospice executives must be educated on AI capabilities and KPI interpretation. Workshops or collaborations with IT experts can help managers understand, for example, how the Health Bot works or how to read predictive analytics dashboards. Demonstrating initial quick wins (like reducing scheduling errors) can build confidence.

- **Data infrastructure:** Even the best KPIs are only as good as the data feeding them. Hospices will need to digitize records and create data flows (e.g., using Microsoft’s FHIR-based Health Data Service). Azure’s compliant platform can host this data securely. Management should ensure interoperability (internal systems and any external labs or pharmacies) so that KPIs reflect the full picture.

- **Process redesign:** Introducing AI often requires rethinking workflows. For instance, if a Health Bot handles initial triage, staff will need protocols on when to intervene. KPI governance should define responsibilities (e.g. “the nurse manager reviews response-time KPI weekly and adjusts staffing”). Regular review meetings can use KPI dashboards to track progress.

- **Contextual challenges:** Bulgarian hospices face funding and regulatory constraints. There may be limited IT budgets or weak internet connectivity in rural areas. Also, staff may be sceptical of technology. The management must address these by highlighting how KPIs and AI

lead to better patient care without replacing human jobs. Citing examples (like the UK case [7] or the Permanente AI-scribe study [8]) could reassure stakeholders that AI complements staff roles.

- **Continuous improvement:** The KPI framework should evolve. For example, new regulations (if Bulgaria implements national palliative standards) may introduce required metrics. Meanwhile, as AI tools mature (e.g. adding Azure OpenAI services for patient coaching), managers may add KPIs on usage of new features. The key is to maintain a data-driven culture: using KPI trends to inform decisions, not just as numbers.

In a broader sense, this framework aligns with global health goals. The WHO emphasizes universal health coverage and recognises digital health as a pillar. By benchmarking performance with KPIs, Bulgarian hospices can prepare to meet future standards. Moreover, publishing KPI outcomes (anonymously or regionally) could help benchmark the sector: for instance, if one hospice shows 90% family satisfaction, others will be motivated to match it.

CONCLUSION

As Bulgarian society ages, hospice care must become both efficient and high-quality. AI-driven administrative tools, as exemplified by Microsoft Azure Health Bot and cloud analytics, offer powerful support. This paper has outlined a comprehensive KPI framework for hospice management, tailored to business-trained teams. The framework's Resource Optimization KPIs (such as occupancy rate, admission turnaround, staff productivity, cost per patient day) and Quality of Care KPIs (such as patient satisfaction, symptom control, and emergency transfer rates) cover the critical domains of performance. Each KPI is chosen for relevance to hospice operations and for the clear benefit it stands to gain from AI integration.

Empirical evidence from related healthcare settings suggests that adopting these AI tools could yield *double-digit improvements* in efficiency and noticeable gains in patient experience. By monitoring the proposed KPIs, hospice administrators will be able to quantify such gains and guide ongoing AI implementation. Ultimately, this structured approach positions Bulgarian hospices to leverage cutting-edge technology in service of their core mission: providing compassionate, high-quality care to the elderly at life's end.

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WHERE REHABILITATION MEETS NATURE: HIPPO THERAPY IN CHILDREN WITH COGNITIVE IMPAIRMENTS

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ABSTRACT

Hippotherapy is a specialized rehabilitative method in which the movement of the horse is used as a therapeutic tool to improve motor, cognitive, and social functioning in children with developmental and cognitive disorders. The present study explores the effectiveness of hippotherapy, based on a literature review and survey results obtained from parents of children with disabilities. The findings reveal significant improvements in posture, motor coordination, communication skills, and emotional well-being. Despite its proven therapeutic benefits, access to hippotherapy in Bulgaria remains limited due to high costs and an insufficient number of specialized centres. Broader institutional support and increased public awareness are needed to ensure equitable access to this valuable rehabilitative approach.

Key words: *hippotherapy, rehabilitation, children with disabilities, cognitive disorders, therapy accessibility*

INTRODUCTION

Since prehistoric times, the horse has been a herd animal, travelling long distances, lived under open skies, searching for food, and galloping away from danger. The movements of the horse have always symbolized the pursuit of freedom. The three primary gaits – walk, trot, and gallop – are precisely coordinated and visually impressive. When the movements of the rider and horse are synchronized, they become harmonious and proportional, causing no disturbance to either.

The objective of this study is to explore and present the effectiveness of hippotherapy as a rehabilitation method for children with various types of disabilities.

Project tasks include:

- To analyse the effectiveness of hippotherapy in improving physical, mental, and social functioning of children with disabilities, including cerebral palsy (CP), musculoskeletal disorders, autism, and related conditions.
- To encourage the integration of hippotherapy into rehabilitation programs in educational and healthcare institutions serving children with special educational and health needs.

MATERIALS AND METHODS

Without horses, human history would have developed very differently. The long-standing symbiosis between horses and humans is reflected in

numerous aspects of life [5]. As early as 435–354 BCE, Xenophon, who wrote a treatise on riding that is still valid 20 centuries later, noted that “the outward appearance of a horse is the finest reflection of the inner nature of a human being” [14]. In Ancient Greece, Hippocrates (478–370 BCE) recommended horseback riding for insomnia in *The Book of Diets*, while Asclepiades (124–40 BCE) suggested riding as therapy for epilepsy and various cases of paralysis [3, 11].

One of the earliest modern studies examining the therapeutic use of horses was conducted by Cassign in Paris in 1870. He observed that riding had positive effects in individuals with hemiplegia, paraplegia, and other neurological disorders [11].

Organized therapeutic riding in centres for people with disabilities began in Europe, particularly in the United Kingdom, after World War II. In 1952, at the Helsinki Olympic Games, Danish rider Liz Hartel won a silver medal in dressage after recovering from poliomyelitis. Her achievement was remarkable because she competed on equal terms with able-bodied men and mounted her horse from a wheelchair. Although she could not stand independently when receiving the medal, she persevered in her riding training. Her example inspired many individuals with physical disabilities to discover their potential through horseback riding and not allow their conditions or past experiences to overpower them.

Today, the United States boasts over 1,000 centres for therapeutic riding, hippotherapy, and recreational equestrian activities; the UK has over 600, and Poland has more than 60. Such centres have also been established in Italy, France, and Germany. In Russia and Greece, therapeutic riding began to develop in the early 1990s. In Bulgaria, organized hippotherapy started in 1993 at the Khan Asparuh equestrian base in Sofia for children with cerebral palsy followed by the establishment of the National Association for Therapeutic Riding and Hippotherapy – Ustrem in 2001.

The term “hippotherapy” derives from the Greek word *hippos*, meaning horse, and refers to treatment using the horse’s movement as a therapeutic medium. It is a form of therapeutic exercise based on neurophysiological principles and primarily employs the horse’s walk, which provides rhythmic, three-dimensional impulses to the patient. Trot and gallop are generally unsuitable for most patients, as they place excessive stress on the neuromuscular system. During the walk, approximately 90–110 rhythmic impulses per minute are transmitted, improving motor skills, increasing mobility in the hips and spine, and correcting posture and head position [2, 6]. These impulses also stimulate balance and coordination, reduce abnormal muscle tone, and activate agonist and antagonist muscle groups, especially the abdominal and back ones.

In addition to the multidirectional impulses from the horse’s back, various exercises and elements from rehabilitation methodologies such as Vojta, Bobath, and Kabat can be included [9]. A characteristic feature of hippotherapy is that saddles are often excluded; instead, a special belt with handles, called a “trok,” is used, or the patient sits on a soft pad or directly on the horse’s back. This allows the patient to perceive even subtle movements and benefit from the horse’s higher body temperature (approximately 1–1.5°C higher than human temperature), which aids muscle relaxation and stimulates soft tissues [12]. Horseback riding, including hippotherapy, is the second sport after swimming that engages virtually all muscles of the human body. Hippotherapy has proven beneficial for cerebral palsy, orthopaedic problems, spinal cord injuries, central nervous system injuries, scoliosis, multiple sclerosis, visual and hearing impairments, Down syndrome, autism, depression, eating disorders, and so on.

The method is grounded in extensive scientific research, especially since the 1960s. Hippothera-

pists in Germany, France, England, and Scandinavian countries have made significant contributions, publishing numerous studies, books, and textbooks. Russia, Poland, and the Czech Republic have also made substantial advances. In hippotherapy, the main therapeutic tool is the horse’s movement, which produces the therapeutic effect. Horse-assisted therapy, while including riding, is primarily a psychological approach where the horse itself, interaction, emotional bonding, and nonverbal communication are the therapeutic medium. Numerous studies demonstrate the positive impact of hippotherapy on various motor impairments. Recent research shows that the horse’s unique three-dimensional movement significantly benefits posture, body control, and motor functions in children with cerebral palsy and other neurological disorders. A systematic review in 2024 confirms that hippotherapy improves gross motor skills, balance, coordination, gait parameters, and muscle strength in children with CP [2]. A meta-analysis has found that hippotherapy and therapeutic riding have short-term but clinically significant effects on reducing lower limb spasticity [8]. Beyond its somatotropic effects on spasticity, ataxia, and body control, hippotherapy also provides significant psychotherapeutic and emotional benefits through new stimuli in rehabilitation and emotional contact with the horse [9]. Improvements in postural control are well documented; a systematic review in 2023 shows that hippotherapy supports both static and dynamic balance and posture in children with spastic hemiplegia and diplegia [10].

Recent clinical data also support the positive effects on muscle tone: a 2025 study using a hippotherapy simulator demonstrated improved postural control and reduced spasticity in the hip adductors of children with bilateral spastic CP [4]. Additionally, a pilot study using electromyographic analysis found that a 12-week hippotherapy program led to significant changes in postural muscle activity, confirming activation of agonists and antagonists and improved posture correction [7]. Positive changes were observed within just 34 sessions. Engelman [1] applied a hippotherapy program to patients with paraplegia and tetraplegia, finding benefits in contracture management, coordination and balance improvement, pain reduction through better blood circulation and joint mobility, and other psychological effects. Spasticity reduction lasted 2 to 36 hours after the ride, improving the quality of life and reducing medical care. One weekly session reduced hip and back pain in 58 out of 60 patients over one week. In

individuals with Down syndrome, hippotherapy and therapeutic riding can reduce hypotonia, enhance mental balance, and promote active quality of life through horse care, riding, and competition [13].

CONCLUSIONS

Survey results confirm the positive effects of hippotherapy on children with cognitive impairments. Parents report significant improvements in motor abilities, concentration, memory, communication skills, and social interaction. Emotional well-being was also enhanced, with reductions in anxiety, improved mood, and increased independence and self-confidence.

However, the findings also highlight barriers to access, including the absence of local centres and high costs. These challenges underscore the need to expand therapeutic facilities and integrate them in social programs providing therapy for children with disabilities. Hippotherapy is a valuable and effective method for enhancing motor activity and stimulating cognitive development in children with impairments and deserves wider promotion and institutional support. Policies for subsidizing and expanding infrastructure nationwide are recommended to ensure equitable access, improve quality of life, and facilitate social integration.

Summary of Survey Results on Parental Perspectives

The survey included 61 parents of children participating in hippotherapy programs. Most respondents were parents of preschool and primary school children aged 4–12 years (77%), followed by those aged 13–18 years (16%) and under 4 years (2%). Most participants were parents of boys (87%), and 79% indicated that their child had a diagnosed disability, most commonly autism spectrum disorder, cerebral palsy, or sensory impairments.

Regarding therapy duration, 45% had participated in hippotherapy for 1–3 months, 30% for more than 6 months, and 25% for less than one month. Parents identified their main goals as improving motor skills (60%), sensory functions (50%), emotional well-being (40%), and socialization (25%). Overall satisfaction with hippotherapy was high: 66% rated it as very positive or positive, while only a small fraction expressed uncertainty. The main challenges reported were financial limitations (50%), lack of time (30%), and child adaptation difficulties (20%). Accessibility to hippotherapy services was described as good

(20%), moderate (50%), or poor (30%). Most families attended sessions once per week (55%) or twice per week (30%), supporting consistent therapeutic engagement. In terms of perceived effectiveness, 75% of respondents rated hippotherapy as effective or very effective. Moreover, 79% stated they would recommend it to other parents, reflecting high overall satisfaction.

However, 60% reported insufficient public information about hippotherapy, emphasizing the need for increased awareness and education.

Regarding professional quality, over 80% considered their therapists qualified and attentive. Positive child reactions were also noted: 62% of children participated with interest and enjoyment. Parents expressed interest in additional sensory, emotional, and individualized support programs, as well as improved accessibility and reduced costs.

In summary, the findings highlight strong parental approval of the therapeutic value of hippotherapy, particularly in improving motor and sensory abilities. Nonetheless, the data reveal continuing challenges related to financial accessibility, limited availability of services, and insufficient public awareness, suggesting the need for broader institutional support and program development.

Recommendations

Based on parental feedback, the following recommendations are proposed:

- Expand the network of hippotherapy clubs: Promote new centres in various regions, especially underserved smaller towns.
- Introduce financial support for families: Develop state or municipal subsidy programs to make hippotherapy more affordable to children with cognitive and motor disabilities.
- Training and qualification of specialists: Organize courses for hippotherapists, instructors, and rehabilitators according to international standards.
- Information campaigns: Increase awareness among parents, doctors, and rehabilitation specialists about the benefits of hippotherapy.
- Integration into individual therapy plans: Include hippotherapy as an officially recognized method in individualized educational and rehabilitation programs for children with special needs.
- NGO support and private sector collaboration: Encourage partnerships between NGOs, social service providers, and private farms or equestrian centres to develop programs.
- Research and monitoring: Promote ongoing research and monitoring to assess long-term therapeutic outcomes.

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MASKS OF LANGUAGE
PART ONE: CONCEPTUAL AND FUNCTIONAL APPROACHES TO THE LANGUAGE OF
WAR IN LITERATURE

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ABSTRACT

The starting point (which also serves as a methodological orientation) in this topic is that war is inherently woven into language—both as a way of thinking and as an all-encompassing metaphor, as well as a means of structuring relationships between us—whether they be love, a real battle, a dispute, or another type of social interaction through opposition. Drawing on the ideas of American linguists George Lakoff and Mark Johnsen about a metaphorical conception operating in the human system of thinking, we arrive at the conclusion that "discursive violence" infiltrates the language of fiction. Though not always visible, it forms part of a broader strategy of manipulation and the construction of a national ideological model.

Key words: *language of war, discursive environment, metaphorical concept, discourse analysis*

Over the millennia of humankind's cultural and historical development, war has evolved from a sacred act into a "taboo" topic, so that human life might be elevated to the highest and inviolable value. In the end, however, this taboo has been broken, and today we are witnessing a literal, real, prototypical war between Russia and Ukraine. This conflict has stirred atavistic tendencies toward polarization in societies and nations beyond the battlefield itself. Under the mask of pacifist pathos, the media and social platforms seethe with hate speech and outbursts of verbal aggression which, in light of the current situation, have assumed dimensions potentially more dangerous than the war itself.

The explanation for the rapid and intense resurgence of obsolete forms of hostile attitudes and "against-" reactions can be sought in language and in the ways it operates across different discursive environments. From the outset, however, we must clarify that by "discursive environment" we primarily mean a textual environment, and that the concept of "discourse" is used in the sense established by Michel Foucault: discourse as a source of the social effect of power and, accordingly, of symbolic violence. It is also important to note that in this context all forms of discursive violence will be understood as tied to the metaphor of war.

There is no doubt that language, beyond being a basic means of communication, is also one

of the most powerful and influential instruments for exerting beneficent or destructive effects on human beings. Language is also our supreme privilege to express ourselves, to (self-)identify, and to internalize knowledge about the world around us through names and concepts. Broadly speaking, and in a gesture that may seem almost radical, we can agree with Wittgenstein that the limits of language are the limits of our (human) world. At the same time, we cannot fail to acknowledge that language, embodied in words and their contexts, can be both transparent and concealing, socially inclusive and exclusive, welcoming and repelling, peace-making and militaristic.

The uses of language, especially in texts with a public orientation, which for the purposes of this project will be treated as literary works and various media materials, often escalate into abuses of language's capacity to conceal techniques of manipulation and strategies for influencing the reception of facts in accordance with authorial subjectivity rather than objectivity.

The starting position (which is also a kind of methodological orientation) in the topic thus framed is that war is originally woven into language: as a way of thinking, as an all-encompassing metaphor within language, and as a structuring principle of our relations, whether we speak of love, actual battle, argument, or other forms of social interaction based on opposition. Through

the idea of a metaphorical concept operative in the human system of thought, the American linguists George Lakoff and Mark Johnson reach the interesting conclusion that metaphor is a fundamental mechanism in our perception and structuring of reality.

Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature. The concepts that govern our thought are not just matters of the intellect. They also govern our everyday functioning, down to the most mundane details. Our concepts structure what we perceive, how we get around in the world, and how we relate to other people. Our conceptual system thus plays a central role in defining our everyday realities [1].

In line with this thesis, the present text presupposes an understanding of war as a “metaphorical concept” deeply and originally embedded in our human activity – social, cultural, and creative.

Although numerous studies have shown how language influences identity or reveals concealed contents, that is, how it functions as a projection of hidden identity, the field of discursively concealed conflictual attitudes remains untitled, because the undercurrents of language are treacherous and well masked in the millennia-long development of this most important instrument of our cultural existence. Within various textual environments – understood here, as stated, or discursive environments – lie the traps of hidden ideological constructs of ethnic, social, economic, moral, and other character.

In other words, we are dealing with discursive violence infiltrated through language, which underlies the constantly manifest “metaphorical concept” of war even where we least expect it. In short, the discursive strategies embedded in language are the invisible threads of manipulation, toward which we must be vigilant and sensitive. The role of the media in this respect is crucial, given their capacity to shape public attitudes, format entire societies, generations, and groups, influence domestic and international political decisions, and even affect collective identity. Under these conditions, it is easy to hurl the most serious accusations of negative influences and manipulations at the media. But from the perspective of our understanding of the masked language of war, and thus of violence, it is not unreasonable to seek manifestations of hidden propaganda and manipulation of thought in other discursive environments whose effects are durable and long-lasting.

One such refined discursive environment is art, and above all, literary art. Beyond the formal and pragmatic properties of language with which linguists concern themselves, it is worth examining how and to what end literature’s figurative language employs metaphorical transformations of images and concepts within the fabric of the literary text. In fact, we cannot fail to realize that the ethical dualism upon which we project social morality is originally an aesthetic phenomenon. Do we not invest a conflictual meaning in the antagonism of dichotomous pairs (good – evil; beautiful – ugly; sublime – base, etc., the list is endless), a meaning that demands a choice of one side over the other? Many contemporary conflicts are connected with a deep and multi-layered cultural antagonism cultivated by civilization’s most powerful discursive weapon, that of literature. As we can conclude from its long path of development, in its beginnings literature often functioned as a persuasive tool, affirming that a society is strong when it knows its origins as legitimate, “won” through battle or war, and through the heroic self-sacrifice of its forebears. It is no coincidence that heroic epics are the archetypes of literary verbal art.

When approaching more modern literary models and media texts, a functional approach to the search for the “language of war” will focus on all linguistic markers that point to dehumanization, pathologization, and victimization—markers of stigmatization in general. It is a great challenge to trace the roots of delegitimization and rejection of a particular social subject in the aesthetic sphere of literary creation. Is it possible that, through the beauty of literature, we unconsciously apprehend the world in authentically and form hostile attitudes where only the aesthetic ideal of humanity ought to prevail? And how can we even link war and violence with the aesthetic function of language in literature? In fact, the question is almost rhetorical, since the development of literature itself begins with the great epic tales of heroic battles, which became paradigms of aesthetic, legal, and scholarly experiences of war. “Aesthetic experience” means the vision – cultivated over millennia – of the warrior and his bravery, which elevates him to heroic status in the etymological sense of the word. As Jesse Glenn Gray observes about the appeal of war in *The Warriors*:

“Yet many men both hate and love combat. They know why they hate it; it is harder to know and to be articulate about why they love it. The novice may be eager at times to describe his

emotions in combat, but it is the battle hardened veterans to whom battle has offered the deeper appeals. For some of them the war years are what Dixon Weeter has well called ‘the one great lyric passage in their lives’ [2].

Gray also speaks of the paradox of this attractiveness of war as an originally human phenomenon, stigmatized in *The Holy Scriptures* as “the lust of the eyes,” the lascivious desire of the eye to greedily consume the extraordinary disorder of things in the spectacular forms of excess: “The eye is lustful because it requires the novel, the unusual, the spectacular” [2]. Of course, J. Glenn Gray himself was a participant in the Second World War and speaks first-hand about these unexpected dimensions in the perception of war, where comradeship surpasses all forms of the “I” and friendship to become an ecstatic bond of “I” with “we.”

It turns out, ultimately, that the language of literature is fundamentally allied with the language of praise: battles, feats, heroes, achievements, and victories are praised. We will not present here examples of the deep aesthetic (which is to say, ethical) grounds for the language of war being naturally inherent in literature’s archetypes. Our more important goal, under the sign of a functional approach to the language of war, is to show that in the deep recesses of our human perception there exists an ontological aesthetic and ethical code that invariably presupposes conflictuality in relations. And no tabooing or stigmatizing of the antagonism between people and societies can displace what we call “collective identity” in our shared belonging to a particular group. In this sense, from a functional standpoint, there is not much difference between Homer’s epic *Iliad* and the first Bulgarian literary document (with all caveats about its literariness), *History of the Slavo-Bulgarians*. Both works constitute a “narrative” in which mythology and history effect symbolic communication to affirm the boundaries of a new collective consciousness and identity, a tendency particularly characteristic of Bulgarian literature before and after the Liberation, as can be seen by examining a couple of texts written by Ivan Vazov.

Literature is what actively participates in presenting and perfecting language even when it comes to the double taboo of war and death. And if a literary work cannot be qualified as a propagandistic or violent discursive act, we can at least seek out the hidden “irritant” images that strongly influence emotional attitudes and the reactivation of primitive behavioural forms. In

such an evolutionary perspective, Ernest Becker interprets heroism as a cultural and aesthetic response to the “fear of death” in his book *The Denial of Death*:

“After Darwin the problem of death as an evolutionary one came to the fore, and many thinkers immediately saw that it was a major psychological problem for man. They also very quickly saw what real heroism was about, as Shaler wrote just at the turn of the century: heroism is first and foremost a reflex of the terror of death. We admire most the courage to face death; we give such valor our highest and most constant adoration; it moves us deeply in our hearts because we have doubts about how brave we ourselves would be. When we see a man bravely facing his own extinction we rehearse the greatest victory we can imagine. And so the hero has been the center of human honor and acclaim since probably the beginning of specifically human evolution. But even before that our primate ancestors deferred to others who were extra powerful and courageous and ignored those who were cowardly. Man has elevated animal courage into a cult” [3].

Behind the aestheticization of heroic behaviour (perhaps the most frequent object of representation in literature, particularly prominent in Bulgarian literature) there always glimmers the antagonistic impulse to annihilate evil. Yet, the criteria for defining “evil” are often relative, and all that validates them are the perceptions of “otherness” and “difference,” rather than objective principles. Thus, in the impulse to dominate and/or oppose emerges what we defined above as our understanding of the language or discourse of war, which also includes “symbolic violence.”

French sociologist Pierre Bourdieu defines symbolic violence as coercion that dominated subjects do not perceive as such and to which they willingly submit:

“Symbolic violence is the coercion which is set up only through the consent that the dominated cannot fail to give to the dominator (and therefore to the domination) when their understanding of the situation and relation can only use instruments of knowledge that they have in common with the dominator, which, being merely the incorporated form of the structure of the relation of domination, make this relation appear as natural; or, in other words, when the schemes they implement in order to perceive and evaluate themselves or to perceive and evaluate the dominators (high/low, male/female, white/black, etc.) are the product of the incorporation of the (thus

naturalized) classifications of which their social being is the product” [4].

According to Bourdieu, symbolic violence is derived from forms of “symbolic domination,” which may be sexual, ethnic, cultural, linguistic – in short, of any kind. And there are no logical, rational arguments in favour of the dominated person’s position of subordination, because the social structures implemented in public life from the beginnings of collective thought are what Bourdieu calls “the obscurity of the dispositions of habitus.” The unconscious social code, habitus in Bourdieu’s understanding, is primarily inherited and secondarily incorporated into human consciousness.

Bourdieu’s example of the paradoxical logic of male domination and female subordination is particularly apt to explain the effects of such a social order which, for example, in Bulgarian literature is crowned as an absolute value. In this sense, the catastrophic and tragic visions of the loss of patriarchy in Bulgarian literature can be viewed as part of a hidden discursive manipulation in favour of symbolic violence against the “other” (in the social sense of otherness). In fact, in Bulgarian literature symbolic violence, especially as manifested in male domination, acquires a performative paradox which Milena Kirova (well acquainted with the psychoanalytic paradigm and Bourdieu’s sociological observations) articulates as “identification with the aggressor”: “The Bulgarian National Revival knows no

greater supporter of the patriarchal status quo, and especially of male domination within it, than... the women themselves” [5].

From all that has been said so far, it becomes clear that literary and media texts, by virtue of their mimetic nature, are forms of discourse in which symbolic violence may acquire the potential real war. Whether this is truly possible remains to be explored using the resources offered by new AI-based technologies.

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MASKS OF LANGUAGE
PART TWO: THE LANGUAGE OF WAR – EXPERIMENTAL APPROACHES

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ABSTRACT

This article presents the results of the use of the digital tool WarLang, which supports the discursive analysis of two literary texts included in our study. The analysis of the lexical and semantic units extracted by the WarLang chatbot enables observations on the content of Ivan Vazov's works that can be regarded as a new type of discursive interpretation in order to assess the extent to which the Bulgarian author's works construct an ideological "narrative", generating a form of "symbolic violence" through language that durably shapes collective perceptions of the hero and the enemy.

Key words: WarLang, Ivan Vazov, symbolic violence, ideological narrative

INTRODUCTION

Within Bulgarian national self-consciousness, there has always existed a dominant cultural code linked to our national identity as a supreme value transmitted across generations. The greatest role in the interaction between personal values and collective attitudes has been played by literature, especially from the period following Bulgaria's Liberation. Above all in this respect stands Ivan Vazov, the Patriarch of Bulgarian literature. By creating a form of national mythology, Vazov appears to assume the task of compensating for centuries of ethnic, religious, and cultural oppression prior to Liberation.

The guiding thesis of the present experiment is that in achieving these mythopoetic aims, Vazov activated ideological narratives that exclude critical thinking and the application of evaluative criteria in interpreting what he presents as "events" of ontological significance for the Bulgarian people. His works, invariably and unprecedentedly, constructed the foundational "plots" of Bulgarian history and self-awareness. For this reason, Vazov is a suitable object of study from the perspective of uncovering the discursive strategies in his works that determined (and legitimized) the cultural notions of the Bulgarian people regarding their origin, mission, and place on the historical map of free countries.

In the early phase of his creative work, shortly before and immediately after Liberation, Vazov predominantly wrote about Russia, perceiving and conceptualizing it as saviour and sole protector of the oppressed Bulgarian people.

The poem *Russia! (Русия!)*, written in 1876 and included in *The Sorrows of Bulgaria (Тъгуме на България)* collection, is the most vivid example of language's capacity to create durable emotional and cognitive attitudes that help merge personal and collective identity through ideologically marked metaphors and images. The poem is structured in five in chronologically arranged parts. The first one adopts an autobiographical tone, recounting childhood memories and the formation of love for the "fraternal" nation. The second develops the idea of faith and messianic expectations in the reader; the third is a kind of emotional confession to Russia; and the fourth and fifth deal with faith is again, culminating in an apostrophic exaltation of Russia and the elevation, as a point, of the concept of Russia as Messiah.

To prove empirically that Vazov's language achieves a discursive ideological thrust by means of a highly poetic and expressive register, we employ new AI-based technologies, namely, WarLang, a specially parameterized chatbot, available from <https://poe.com/WarLang>. The tool functions as a discourse analyzer specializing in the language of war and performs detailed linguistic and semiotic analysis of smaller and larger text units in which explicit or implicit militaristic vocabulary is used. It is built on GPT-4o-mini large language model.

The aim of the chatbot's discursive analysis is to identify ideological constructs capable of shaping collective identity "from the outside," without any critical reflection – in other words, that are propagandistic in manner.

In the humanities, and more specifically in the study of fiction and media texts, the relevance of

the information analyzed by the tool is checked by simultaneously performing an expert critical reading by a student/teacher/researcher. The automated analysis is evaluated alongside human interpretation to identify both strengths and limitations.

WARLANG'S ANALYSIS OF "RUSSIA!"

The chatbot extracts and classifies the following elements:

1. *Extraction of Lexical Units*

- **Military terms:** double-headed eagle, Russian tsar, tyrant, irons, blood, slavery
- **Neologisms:** "ready for vengeance," "your misery's last hour," "pagan" (as slur)
- **Jargon:** "Muscovites," "hurrah"
- **Metaphors:** "Russia as saviour," "the human being as slave," "war as liberation"
- **Offensive or ideologically charged expressions:** "the tyrant," "pagan blood," "slavery"

2. *Semantic Classification*

- **Weapons and technology:** double-headed eagle, irons
- **Combat actions and strategies:** vengeance, liberation, war
- **Emotions and psychological states:** hope, sorrow, anger, fear
- **Heroization and victimization:** martyrs, violated maidens, orphans
- **Enemy images:** tyrant, pagan blood
- **Cities and symbolic places:** Russia, the Balkans, Moscow, Bulgaria
- **Ideological markers:** nationalism, salvation, brotherhood

3. *Functional Analysis*

Lexical unit	Evaluative charge	Metaphoricity	Ideological load
double-headed eagle	Positive	Literal	nationalism
Russian tsar	Positive	literal	legitimation of liberation
tyrant	Negative	literal	demonization of the enemy
slavery	Negative	literal	victimization of the people
vengeance	Negative	figurative	nationalism
hope	Positive	figurative	legitimation of actions

4. *Thematic Glossary*

- **Double-headed eagle:** A symbol of Bulgarian statehood and identity.
- **Russian tsar:** A figure symbolizing salvation and liberation from tyranny.
- **Tyrant:** The image of the enemy who oppresses and torments the people.
- **Slavery:** A state of rightlessness and oppression motivating the striving for freedom.
- **Martyrs:** Heroes who sacrificed their lives for the people's freedom.
- **Moscow:** A symbol of hope and salvation associated with Russia.

5. *Analysis of Metaphors*

- **"Russia as saviour":** A conceptual metaphor linked to deep historical and cultural notions of Russia as liberator.
- **"The human being as slave":** A thematic metaphor reflecting concrete social conditions and historical reality.
- **"War as liberation":** A conceptual metaphor tied to the idea of national self-determination and the struggle for freedom.

6. *Discursive Strategies*

- **Legitimizing violence:** Using terms and images that justify violence as a means of liberation.
- **Constructing enemy images:** Defining "the tyrant" and "pagan blood" as the people's chief enemies.
- **Creating ideological narratives:** Emphasizing brotherhood with Russia and presenting it as a saving power, which serves to legitimize future actions.

7. *Generic Classification*

The text falls into the epic genre. The argument includes:

- **Thematics:** The striving for liberation and national identity characteristic of epic works.
- **Style:** Persuasive rhetoric saturated with pathos and heroic language.
- **Narrative:** Personal and collective experience tied to historical events and struggle, characteristic of the epic genre.

STRENGTHS OF WARLANG

WarLang demonstrates significant potential for objectifying and revolutionizing literary analysis. It is obvious that the instrument identifies discursive strategies connected with the legitimization of violence through the image of freedom and the ideological conceptualization of Russia

without any subjectivity. It successfully identifies evaluatively marked lexemes, such as double-headed eagle, Russian tsar, hope, tyrant, Muscovites, slave, martyrs, vengeance, and blood. It also adequately presents the grand conceptual metaphor of war through victimization and heroization.

The analysis of the lexical and semantic units extracted by WarLang makes it possible to situate observations on the work's content within a new type of discursive interpretation, so as to evaluate the extent to which the text builds its "narrative" through an ideological and/or propagandistic strategy, creating a kind of "symbolic violence" through language in order to durably influence the collective notions of the hero and the enemy. The tool readily uncovers the hidden structures and motifs related to a particular strategy, namely, to suggest the Pan-Slavic idea of blood brotherhood with the Russian people, on the one hand, and to legitimize the hatred for "the tyrant" through the idea of suffering inflicted on the victim – the Bulgarian people, on the other. It also sacralizes the image of the saviour through messianic discourse.

From a literary-critical perspective, the chatbot is extremely useful and supports the researchers' work, which can in turn build upon the analysis by accounting for the historical and sociocultural context of the work's creation and by seeking deeper structures that play an important role in the aesthetic and ideological suggestions. (In this case, the historical context is connected to concrete historical events conceptualized in Vazov's poem in the images of the saviour and enemy. The language employed combines solemn rhetoric through artistic devices such as epithets, apostrophes, and metaphors. The metaphors used in the poem construct a personified image of Russia: "All Russia is speaking," "the world trembled at your voice." The enemy's image is presented demonically: "the tyrant," "pagan blood," while people's suffering is elevated to a sacred act through expressions such as "martyrs" and "bloodied fathers.")

INCONSISTENCIES AND DEFICITS IN WARLANG

In its generic classification the chatbot presents the poem as belonging to epic discourse, rightly noting the work's historical and national basis, but without taking into account the metrical and stanzaic organization of the text. Here we must also recognize that the chatbot's "error" is partially true if we accept narrativity in its broader

understanding as a category tied to the narrative nature of any historical discourse; in this case, Vazov's poem, outside the narrow generic sense, can be taken as a kind of tale about our history.

From the point of view of psychological dimensions, the human being marks and makes connections both with emotional tone and with the author's biographical experiences. Clearly, an AI-based tool cannot account for these deeper human "structures," projected in one way or another into the poetic text, but this too is not a deficit in the absolute sense, since in discursive analysis psychological and biographical links are not of importance; in fact, on the contrary, they could distort an objective analysis of the work.

What can be identified as a more substantial deficit is that the tool fails to detect the discursive "pressure" beyond the grammatical function of the verb paradigm of person. In the second part, the poem moves from the "I" of retrospection into the speaker's childhood to the "we" of the people, thereby activating a strategy to suggest full overlap and to foreground the ideological paradigm: the people, like the lyrical subject, believe in Russia as a liberator. Grammatical person in Vazov's work almost always encodes a subjectivism projected into a suprapersonal "call" ("we call to you; come to us").

Other indicators of the instrumentalization of language toward ideological and pre-set emotional attitudes are the paratactic constructions in which scenes of naturalized suffering of the victim/martyr (women, children, fathers, and all Bulgarian people, in short), through explicit images of tears, sighs, and blood "throughout all Bulgaria," stand in the same emotional register as the subsequent rapturous heroization of "Russia! That mighty land / in breadth, in number, in might!" The parataxis here may be related to the proportionality and symmetry in the presentation of the victim's suffering and the saviour's bravery.

The consistent use of iambic meter is also a clear sign of a stable attitude in presenting the images; there is no emotional wavering or dissonance in the poetic construction of the two images, victim and hero, which speaks of a pre-constructed model in which stylized images are reduced to rhetorical devices of persuasion with the goal of forming a one-sided notion of the indestructible bond between the slave, the Bulgarian people, and their saviour, Russia. It is notable that the nominative chain associated with Russia ("that holy, native, dear name") is built from a solid series of names and images – forty-eight in all ("double-headed eagle," "faded image," good

old man, Bulgarian tsar, Muscovites, crown, Russia's mighty call, Russia, great land, brotherly hand, the tsar, sacred Moscow, midnight empress, the World, Messiah, father, holy name, Russian honour, the Russian eagle, distant Kamchatka, the Finnish seas, etc.). Against this numerical designation stand only two images of the enemy: "tyrant" and "pagan blood." That is, the enemy image is already culturally pre-constructed: it is borne by the national imaginary, and these two designations suffice to trigger an emotional code of hostility and hatred.

In this case we can also suppose that, in engaging the reader's reception, it is more important to form identity along the line of co-martyrdom with the people and co-brotherhood with the saviour. The enemy remains more an abstract image of evil and oppression in principle, which in the case of the poem *Russia!* is embodied in the image of the Turks. In light of these structural-semantic considerations, it becomes clear that for the ideological "narrative" it is more important to form an identity that emotionally connects with the perception of Russia as the deliverer of the Bulgarian people. Thus the symbolic codes of domination and, consequently, subordination are formed (as per Bourdieu).

Paradoxically, Vazov's poem also demonstrates the mechanism by which cultural-ideological codes are transmitted across generations with the use of "my mother" and "my father." In the first part of the poem, as noted, in the retrospection of memory, the lyrical speaker demonstrates the process of a form of "indoctrination," which receives its poetic expression and definition in the first distich of the second part: "And thus, from early on, with this idea, / with this faith I began to live." In a sense, Vazov appears at once as the object and subject of ideological formation. What is said by the parents is that pre-inscribed power in language. Since there are no indications of any change in the lyrical speaker's thinking in the transition from child to adult, "vengeance" ("and I wait, ready for revenge") becomes a generationally transmitted "testament", which in turn also functions as a discursive strategy for constructing meaning and a goal for every Bulgarian's life, to avenge ("and all the people are waiting"). If we again invoke Bourdieu's concept of symbolic violence, vengeance (whose subject is the fraternal Slavs) against the enemy (the tyrant oppressor) becomes habitus, that is, a system of dispositions automatically and uncritically transferred onto each Bulgarian; it becomes a norm and a stereotypical attitude that will be hard to overcome.

Thus, the conceptualization of Russia in this poem proceeds entirely under the sign of heroization, which in turn is presented through the eyes and image of the victim, in this case the lyrical speaker and the entire Bulgarian people. The messianic paradigm, articulated at the poem's end – Russia-Messiah – corresponds to the discursive idealization of the Russian warriors. In the context of the cosmic antagonism (in Bulgarian and historical terms) between the good (Christians, Russians) and the evil (non-believers/pagans, Turks), any socially unacceptable (today) images of spilled blood and sacrifice are not only permissible but glorified: "Oh, soon to us there will be extended / a powerful, strong brotherly hand, / and pagan blood will once again flow," or "let each of you be first / for this great idea / to sacrifice property and blood." The idealization of the "brothers," set against the stigmatization of the "others," is one of the best manipulative mechanisms in creating (meta)prejudices that exceed the dimensions of reality.

An interesting observation about the chatbot performance emerged when a second text, again by Vazov, was provided, but this time with a reversed ideological sign in the attitude toward Russia and the Russian warriors. Through the discursive strategies of his poetic aplomb, Vazov constructed an entirely different image of the "fraternal" country: it is an enemy in the poem *To the Russian Warriors* (*Ha pyckume vouhu*), written in 1916.

In the geopolitical context during the First World War, Russophile Vazov was put to the test. On the one hand, there was the systematically cultivated and nourished love and gratitude to Russia, thought of as liberator, and, on the other, the creator's internal polemic regarding its role and attitude toward Bulgaria in the global conflict. The drama in Vazov's text arises from the painful mismatch between the favoured, even sacralized image of Russia and the failure to grasp the new political constellation determined by the former liberator's imperial ambitions. The author feels betrayed, but the lyrical text does not dare to explicitly name the Russian troops as aggressors. The opening quatrain introduces the image of the Russians, traditionally calling them "Slavic brothers," thus trying to defuse the tension revealed in the rhetorical questions. The lyrical "I" problematizes their presence on the "Balkan fields." The image metonymically embraces the sacred territory of the homeland. This time the "brothers" are identified apophatically: they are "unloved, uninvited guests." The former liberators become aggressors.

The semantic nuance in constructing the enemy's image is identical to the presentation of the enemy in *Russia*.

They are "guests," i.e., they have no primordial right to territorial claims over Bulgarian land. This right belongs solely to the Bulgarian people, it is no accident that the Revival tradition and post-Liberation literature of the 1880s and 1890s persistently employ the metaphor of the homeland as a "sacrificial altar." The Bulgarian people redeemed the right to call the land their own with their blood shed in the April Uprising and the War of Liberation.

WarLang is once again infallible in extracting qualitative criteria in the stigmatization of the enemy, correctly marking the phrase "unloved, uninvited guests" and situating it within the field of a discursive strategy that constructs the image of the aggressor. Here, however, the tool cannot capture the deep psychological context that is obvious to us, the spiritual collisions of the implicit author, who evidently conducts a tense dialogue both with the imagined composite image of the Russian warriors, embodiment of the liberator state, and with himself. The analysis of metaphors and discursive strategies offered by the chatbot adequately identifies the enemy as oppressor. The legitimization of violence is highlighted by underscoring the struggle for freedom and the right to defend against a new yoke ("You bring a new yoke").

The text's tension results from the lyrical I's inner resistance and unwillingness to accept the negative transformation. Now the Russians are viewed as bearers of an existential threat, with the poetic metaphors once again serving to construct the image of a dehumanized evil ("and you come enraged," "your gaze shines ominously"), as WarLang notes.

The text also employs biblical imagery. Christ's banner appears ambivalently in Vazov's text, understood in the context of heroic self-sacrifice during the Russo-Turkish War, but also in a negative light with respect to the current historical situation. It is at once a metaphor of philanthropy and misanthropy, of the broken chains of the heavy (former) yoke, and a sinister marker of the new "shameful yoke." Through this duality, the symbol becomes a bearer of a strong emotional code for the nation's spiritual rending, between the memory of salvation and the sense of betrayal, between the sacred and the profane dimension of freedom. Analyzing discursive strategies, the WarLang chatbot defines the phrase "Christ's ban-

ner" as an attempt to create an ideological narrative legitimizing the struggle for freedom. The chatbot captures the ideological layer but misses the religious-existential one. It does not register the symbol's ambivalence and emotional dynamics. In Vazov's context, "Christ's banner" is not merely a sign of the struggle for freedom but a marker of a spiritual crisis between faith and reality and between salvation and "new slavery." It is precisely this two-layeredness that turns the religious image into a field for transforming and re-contextualizing inherited (previously instilled) ideologemes. That is, Christ's banner begins to transmit ideological tension such that, by analogy, a link is forged with the lyrical subject's emotional strain brought on by the axiological overturning of Russia's image.

Freedom is the other important symbolic and literal code in the poem. It is named as an idol (*kumir*), for which the Bulgarian people are ready to fight and die, regardless of who the enemy is. The machine analysis lists the word *kumir* ("idol") under "offensive or ideologically charged expressions," noting in parentheses that it may carry a negative connotation. Such an observation is irrelevant to the philological reading. In the context of the biblical narrative, *idol* indeed bears a negative evaluation: The Old Testament story of the golden calf. In this case, however, the lexeme does not function in a religious-dogmatic context but in a symbolic-axiological one. Vazov uses it not to expose idolatry but to elevate the idea of freedom as the supreme life and national ideal. The machine analysis fails to distinguish this metaphorical usage from its canonical, theological meanings, thereby missing the essential transformation of the concept, from a religious symbol of the fall into sin to a secular sign of collective self-assertion. Freedom becomes a sacralized idea and mental image, influenced by strategies for constructing a social and emotional code of victimization and, correspondingly, of heroization. Once achieved, freedom is not a given but a basic condition for self-identification. Anyone who raises arms against the homeland becomes an enemy. Here, a fundamentally ideological (however, within the context of Vazov's oeuvre, counter-ideological) discourse clearly emerges, insofar as the pro-Russian ideology created by Vazov himself is being attacked.

The entire poem openly presents strategies for constructing a social and emotional code of victimization and, correspondingly, of heroization through the ideological "narrative" of freedom as the highest value. Freedom here is constructed as

both a literal and symbolic image for forming collective identity. The chatbot is precise in pointing to discursive strategies that legitimize violence and self-sacrifice. And Vazov, as an authority who encompasses evaluations and emotional responses on behalf of the collective “I” of the people, becomes a producer and disseminator of “truth” (which in this case is equal to ideology) in the relevant historical conditions and, correspondingly, of power (if we lean on Foucault’s concept of power produced through discourses). In this scandalous, almost auto-intertextual situation – where one and the same object receives opposite evaluations (*Russia* as a saviour versus *To the Russian Warriors*, where Russia is a subjugator) – Vazov truly functions as an ideological mentor who addresses the people’s collective “I” in order to guide it to “correct” evaluations of a phenomenon or object, even if that means dehumanizing the erstwhile image of the Saviour in the face of Russia. In its purest form, this is national engineering.

In the context of the grand conceptual metaphor of war as structuring our thinking and being, we may say that Vazov was an ideological engine of militaristic attitudes, insofar as even in peacetime he is subject to the need periodically to reactivate the image of the enemy and/or the image of the saviour in order to shape collective consciousness in a particular direction. And he succeeded.

The chatbot’s work as a research tool for analyzing military and political discourse cannot, of course, exhaust the diversity of language capacities to conceal discursive strategies of a propagandistic or ideological character; nevertheless, it proves valuable as a first step in overcoming inherited interpretive paradigms and automatized receptive attitudes toward works we have known since childhood.

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REDESIGNING ESP LEARNING THROUGH PARTIAL FLIPPING: A PEDAGOGICAL EXPERIMENT IN HIGHER EDUCATION

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ABSTRACT

With the rise of digital technology in education, new methods such as the Flipped Classroom Model (FCM) are reshaping teaching practices. In English for Specific Purposes (ESP), FCM enables students to study domain-specific language content at their own pace before class, reserving classroom time for communication and application. This study examines a partially flipped ESP course for university students, where only selected activities, such as pre-lesson vocabulary introduction and video-based lectures, were flipped. In-class work remained collaborative and interactive. Results showed improved motivation, autonomy, and performance among students compared to traditional methods, highlighting partial flipping as an effective pedagogical approach for enhancing ESP instruction in higher education.

Key words: flipped learning, ESP, technology

INTRODUCTION

The twenty-first century has been marked by rapid technological advancement across numerous domains, including the field of language education. Contemporary learners are increasingly proficient with digital tools and demonstrate a clear preference for socially interactive and collaborative learning environments. In response, educators are actively seeking effective strategies to integrate technology in ways that enhance instructional design and promote collaborative learning outcomes. Scholars such as Basal [1] affirm that the thoughtful integration of technology into the teaching process significantly contributes to the effectiveness of language instruction.

A notable innovation in this context is the Flipped Learning model, an active learning approach that leverages digital technologies to create more dynamic and engaging classroom experiences. As Basal notes, flipped learning reconfigures the traditional instructional model by relocating content delivery, typically through multimedia resources such as videos, to the individual study phase prior to class[1]. This shift enables classroom time to be repurposed for collaborative tasks, problem-solving, and applied language use. He describes the Flipped Classroom as a distinctive educational model gaining global recognition for its ability to harness technology to invert conventional teaching roles. In this model, students engage with instructional

content independently before class, thereby transforming in-person sessions into interactive learning environments focused on discussion and exploration. As Hung emphasizes, the core of flipped learning lies in this strategic inversion, where technology becomes a central instrument in redefining both the delivery and experience of education[2].

FLIPPED VS TRADITIONAL CLASSROOM

The evolution of educational methodologies in the 21st century has prompted educators to re-evaluate the traditional classroom model and explore innovative approaches that align more closely with the learning preferences and needs of contemporary students. One such approach gaining significant traction is the flipped classroom, which reverses the conventional sequence of instruction by delivering content outside the classroom and dedicating in-class time to active, student-centred learning. The following sections offer a comparative analysis of the traditional and flipped classroom models, highlighting their respective strengths, limitations, and pedagogical implications.

TRADITIONAL CLASSROOM MODEL

In the traditional classroom setting, the teacher serves as the primary source of knowledge, delivering content through direct instruction. Students are typically passive recipients,

expected to listen, take notes, and later engage in homework tasks based on the material presented. Instruction follows a structured curriculum with predefined learning objectives and assessments. The teacher's expertise plays a central role in content delivery and classroom management.

Table 1. Strengths and limitations of the Traditional Classroom Model

Strengths of the Traditional Model:	Limitations of the Traditional Model:
Direct Instruction: Enables teachers to clearly present concepts and control the flow of information	Limited Student Engagement: Students often play a passive role, which can diminish motivation
Structure and Organization: Provides a predictable and systematic learning environment	Lack of Critical Thinking: Puts emphasis on memorization which may not cultivate higher-order thinking skills
Teacher Expertise: Leverages the educator's experience to guide student learning	One-Size-Fits-All Approach: Fails to accommodate diverse learning styles and individual needs
Classroom Management: Maintains order through established routines and expectations	Minimal Feedback and Interaction: Provides limited opportunities for personalized support and timely feedback

So, the rigidity of the traditional model has prompted growing interest in more flexible and responsive teaching strategies, particularly as digital platforms and social media have made it easier to share and explore alternative instructional methods.

FLIPPED CLASSROOM MODEL

The flipped classroom model redefines the learning experience by moving instructional content, often in the form of video lectures or digital resources, outside the classroom, allowing students to engage with new material independently before class. This shift transforms classroom time into a space for active learning, where students participate in discussions, collaborative tasks, problem-solving activities, and receive real-time feedback. In this environment, learners arrive better prepared, enabling deeper exploration of the subject matter. Teachers serve as fa-

cilitators rather than lecturers, guiding students through meaningful activities that enhance understanding, encourage critical thinking, and promote the practical application of knowledge.

The FCM has several advantages, among them:

- 1) **Increased Student Engagement:** Encourages learners to take an active role in their education.
- 2) **Enhanced Interaction:** Promotes collaborative learning and more frequent student-teacher communication.
- 3) **Personalized Learning:** Supports differentiated instruction based on student readiness and interests.
- 4) **Development of Higher-Order Skills:** Emphasizes analysis, application, and problem-solving over rote memorization.
- 5) **Timely Feedback:** Enables instructors to address misunderstandings in real time.

THE NEED OF PARTIAL FLIPPING

While fully flipped classrooms offer a transformative shift toward student-centred learning, their implementation can present significant challenges, particularly in higher education contexts where students may lack the autonomy, digital literacy, or time-management skills required for fully independent study. In such environments, a partial flipping approach provides a pedagogically sound compromise. By selectively integrating flipped elements, such as pre-class video lectures, reading assignments, or vocabulary exercises, while retaining teacher-led instruction for complex concepts or skill application, partial flipping ensures a smoother transition toward active learning.

This hybrid model respects the structure and clarity of traditional teaching, which many students still rely on, while gradually cultivating the habits of independent inquiry, collaboration, and critical thinking essential for 21st-century learning. It also allows instructors to be more responsive to learner readiness, adapting the depth and modality of instruction based on observed classroom dynamics. Importantly, partial flipping supports a more inclusive approach to innovation—one that accommodates varying levels of technological access, motivation, and learning styles. In doing so, it aligns with the broader movement toward flexible, student-centred education while maintaining the pedagogical scaffolding needed for long-term success.

RESEARCH METHODOLOGY

This paper aims to explore the effectiveness of implementing FC pedagogy in an English for Specific Purposes (ESP) course. This will be achieved through an in-depth analysis of existing literature on the FC approach, an examination of its advantages, and the author's qualitative reflections drawn from personal teaching experience. The study will also propose practical strategies for incorporating the FC model into an ESP module while addressing potential challenges and suggesting solutions to overcome them.

In line with the research aim, the study sets out the following objectives:

- To assess the impact and effectiveness of the FC approach in an English for Specific Purposes module.
- To provide practical recommendations and implementation strategies for the FC pedagogy based on first-hand teaching experience.
- To identify the potential challenges educators may encounter when applying the FC model and explore ways to address them.

THEORETICAL FOUNDATIONS OF THE FC APPROACH

Integration of Learning Theories

The flipped classroom model effectively bridges behavioural and constructivist learning approaches. While foundational knowledge is delivered outside the classroom through structured, teacher-led content such as lectures and drills, in-class activities emphasize student-driven exploration and collaborative problem-solving. This transition repositions the instructor from a central authority figure to a supportive facilitator, guiding learners as they actively construct understanding [3].

Learning on Demand

One of the core benefits of flipped learning is the flexibility it offers. Students can access instructional materials at any time and from any location, enabling them to learn at their own pace. Features such as pausing, replaying, and reviewing videos empower learners to grasp complex topics thoroughly, while reducing cognitive overload. This format is particularly beneficial for students who join a course late or are absent due to illness [4].

Data-Informed Teaching

Digital platforms used in flipped classrooms often provide analytic tools that offer real-time insights into student performance. These allow

teachers to identify learning gaps, monitor progress, and tailor in-class interventions to address specific misunderstandings, thereby making instruction more responsive and targeted.

Active and Collaborative Classroom Culture

Flipped learning transforms the classroom into a dynamic space for interaction, where time is allocated to meaningful, student-centred activities. Learners engage in collaborative tasks, discussions, and applied exercises that not only deepen understanding but also foster a sense of community and shared learning responsibility [4].

Development of Transferable Skills

Classroom activities in a flipped environment closely mirror real-life contexts, helping students build critical competences such as teamwork, analytical reasoning, and effective communication. These tasks nurture higher-order thinking abilities, including analysis, evaluation, and creation, as emphasized in Bloom's Taxonomy.

Empowered Learners

By shifting the responsibility for initial content engagement to students, flipped learning promotes greater autonomy and intrinsic motivation. Students are encouraged to take ownership of their learning journey, while teachers provide guidance, scaffolding, and feedback as facilitators rather than content deliverers [4].

Enhanced Oral Communication

Both asynchronous and face-to-face components of flipped instruction contribute to the development of students' speaking and listening skills. Frequent opportunities for discussion, presentation, and peer exchange help improve language fluency and communicative competence.

Personalized and Inclusive Learning

The flipped model supports differentiated instruction by accommodating individual learning styles, varying levels of proficiency, and diverse pacing needs. Students can tailor their engagement with the content: they can choose the intensity, duration, and format that best suit their preferences and capabilities.

IMPLEMENTATION OF FC IN AN ESP MODULE

The frame of flipped learning [5] and its main activities are displayed in Fig. 1 and Table 2.

The flipped classroom model requires students to engage with instructional content prior to class by reviewing teacher-provided materials such as readings, videos, or audio resources. This

preparatory phase enables classroom sessions to be dedicated to the development of practical language skills, including speaking, reading, and writing, through interactive, application-based activities.

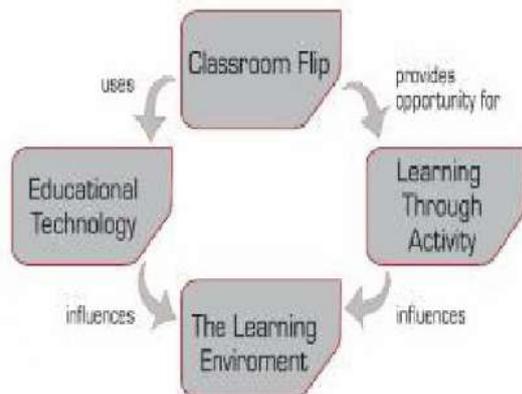


Fig. 1 Flipped classroom frame

Table 2. Activities in flipped learning

Preparation Before Class:	Students engage with instructional materials such as videos, readings, or presentations at their own pace prior to attending class. Content is typically shared through online platforms, email, or learning management systems for easy access.
Engaging Classroom Activities:	Class sessions focus on interactive learning, including discussions, problem-solving exercises, group work, and teacher-facilitated projects. Instead of passively listening, students actively participate and apply their knowledge.
Instructor's Role:	Teachers function as guides and mentors, providing support and direction during in-class activities. They clarify doubts, answer questions, and encourage deeper engagement with the subject matter.

Within this framework, the teacher adopts a multifaceted role as facilitator, guide, and knowledge resource, while students are positioned not only as recipients of information but also as active contributors to the learning process [6]. A key strength of the flipped approach lies in

its adaptability to diverse learning preferences, thereby enhancing its appeal across a broader student population [4]. As a result, learners tend to become more motivated, engaged, and autonomous, taking greater responsibility for their educational progress.

IMPLEMENTING THE FC MODEL IN COURSE DEVELOPMENT

In designing the course, the Flipped Classroom model was adopted as the core instructional approach. This model relocates direct instruction to the pre-class phase through resources such as recorded lectures, assigned readings, or digital content, thereby reserving in-class time for interactive, application-oriented learning experiences.

Fundamentally, the flipped model inverts the traditional teaching paradigm. Rather than introducing new material during lectures and assigning practice as homework, students are first exposed to instructional content independently. Classroom time is then devoted to active learning strategies, including collaborative discussions, problem-solving tasks, and teacher-facilitated activities.

This restructured use of class time enables deeper student engagement through hands-on learning experiences, such as debates and group exercises, fostering the development of critical thinking and communication skills. It also aligns with core educational principles such as student-centred learning, differentiated instruction, and constructivist pedagogy, wherein learners are active participants in constructing their knowledge.

Moreover, the FC model offers considerable flexibility. Instructors can adapt its structure to suit their individual teaching styles, instructional goals, and specific classroom contexts [4]. For the Specialized Texts Annotation and Abstracting course, we conducted a pedagogical experiment to make use of the FC model along with traditional teaching methods.

EXPERIMENT DESIGN

The experiment involved one group of second-year bachelor students from the Chemistry-Faculty enrolled in the course. The group consisted of 12 students. The FC group:

- Studied using a structured cycle: virtual learning content → interactive classroom activities → observation, feedback, and assessment.

- Engaged in interactive discussions and collaborative exercises during class.

To evaluate the effectiveness of the FC model, several key indicators were established: the amount of time students spent preparing for class through independent study, their level of engagement and participation during in-class activities, the number of lessons required to cover each topic, and individual academic performance as measured by assessments and course outcomes. In addition to these quantitative measures, students who participated in the FC were also asked to complete a post-course questionnaire to share their feedback and perceptions of the learning experience.

The FC approach changes the way students engage with learning materials by shifting direct instruction outside the classroom, allowing in-class time to focus on active learning strategies. Table 3 shows how it is managed in practice:

Table 3. Classroom and online activities for the ESP course

Classroom activities	Online activities
Interactive activities aimed at enhancing speaking and writing abilities	Lecture materials for the study
Debates	Vocabulary online training exercises
Brainstorming activities	Listening exercises
Team project work	Peer review discussions
Collaborative evaluation of student projects	Written feedback
Discussion of problems	Online tests
Explanations of language structure	Quizzes

ADDRESSING KEY CHALLENGES IN ESP INSTRUCTION

Teaching ESP presents instructors with a range of challenges, including fostering student motivation to learn a foreign language, integrating authentic, field-specific texts, cultivating comprehensive communicative skills (reading, writing, speaking, and listening), and addressing diverse learning needs through personalized instruction. Simultaneously, students tend to focus on acquiring practical language skills that will

enhance their future employability and professional competitiveness. The FC model offers promising strategies to address these issues by promoting a more interactive, learner-centred, and practice-oriented environment. The following sections will explore how this pedagogical approach aligns with the priorities of both educators and learners. According to the feedback obtained from students at the University of Chemical Technology and Metallurgy (UCTM) through a questionnaire, learners primarily aim to: recognize the relevance of foreign language skills for their future careers, appreciate the value of participating in international professional communication in English, and view language proficiency as a key advantage in solving real-world problems within their chosen fields.

FINDINGS AND RESULTS

From the teacher's perspective, the FC method proved to be highly effective compared to traditional instruction, offering several advantages:

Table 4. Advantages of Flipped Classroom Method

Increased Independent Learning	Students' extracurricular workload grew by 50%
More Efficient Use of Class Time	Routine text work was shifted to homework, allowing more in-class speaking practice.
Faster Topic Mastery	The time required to cover each topic was nearly halved.
Flexible Learning Pace	Students could deal with materials at their own speed and critically analyze texts.
Higher Classroom Engagement	More than 75% of students actively participated in discussions and tasks.
More Personalized Interaction	Increased teacher-student engagement and feedback opportunities.
Improved Academic Performance	Test scores increased.

The feedback from students regarding the FC model was overwhelmingly positive. All participants (100%) reported that the online materials used significantly enhanced their overall learning

experience and improved interaction with both peers and the instructor. Additionally, 90% of the students indicated that the method increased their interest in the course, while 80% found the content relevant and beneficial for their professional growth. The same percentage (90%) valued the feedback provided on assignments and assessments, considering it helpful for their progress. Furthermore, all respondents felt that the approach fostered greater independence and self-direction in their learning. Lastly, 80% acknowledged that the lecturer consistently encouraged their active participation and sustained their interest throughout the course.

Our investigation aimed to assess the impact of flipped learning on ESP training in higher education, and the findings clearly indicate that students responded favourably to this hybrid model. They perceived it as flexible, personalized, and supportive, appreciating the autonomy to engage with course materials on their own schedule. Partial flipping successfully activated core pedagogical benefits such as differentiation, individualization, and increased learner autonomy. As a result, students became more self-directed, confident, and motivated, which contributed to measurable improvements in their language skills.

CONCLUSION

Viewed through the lens of a *partially flipped classroom*, the results of this study reaffirm the pedagogical value of integrating flipped learning principles into ESP instruction. Even when applied in a partial format, this approach was shown to significantly enhance student engagement, comprehension, and academic achievement. By relocating select components of direct

instruction, such as videos or readings, to the pre-class phase, valuable classroom time was freed for interactive, student-centred activities that promoted deeper understanding, collaboration, and meaningful interaction between students and instructors.

Ultimately, this study supports the growing body of evidence that the flipped classroom, particularly in its partial implementation, offers a powerful, adaptable, and student-centred strategy that enhances both learning experiences and educational outcomes.

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INVESTMENTS WITH A MISSION: HOW STRATEGIC FUNDS CONTRIBUTE TO THE FUTURE OF THE NATIONAL ECONOMY

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ABSTRACT

Following the 2007 – 2008 crisis, widely regarded as the largest economic contraction since the 1930s, there has been a significant shift in the way countries manage their resources. Due to historically low interest rates and weaker global economic growth, traditional savings and stabilization funds have lost some of their appeal. In response, many countries have started establishing development funds integrated into their national economic strategy. Strategic funds play an important role in stimulating the national economy through a variety of mechanisms and transmission channels. They can provide capital for start-ups in key sectors or invest in long-term holdings to support the growth and expansion of already established companies [1].

Key words: *sovereign investment funds, sovereign wealth funds, economic development*

INTRODUCTION

Strategic investment funds (SIFs) are entities established by governments or public institutions with a specific investment mandate to achieve economic and social objectives – from stimulating growth and creating jobs to adapting to climate change. They invest primarily in start-ups and sectors that private capital considers too risky or underdeveloped, often mobilizing joint resources with private investors. Depending on their capital structure, strategic funds can be public (fully state-funded) or mixed-capital, and their operating models – permanent or limited-life – reflect the balance between long-term public policy priorities and the pursuit of financial return.

Unlike sovereign wealth funds, which invest primarily abroad, SIFs focus on domestic strategic projects and are often created in response to a shortage of domestic capital. This article explores the characteristics, strategic mandates, and operating models of strategic investment funds, as well

as their role in countering market failures in emerging economies.

WHAT ARE STRATEGIC INVESTMENT FUNDS?

Strategic investment funds are special-purpose vehicles established by governments or public institutions to achieve specific economic objectives (e.g. supporting economic growth, creating new jobs, mitigating or adapting to climate change, stimulating specific sectors or regions of the economy, etc.) while generating financial returns. Traditionally, they invest in sectors and regions where private investors would either not invest or would invest to a limited extent. Funds are mainly directed to start-ups engaged in activities of particular interest to national authorities. These activities may include developing products that the government would like to purchase in order to achieve certain public policy goals (e.g. national security)¹. [2]

¹ In the months since the World Health Organization declared a pandemic, sovereign wealth funds have been used in a number of ways, including to bail out struggling industries. For example, the Turkish government allowed its \$33 billion Turkey Wealth Fund to acquire controlling stakes in distressed private companies through a bill passed by parliament in April 2020. Similarly, the Russian Federation's Russia Direct Investment Fund helped finance the development of

Sputnik V, a COVID-19 vaccine developed by the Russian Medical Research Institute.

In 2006, NASA created its own strategic investment fund, RPC (Red Planet Capital), with a budget of approximately \$90 million and a 5-year lifespan. Its creation was motivated by concerns that the US space program was lagging behind the programs of other countries, as well as that NASA was not spending enough to keep up with the development of some new technologies [5].

Strategic funds may be established as separate, independent entities with a specific purpose, i.e. with a clearly defined mandate, or simply operate as part of a larger sovereign wealth fund (SWF). Those that are fully capitalized by the government or other public institutions are referred to as public strategic investment funds or development funds. Funds with private capital participation are known as mixed strategic funds [3].

It is worth noting here that the main difference between a SWF and a strategic investment fund is that a SWF invests primarily abroad, whereas strategic investment funds direct resources primarily towards strategic projects within the country, which is why they are defined as inward-focused funds. While a SWF typically emerges as a result of abundance (e.g. budget surpluses from mineral exports or the accumulation of substantial foreign exchange reserves), a strategic investment fund generally arises in response to a shortage of capital.

The complex nature of their mandate leads to different operating models. The operating model reflects both the investment horizon and investment strategy. Strategic funds can be established either as permanent structures or as funds with a limited lifespan, and the objectives they pursue often require long-term capital. Public capital funds are typically permanent structures, enabling them to adopt a very long-term investment approach and to reallocate capital after exiting the relevant investment. Conversely, mixed-structure funds that mobilise private capital are typically formed as funds with a limited life, as investors seek mechanisms that allow them to exit their investments after a defined period and realise returns. Funds can also choose to invest directly or to channel capital through intermediaries acting on their behalf.

In recent years, a number of developing economies, including India, Vietnam, the Philippines, Malaysia, and Nigeria, have established SIFs. In terms of assets under management, most SIFs are smaller than sovereign wealth funds. An exception is highly diversified sovereign wealth funds with a strategic component (SIF), which invest both domestically and internationally [4].

CHARACTERISTICS OF STRATEGIC INVESTMENT FUNDS

SIFs are characterized by the following six features [3]:

1. Created and wholly or partly capitalized by one or more governments or by government-owned global or regional financial institutions.

2. Invest primarily, but not exclusively, in unlisted assets (their mandate excludes investments in publicly traded assets), with the aim of generating profit and achieving certain policy objectives (the so-called social return).

3. Seek to mobilize investment in partnership with private capital at the fund level or on a specific project basis.

4. Provide long-term financing, usually in the form of equity, but also quasi-equity² and debt.

5. Operate as professional fund managers on behalf of their investors.

6. Established as pools (or funds) of assets through various legal structures (e.g. investment company, limited partnership, etc.).

Therefore, strategic investment funds are long-term investors supported by the public sector, with the capacity to address market failures and provide a sustainable resource for investment projects. All other things being equal, these investments would not be normally undertaken by private financial institutions for a number of reasons, including:

1. Perceived excessive investment risk due to a lack of prior private investment track record in certain sectors, which leads prospective investors to attribute excessive risk to such investments;

2. Information asymmetry with respect to their potential investments;

3. Inefficient or underdeveloped markets for quick exit of investors at relatively low costs.

The policy objective is central, as the sovereign principal adopts a much broader perspective in assessing profitability than a typical fund manager. Governments are primarily focused on maximizing net benefits to society, while fund managers are primarily focused on financial returns. Accordingly, the mandate of the strategic fund should balance policy objectives with financial performance, ensuring neither dimension dominates at the expense of the other.

Table 1 below provides a comparative analysis of the characteristics of strategic investment funds and sovereign wealth funds, which are also state-owned but have different ultimate objectives and longer-term investment horizons.

² Quasi-equity is a hybrid form of financing with characteristics of both debt and equity instruments.

Table 1. Comparative analysis of SBF and SIF

	Sovereign Wealth Funds (SWFs)	Strategic Investment Funds (SIFs)
Definition	Sovereign wealth funds financed by national reserves	State-backed funds aimed at economic development
Main goal	Long-term preservation and increase of national wealth	Stimulating strategic sectors, ensuring employment and competitiveness
Source of funding	They are financed mainly by revenues (e.g. oil, gas, trade, and foreign exchange reserves) and budget surpluses	Capitalized with public funds: budget transfers or state assets. Often combined with public-private financing.
Investment focus	Globally diversified portfolio (stocks, bonds, real estate, etc.)	Target domestic or regional projects of strategic importance
Risk tolerance	More conservative approach and moderate risk. The long-term horizon allows for investments in riskier and illiquid assets (e.g. infrastructure).	Investments in sectors with insufficient private financing. Higher risk due to investments in innovation and infrastructure projects.
Asset classes	International: stocks, bonds, real estate, infrastructure, PE funds, hedge funds	National: equity participations in companies, infrastructure projects, venture capital, loans for SMEs.
Management	Usually independent management with strict control	Often involves public-private partnerships and policy coherence
Examples	The Norwegian Pension Fund, Abu Dhabi Investment Authority	Bpifrance (France), Irish Strategic Investment Fund
Transparency and accountability	High standards, especially for funds that have adopted the Santiago Principles. For example, the Norwegian pension fund publishes full reports and achieves the highest transparency rating.	Varies. In democratic countries, reports and impact analyses are required.
Geographic focus	International – investing abroad, with the aim of broad diversification.	Domestic or regional – aimed at the country's economy.
Political influence	Minimized through clear laws and institutional frameworks. Domestic investments are avoided to reduce political risk.	More strongly tied to state policy; investments are coordinated with ministries, although implemented by professional managers.
Time horizon	Long-term (decades)	Medium to long term (5–15 years)

Source: Author's summaries of [3], [6] and [7].

THE POLITICAL ROLE AND LEGAL FRAMEWORK OF STRATEGIC INVESTMENT FUNDS

Despite their undeniable advantages, strategic investment funds are not always the best policy

solution to address investment gaps in priority sectors.³ They cannot establish general structural investment constraints or replace sound fiscal management. Without a clearly defined purpose, strategic funds may instead complicate government oversight of public spending and fiscal risk.

³ The links between strategic funds and the macroeconomy are bidirectional, meaning that causality can potentially flow from the economy to the strategic fund and vice versa, with impulses from the fund being transmitted to economic activity. On the one hand, the rate of return on SIF investments is likely to be highly procyclical, rising when the business cycle of the local economy is on the upswing and falling when economic activity is on the downswing. On the other hand, SIFs can pose a problem with macroeconomic sustainability, especially if the fund is very large compared to the

size of the economy in which it is positioned. Since the investment activity of SIFs is associated with the injection of funds into the local economy, this creates a risk of fragmentation of government spending and budget procedures, so the government needs to ensure overall macroeconomic consistency between the activity of strategic funds and the sovereign's budget process. Unlike public equity funds, mixed equity SIFs are typically insulated from macro-fiscal interdependence, as they are not considered part of the government's balance sheet and are usually not directly responsible for economic policy.

By injecting capital into the domestic economy, strategic funds can fragment government spending and the budgetary process, making overall macroeconomic consistency between the fund and the sovereign budget essential. Once a strategic fund acquires equity in a company, it gains voting rights and participates in decision-making, and if a sufficiently large stake is obtained, the fund could acquire significant control over the company. There are concerns that there may be a political agenda for hidden nationalization behind these transactions.

The legal framework governing the operation of a SIF is a set of rules that govern the conduct of the business and investment activities of a strategic fund. A well-designed legal framework can enable a SIF to successfully carry out its mandate. Conversely, a poorly designed legal framework can reduce the effectiveness of a SIF. At the fund level, such a framework should establish contractual and governance mechanisms, including independent oversight, disclosure requirements, investment policies, conflict of interest policies and standards of conduct that promote discipline, transparency and accountability. In this way, the legal framework minimises risks, maintains the confidence of local constituencies (the general public), host country regulators and co-investors, and provides an effective dispute resolution mechanism in the event of conflict between stakeholders of the strategic funds. Although the form and details of the establishment legislation will vary across jurisdictions, several common provisions are traditionally found in the main legislation governing the operation of a SIF [3].

Legal structure and duration. The legislation should define the legal structure of the SIF and specify whether it has a limited lifespan. If there are provisions for winding up the fund, these must be clearly stated and should not undermine the long-term horizon that SIFs typically adopt.

Capital provider and governance. The law should specify who capitalises the fund or, if the SIF is established as a corporation, who provides the equity capital. It should also designate the fund manager and, in the case of a corporation, establish procedures for appointing its board and senior management. The statutes may specify that the government or a specific ministry is an investor or shareholder (as the case may be) in the fund, but that the SIF itself is the legal owner of the assets. Generally, international practice shows that, on the government side, the Ministry of Finance is the trustee of the capital of the fund (or shareholders, as the case may be), as this ministry is

usually responsible for the relevant financial and fiscal consequences associated with the SIF. Ideally, the law would also need to clarify any restrictions on the legal ownership of the assets of the fund or management company.

Operational independence. The legal provisions should specify the extent to which the management company or, in the case of a corporation, the board of directors, is independent of government influence and how this independence is protected through appropriate governance mechanisms. Ideally, the fund manager or board has operational independence secured by the support of the state sponsor.

Sources of funds. The legislation should define the initial assets of the SIF and outline the rules for the inflow of funds. The requirement includes borrowing conditions (if permitted) and the purpose of such borrowing, as well as a clause on whether profits will be reinvested in the fund. If part of the SIF's funds come from contributions of state assets (e.g. from equity interests in state-owned enterprises), the transfer of these assets should be clearly spelled out in the law to ensure that the strategic fund is sufficiently funded for its mandate, and any conditions for when the transfer will take place should be clarified. The law must also specify the terms, conditions, and limits under which funds may be withdrawn from the SIF, including by determining the dividend policy. [3]

CONCLUSION

In conclusion, sovereign investors exert a significant influence on the policy of sustainable economic growth and the long-term prosperity of their nations. As sovereign wealth funds continue to support the strategic goals of the government, implement innovative solutions and respond to complex market conditions, their importance to nations becomes irreplaceable. As a result, many countries have begun to create development funds integrated into their national economic strategy. In the Bulgarian context, it would be a good idea for policymakers to consider whether some of the fiscal reserve could not be transformed into a strategic investment fund and directed towards structurally significant and innovative industries.

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UPDATE OF THE PHRASEOLOGISM “*THE DOGS BARK, AND THE CARAVAN MOVES ON*” IN MODERN PUBLIC SPEECH

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ABSTRACT

This study focuses on a phraseologism and its updated variants in contemporary public speech. The excerpted material is drawn from the CLASSLA-web.bg corpus.

Key words: *phraseology, update, semantics, public speech*

INTRODUCTION

In recent years, interest in phraseological units has not decreased; on the contrary, it has expanded, with increasing attention to their function in various communicative spheres. For different communicative purposes, phraseological units are transformed, updated, and innovated, acquiring new meanings and/or structure, as well as new expressive and stylistic characteristics [1].

Public speech is a particularly important object of observation. In the 20th and 21st centuries, terms such as *public speaking*, *public speech*, and *public communication* have come into use. *Public speech* is understood as a specific performance in before an audience [2].

This study examines public speech as part of a dynamic and diverse space where political, media, academic. and popular communication intersect. It is there that phraseologisms are updated, modified, and reinterpreted in response to changes in the social and cultural environment.

PHRASEOLOGISMS – DEFINITIONS

In this text, we adhere to the definition proposed by Czech linguist F. Čermak, who characterizes phraseologisms as stable combinations of at least two forms (morphemes, lexemes, collocations, or sentences) distinguished by formal, collocational and semantic anomalies and representing a unit of a higher level [1]. We also adopt the definition offered by a representative of the Bulgarian phraseological school, K. Nicheva, who maintains that “a phraseological unit is a commonly known, within a given speech community, supra-lexical, separately formed, relatively stable, and reproducible linguistic unit with a single

meaning, composed of lexical units whose meanings have more or less faded or have become completely desemantized, close (but not equal) semantically and functionally to the word. Structurally, the phraseological unit is a word combination or an open (more rarely closed) sentence and, as a rule, possesses marked expressiveness” [3].

PHRASEOLOGISMS – UPDATE

According to Mlacek, when discussing the updating of phraseologisms, the original meaning of an expression is most often specified, although sometimes it can even acquire a literal interpretation based on its individual lexical components [4].

The potential for updating a phraseologism is not unlimited, because not every component allows such modification; it depends on the parts of speech involved and the degree of semantic cohesion between the components of the phraseologism.

Presentation in lexicographical sources:

The dogs (are) barking, and the caravan is moving on. Something continues to happen or develop, despite being criticised or condemned by others [5].

Presentation in public speech:

Semantically, this phraseologism combines the figurative idea of the futility of speech (the barking dogs) with the constancy of action (the moving caravan), becoming a symbolic linguistic mechanism for ironically expressing the stability of processes regardless of external reactions.

Its use in public speech demonstrates a high degree of updating, enabling adaptations to various discursive contexts – political, social, and media.

In the present study, the examples are classified into three subgroups according to the manner in which the stable structure of the phraseologism is transformed:

1. Phraseologisms with updating through component substitution – one of the basic elements (for example, *dogs* or *the caravan*) is replaced with a new one, creating modified imagery and contextual semantics.

2. Phraseologisms with updating through omission of a component – a shortening of the phraseological structure is observed, which does not eliminate but rather concentrates and strengthens the semantic force of the expression.

3. Phraseologisms with updating through structural change – various syntactic and compositional transformations that expand or modify the expression without completely severing its connection with the original source.

This three-level classification allows for more precise tracking of the processes of phraseological updating and demonstrates how stable expressions, despite their fixity, remain dynamic and open to creative use in public speech.

PHRASEOLOGISMS WITH UPDATING THROUGH COMPONENT SUBSTITUTION

In the example from public speech, *The caravan is moving on, and the dogs are whining*, a lexical substitution of the component *bark* with *whine*, introduces a new nuance. In context, this change intensifies the dismissive effect, creating an impression of insignificance.

In the example *Because the mayor is napping, the scumbags are barking, the caravan is moving on*, the substitution *dogs* → *scumbags* intensifies the negative connotation and emphasizes social contempt.

In *Desolate, DW is barking, the caravan is moving on*, the replacement of *dogs* with a specific subject (DW) transfers the metaphor to a concrete media actor.

Replacing the second component (“*the caravan moves on*”)

In *Chalgarization, Boykovization – the dog is barking, the jeep is moving on*, the substitution of *caravan* with *jeep* updates the expression politically, referring to Boyko Borisov's style of governance.

In *The Dogs Bark, Business Goes On*, replacing the second component with the lexeme *business* shifts the semantics towards a commentary of the economic situation in Bulgaria.

In *The Dogs Bark, the Cart Goes On*, the substitution of *caravan* with *cart* replaces the oriental image with one closer to rural culture, without altering the core meaning.

The update in *The Dogs Bark, and Are Prices Falling or Rising?* consists in replacing the second part of the phraseologism, transforming the meaning entirely and linking it to a specific economic context.

Further examples include: *The dogs are barking, the GERB are stealing*, where the second part of the construction is replaced and the political party *GERB* is added to it, thus transferring the expression into the sphere of political satire. In *The dogs are barking, science goes on, the career also goes on*, an expansion is observed through two replacements, which develop a new semantics related to the sustainable development of knowledge and the professional progress despite criticism.

PHRASEOLOGISMS WITH UPDATING THROUGH THE OMISSION OF A COMPONENT

The examples from public discourse that are the subject of analysis in this subgroup are updated through the omission of a component from the structure of the phraseologism. In the following examples, the first part of the phraseologism is omitted: *The tragicomedy continues, and the caravan moves on in the middle of the wilderness* or *The forums are full of wit but with zero efficiency, and the caravan is moves on*. The expression remains recognisable through *caravan*, preserving its core semantics while becoming more abstract and universal, without being tied to the image of dogs.

Other examples from public speech demonstrate strong political associations: *The caravan is moving on and the MRF (Movement for Rights and Freedoms) are going to worship by the Bosphorus; And the caravan is moving on to a full mandate, the caravan of modern European Bulgaria*. Here, omitting the first component places a clearer emphasis on a specific political situation.

There are also examples where the shortening of the first part allows the expression to be used as a generalizing framework: *And life goes on and the caravan goes on; Days pass, the caravan goes on*. In these cases, the phraseologism loses its original oppositional structure (barking vs movement), but the semantics of continuous development is preserved in a broader, philosophical sense.

Also interesting are incomplete variants retaining only the first component *the dogs are barking*, as in: *The dogs are barking, Tsvetanov is creating a Euro-Atlantic institute* or *The dogs are barking, the judicial support is disappearing*. Here, the missing second part is replaced by new content which plays the role of *caravan*, i.e. a steadily ongoing process. In this way, semantic updating is achieved through contextual addition, the expression is used as a model in which the missing component is replaced by a specific object of criticism.

PHRASEOLOGISMS WITH UPDATING THROUGH STRUCTURAL CHANGE

In public speech, the updating of a phraseologism through **a change in structure** indicates both its adaptation to different political, social and cultural contexts, as well as the need for its use in a specific situation.

In the example *The circus is full... the caravan is moving on... the dogs are barking... in the Russian Federation there are NO NGOs*, there is a fragmentation of the expression in several parts and supplementation with a specific context. Although the structure changes, the core semantics remain: criticism is powerless and processes continue. Thus, by changing the structure and vocabulary, the main core of the phraseologism is preserved, but a new contextual nuance is given – an ironic criticism of public reactions and their sterility.

In *The lumpen and judicial haters will continue to moan in the forums, but the caravan is moving on*, the substitution of the lexeme *dogs* with the phrase *lumpen and judicial haters* is striking and makes the expression socially marked and directed against a specific group.

In *Otherwise, the dog barks on the Internet ... the caravan of misery goes on and on ... and time passes and generations are crippled by misery and ignorance*, the phraseologism is expanded by adding *on the Internet* and *of misery*, which transforms the abstract metaphor into explicit social criticism, emphasizing the powerlessness of online protest and the persistence of social problems.

In some examples, *not* appears in the second part of the saying: *And the dogs are barking, despite this, the public transport is not running*. The insertion of the two free word combinations *the public transport* and *despite this* expand the structure of the phraseologism. Thus, the initial idea of movement despite criticism turns into stagnation.

In *BB is simply walking, and the dogs are barking (and analyzing)*, a change in order and the addition of clarifications are observed. The phraseologism is rearranged: first the *walking* of a political leader (Boyko Borisov) is emphasized, then is the reaction of the *dogs*. The insertion of *and analyzing* produces an ironic tone, emphasizing the meaningless speeches of political commentators.

Finally, a contextual rethinking is observed in *Maybe the dogs are barking in the forums – the caravan is moving*. The addition of *in the forums* concretizes the space of *barking*, its virtual environment. Thus, the expression acquires current social semantics, related to the powerlessness of internet discussions.

CONCLUSION

Across all three subgroups, a clear tendency towards updating is observed. The composition and semantics of phraseologisms reflect various extralinguistic factors related to social context, political evaluation, engagement in public life and the speaker's linguistic creativity.

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THE CONCEPTS OF INTEGRATED REGIONAL DEVELOPMENT AS A FACTOR OF DECENTRALISATION AND EFFECTIVENESS OF THE EUROPEAN STRUCTURAL FUNDS PROJECT MANAGEMENT

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ABSTRACT

This study examines the current status and challenges of the regional development process in the South East Planning Region of Bulgaria. An important priority of this process is the decentralisation of the Project Cycle Management, aimed at attracting investments and funding. The objective of the present analysis is to identify the results of the evaluation of the current Concepts of Integrated Territorial Investments (CITIs) and, based on this evaluation, to assess their impact on the decentralisation and effectiveness of European-Funded Project Cycle Management.

Key words: project cycle management, integrated territorial strategy, South East Planning Region, concepts of integrated regional development, decentralisation and effectiveness of European structural funds project management, prioritisation and assessment of project proposals

INTRODUCTION

During the 2021 – 2027 programming period of the European Union (EU), the absorption of EU structural funds in Bulgaria is based on an approach fundamentally different from the previous programming periods (2013 – 2017 and 2014 – 2020). The core of this approach is the Concepts for Integrated Territorial Investments (CITIs), developed by municipalities, district governors, NGOs, representatives of universities, local businesses, and other stakeholders, and funded by the EU Structural Funds and national sectoral programmes [1].

This prioritisation and assessment of the CITIs are based on a scoring evaluation of project proposals both by an appointed regional-level commission and by the Regional Council of the South East Planning Region, whose administrative centre is the city of Burgas [2]. This approach complies with the general principles of Project Cycle Management theory (Fig. 1) and includes the phases of programming (Integrated Territorial Strategy for Investments) [3], identification and formulation (design) by the applicants, and assessment of project proposals by the Regional Council for Development (RCD) [4].

As a result, the principle of active participation by local communities, business representatives, the non-governmental sector, trade unions, and universities in the planning and implementation of the project cycle for EU Structural Funds

absorption is largely realised. This constitutes a prerequisite for improved decentralisation and enhanced effectiveness of European and national funding. Key criteria for assessment and prioritisation include the compliance of individual CITIs with the Integrated Territorial Strategy of the South East Planning Region. Furthermore, the final evaluation of project proposals is carried out by the RCD. The communication process includes public presentation and discussion of prioritised CITIs with local communities through the official Regional Information Centres located in the regional centres, in due time [4].

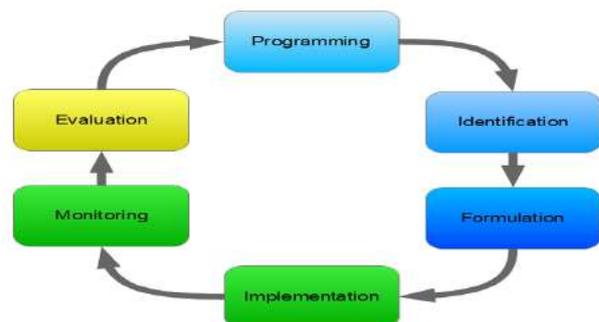


Fig. 1 Project Cycle Management Phases [5].

EXPOSITION

Regional scope of the Concepts for Integrated Territorial Investments

In the evaluation process of the Concepts for

Integrated Territorial Development (CITIs), five submitted concepts were considered, with applicants being the municipalities of Sliven, Kazanlak, Yambol, Karnobat, and Aitos. The distribution of the evaluated and planned for European funding CITIs by sector is shown in Table 1.

Table 1. Distribution of the evaluated and planned for European funding CITIs by sector

No	Sphere of impact of integrated territorial investments (measures)	CITI (number)	Relative share (%)
1	Healthcare	5	100
2	Social services, prevention of desegregation, promotion of employment	5	100
3	Culture	1	20
4	Education	5	100
5	Technical infrastructure and transport	1	20
6	Strengthening of landslides and riverbeds, ensuring conductivity and flood protection	2	40
7	Scientific research	3	60
8	Management of water resources, waste and circular systems	2	40
9	Energy efficiency measures and green urban infrastructure	3	60

A balanced distribution of the envisaged investments across administrative districts is observed as a prerequisite for reducing intra-regional disparities within the South East Region. However, the CITIs lack investment intentions for the other municipalities in the South East Planning Region, namely Galabovo, Opan, Chirpan, Maglizh, Pavel Banya, Bratya Daskalovi, Radnevo, Nikolaevo, Tvarditsa, Nova Zagora, Sungurlare, Nessebar, Ruen, Malko Tarnovo, Sozopol, Tsarevo, Primorsko, Tundzha, Straldzha, Elhovo, and Bolyarovo.

Typology of regional problems and potentials addressed by the presented CITIs

The following regional problems stand out in terms of their significance, prioritization, and frequency of identification:

1. Healthcare

A key sectoral priority of the EU Union Structural Funds and a significant national priority is

the improvement of the quality of healthcare. A need has been identified to ensure equal access for residents in remote areas to timely examinations, diagnostics, treatment, and consultations. Particular emphasis is placed on the acquisition of modern equipment for the prevention and early diagnosis of cardiovascular diseases, including next-generation imaging technologies based on artificial intelligence. These technologies are including next-generation imaging technologies based on artificial intelligence. These technologies are expected to improve the quality of cardiac, vascular, and electrophysiological procedures.

Despite the successful development of university education in medicine in the South East Planning Region, there is a serious shortage of qualified medical personnel. A large proportion of nurses are of retirement or pre-retirement age. There is an urgent need to improve the quality of education and training, enhance environmental awareness and health culture, modernise hospital equipment, support general practitioners, and introduce mobile medical offices. Despite the implementation of a number of successful projects, such as the supply of ventilators, equipment for the Complex Oncology Centre, and the construction of a Children's Hospital, access to modern health and social infrastructure remains limited, particularly in small settlements.

2. Social sphere

In the social sphere, the analysis identifies the following major challenges:

- Significant intra-regional demographic, social, economic and territorial imbalances
- Continuous population decline with strongly, especially in the southern parts of the region and in small towns and villages
- The need to ensure sustainability of results achieved through previously EU-funded social projects
- The need to promote inclusive and quality education, particularly for vulnerable groups
- Self-isolation of minority communities, widespread illiteracy, insufficient language proficiency, and incomplete primary or secondary education
- Marginalised communities with low economic activity and limited labour market integration

There are families that cannot cope with their daily responsibilities, particularly those with children with disabilities.

Most regions in Bulgaria are characterized by unfavourable demographic indicators, with aging

workforce and declining labour supply amid rapidly changing labour market requirements, all of which in combination with insufficient supply of integrated community-based services as an alternative to institutional care.

3. *Education and science*

The study highlights the need to establish a branch of a medical university in the city of Kazanlak in order to create a sustainable environment that supports social integration, equal access, and improved quality of life. There is also a need to increase the attractiveness and expand dual education models that familiarise students with real working conditions and technological processes in local enterprises. Such activities will improve their knowledge and skills in line with the requirements of the labour market, enhance their motivation and support informed choices for career development and adaptation of education to the needs and potential of the region.

The analysis of the existing scientific institutes and laboratories in the region reveals the need for modern research infrastructure in the field of plant breeding, which is currently limited due to the lack of modern equipment. The provision of tangible and intangible assets is key to the development of varieties and hybrid plants, which is an important pillar of the national scientific priorities in this area. In this context, research activities, the transfer of knowledge and innovation to agricultural practice, increasing the technological level of research institutes and the scientific capacity in the field of sustainable and climate-adapted agriculture are key objects of funding in the South East planning region.

Additionally, insufficient modernisation of laboratories affects research testing and support for children and students from vulnerable groups as a prerequisite for increasing their social prospects. Moreover, there are no conditions for the implementation of the European Child Guarantee to ensure quality early childhood education and care, inclusive education, and school activities.

The educational environment should increasingly stimulate scientific potential, green and energy-efficient solutions, and climate risks prevention, contributing to a healthier learning environment with a reduced risk of chronic and social diseases and more inclusive learning conditions.

4. *Business*

The evaluation process identifies an urgent need for active support for entrepreneurship among vulnerable groups, reduction of production costs, increased competitiveness, and develop-

ment of sustainable and ecological business models. There is insufficient application of technological solutions for reuse, recycling, and waste minimisation, as well as limited integration of energy and resource efficiency systems in the context of circular economy.

- Insufficient resource efficiency of small and medium-sized enterprises, as part of the territorial approach to sustainable economic development, based on circular economy and resource efficiency, with a focus on extending the life cycle of products through design for durability, reuse and optimization of processes, as well as support for partnerships between enterprises to achieve industrial symbiosis: sharing resources, services, secondary products, developing a connection between productions, where the waste from one becomes a raw material for the other

- An urgent need to create employment opportunities outside agriculture and forestry for a significant part of the municipalities in the region, particularly the remote ones

- The need for modern solutions to limit production waste, introduce green technologies and increase resource efficiency, meeting the need of local businesses to adapt to climate change and new market requirements

5. *Environment and air quality*

The increasingly tangible climate changes increasingly necessitate regional planning aligned with the specific environmental characteristics and problems of each region, district or municipality. Communities are strongly aware of the need for measures to reduce the vulnerability of the region to climate change and improve the capacity to adapt natural, social and economic systems to the inevitable and increasingly intense climate impacts. It is necessary to develop joint policies, protocols, procedures, projects, and approaches for risk prevention and rapid response to potential emergencies, especially related to the risk of flooding in urbanised and non-urbanised territories.

The focus of the analysts is environmental sustainability and prevention of floods and natural risks that threaten the life and property of the population, as well as the prevention of floods in urbanized sections of rivers. There is an urgent need for digital transformation and the introduction of innovative technological solutions, implemented in partnership with higher educational institutions, and the provision of means and tools for more effective management and monitoring, which can be used for both educational and social

purposes as well for environmental control. The study highlights a series of disaster situations, mainly related to the development of powerful convective storms, which have caused serious damage in the region. A consequence of these processes is the increased frequency of floods. Within the South East Development Region, a number of areas with significant potential flood risk (RPFR) have been identified according to the PUR of the Black Sea and East Aegean regions. Ecological restoration of high-risk territories and building capacity for innovation requires complementarity and multiplication of results between the regional, municipal, and partnership levels of territorial planning. At the same time, an environmentally friendly approach to river basin management will contribute to biodiversity protection and sustainable use of natural resources.

6. *Improving energy efficiency*

One of the imperatives of regional development at the national and regional levels is the increase of energy efficiency of multi-family residential and public buildings. A significant portion of the housing stock and public buildings exhibits low energy efficiency.

7. *Sports*

In the field of sports, there is a shortage of sports facilities and infrastructure promoting active lifestyles, which directly affects public health and social well-being of the population in the region.

Impact areas of the investments envisaged in the assessed CITIs

In view of the above, a relatively even distribution of investment intentions by sectors of impact of EU funds is observed. The main focus of investment intentions is on the following sectors: Education, Healthcare, Social Services, Energy Efficiency Measures and Green Urban Infrastructure, and Scientific Research. A significant change in investment intentions by sector compared to the CITIs is evident.

Sources of financing of the measures

As sources of financing for the CITI that have undergone an assessment for ASD and prioritisation, operational programmes financed by EU funds, applicants' own funds, and the Fund of Funds are indicated. The main sources of financing for the assessed CITIs include: Regional Development Program 2021-2027, with a declared resource of 150 million BGN; Environment Program 2021-2027, with 26.5 million BGN; Human Resources Development Program 2021-2027,

with 3.6 million BGN; and Education Program 2021-2027, with 4 million BGN. The relative share of the CITIs provided for financing from the RDP 2021-2027, HRD 2021-2027 and OP 2021-2027 is 100% [3].

Contribution to the implementation of the Integrated Territorial Strategy

The contribution of the CITIs to the measures and activities envisaged in the priorities and objectives of the Integrated Territorial Strategy for the Development of the South East Region are shown in Table 2.

Table 2. Contribution of CITIs to implementation of regional ITSI [6]

Strategic priority of ITSI	Measures in the CITI with an intended contribution to achievement of the named priorities (number)	Relative share (%)
Strategic priority 1: Support for a sustainable and smart economy of the SEE 9	9	27
Strategic priority 2: Improving the educational level of the population and the quality of life in the SEE	20	61
Strategic priority 3: Territorial cohesion and integrated development of urban, rural and coastal areas	4	12

A significant part of the measures envisaged in the CITIs (20, i.e. 61% of the total number) correspond to and will contribute to the implementation of Strategic priority 2: Improving the educational level of the population and the quality of life in the SEE.

The second largest share (27%) contributes to Strategic priority 1: Support for a sustainable and smart economy of the SEE with 9 measures.

The identification of regional problems on local and regional levels creates condition for a problem-orientated regional strategies and improved absorption of EU and national funding.

CONCLUSION

In the context of what has been said, it can be summed up that healthcare, social services, education and science, business development, environmental sustainability, and quality of atmospheric air are increasingly recognised by local stakeholders as priority sectors for regional development.

Within the framework of decentralised Project Cycle Management of European funding, these sectors are identified as key to achieving optimal value for investments for local communities in the South East Planning Region of Bulgaria. These findings may serve as an important reference point for the next phase of CITI proposals.

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THE CONTEMPORARY GLOBAL CONFRONTATION OF NATIONAL AND COMMUNITY FOREIGN TRADE POLICIES AND THE STRATEGIES OF BULGARIAN BUSINESS

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ABSTRACT

This paper aims to identify and develop sustainable business models, approaches, and corporative policies for Bulgarian exporters in the context of contemporary global business challenges. The research examines the origin and effects of the current shaping the global confrontation of foreign trade policies, characterised by turbulence and increasing systemic entropy.

Key words: *sustainable business models, challenges of global turbulent business environment, problem-orientated competitive reaction of Bulgarian companies*

INTRODUCTION

The first half of 2025 was marked by unprecedented turbulent changes in the foreign economic policies of countries and integration communities, unmatched since the late twentieth century. These changes were dominated by tariff and non-tariff measures, the disregard of agreements, such as those within the framework of the World Trade Organization, and extra-systemic negotiating behaviour.

Within the framework of the American administration that took office in 2025, over 50 announced increases, decreases, escalations and pauses in the operation of tariffs across different geographical regions were observed. As a result, significant fluctuations occurred on commodity and stock exchanges, along with sharp short- and medium-term shifts in international market conditions changes in the conjuncture of international markets. In certain short time intervals, these fluctuations reached double-digit percentage differences.

Market volatility and unpredictability increased considerably. Companies of all sizes, as well as countries and integration communities, were placed in a difficult position, facing global risks, limited alternatives, declining sales, and shrinking profit margins. This situation, marked by features of entropy, affects bilateral, multilateral, and global economic relations alike.

EXPOSITION

1. Global business trends and challenges

Transnational corporations such as General Motors and Stellantis recorded significant losses

in the first half of 2025, measured at over \$1 billion. The German automotive industry is among the most affected: BMW forecasts a 30% decline in profits, Mercedes-Benz around 50%, and Porsche up to 75%. Italian car and machinery manufacturers, as well as French chemical exports, are also expected to face serious challenges. Tariffs are largely borne by exporters, who are forced to reduce their margins in order to maintain their market positions. American protectionism is particularly visible in the automotive sector. This has led to a restructuring of global market supplier networks in a number of sectors, such as automotive components, food products, liquefied natural gas, microchips, furniture, etc.

The causes of this transformation in international economic relations lie in the simultaneous and interconnected impact of political, economic, and military factors, including:

- Political and military conflicts in Eastern Europe, the Middle East, and North Africa;
- Rapid development of the role of AI and ICT;
- Rising prices of precious, non-ferrous and rare-earth metals;
- An increase in the average effective tariff on American imports to Europe from 2.5% to 15%;
- The risk that customs conflicts may expand to trade in services and energy, particularly given Europe's dependence on liquefied natural gas imports from the United States.

Some of these factors indicate a potential change in the international economic order established at the end of the twentieth and beginning of

the twenty-first century, accompanied by nonlinear development of the global business environment.

As a result, signs of a cooling of the global economy have emerged. According to forecasts by the International Monetary Fund (IMF), global economic growth is expected to slow to 3.2% in 2025 and 3.1% in 2026, which is below earlier forecasts of around 3.7%. The main reasons for the weaker dynamics include high tariffs, geopolitical uncertainty, and accumulated public debt in many advanced economies.

The IMF identifies four main threats:

- A new round of tariffs which could reduce global GDP by an additional 0.3% next year;
- Fiscal vulnerability due to insufficient consolidation and risk increasing debt service costs;
- Political pressure on central banks undermining monetary policy credibility;
- Volatile inflation driven by climate shocks and geopolitical conflicts.

The report, prepared in partnership with Zurich Insurance Group and Marsh McLennan and presented at the World Economic Forum in Davos, warns that cooperation on pressing global issues may be insufficient and requires new approaches and solutions. Based on the views of over 1,400 global risk experts, policymakers, and industry leaders surveyed in September 2023, it highlights a predominantly negative short-term outlook for the world that may worsen over the long term. While 30% of global experts expect an increased chance of global catastrophes in the next two years, almost two-thirds expect them to happen over the next 10 years [1].

2. Possible measures in response to global trade and tariff challenges

2.1. Policies at the global level

In response to tariff changes, the United States negotiated bilateral trade agreements with the European Union, Japan, and South Korea, introducing ad valorem import duties of 15%. Markets reacted positively to the EU-US agreement which puts an end to uncertainty and provided a basis for possible future negotiations about the return to free trade, involving the EU, the US, and China.

At the same time, global free trade negotiations have accelerated, which has led to an unprecedented pace of alliances between partners trying to compensate for the loss of exports to the US. For example, MERCOSUR reached a free trade agreement with the European Free Trade Association and resumed negotiations with Canada in an attempt to diversify its trade and economic

relations, which were blocked in 2021. It is symptomatic that countries such as India and France, which were previously reluctant to open their markets, have softened their resistance to the EU-MERCOSUR agreement. It is believed that the new trade agreements will partially compensate for losses in trade with the more protectionist USA.

As for US monetary policy, it should be noted that the Federal Reserve's key interest rate of 2.25% remains relatively high and, if reduced by the country's administration, could stimulate the US economy over a 24 – 36 month time horizon [2].

Furthermore, the US focus on deregulation, open economic models, and the integration of artificial intelligence in education requires new approaches and an adequate response from the European Union and other economic communities.

2.2. Organizational response at the Community level

Trade between the EU and the US has been significantly affected. According to analyses by the German Central Bank, the new US tariffs may have an insignificant impact on Eurozone inflation. In addition, the European Central Bank also possesses instruments to counteract negative developments, such as higher basic interest rates. The Bruegel think tank estimates that increased US tariffs may lead to a 0.2–0.3% annual decrease in EU GDP, while some other forecasts predict a decline of up to 0.5%. As far as investments are concerned, the uncertainty of the business environment will be a relevant factor [3].

An adequate response could include a stimulation of the internal demand within the EU Single market. This is obviously one of the objectives of the new EU budget, amounting to EUR 2 trillion. Some analysts argue that reduced regulatory burdens could also support competitiveness.

Some local producers would try to sell on the EU instead of the US market and this could lead to 30 – 40% decrease of turnover.

European and US companies remain deeply interconnected through global value chains. For example, vehicles produced by BMW in the US are exported globally, illustrating the integration of transatlantic production networks.

At the same time, companies must adapt supply chains to geopolitical tensions, climate change, and cyber threats from a growing number of malicious actors. This requires enhanced cooperation at national and community level, as well as a better partnership between public and corporate sectors.

2.3. Corporate-level approaches

According to Nicolai Tangen, CEO of Norges Bank Investment Management, which manages Norway's USD 1.8 trillion sovereign wealth fund, there is no way to stop the storm that increased tariffs have caused. The fund cannot really hedge fully against that scenario and their adopted strategy is long-term diversification and composure rather than reactive adjustments. About half of this fund is invested in US stocks and bonds, and with USA new tariffs, the fund could lose more than a third of its value. The fund has opted to keep its stocks exactly where they are instead of trying to fight against what it believes is inevitable [4]. The fund management is willing to wait out a trade war, even if it means a possible loss of USD 600 billion.

IKEA, the world leader in furniture retail, plans to increase its US-based production in response to new tariffs on furniture and wood products. Currently, only about 15% of the items sold in the US are produced locally, compared with 75% in Europe and 80% in Asia.

In parallel with its investments in the USA, IKEA is also expanding its presence in Latin America with stores in Costa Rica and Panama, as well as new locations in Manhattan and other US cities. The company is also experimenting with smaller formats such as Lada, more accessible stores in existing shopping areas that promise a delivery within 24-48 hours. The management intends to continue to expand their presence in both the USA and Canada, ensuring sustainable access to materials and production. "This is a long-term process", said IKEA CEO Jon Abrahamson Ring. He pointed out that the company has not yet raised prices in the US market despite the higher tariffs, but did not rule out that this could happen in the future. IKEA, which produces about 1% of global industrial production, has already announced investments of USD 2.2 billion in new stores and manufacturing facilities in North America. Its main goal is to increase local production and reduce dependence on imports, especially from Asia, which is affected by higher tariffs [5].

In view of these challenges, other market leaders are reorienting towards the development of their own internal divisions for the production and subcontracting of key components. A significant wave of mergers and acquisitions is also observed, particularly in the IT sector.

2.4. Approaches and measures at the national level

In the context described above, the business and the government in Bulgaria are looking for

appropriate organizational responses in order to maintain the competitiveness of enterprises, especially the export-oriented ones. In 2024, Bulgarian exports amounted to BGN 86,689.1 million, representing a 0.2% decrease compared to 2023. Imports (CIF prices) totalled BGN 99,553.6 million, a 2.6% increase [6]. Fig. 1 presents the nominal change in the value of Bulgarian exports during the period 2023 – 2024 (compared to the same month of the previous year).

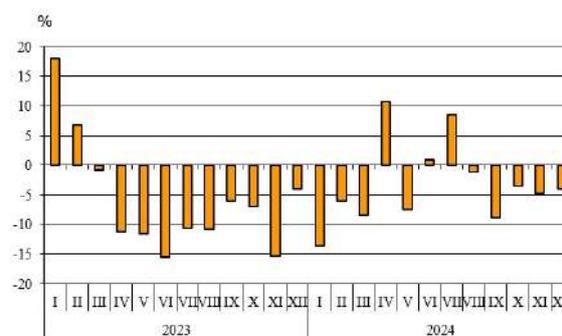


Fig. 1. Nominal change in the value of Bulgarian exports during the period 2023 – 2024 [7].

Bulgaria remains highly dependent on foreign markets and is vulnerable to possible significant disruptions in international supply chains. Regarding the indirect effect of the tariff increase, a negative impact is expected on the growth of Bulgarian industry, particularly sectors integrated into European supply chains that deliver directly to the US, such as automotive components, mechanical engineering, electronics, and electrical engineering. This would affect the incomes of Bulgarian company employees, which would affect the demand on the domestic market, and is a prerequisite for increased severe competitive.

With a view to the development of bilateral trade and economic cooperation between Bulgaria and the United States, government negotiations with US representatives have identified potential areas of mutual interest, including energy (especially nuclear), infrastructure, artificial intelligence, data centres and defence technologies.

According to the American Chamber of Commerce in Bulgaria, revenues of American companies operating in Bulgaria reached BGN 10.5 billion in 2021, compared to 7 billion five years earlier. The number of employees was over 40,000 compared to 28,000 in the previous analysis. The data show that investments are mostly in the processing industry, the production of basic food and agricultural products, the furniture sector, and

other household appliances, with a serious presence in electronics and mechanical engineering. Companies in the field of professional and business services, including medical research, have also been registered.

Data show that the percentage of Bulgaria's exports to the US is low, around 2.4% of total exports, or USD 2 billion. There is evidence that certain sectors, such as the export of refined copper, benefit from relatively low customs duties, supporting competitiveness [8]. Faced with these challenges, the central institutions and the corporate sector in our country are forming both an operational and strategic organizational response with a view to maintaining competitiveness at the corporate and national level.

CONCLUSION

A number of real and potential approaches and practices of organizational behaviour could be identified for implementing effective policies in a turbulent global environment. In view of the inertial nature and relatively stable homeostasis of business organizations and the relations between them, such actions must be long-term rather than palliative, and be based on problem-oriented strategies with a horizon of five years or more. The following priorities may be identified:

- Diversification of trade partners and more secure supply chains;
- Accelerated absorption of funds under the National Recovery and Resilience Plan by public institutions, ministries and municipalities, given the approaching deadline for eligibility of expenses;
- More effective utilisation of EU Structural Funds;
- Investment in green energy transformation and renewable energy;

- Support for battery production and renewable technologies;
- Implementation of circular economy principles as a prerequisite for achieving sustainable competitive advantages;
- Active participation in the expanding market for AI applications;
- Opportunities for smaller companies and with smaller capitalization oriented towards domestic markets, in view of their higher attractiveness for investors in the current conditions;
- Leveraging opportunities arising from expected Eurozone accession and increased lending capacity as a result of the release of EUR 7.5 billion from the minimum reserve requirement, as the rate will decrease from 12% to 1%.

These measures could support the resilience and competitiveness of Bulgarian enterprises in the evolving global trade environment.

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CONTEMPORARY EDUCATIONAL APPROACHES AND PEDAGOGICAL PRACTICES

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ABSTRACT

The demands of modern educational practice are the result of rapid changes and challenges which reshape the model of the learning process. Technological developments in contemporary life, socio-cultural changes and the needs emerging from the globalized knowledge society require the redefinition and re-evaluation of pedagogical approaches. In addition to essential technical improvements, transformations are also required that affect the nature of learning, the role of the teacher and student participation.

The new educational framework must include digital technologies that enhance the possibilities for personalized learning, interactivity and access to knowledge. At the same time, the interdisciplinary approach to knowledge, as reflected in the philosophy of STEAM (Science, Technology, Engineering, Arts, and Mathematics), promotes creative thinking and connects theory with practice. Based on these principles, the educational process acquires content, methodology and pedagogical objectives.

Particular attention is given to the importance of inclusion, both in terms of social acceptance of diversity and in adapting teaching to meet the needs of all students, regardless of ability, origin or cultural background. The principle of sustainability also constitutes an important stimulus, encouraging the school community to develop attitudes and skills that promote responsibility towards the environment, society and future generations.

This article identifies and analyzes the impacts of the above transformations on teaching methodologies and student participation. Through indicative examples and innovative practices, proposals are presented that can contribute positively to the educational process, promoting learning engagement, creativity and adaptability of the subjects in the school environment.

Key words: *contemporary education, pedagogical practices, digital technologies, STEAM, inclusion and integration, education for sustainability, innovative teaching methods*

INTRODUCTION

Modern education is undergoing a series of rapid changes that are increasingly misaligned with traditional forms of teaching. More specifically, conventional approaches are characterized as anachronistic and are challenged by the demands of new technologies and digital tools. At the same time, the need for an inclusive and holistic educational approach creates additional demands for both teachers and students.

According to the research *A Collaborative Learning Framework for Computational Thinking* (2022), computers are described as “vehicles of powerful ideas”, leading to a cultural transformation that goes beyond the simple learning of commands [1]. Digital technologies not only offer easy access to knowledge, but also promote personalized learning and collaborative action in educational environments that depart from the traditional model. Each state should adopt digital

learning not as an end in itself, but as a means to improve both learning outcomes and teachers’ professional training [2].

Inclusion and sustainability in the educational process also require particular attention, as they play a decisive role in embracing diversity and dynamically integrating every student. Digital inclusion (“e-inclusion”) has matured and is recognized as an essential element in supporting students with special educational needs, enhancing holistic, right-centred and integrative learning [3]. Based on Papert’s theory, STEAM contributes to interdisciplinary thinking, creativity and the connection between theory and practice through trial and error [3].

This article records the impacts of these changes on teaching practice and student participation. By drawing upon a set of modern examples and innovative methods, it seeks to document effective strategies that enhance learning engage-

ment, encourage collaboration and prepare learners for the challenges of a rapidly changing, digital and sustainable world.

DIGITAL TRANSFORMATION AND EDUCATIONAL INNOVATION

The digital evolution of society has generated a series of major transformations in the educational environment, with technology shaping new pedagogical practices, methods and learning relationships. A typical example of school digitalization is the COVID-19 pandemic, which reshaped not only the form of teaching but also the roles of teachers and students [4, 5].

The change from traditional, teacher-centred teaching methods to more flexible and participatory formats was not a simple matter, as it required technological tools that recognize differentiated instruction, personalized learning and continuous feedback [2]. For example, Learning Management Systems (LMS), educational games, augmented reality (AR) and interactive collaboration tools such as Padlet, Mentimeter, and Jamboard have offered completely different learning experiences tailored to student's interests, needs and learning profiles.

Information and Communication Technologies (ICT) are not merely technical tools supporting the educational process; they redefine knowledge by making it multimodal and dynamic, emphasizing collaboration, creativity and participatory learning [6]. As a result, the development of digital skills is considered essential both for professional integration and for the participation of young people in the knowledge and innovation society [7].

The theory of active learning promotes student participation, preventing learners from becoming passive recipients of knowledge. The aim is to build a framework of knowledge through experiential, experiential and collaborative activities [8]. When used pedagogically, technology enhances this type of learning and helps students create content, overcome problems, collaborate remotely and engage in authentic learning experiences [9].

Subsequently, educational innovation fosters a dynamic learning environment based on flexibility, multimodality and interdisciplinarity. In this way, students can develop their cognitive, social and digital competences [10]. Innovation, however, is not limited to the use of new tools, but requires a change in the entire teaching culture, so as to emphasize learning engagement, self-regulation and problem-solving in meaningful contexts.

It is therefore clear that the teacher becomes the facilitator, coordinator and designer of learning experiences. By taking advantage of new technological developments, teachers are called upon to develop digital pedagogical competence and flexibility in students, since the integration of technology is not based only on the necessary equipment, but also on pedagogical motivation and a willingness to experiment and collaborate [4].

INCLUSION IN THE DIGITAL AGE: CHALLENGES AND PROSPECTS

The digital age has introduced new opportunities and challenges concerning the inclusion of all learners. Digital inclusion (e-inclusion) refers to equal access of all individuals to ICT, regardless of gender, age, disability, nationality or socio-economic status [11]. E-inclusion is considered essential for maintaining educational equality in the era of digital knowledge.

Modern technological tools increasingly support students with Special Educational Needs (SEN), opening new fields for development and innovation. The use of specialized software for reading and writing, customized interfaces, augmented reality applications and alternative communication (AAC) systems is offered to all students, promoting their autonomy [12]. It is important to note that accessibility technologies do not replace pedagogy, but strengthen it by adapting teaching to individual needs in line with the principles of Universal Design for Learning (UDL) [13].

Furthermore, the role of technology in promoting educational equity and sustainability can be characterized as two-fold. More specifically, it includes a series of valuable tools that facilitate personalized learning, collaboration and participation, addressing barriers for marginalized students [5]. However, unequal access to equipment, internet connectivity and digital skills often intensifies existing social inequalities, a phenomenon known as the "digital divide" [14]. A typical example is the COVID-19 pandemic that unexpectedly entered people's lives and dramatically demonstrated the urgency of systematic interventions to ensure digital justice, as many students worldwide were excluded from the educational process due to lack of infrastructure. To this end, technology should function as a lever for inclusion, adopting coherent digital equality policies and training teachers in digital pedagogy and accessibility. Es-

pecially in the context of sustainability, technology plays an important role in reducing educational poverty through the use of open learning resources, distance learning and shared learning platforms [15].

In conclusion, the transition to truly inclusive digital education is neither an easy goal nor self-evident. With the right social, political and educational reforms, however, technology can be the most important means of shaping a fair and democratic learning community. The challenge to achieving this lies in ensuring that digital transition addresses everyone and no one is left behind. In this way, an educational future is supported where access to knowledge is universal, qualitative and meaningful for all

STEAM AS A HOLISTIC TEACHING APPROACH

The STEAM (Science, Technology, Engineering, Arts, and Mathematics) didactic approach is an innovative 21st century educational method that links scientific and technological knowledge with creativity and artistic expression. It moves beyond the monothematic nature of traditional teaching and adopts an interdisciplinary approach to solving each problem, connecting theory with practice and promoting experiential learning [16].

The pedagogical nature of STEAM is strongly influenced by Seymour Papert's constructivist theory, which emphasises active, creative learning. According to Papert (1980: 165-169), learning has greater substance when students "do something real," such as building a robot or creating a digital story. For example, educational robotics is a prime application of constructionism within the context of STEAM pedagogy, as it integrates engineering, programming and creativity.

The interdisciplinary nature of STEAM fosters holistic student development by promoting combinatorial thinking, communication between cognitive subjects and the ability to deal with complex problems. In addition, the integration of Art (Arts) cultivates imagination, aesthetic perception and expression, helping students develop a multifaceted intelligence with a deeper understanding of the real world [17].

A number of programs have been written for the practical application of STEAM in education. For example, in primary schools in Greece, programs such as the construction of smart city models with Arduino, the creation of digital stories using Scratch and sound, or the design of sustainable structures with recyclable materials with a focus

on environmental education are implemented. The above activities enhance autonomy, collaboration and innovation [18].

A special mention should be made of the development of STEM/STEAM centres in schools using tools such as 3D printers, microcontroller systems (e.g. Micro: bit, Raspberry Pi) and creative thinking platforms (e.g. Tinkercad, Makey Makey). Overall, a student-centred environment is formed that supports digital and metacognitive skills.

In any case, successful implementation of STEAM requires teacher training, curriculum redesign and appropriate infrastructure. STEAM includes cross-curricular activities, but in reality, it is a new philosophy of learning aimed at cultivating creative, responsible and active citizens for the 21st century.

METHODOLOGY

This study adopts a bibliographical approach, analyzing contemporary pedagogical theories to explore the trends and challenges of digital transformation in education. More specifically, reference is made to the integration of innovative methods such as project-based learning, the use of Artificial Intelligence (AI) in the teaching process, as well as methods for developing metacognitive skills, in the light of educational inclusion and differentiated teaching.

Project-based learning emphasizes the exploration of authentic problems, promoting collaborative and active learning, while fostering student autonomy and critical thinking [19]. As a result, students assume the roles of researchers and creators, aiming to solve problems and draw conclusions through experiential activities. The aim is not to simply transmit knowledge, but to create a student-centred learning environment, where teachers act as facilitators and guides.

Artificial Intelligence introduces adaptive learning environments, intelligent assessment systems and educational chatbots. Thus, personalization of teaching is enhanced and dynamic feedback is provided to students [20]. When AI users are pedagogically motivated, they benefit from its ability to support the development of self-regulation and metacognition skills, while at the same time enhancing the possibility of differentiated intervention depending on the needs of each student. However, there have also been significant ethical and pedagogical issues related to excessive dependence on technology and the role of the teacher in the digital transformation.

Furthermore, in the present study, students are encouraged to reconsider the way they learn and recognize the development of metacognitive skills. In other words, they learn to plan their learning path, evaluate their progress and take an active role in the educational process [21]. The promotion of metacognition is a modern theory that supports active learning that is reinforced through strategies such as diaries, portfolios, self-assessment and the use of reflection tools such as concept maps.

Subsequently, STEAM approaches equally support active participation and activate different learning profiles, through interdisciplinary and multimodal learning scenarios. As a result, there is accessible, attractive and meaningful learning for all students, regardless of their social, linguistic or cognitive profiles.

Finally, didactic differentiation is fundamental for educational innovation, especially in the context of inclusive education. This strategy aims to adapt the content, process, product and learning environment, following the interests, needs and capabilities of students [22]. Through flexible learning scenarios, teachers can use digital and non-digital tools to create appropriate conditions for active participation and collaboration. The personalization of learning, when combined with the principles of pedagogical differentiation, reduces inequalities and contributes to learning inclusion. Overall, the methodological approach of this study aims to theoretically document the above innovative practices, in order to record their pedagogical benefits, their practical application and what the teacher is called to overcome in order to achieve their implementation.

RESULTS AND DISCUSSION

Innovative teaching strategies and new technological tools contribute to enhancing student participation, revising the educational processes of yesterday and creating more attractive and engaging learning environments. Through active learning and the use of digital and interdisciplinary methods, skills such as self-regulation, collaboration, creative problem-solving and critical thinking are strengthened [23]. Modern pedagogical approaches emphasize the differentiation of teaching, facilitating teachers to be flexible in terms of the individual needs of each student, offering equal access to knowledge. In this way, educational justice based on student inclusion and development by respecting individual learning paces and capabilities is promoted. At the same time, it is necessary to integrate empathy into the

educational environment through discussions and the cultivation of a more general positive climate to enhance emotional intelligence.

According to UNESCO [5], technology oriented towards the social dimension of learning creates essential life skills and results in lifelong learning, which is an essential resource in an era of rapid changes. Based on the new data and demands of society, schools must evolve into dynamic environments that promote adaptability, innovation and social responsibility.

Therefore, the continuous development of pedagogical practices and the adoption of digital and inclusive tools are essential to address the challenges of modern education. The evolution of teachers and the strengthening of their digital and pedagogical competence are the means for the success of the above transformations.

CONCLUSIONS

The integration of modern technological practices into education is becoming an imperative, as it is the only way to enrich the learning experience. However, the successful implementation of these innovations requires teacher training and institutional support, so that teachers can effectively make use of ICT, artificial intelligence and interdisciplinary approaches, such as STEAM.

For the success of the above practices, educational policy must encourage pedagogical experimentation, professional development and resource provision. Institutional flexibility is important for schools to respond to the constantly changing social and technological conditions and for strengthening teacher autonomy.

At the same time, teachers must be supported through professional networks, mentors and communities of practice to ensure long-term successful innovation. Teachers must become the front runners of change in the schools by demonstrating professionalism and striving for a culture of collaboration and reflection.

In conclusion, technological and pedagogical innovation in education depends significantly on teachers themselves. Targeted training, institutional backing and the continuous professional growth are fundamental to achieving a fair, flexible and effective educational system capable of meeting the demands of the 21st century.

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DESCRIPTION OF THE RELATIONSHIPS BETWEEN HUMAN CAPITAL STRATEGY AND OTHER FUNCTIONAL STRATEGIES

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ABSTRACT

This article describes the mutual influence that exists between the human capital strategy and the other functional strategies developed on the basis of the corporate strategy. These interrelationships are graphically presented and their essence is explained. The specifics of the financial, production, marketing and innovation strategies is successively examined. The human capital strategy is presented as building on the human resources management strategy. The mutual influence that exists between the functional strategies and the human capital strategy in pursuing the implementation of the corporate strategy and the goals set therein is described in depth.

Keywords: *human capital, functional strategies, corporate strategy, influence*

INTRODUCTION

Business organizations function by transforming/processing incoming material flows (raw materials and supplies) into a final product and/or service, through the use of energy, technology, knowledge and labour. The sale of the produced products and/or services generates incoming cash flows, which serve to cover operating expenses and contribute to the formation of the company's profit. In this way, on the one hand, the reproduction of company resources and continuity of the incoming material flow are ensured, and from there, other things being equal, the production process itself, and on the other hand, the fulfilment of the main goal – profit.

In order to function the process chain, organizations raise financial resources in the form of their own and/or attracted (long-term and short-term) capital. Subsequently, the accumulated funds are invested in the acquisition of assets – current and non-current, which will ensure the production and/or supply of the relevant product/service, as well as all activities related to its provision on the market. The performance of each of these specific functions (raising capital, investing it in assets, organizing and running the production process, supplying incoming raw materials and materials, distributing finished products, etc.) cannot be achieved without the presence of workers with specific competences and motivation. In other words, a qualified workforce is a key component supporting the implementation of both operational and strategic activities, as well as the

achievement of the strategic goal of each organization.

The purpose of this article is to present the mutual influence and nature of the relationships that exist between the corporate strategy and the functional strategies resulting from it and the human capital development strategy.

EXPOSITION

A number of authors have studied the relationship between the strategy and the main business objective of the organization and the resulting financial, production, marketing, innovation and, last but not least, human resource management strategy aligned with the strategic priority of expanding human capital [1]. According to Wright and McMahan [2], the application of methods for effective human resource management leads to an increase in the experience, skills and behaviour of workers, which contributes to the achievement and maintenance of a competitive advantage of the organization and, other things being equal, has a positive impact on the achievement of the company goals. At the same time, Kong and Thomson [3] distinguish operational from strategic personnel management activities, indicating that human capital (HC), which is part of intellectual capital in modern organizations, should guide the implementation of the activities set in the human capital management strategy. From this perspective, human capital management strategy is directly integrated into the overall company strategy and leads to decisions-making related to investments in

training and development of personnel, ensuring continuity in the organization and policies for building and retaining talents. The human resource management strategy is complementary: it provides the tools and implementation of the operational processes set out in the human capital development strategy. At the same time, there is a connection between the different functional strategies within the overall company strategy, which is shown in Fig. 1. The successful implementation of the financial, marketing, production and innovation strategies for creating a value proposition to the customer must be supported and provided

with the necessary quality and quantity of labour based on the human capital development strategy [4]. At the same time, according to Lepak and Snell [5] different business strategies require specific investments in the formation of human capital. In their study, Roodposhti, Chirani and Bargkar [6] emphasize the positive aspects of considering investments in human capital formation not as an expense, but as an asset, contributing to the sustainable development of the corporate environment and in particular maintaining financial discipline in organizations.

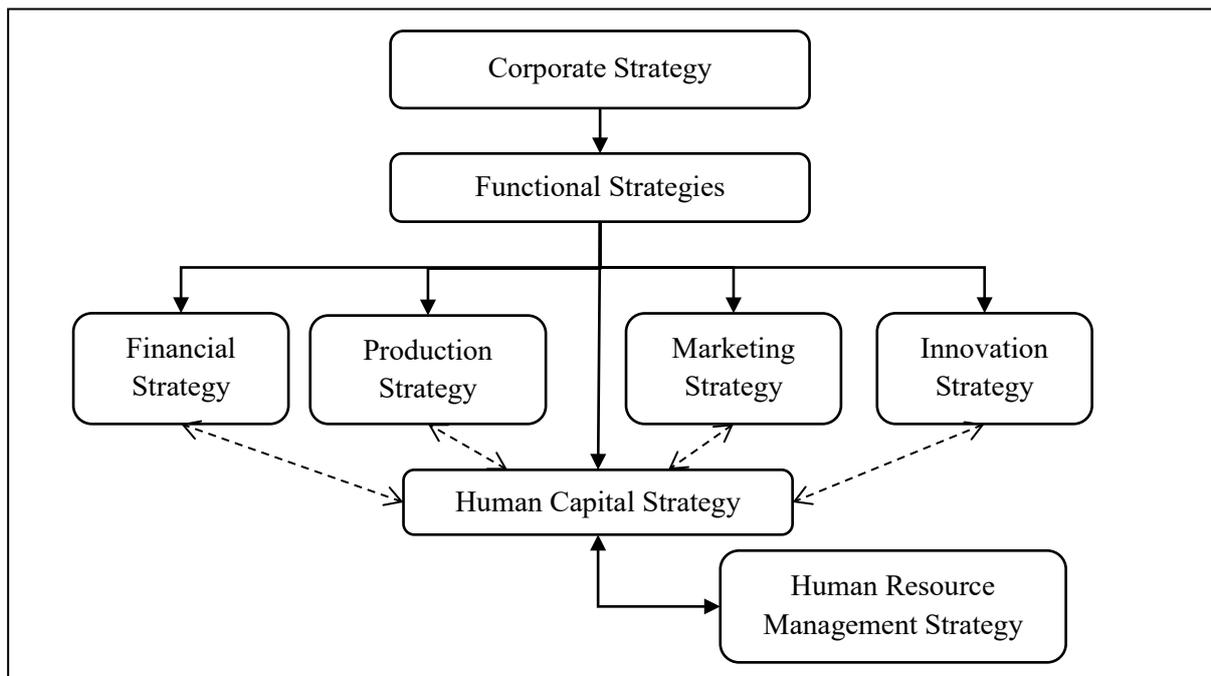


Fig. 1. Relationships between corporate and human capital strategy

Human Capital and Financial Strategy

In order to trace the relationship between the human capital development strategy and the financial strategy, it is necessary to consider the elements that make up the latter and which are attributed as functions of the financial manager and the financial and accounting department as a whole. These elements can be presented as follows:

- ✓ Financial planning – determination of short-term and long-term financial goals, as well as the volume, structure and forms of management and control of the necessary funds to ensure the implementation of the financial strategy set by the management. It is a derivative of the overall company strategy. Moreover, in the context of the challenges arising from Industry 4.0, a holistic ap-

proach to coordination between financial goals and human capital development is necessary [7].

- ✓ Capital raising – generally related to determining the sources (own and/or borrowed funds), methods (credit, issuance of securities, leasing, etc.) and forms (current or non-current) of raising capital. The specific issues for which optimal solutions are sought are related to determining: the ratio between equity and debt [8]; negotiating the most favourable conditions for using debts from financial institutions (term, interest rate, conditions for early repayment, etc.), as well as preparing, placing and managing these financial instruments in order to achieve the lowest possible cost of debt capital.

- ✓ Capital investment – starts with the preliminary evaluation of various investment projects, according to selected criteria (net present value, payback period, etc.), in order to choose the

one that will bring the greatest benefits to the organization. The process continues with providing operational activities (deliveries, work and management processes, formation and growth of human capital, placement, marketing, etc.) with the necessary financial resources, as well as maintaining low risk, company liquidity, high levels of return and low cost of attracted resources.

✓ Control and management – development, implementation and maintenance of rules and procedures for control over accounting policy, counteraction to abuse and inefficient spending of funds, as well as comprehensive monitoring of incoming and outgoing cash flows. Also included are: generating management reports, analyses and providing primary accurate and reliable information through the annual financial report to prepare financial analyses for the needs of owners, investors, managers and state institutions [9].

In modern organizations, each stage of financial management and the implementation of the financial strategy is directly related to the formation, maintenance, development and reproduction of human capital. On the one hand, the activities of the formation, management and accumulation of human capital form one of the main expense items in the budget of each organization. On the other hand, the successful implementation of the financial strategy requires the provision of periodic training and qualifications of the already hired personnel, including the management teams, in order to ensure the maximum favourable conditions for the organization, related to the raising, investment and control and management of incoming and outgoing financial flows.

Human Capital and Production Strategy

Strategic alignment between the production and the human capital strategy is important for a number of reasons, but most importantly for optimizing organizational efficiency and maintaining competitiveness. When human resource management activities (such as recruitment, training, development, performance appraisal, etc.) are derived from and synchronized with the goals set in the corporate strategy (such as the so-called "lean production", increasing market share, etc.), this leads to increasing effectiveness and efficiency of the processes in the organization and, as a result, improved market position.

The production strategy describes in detail the production plan and program, as well as the resources required for their implementation. First,

the number and type of units that must be produced in the relevant planning period are determined. According to the specification of the planned production and the capacity of the available machinery, facilities and equipment, the load on the production capacities is calculated (usually in machine hours). Subsequently, the number and quality of labour force to operate the necessary equipment in order to fulfil the parameters of the production strategy is also determined. The relationship between the production and human capital strategies can be considered in two aspects. On the one hand, it is necessary to ensure the implementation of the already developed production strategy with human resources, and on the other hand, in order to ensure the feasibility of the corporate strategy, the planning process itself must be carried out by workers who have the necessary knowledge, experience, motivation and competences. In addition, linking the production and human capital strategies is particularly important in view of the challenges arising from the trend of business digitalization. According to Zahro and Diana [10], it would be difficult to achieve the set goals in the context of digitalization if the human resources development strategy is not integrated into the corporate strategy through the production strategy.

The human capital strategy also influences the production strategy and, hence, the corporate strategy. The channels of influence are mainly related to the methods and techniques set in it for: selection and recruitment of personnel; introduction, training and development of workers; performance evaluation and allocation of remuneration and incentives; motivation and career growth; maintaining a good microclimate and resolving conflicts and crises in the workplace. In their recent study, Hasan and Mishra [11] point out that the application of factors – “motivators”, according to Herzberg’s theory, leads to reduction of employee turnover, and hence to the achievement of the set company goals. Methods and techniques for human capital management are a kind of “engine” of production innovations, as they carry out strategic selection and development of personnel, which generate innovations and optimization of the processes in organizations [12].

Human Capital and Marketing Strategy

The integration between marketing strategy and human capital strategy is a one of the necessary conditions for achieving the strategic organi-

zational goals and ensuring sustainable development. This is due to the fact that marketing generally shapes the "external image" of the company, while human capital represents its potential for innovation and growth.

The marketing strategy contains the main planned activities for identifying customer needs, selecting target markets and positioning the brand, through which the organization achieves a competitive advantage and a sustainable market position [13]. It is known that in order to achieve the business goals set out in the corporate strategy, it must be linked and coordinated with the marketing, production, financial, innovation and human resources strategy through the human capital strategy [14]. In fact, according to Kotler and Keller, when talking about marketing strategy, one means designing and implementing a main marketing strategy that defines target markets and the value proposition to the customer and five alternative marketing strategies (commercial, product, manufacturing, classical and/or socio-ethical) [15], each of which focuses on a different aspect of the marketing mix.

The relationship between marketing and human capital strategy is mainly along the lines of providing the marketing department with the necessary personnel to ensure both the drafting of strategic plans and their operational implementation. According to Tho, Phong, Quan and Trang [16], marketers will be more effective and productive in their work if employers implement appropriate human resources policies and practices. Al-Qerishi, Mokhtar and Abas [17] emphasize the key role of human capital in maximizing the benefits of strategic innovations in marketing. Professionalism, skills, rewards and motivation of employees are the basis of quality service, which leads to customer satisfaction and, as a result, to successful implementation of the marketing strategy. Hiring, training and motivating the right employees falls within the scope of implementing the human capital strategy. In order to provide excellent customer service, organizations must have qualified and motivated personnel, provided by applying the human resource management toolkit. Therefore, "the successful implementation of the marketing strategy requires the successful implementation of human resource management activities" [18, p. 405]. At the same time, if the marketing strategy is developed in isolation from the other functional strategies in the organization, the employees of the human resources department may not understand the requirements for the personnel set out in it. This would lead to the lack

and/or incorrect planning and/or implementation of the training necessary to achieve the set objectives, which will make it difficult to achieve business goals.

The conclusions of a study by Olson et al. [19] are evidence of the mutual influence between the marketing and human capital strategies. They include:

- ✓ some of the human capital formation policies (namely: selection, training, assessment, and remuneration) have a significant impact on the implementation of the marketing strategy;

- ✓ depending on the chosen corporate and marketing strategy, in particular, different forms of remuneration and incentives for employees are applied;

- ✓ the characteristics of human capital (value, rarity, uniqueness) help to ensure sustainable competitive advantages.

In conclusion, it can be said that a number of authors [3, 20] have studied and found out that investments in human capital improve the overall performance of organizations, regardless of whether they are small, medium or large enterprises [21], including the implementation of the marketing strategy. Moreover, when organizations strive to achieve competitive advantage based on investments in innovation, it is imperative that there is a synergy between the two strategies – marketing and human capital [22].

Human Capital and Innovation Strategy

Innovation strategy, also known as research and development (or R&D) strategy, plays a key role in maintaining the competitiveness and sustainable development of organizations in the current conditions of strong competition and digitalization of business [23], as it contributes to the creation and introduction of new products and/or production technologies to the market. This, in turn, guarantees flexibility and adaptability of companies to cope with the dynamics of the environment. The R&D strategy should outline the steps and "solutions for using company resources to achieve innovation goals, thus building a competitive advantage" [23, p. 5]. It follows that the role of innovation strategy can be regarded in several aspects, each of which corresponds to the human capital strategy to one degree or another.

The research and development strategy seeks to build an environment of creativity in organizations in which individuals are encouraged to work at the edge of their intellectual capacity and at the same time maintain their continuous interest in

new ideas and solutions [24]. Innovation is considered a major driver of growth for the economy in general and for business organizations in particular, as it allows them to reveal their uniqueness and irreplaceability [25]. Last but not least, innovation is a sign of adaptability to the constantly changing business environment. R&D is based on the presence of knowledge (explicit and/or tacit) in an organizational context which is capable of generating concepts and ideas [23]. Since human capital is the carrier of knowledge, it appears as a key resource for the implementation of organizations' innovation strategies [25]. For this purpose, it is necessary to find and attract the most suitable employees who have creativity and motivation to work in a dynamic environment. They must also be able to balance work and personal life. Moreover, some of the main activities related to human resource management are reflected and must be synchronized with the innovation strategy during its development and implementation.

The current state as well as forecasts for the development of personnel availability in companies are of great importance when developing the strategy for research and development. Also, the successful implementation of the already developed strategy may require increasing the knowledge, skills, attitudes, and motivation of employees and/or hiring additional personnel with a specific competency profile that is currently lacking. This requires coordination between the innovation and human capital strategies. In the first case, the organization will proceed to planning, developing and implementing training programs for existing staff, and in the second – to launching a procedure for selecting, assessing and recruiting new employees.

As mentioned above, the successful implementation of the innovation strategy requires the formation and maintenance of a supportive, inclusive, flexible and dynamic work environment that encourages creativity and taking measured risks [26]. In practice, these are some of the characteristics of the so-called "talents" in the organization, who are of key importance for the management of innovation processes. Here again, the diffuse connection between research and development strategies and human capital is manifested. The scope of the formation and accumulation of human capital and, in particular, human resource management includes activities such as identification, attraction, hiring, training, career development, maintaining a favourable work environment and a good microclimate. All these contribute both to the establishment of a creative environment that

encourages ideas and concepts, and to the attraction and management of talented employees for managerial positions.

In conclusion, it can be said that investments in human capital lead to increased efficiency of the workforce, which in turn guarantees, other things being equal, the implementation of the innovation strategy. Companies that develop research and development activities are characterized by high profitability, competitiveness and a stable market position.

Human Capital and HR Strategy

The human factor is a major source of competitive advantages in all organizations. This determines the key role of the human resource management strategy in pursuing the implementation of strategic goals [27]. Also, the quality of the available human capital (knowledge, skills, qualifications, experience, attitudes, and motivation) is a sign of the level of labour productivity and the ability to maintain competitiveness [28]. As mentioned at the beginning of this study, the human capital development strategy builds upon the human resources management. In general, the human resources management strategy focuses on current activities related to personnel management (e.g., selection, recruitment, performance evaluation, remuneration, etc.), through which it supports the implementation of the company's strategy. Employees are considered part of the company's resources through which operational tasks are performed, and the implementation of the strategy itself is measured by indicators such as the level of staff turnover and time required to hire one worker. The human capital strategy treats employees as a strategic asset that can be invested in and that can be a source of competitive advantage. Its focus is on developing knowledge, skills, talents, innovations and organizational culture in the organization through the selection, training, retention and development of the right employees. The effect of the implementation of the human capital strategy is measured by complex indicators, similar to investments in physical capital, such as return on investment in training, payback period, net present value, etc. The application of both strategies:

✓ supports the implementation of the set business goals: "An effective human resources strategy is proactive and provides the methods, environment, structure and resources that employees need to achieve business goals" [29];

✓ contributes to sustainable development: investments in human capital increase the quality of personnel, which directly and indirectly leads to increased productivity, minimizing production costs by reducing scrap and defects, improvement of product quality and brand recognition, and enhancement of innovation potential;

✓ increases employee engagement and motivation: the main goal is to minimize staff turnover and maximize employee satisfaction and productivity by effectively applying techniques for performance evaluation, reward and incentive, training and career development, motivation, conflict and crisis resolution, and maintaining a favourable microclimate [30, 31];

✓ helps overcome environmental challenges: investments in people help companies be more flexible and adaptable to environmental dynamics [32] in all its manifestations, such as negative demographics, technological innovations, digitalization, political instability, economic crisis, military conflicts, and natural and/or health disasters.

CONCLUSION

This article presents the interrelationships that exist between the human capital strategy and the other functional strategies, whose main goals are aimed at implementing the overall corporate strategy and achieving the business goals set in it. The relationships that exist between the corporate strategy, the functional strategies resulting from it, and the human capital strategy are shown. The essence of the financial strategy and the influence it has on the implementation of the human capital strategy are presented, as well as the need for coordination between them. The main steps and content of the production strategy are examined, and so is the existing mutual influence between it and the human capital strategy. The need for coordination between the marketing strategy and the activities of forming and accumulating human capital, and human resources management, in order to maintain the competitiveness of the organization and the stability of its market position, is explained. The essence of the innovation strategy is also examined, emphasizing its importance for modern organizations in the context of the continuous digitalization. The close links that exist between the accumulation of human capital and the opportunities for innovation are described. Finally, the human resource management strategy and the human capital strategy that builds on it are

examined sequentially, in the context of the implementation of the goals set in the company strategy.

Due to the specifics of different business organizations, it is possible that some of the existing interrelationships in business practice are not covered in this analysis. This may be the subject of additional research on the topic.

The article attempts to present all existing connections between the human capital strategy and the other functional strategies, as well as the channels through which the implementation of each strategy supports the implementation of the others towards achieving the set strategic goals.

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AI IN HUMAN CAPITAL

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ABSTRACT

This article analyses and presents a qualitative assessment of the impact that artificial intelligence systems have on activities related to the formation, retention and accumulation of human capital. The essence of the activities that build the value of human capital is presented consistently, and their key features are described. The stages of emergence and development of artificial intelligence systems are outlined chronologically. The benefits that arise from the implementation of artificial intelligence in human capital management systems are analysed and specific practical examples are provided. Finally, the problems, risks and trends associated with the increasingly deeper penetration of artificial intelligence into human capital management are examined.

Keywords: artificial intelligence, human capital, benefits, business

INTRODUCTION

Over the past five years, artificial intelligence (AI)-based systems have emerged and found widespread application. They have been integrated into existing products and solutions for human capital management, while also enabling the development of entirely new ones. Overall, the popularity of AI-based systems has increased sharply during this period, as shown in Fig. 1. This growing interest can be explained by the fact that such systems automate, fully or partially, processes that were previously only performed by humans [1, 2].

Activities related to the formation, retention and accumulation of human capital in the organization are no exception to this trend, with AI-powered solutions constantly emerging to facilitate and scale these activities [3].

At the beginning of this article, it is important to emphasize that human capital management

builds upon the operational activities related to human resource management, although some authors do not draw a significant distinction between the two.

The purpose of this article is to present a qualitative analysis of the application and impact of the AI-based systems on the formation, retention and accumulation of human capital in organizations.

EXPOSITION

Investments that supports activities related to the formation, retention and accumulation of human capital are among the key factors in achieving sustainability and competitiveness of organizations. This is due the fact that the totality and development of employees' knowledge, skills, attitudes, behaviour, professional experience, and motivation have a significant impact on overall organizational performance.

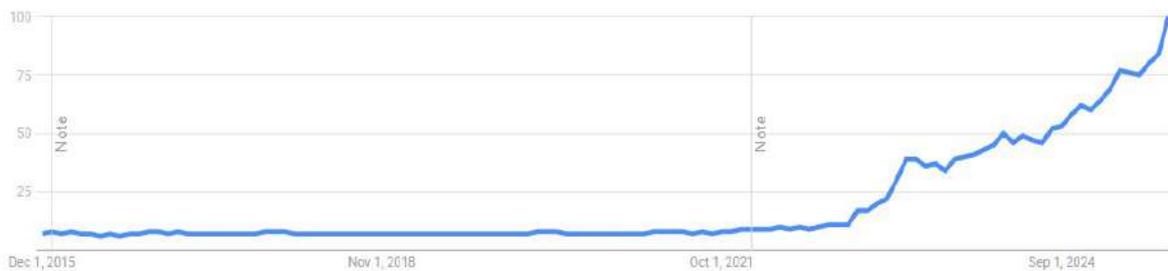


Fig. 1. Popularity of "AI" key word search in Google Search
Source: Google Trends [4]

Human capital management has the characteristics of a business process, as it consists of sequentially occurring activities (formation, retention and accumulation), the implementation of which runs parallel to material flows and supports all other organizational processes. At the same time, a key characteristic of AI-systems is that they automate processes and activities that were previously performed and/or managed by humans. Therefore, the implementation of AI systems leads to the optimization of the processes of formation, retention and accumulation of human capital and frees up time and labour resources, , allowing them to be redirected towards higher-value tasks.

Essence of human capital

According to human capital theory, individuals possess certain competencies (knowledge, skills, and attitudes) that can be updated, improved and enhanced through targeted investments (individual, organizational or societal), thereby stimulating productivity and innovation at individual, company and national levels [5]. From this perspective, human capital is a key factor in the knowledge economy [6], with emphasis placed not only on traditional competencies but also on digital skills, creativity and lifelong learning.

Although there is no universally accepted definition, human capital management generally includes activities related to:

- planning long-term skills and talent needs;
- identifying, attracting and selecting high potential employees;
- integrating and developing new and existing staff;
- increasing productivity through targeted training, the introduction of new technologies and the stimulation of innovation;
- building sustainable motivation mechanisms;
- developing a culture of effective communication and collaboration;
- maintaining and developing positive organizational culture and leadership.

Overall, investments in human capital lead to increased productivity, higher employee income, stronger company market positions and improved societal welfare.

Emergence and development of AI systems

The widespread application of artificial intelligence in everyday life and business was significantly accelerated by the launch of ChatGPT by

OpenAI on 30 November 2022. The product gained remarkable popularity within months. By April 2025, it was reportedly used daily by more than 100 million people [7]. Its popularity can largely be attributed to its chatbot interface, through which users submit prompts and receive text-based responses in real time [8]. In recent years, its presence has expanded across numerous areas of professional and everyday life, particularly through integration into widely used platforms such as LinkedIn AI, Meta AI, Zoom, Gmail and Microsoft 365.

In 2018, OpenAI developed GPT-1, the first prototype of a large language model (LLM), containing 117 million parameters and designed to predict the next word in a sentence [9]. Subsequently, it was followed by GPT-2 (1.5 billion parameters). Initially, it remained an internal product, and a limited number of researchers were given access to it. In 2020, GPT-3 was launched with 175 billion parameters, representing a significant leap in scale and output quality compared to the previous version. In 2022, ChatGPT was released, which revolutionized this field of science and led to its practical application.

The reaction of market competitors was lightning fast and in the following 2023, alternative models appeared, including Google Bard (later replaced by Gemini), Anthropic's Claude and xAI's Grok. In the same period, Meta released the open source LLaMA model, later followed by Mistral. As of October 2025, leading open models included "qwen3-max-preview" by Alibaba and "deepseek-v3.2" by Deepseek. At the same time, closed models such as OpenAI's o1, Google's Gemini 2.5 Pro and Anthropic's Claude 3.5 Sonnet maintained strong market positions [10].

Simply put, LLMs function by predicting the next word in a sequence based on prior context. Their main limitations are the availability of computing power, data volume and context breadth. A "training plateau" is also a recognised constraint. Many of the models are used for information search, text processing, error correction, and text composition based on a given query. Models with multimodal capabilities are emerging and improving: they can generate, recognize and modify images; recognize and process human speech; and generate music based on a text description [11].

LLMs are undergoing continuous changes, which turns them into more complex and autonomous systems. According to the degree of autonomy, intelligent systems can generally be classified as:

- Chatbots – non-autonomous systems that communicate with users via short text messages;
- Copilot systems – semi-autonomous systems that monitor user behaviour and provide real-time assistance;
- AI assistants – they are not fully autonomous but can make decisions independently. They can choose a calculation method or discover the optimal method for obtaining a predetermined outcome;
- AI agents – autonomous systems able to perform tasks independently and react to unexpected events and inconsistencies [12, 13];
- AI “super-agents” – hypothetical systems coordinating multiple AI assistants to automate complex processes (e.g., complete automation of production).

Regardless of their level of autonomy, the systems described above can interact with one another. For example, an AI assistant can activate multiple AI agents to complete a task and a chatbot can call AI agents to search for information on the Internet [14].

Benefits of integrating AI into human capital

In addition to universal LLMs, there are also specialized AI solutions that provide measurable benefits in human resource management and human capital development. These include improved management decision quality and accelerated recruitment, development and retention processes [1, 2, 15]. AI supports HR teams in a number of activities such as extracting specific skills data from CVs, generating and refining job advertisements and job descriptions, summarizing and ranking applications according to selected criteria, automatically scheduling interviews and coordinating them in a work calendar and/or periodic reminders of upcoming meetings. AI agents can also be useful in developing personalized training programs, assessing job performance, knowledge and skills and identifying skills gaps, predicting turnover risk and recommending retention measures. Various AI-based tools optimize decisions related to internal mobility, such as rotation and/or vertical transfer, engagement analysis, positions design, HR document preparation (offers, contracts, annexes), training planning, effectiveness assessment and development of leave schedules. They are also often used in making strategic decisions related to human capital, such as workforce planning, forecasting labour demand and developing mechanisms for candidate selection and assessment.

Various software products are already available on the market that help in the organization and optimization of processes related to personnel and human capital management. The integration of AI into them leads to an improvement in their overall performance, as it reduces information processing time, lowers administrative burdens, optimises costs and increases overall organisational effectiveness and efficiency.

Examples of AI in human capital

SAP, Europe’s largest and the world’s third largest software company, integrates AI agents into its human resource management solutions for specific business scenarios. Their portfolio includes Core HR & Payroll, talent management, HR analytics and workforce planning, as well as performance measurement modules. AI automates screening and skills extraction from CVs, generates and refines job postings and descriptions, suggests options for internal rotations, personalizes training, predicts the risk of leaving and detects imbalances in pay between individual positions. An integrated AI assistant built into SAP’s architecture extracts and summarizes data, answers HR policy queries, assists in developing leave schedules, prioritizes requests, suggests “next best action” and prepares and sends automated responses to employees (e.g. about leave, schedules and bonuses) based on current processes and records [16].

Oracle, the world’s second largest software company, actively integrates AI functionalities into its human capital management products to generate job postings and descriptions based on the parameters of the position, present company information, summarize basic data about candidates, evaluate and analyse applications, and support candidates through automatically generated responses. In this way, they accelerate the publication of advertisements, reduce manual labour, unify the style and improve the “candidate experience” [17].

IBM’s WatsonX also optimizes selection and assessment of new employees in the following areas:

- summarizing data from candidates' CVs and from candidates' performance during a job interview;
- extracting specific skills indicated by the candidate in his/her CV;
- assessing candidates for compliance with the profile of the vacant position;
- generating questions for interviewing candidates;

- predicting the risk of leaving;
- predicting the possibility of internal rotations and/or training.

Overall, the implementation of AskHR in companies results in a reduction of the time required to select and hire candidates, an optimization of the number of “correctly” hired candidates, automation of processes and a reduction of manual labour, higher traceability of HR processes and an increase in the value of human capital in organizations.

Workday Inc. has been developing human resource management systems for over 20 years and systematically integrating AI into key processes in recent years. The company has introduced several AI agents (Policy Agent, Contracts Agent, Payroll Agent and Financial Agent) to support and automate processes related to the implementation of company policies, preparation of contracts, labour payments and financial operations [18].

Alongside the four companies discussed above, numerous start-ups are developing AI-based HR solutions aimed at supporting both operational human resource management and the formation and accumulation of human capital. It is largely considered apt for such developments to be carried out in start-ups due to the very nature of these organizations. This is also confirmed by the data presented in Table 1 on American start-up support institutions. The table shows the number and percentage of start-ups that develop AI solutions, as well as those that are directly focused on human resource management activities and increasing human capital with the help of AI, compared to the total number of companies included in the portfolio of financing organizations.

Table 1. A representative sample of American institutions involved in supporting and financing start-ups [19, 20, 21, 22, 23, 24]

Financing organizations	Number of start-ups financed	Start-ups doing AI		Start-ups doing HCM	
		Qty.	%	Qty.	%
YCombinator	5474	1000	18.27	80	1.46
Techstars	5043	1573	31.20	338	6.71
500 Global	2207	113	5.12	107	4.84
Founder Institute	1000	100	10	30	3
SOSV	726	50	6.9	–	–
Entrepreneurs First	458	82	17.91	10	2.18

Risks

Excessive automation of processes poses risks of “dequalification”, dependence on algorithms and reduced professional competence. Insufficient human supervision (human-in-the-loop) can

Problems, risks, trends and opportunities of implementing AI into human capital

In the coming years, AI will penetrate into various business areas even deeper, including the activities of selection, development and management of talents, which are part of the processes of formation and accumulation of human capital. However, the application of large LLMs in human capital management is accompanied by a number of problems and risks, mostly of ethical nature. Below are presented some of the problems and risks of using artificial intelligence in human capital management, as well as the trends and opportunities in the development of this technology.

Problems

The main challenge in the implementation of artificial intelligence in human capital management systems is the so-called “data bias”. It arises when training data do not accurately or ethically reflect reality, leading to distorted outputs. For example, models trained predominantly on English-language data may perform less accurately in other languages.

Another challenge lies in ensuring the quality and integrity of the data on which these systems rely. Very often, primary data are partial and/or comes from different sources with different formats (for example, from a CV, from an interviewer’s opinion, etc.). This leads to inaccuracy in the predictions that AI systems make and to a deterioration in their reliability. The ethical question remains open: “Is it right for algorithms to influence decisions related to hiring, evaluating, training and firing workers?” without being controlled by a human [25, 26].

lead to problems and/or loss of benefits. For example, in recruiting new employees, an atypical but potentially valuable candidate may be overlooked. Security risks regarding confidential or

sensitive data that HR systems work with are significant. It is necessary to invest in software and hardware technological solutions to ensure security and prevent data leakage. Last but not least, there are also risks associated with resistance to AI adoption due to technostress, fear of surveillance or a feeling of insecurity in the workplace. These risks can be overcome through training, transparent communication and managerial support [25].

Trends and opportunities

In the future, automation of routine HR activities is expected to deepen, which will lead to the release of human potential and time and their redirection to other more important tasks. The development and implementation of intelligent predictive models aimed at workforce planning in terms of necessary knowledge and skills are likely to become more widespread and so is the development of career paths and movement of the workforce across different positions. Another trend is related to the so-called “personalization”, in which AI agents will play the role of “virtual assistants” in teams by managing the performance of individual tasks or “digital career assistants” who will develop individual training courses and career paths, taking into account the specific personal and professional qualities of each employee. Simultaneously, ethical frameworks, regulatory standards and Responsible AI practices will gain importance. New professional roles – including HR analysts, HR technologists and ethics specialists – will emerge to interpret AI outputs and ensure fair decision-making [1, 3, 15].

CONCLUSION

This article attempts to qualitatively assess the impact of artificial intelligence on human capital management activities. The essence and main characteristics of human capital as well as the activities that build it have been described. The emergence and development of artificial intelligence systems have been presented in chronological order, and the main benefits that arise from their implementation in human capital management information systems have been analyzed. Examples of artificial intelligence implementation in software products of four of the major global companies offering digital solutions for the business have been examined. Particular attention has been paid to associated risks and ethical challenges, as well as emerging trends.

Future research could expand this analysis by examining the impact of AI implementation on the innovative capacity of start-up companies.

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CLASSIFICATION OF HUMAN CAPITAL INVESTMENT COSTS

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ABSTRACT

The purpose of this article is to present a classification of human capital investment costs incurred organizations. The division of costs is based on the specific characteristics of human capital, and four main criteria are proposed: according to the object of investment; according to the function of the costs themselves; according to the nature of their manifestation; and according to the entity providing the financing. For each criterion, the essence and characteristics of the relevant costs are explained in detail. The rationale for this classification is discussed, emphasizing its importance for analyzing the return on investment in human capital, which contributes to increased organizational efficiency and adaptation to changes in the business environment.

Keywords: investment costs, human capital, classification, organizational efficiency

INTRODUCTION

Classical human capital theory assumes investments in knowledge, skills and health, which increase worker productivity and generate future economic benefits at individual, corporate and national levels [1, 2]. The inclusion of emotional intelligence, leadership, adaptability, creativity, innovative capacity, and digital and social skills within the value of human capital expands the range of activities for which companies should allocate resources and make investments [3, 4]. These skills can be summarized in the concept of “competence capital”, used by a number of contemporary authors to describe the collection of abilities enabling the effective application of a wide range of non-traditional competencies in employees’ work activities [5, 6, 7].

The formation, maintenance and accumulation of these elements of human capital generate costs of various types and functions. The complex and multi-layered nature of human capital necessitates a classification of these costs. Such a classification enables investments to be analysed according to their content, function, nature of manifestation and level of decision-making and benefit accumulation.

The purpose of this article is to present a classification of human capital investment costs.

EXPOSITION

In this research, human capital investment costs are classified according to four main criteria:

✓ according to the object of investment – indicating the component to which the investment in human capital is directed (education, qualification, health, competence capital);

✓ according to the function – reflecting the role of investment costs in the life cycle of human capital (formation, maintenance, accumulation);

✓ according to the nature of manifestation – distinguishing the way in which costs are accounted for (direct, indirect and opportunity costs);

✓ according to the level of investment – determining the entity that finances the investment.

Cost types by object of investment

Depending on the object of investment, human capital investments can be further divided into categories corresponding to the individual components of its value.

Investments in education cover all costs generated in the process of acquiring primary, secondary and higher education. They include:

✓ tuition fees at different educational and qualification levels;

✓ the cost of textbooks and teaching materials;

✓ teachers' salaries;

✓ public investment in educational infrastructure.

Since the emergence of classical theory, these costs have been regarded as the primary channel for the formation of human capital [1, 8].

Investments in professional qualification and retraining include different forms of on-the-

job and off-the-job training, professional qualification and certification courses. On-the-job training may involve mentoring, demonstrations and coaching, while off-the-job training includes lectures, business simulations, knowledge-sharing activities and team-building initiatives [9]. The category also encompasses the costs of planning, organizing and conducting internship programs, job rotation, job enlargement and enrichment of positions. Such investments enable employees to adapt their competencies to technological, digital and organisational changes. Thus they increase their specific competencies, which cannot be transferred when changing jobs and for this reason are considered a source of competitive advantage for the organization. Typically, these investment costs are accounted for indirectly through:

- ✓ the time experienced employees spend on coaching, demonstrations, and mentoring others;
- ✓ the time employees spend away from their workplace attending training, exchanging expertise, etc.;
- ✓ temporarily reduced productivity during training or job transitions;
- ✓ organisational costs of training delivery;
- ✓ trainers' remuneration;
- ✓ the costs of feedback and evaluation processes from trainees and trainers.

Investments in health: Health-related costs contribute to the physical and mental well-being of workers and include:

- ✓ prevention programs financed by employer or trade union organizations;
- ✓ additional health insurance provided by employer;
- ✓ additional psychological support services and sports and recreation facilities provided by employer [10];
- ✓ public expenditure on healthcare wages and infrastructure.

Employees in good health are absent less frequently, perform assigned tasks more effectively and, other things being equal, generally demonstrate higher productivity. They also impose lower healthcare costs on public systems. All these factors have a number of beneficial effects for individuals and organizations, and the economy as a whole.

Investments in "competence capital" include a number of costs associated with:

- ✓ organization and implementation of training programs for the formation of communication skills, emotional intelligence, leadership, teamwork and adaptability;

- ✓ participation in scientific conferences and professional forums for the exchange of knowledge, good practices and innovations;

- ✓ stimulation of research and development activities and the implementation of their results;

- ✓ training and coaching programs to build trust, internal communication and corporate culture;

- ✓ hardware and software for internal organizational databases and intelligent management systems;

- ✓ specialised digital skills training, including work with artificial intelligence systems and specialized software;

- ✓ curriculum adaptation in formal and informal educational systems to incorporate soft and digital skills [11].

All these costs are directly related to the accumulation of skills and competencies that are critical for the modern economy; they strengthen analytical and creative thinking, enhance competitiveness and generate organisational know-how, corporate culture and innovation capacity, contributing to national economic growth [12].

Cost types by function

Human capital investment costs can be grouped into three categories according to their purpose.

All costs related to the acquisition of basic skills and competencies fall into the category of human capital **formation costs**. These include public expenditure on salaries and infrastructure in primary, secondary and higher education, individual expenditure on tuition fees, educational materials and foregone income during study. Public and individual health-related expenditures, such as on immunizations, screening, and medical fees, also fall within this category.

The second category of costs are those for maintaining human capital, i.e. for preserving and updating employees' existing skills and competencies [13]. **Maintenance costs** include a number of costs related to:

- ✓ periodic workplace and outside training to update specific and/or general knowledge and skills, to renew cognitive and/or non-cognitive competencies;

- ✓ employer-provided health screening;

- ✓ periodic training and seminars related to maintaining healthy and safe working environment;

- ✓ rehabilitation and retraining following occupational injury or illness [14].

In practice, the investment costs of maintaining human capital directly correspond to the concept of lifelong learning and the need for continuous adaptation to the changing environment [15].

The third category of investment costs is related to increasing the value of human capital beyond its current level [16]. **Accumulation costs** include:

- ✓ specific training, qualification courses, specializations, and additional educational and qualification and/or scientific degrees;
- ✓ additional social and/or health insurance packages provided to workers, such as additional pension and/or health insurance, and highly specialized medical interventions;
- ✓ support for innovation and development at company and state levels.

Cost types by nature of manifestation

According to the nature of their manifestation, human capital investment costs are classified as direct, indirect and opportunity cost. This classification is extremely important when carrying out a preliminary or subsequent assessment of the economic efficiency of investments.

Direct costs include all costs related to the direct financing of education, qualification, health status and employees' "competence capital" by individuals, business organizations and public funds. They include tuition fees, training expenses, teachers' and trainers' salaries, costs of educational materials, teaching aids and information resources, organisational training budgets, medical expenses, etc.

Indirect costs include investments in educational infrastructure development, knowledge management systems and learning culture in organizations [17], costs of internal communication networks, administrative support for training and development programs for workers and employees, administrative and operational capacity for developing innovations and acquiring intangible assets [18], as well as "the opportunity to maximize the quality of the educational product" [19, p. 79].

Opportunity costs are a specific category that includes:

- ✓ income by an individual during the time he or she was engaged in the formation, maintenance and/or accumulation of human capital;
- ✓ reduced production capacity of the firm during the time its employees were subject to investment in human capital;

✓ costs of capital invested in direct and indirect public spending on education instead of in an alternative form of investment.

Knowing and including the costs of lost benefits when assessing the return on investment in human capital is of particular importance for determining the discount rate and for a correct comparison with alternative investments in physical and/or financial assets [20].

Costs types by level of investment

This criterion reflects the economic entity financing the investment and subsequently receiving the benefits: individual, firm or national.

The costs that individuals and households make on all forms of education (formal, non-formal and informal), healthcare and labour mobility can be summarized as **individual investment costs** for human capital [8].

At the **firm** level, costs relate to training, qualification, career development, corporate culture, recruitment and assessment, knowledge management, social and health benefits, acquisition of "soft competencies" and digital skills.

In practice, human resource management activities at the organizational level are those that form, maintain and accumulate human capital. The main activities at this level of analysis are:

Planning – ensuring the necessary quantity (number of workers) and quality (competences, motivation, etc.) of the workforce, according to the organization's strategy. This activity is related to a comparison between the demand for employees resulting from the set performance goals and the available ones.

Job analysis and design – the basis on which the job description is developed and/or updated. The analysis is related to a description of the key requirements for each position as well as the specific competencies that are necessary for its implementation. The design describes the "ideal" candidate for a position [9].

Recruitment and hiring – determining the sources for recruiting personnel with the potential to meet the requirements of the vacant position, as well as selecting the most suitable candidates and carrying out all necessary actions for their appointment.

Introduction and assessment – introduction to the work environment includes initial training, familiarization with regulatory documents and organizational policies, as well as time for adaptation and reaching the maximum expected productivity. Performance assessment is a process in

which the correspondence between the requirements of the position and the work performance of the employees is monitored [21].

Training and development – processes and procedures for acquiring new knowledge, skills and attitudes, which aim to improve the quality of workers. The acquired new competencies are expressed in the development of personnel by occupying new more complex and more responsible positions [17].

Remuneration and motivation – development of systems for adequate compensation of employees' work, according to the hierarchy of the position they hold, as well as the application of a set of incentives to increase their motivation.

A number of studies [22 - 26] indicate that the costs of investments in human capital are related only to training and development of personnel. However, the costs of implementing other activities (planning, analysis and design of positions, selection and hiring, introduction and assessment) are also resource-intensive, contribute to the growth of human capital and generate future benefits. Therefore, they should not be excluded from analysis. Investments at this level aim to improve productivity and adaptability of companies to changes in the environment and, hence, organizational efficiency [27].

The aggregate of public costs related to the development of education, healthcare, unemployment and social assistance systems, financing of innovation support funds, as well as the availability of fiscal incentive programs for the maintenance and accumulation of human capital form investment spending at the **national** level. They are key to maintaining long-term economic growth and social well-being [20].

Regardless of the object, the reason for occurrence, the type, nature and level of spending, these expenditures are “investment spending with a long-term effect, which are carried out in more than one area over a certain period of time” [28].

CONCLUSIONS

This article presents a classification of human capital investment costs. Due to the diversity and specificity of this type of capital, the costs directed at it are classified according to: the component to which the investments are directed; their role in the life cycle of human capital; the possibilities for reporting them to the investment objects; and the entity financing the investments.

All elements of the costs are described in detail according to the various criteria. According to the

object of investment, the costs are classified into costs for education, professional qualification and retraining, health, and the acquisition of “competence capital”. Next, the costs are described according to their function: for formation, maintenance and accumulation of human capital, presenting their essence and features. The structure and characteristics of direct, indirect and opportunity costs, which are part of the classification according to the nature of their manifestation, are examined. Finally, the investment costs are analysed according to the entity that pays them. In this category, the features of the costs incurred at the individual, company and national levels are described.

Due to the diversity and specificity of human capital, and hence the costs that form it, some of the investment costs may have been unintentionally omitted in this study.

The classification of human capital investment costs is of utmost importance in conducting further analysis of the effectiveness of these costs. Carrying out such an analysis would help to improve organizational efficiency and maintain competitiveness.

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**ARTIFICIAL INTELLIGENCE AND THE FAMILY AS PARTNERS IN HEALTHCARE:
BENEFITS AND BARRIERS IN LONG-TERM CARE FOR GERIATRIC PATIENTS
(USING THE EXPERTISE OF SAINT ANNA HOSPICE)**

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ABSTRACT

Recent literature and studies have demonstrated the benefits of implementing combined approaches that involve artificial intelligence (AI) and family members in long-term care for geriatric patients. However, the use of AI and family-centred approaches in intensive care settings continues to face persistent resistance from healthcare professionals. This was particularly evident during the visitation restrictions introduced amid the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. A pilot study conducted at Saint Anna Hospice, using the Patient, Family and AI Access to Care Model, found that applying a structured protocol for engaging families through AI-supported patient care resulted in increased family satisfaction. The challenge lies in identifying the barriers that influence decision-making leading to the exclusion of families as partners in care, and in developing strategies to overcome these obstacles through the appropriate application of artificial intelligence.

Key words: *healthcare, geriatric patients, health management, artificial intelligence, family and AI care model of access in healthcare*

INTRODUCTION

Defining the combination of patient care between medical staff and relatives with the support of artificial intelligence

Over the past decade, healthcare systems have undergone profound transformation driven by the advent of artificial intelligence (AI) and an increased focus on holistic patient care [6]. At the heart of this approach lies not only medical intervention, but also the socio-emotional support that patients receive from their families. Health management, as both a scientific and practical field, increasingly recognizes the integration of technological innovations and human relationships as a key factor for the effectiveness and sustainability of the healing process [4]. All individuals belong to a family or originate from one. Family structures are based on interconnection between their members, and each family defines its own composition and allocates labels, roles and responsibilities. This definition may not coincide with the beliefs or values held by healthcare providers, but it must be recognized as meaningful for both the patient and the family [1]. According to modern health management theories, successful recovery requires coordinated interaction between the clinical, technological and psychosocial components of care.

Family well-being depends on its ability to respond and adapt to crises that arise throughout its life cycle, as well as on the health of its individual members. The impact of illness on patient and family dynamics became particularly evident during the recent SARS-CoV-2 (COVID-19) pandemic. Visitation restrictions in acute and long-term care facilities, introduced for public health safety reasons, disrupted family systems on an unprecedented scale [10].

Artificial Intelligence in identifying family needs

Artificial intelligence is increasingly integrated into medical diagnostics, prediction of treatment outcomes and personalised healthcare. Simultaneously, the family remains a primary source of support, directly influencing patient motivation, emotional wellbeing and adherence to treatment.

Traditionally, medical care has focused primarily on the patient. Although family-centred needs have been acknowledged as important, they have often been neglected during critical illness. Research indicates that when families perceive that nurses and healthcare professionals attend to their needs, they feel reassured that their relative is also receiving appropriate care [3]. This perception can positively influence both the patient's physical and psychological wellbeing. Trust (or

distrust) expressed by family members may be transferred to the patient and subsequently affect clinical outcomes.

Research findings [5] were among the first to classify family needs in intensive care settings. Studies show that patients receiving stable family support demonstrate faster recovery and reduced levels of chronic stress. These findings align with the patient-centred model of health management, in which technological solutions complement rather than replace human contact.

Identified family needs include proximity to the patient, emotional support from the healthcare team, access to clear information regarding treatment, and involvement in care processes. These needs have been confirmed in recent narrative and systematic reviews [11–13]. As part of best practice, healthcare professionals should be aware of these needs and assume responsibility for addressing them.

BASIC RESEARCH AND DISCUSSION

The model for providing patient and family access to medical care using artificial intelligence

AI is transforming traditional medical practices by automating diagnostics, analyzing clinical data, and predicting health risks. In healthcare management, this contributes to more efficient resource allocation, workflow optimization, and improved decision-making. Machine learning systems assist physicians in interpreting medical imaging, analyzing laboratory results, and monitoring the status of patients with chronic diseases [2].

However, medical practice does not always reflect full acceptance of family involvement in patient care. This may be due to several factors: the absence of a structured framework addressing the interrelationship between patient, family and healthcare team; insufficient knowledge of family systems theory and resilience; and perceived time constraints associated with family engagement. Personal clinical experience in caring for critically ill patients and their families, observation of patient–family interactions, and recognition of the nurse’s role as a mediator between family, patient, and healthcare team contributed to the development of the Patient–Family Access to Care Model [14]. This mid-range theory describes patient- and family-centred principles supported by the integration of AI as a balancing element within the partnership between patient, family and healthcare providers. The model focuses on identifying family needs and applying concepts of

family resilience and systems theory to understand the patient and family’s experiences of illness and recovery [9]. Two groups, “Family Defined” and “Healthcare Team,” are represented by intersecting ovals. The common thread between the groups is the patient and the nurse who serves as the care coordinator. Both groups are influenced by the community and the environment. A sense of trust and connectedness exists when both groups allow for openness, communication, and the flow of information between members who remain accessible and available. Although originally developed for critical care, the model is applicable across diverse healthcare settings.

Research using the Patient and Family Access to Care model supported by artificial intelligence

A study conducted in a long-term geriatric care facility, St. Anne Hospice, implemented the model using a multidimensional AI-supported approach to patient and family care. Prior to data collection, focus group sessions were held with physicians and nurses directly involved in critical care.

Physicians highlighted the importance of communication but identified limited opportunities for family meetings as problematic. Incorporating AI as a communication intermediary between patients, families and medical teams produced significant improvements in organisational health service management.

Many nurses acknowledged that family presence provides comfort to patients but reported that training and explanations were time-consuming. AI integration helped optimise these processes. When asked whether nurses should provide explanations directly to conscious patients, most agreed this remained an essential communication step that should not be entirely delegated to AI.

Both groups confirmed that most patient health information at admission was obtained from families. However, nurses perceived the time required to provide AI-supported updates to multiple relatives as a potential burden [6].

While recognising family needs, some nurses were uncertain whether meeting these needs fell within their responsibilities during critical illness. The prevailing belief was that this took the focus away from the patient and was a potential source of tension between staff and relatives. Conflict can arise when families perceive bedside presence as a sign of loyalty and commitment, while the medical team worry that an outsider poses a potential infection risk. AI-mediated communication

can reduce such tensions and minimise infection risks [7].

In addition to technological advantages, AI also enables new communication models through chatbots, virtual assistants and mobile applications that encourage active patient participation in recovery [8]. Nevertheless, ethical data management and balance between automation and human empathy remain essential.

Family members were invited via AI systems to participate actively in care planning. The results of this study showed higher satisfaction in the treatment group regarding nurse encouragement, perceived quality of care, health care team availability, and number of visiting hours ($n=53$; $p<0.05$). Families with previous ICU experience reported greater satisfaction regarding privacy needs. A significant finding related to spiritual support confirms the usefulness of AI as a communication mediator. There was an even distribution across groups in terms of age, race or ethnicity, length of ICU stay, and family member-patient relationship via AI, with no significant differences between groups on these variables [4].

Recommendations for engaging families as partners in care through AI mediation

What role do nurses play in facilitating this partnership? The study identified four AI characteristics that support communication between patients, families and medical teams: having a holistic perspective, using an educational approach to care, changing the environment to achieve health improvement, and focusing on family health rather than disease. AI successfully replaces the nurse as care coordinator in the following areas:

- recognising the family's role in the health process and its influence on collective wellbeing. Those who are knowledgeable about family systems are better equipped to assess the family's response to illness and recovery.
- identifying key family members who serve as medical historians and are often the voice of unresponsive patients.
- establishing expectations and a primary family contact upon admission.
- providing structured information about care processes. The inability of families to provide adequate care assistance due to a lack of knowledge may result in readmission or deterioration of the patient's health status.
- encouraging safe family involvement in minor care activities, such as bathing or adjusting range of motion.

- offering resources to support emotional and physical self-care.

- facilitating active listening and presence.
- supporting staff resilience strategies (adequate staffing, rest, stress management and communication).

CONCLUSION

Shared communication remains the most fundamental intervention. The integration of artificial intelligence and family support represents a new paradigm in health management. While AI delivers objective, continuous patient data, families provide emotional context and social connection that facilitate adaptation to treatment.

Combining these elements enables the development of a hybrid model – *technology-assisted family care* – in which AI systems provide guidance and data to both healthcare professionals and family members. This approach not only optimises clinical outcomes but also enhances patient engagement, satisfaction and trust in the healthcare system.

Healthcare professionals must allocate time to provide information to both patients and families without compromising care delivery. Communication strategies should consider generational differences and technological accessibility. Inadequate communication may lead to conflict among patients, families and healthcare teams. Effective mitigation depends on maintaining high-quality communication and shared responsibility for care [5].

The roles of artificial intelligence and the family in the recovery process should not be viewed as isolated components but as complementary elements within a comprehensive health management model. While AI offers precision, speed and personalisation, families contribute empathy and human connection. Health policy should promote synergy between these factors by integrating technological innovation within a human-centred framework. Only through such integration can optimal recovery and sustainable societal health development be achieved.

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METHODOLOGICAL ASPECTS AND PRACTICAL APPLICATIONS OF ACCOUNTING IN THE RESTAURANT SECTOR

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ABSTRACT

This study examines the features of accounting in the restaurant sector in the context of modern economic and business realities. Emphasis is placed on the specific characteristics of accounting in catering enterprises. The paper focuses on the specifics and nuances of activity in this sector, examining the essence, key objectives, and classification of catering enterprises. Particular attention is paid to the process of pricing restaurant products as a key element of management and accounting in these enterprises.

Key words: *accounting, price formation, restaurant business, catering, goods, finished products, costs*

INTRODUCTION

The restaurant industry in Bulgaria is experiencing rapid growth and represents a key sector of the economy. Managing the financial aspects of such a dynamic environment presents unique accounting challenges that must be understood in order to support business success.

Despite its apparent simplicity and profitability, the restaurant business involves the same degree of uncertainty and risk as any other business. It is directly dependent on the volume and structure of consumer demand and on intense competition, which constantly changes its methods: from new advertising strategies and designs to the emergence of innovative fast-food outlets, national cuisine restaurants, and independent or chain catering businesses.

Survival and growth under these conditions require highly professional management. This explains the special attention given to the creation and interpretation of accounting information. The most important information concerns the costs of kitchen production, as these are the highest and most dynamic in the restaurant business and require daily control. However, due to the specific nature of the activity, such information is either difficult to generate or is produced using numerous assumptions.

The aim of this study is to reveal the specifics of accounting in the restaurant sector and the nuances that accountants encounter in their daily work within the public catering system.

The theoretical and methodological basis of the study draws upon publications in the field of trade and the organisation of public catering, as well as regulatory documents. The methods used include collecting, studying, comparing, systematising, and analysing the information obtained during the research.

THE ESSENCE, KEY OBJECTIVES, AND CLASSIFICATION OF FOOD SERVICE ENTERPRISES

The essence

There is no official definition of the term “public catering” in Bulgarian legislation. However, the term is used in various normative acts regulating the activities of public catering enterprises, for example, Regulation No. 14 of 9 December 2021, which describes hygiene requirements for food production, processing, and distribution facilities.

Public catering refers to businesses dedicated to providing meals and entertainment outside the home. Essentially, this sector, often known as the restaurant business, includes food production, customer service, and the satisfaction of nutritional and social needs in various settings:

- Food production – in kitchens, restaurants, canteens, and other facilities.
- Customer service – serving, delivery, or self-service.
- Meeting nutritional and social needs – by offering a varied menu, accessibility, and appropriate dining conditions.

Catering enterprises are establishments where meals, confectionery products, and other items are prepared for sale directly to the public in designated premises: restaurants, pastry shops, snack bars, cafés, canteens, catering services, fast-food outlets, hospital and school canteens, culinary shops, and others. In many cases, these businesses also purchase specific goods from external suppliers, such as bread, alcoholic beverages, cigarettes, and similar items, which they sell for immediate consumption in their original form.

In addition, there are catering establishments that do not prepare their own products but only sell purchased ready-made goods. Such enterprises include bars serving non-prepared goods, cafeterias, and other similar businesses organised on a purely commercial basis.

Thus, catering enterprises simultaneously perform two activities:

- (a) Production – preparation of their own products, and
- (b) Retail trade – sale of these products and of finished goods purchased from other enterprises directly to consumers.

In the narrow sense of the term, catering enterprises are commercial entities, as their activities generate profit. In a broader sense, catering businesses also include canteens of enterprises, institutions, and organisations. These operate at minimal profit; meals are provided almost at the purchase price of the food products used, while overhead costs are covered by the respective institutions. Access is generally limited to employees rather than the general public.

Key objectives

Public nutrition is of fundamental importance in every country and forms part of the broader concept of consumption. Idealistically, one of the principal objectives of catering enterprises is to provide healthy, nutritious, varied, and affordable food, thereby contributing to improved quality of life.

To fulfil their purpose, catering enterprises must base their organisation, economics, and planning on sound scientific and hygienic principles, ensuring the efficient and appropriate use of food products and other production resources. This enables the reduction of handling and production costs and strengthens control against waste.

The primary tasks of public catering enterprises involve providing food and service to consumers in various public and commercial settings. They can be summarized as follows [1, 2]:

(a) Production of culinary products – preparation of a variety of foods and beverages that meet standards of quality, safety, and consumer preferences.

(b) Social function – provision of affordable meals for various social groups (students, workers, retirees), fast and convenient service according to establishment type (restaurant, cafeteria, bistro, café, etc.), and maintenance of hygienic conditions and a pleasant environment in convenient locations.

(c) Economic efficiency – achieving profitability through optimal resource use, cost reduction, and revenue growth.

(d) Marketing – attracting new customers, building loyalty, adapting to market trends, and introducing new products and services.

(e) Food quality and safety control – compliance with sanitary requirements and food safety standards.

Classification of food service enterprises

There is a wide variety of catering enterprises. According to the Law on Tourism, establishments adjacent to accommodation facilities and independent catering and entertainment establishments are categorised as restaurants, fast food outlets, drinking establishments, cafés, and bars (Table 1):

Table 1. Star ratings of catering enterprises

Type of establishment	Star ratings (up to)
Restaurants	★, ★, ★, ★, ★
Fast food	★, ★, ★
Pubs	★, ★, ★, ★
Cafés and pastry shops	★, ★, ★, ★, ★
Bars	★, ★, ★, ★, ★

Categories are assigned according to compliance with minimum standards, such as area, sanitary facilities, furnishings, and service, which vary for each star rating and type of establishment. Specific requirements by category and subtype of businesses are detailed in the Ordinance governing classification and registration of accommodation and catering and entertainment establishments, the procedure for determining the category, and the conditions and procedure for registering guest rooms and guest apartments.

Overall management and control are exercised by the Ministry of Economy and local authorities. The Ministry determines state policy, regulations, and general operational rules, while municipali-

ties and local authorities exercise direct management, organization, and control over the activities of the establishments within their territory.

PRICING IN CATERING ENTERPRISES

The preparation and sale of food products involve costs for raw materials, labour, fuel, depreciation, and other expenses.

In theory, all costs should form part of both the production and commercial cost price of kitchen production. In practice, however, these costs cannot be often clearly distinguished (either because of the simultaneous production of many products, or because production and sales are carried out in the same premises by the same personnel), it is accepted that they should be reported collectively rather than separately, as is the case in other manufacturing enterprises. As a result, public catering establishments do not calculate the actual (real) and market cost of production. Instead, they directly calculate selling prices.

In the restaurant business, diverse activities take place in a unified process: production, trade, and consumption organization. The following activities distinguish "catering" from other commercial activities [3, 4]:

Production activity consists of preparation of kitchen and confectionery products through heat treatment.

Commercial activity consists of sale of prepared products in the company establishments and purchased goods, such as bread, dairy and meat products, alcoholic and non-alcoholic beverages, fruits, nuts, cigarettes, obtained from other providers.

The activity of organizing consumption involves maintenance of premises, interior arrangements, and customer service. The amount of this expense is determined by the category of the business.

The direct link between the place and time of production and final consumption is the reason why the activities of catering enterprises are measured and assessed by the volume of turnover from the sale of goods and kitchen production and, on this basis, are treated as a commercial activity.

The integrated process of production, sale, and consumption prevents the separate accounting of costs for these three activities. For this reason, the production cost of kitchen products is not calculated and is not reported separately. This has led to the application of a modified method for direct

calculation of the selling price of meals, regardless of the accounting information on the costs of their preparation.

According to this method, the price of a serving is determined by adding a catering markup to the purchase price of the products used. This is based not on the actual costs of the products, but on the standard amount for 10 or 100 servings according to the recipe book used. Depending on the level of management, the price is also adjusted to some extent to consumer demand.

Only the value of the products used is included in the calculation of the selling price of meals as a separate item. Labour costs and other material and monetary costs for the production and sale of products, including the costs of purchasing the products, are included in the price as a whole through the public catering markup. This is expressed as a percentage of the price of the products and is intended to cover the aforementioned costs and ensure a profit for the enterprise. Markups are not regulated; they are determined by the enterprises on the basis of the aforementioned cost structure and sales revenue.

Dish prices are typically set quarterly, based on fixed product prices and applicable markups.

Products of the same type but of different quality are calculated as first quality, while fresh vegetables, whose retail prices change relatively frequently, are calculated at weighted average quarterly prices. However, if fresh vegetables are used only for salads, they may also be calculated at weighted average monthly prices.

Goods preserved in glass jars (whose price includes the cost of packaging) are calculated in dish prices only at the value of the raw materials in the jars, increased by the respective markup. In this case, the value of the jars is recorded separately in the Packaging account.

A price list should be issued in the form of a regulation for fixed product prices and average weighted prices for fresh vegetables before the start of each quarter.

Since spices are used in minimal quantities and are of insignificant value, it is permissible when calculating the prices of dishes not to list them separately, but to include them at a value that covers their cost.

The estimated markups, expressed as a percentage depending on the category of the establishment, are added to the total value of food products, including vegetables and spices. The markups are the same for all types of products (e.g., 150% for first-category establishments, 120% for second-category establishments, and

90% for third-category establishments). Certain products, e.g., vegetarian or dietary dishes or coffee, may carry higher markups (10% at least) on the ground that their processing is more labour consuming.

The selling price for the category and/or for consumers, with or without an artistic program, for ready-made goods sold in establishments is calculated using the same formula, but with a sales markup. Their sale does not require heat or cold processing, but only cutting or arranging.

The majority of sales in restaurants are made in cash. As a rule, the people who prepare the meals and goods, such as cooks and bartenders, do not participate in the sales process. Sales are carried out by waiters or salespersons (cashiers). This requires specific documentation of sales in restaurants.

Sales departments set the prices of kitchen products for the different categories of establishments using calculation sheets based on the weight (quantity) of the food products in the dishes at their fixed prices and based on the markups for the specific business categories. The weight of the products in the individual dishes is set out in the Collection of Recipes for Culinary Products in Catering Establishments.

When calculating the prices of dishes, the following typical provisions must be taken into account:

(a) Depending on the type of dish and the fats available on the market, prices must be calculated using the most appropriate fat; this must be entered in the price list of dishes for the chef's information.

(b) All meals for which a side dish is provided are calculated net, i.e., without the side dish.

(c) All side dishes are calculated as simple side dishes with their price per kilogram (a simple side dish consists of only one type of side dish, e.g.

only lyutenitsa, while a complex side dish consists of several types of side dishes, e.g. lyutenitsa, baked beans, and sautéed potatoes); the price of complex side dishes is determined depending on the weight and types of side dishes served; the price of the side dish thus formed is added to the price of the respective dish to obtain the total price of the dish with a side dish.

The different markups for individual establishments are influenced by their category, as this determines the costs of the setting and service. For this reason, the selling price of meals determined by the markup is called the category price. It determines the enterprise's revenue from sales of products and goods. When businesses have music played on a sound system or live, or an artistic program is presented, a surcharge for the music and/or artistic program is added to the price for the category. This is the price for the additional leisure and entertainment options offered to visitors.

VAT may also be calculated in the selling price of meals if the enterprise is registered under the VAT Act. The price determined therein is the price for end consumers.

The calculation of the price for the category and for consumers, respectively, with and without an artistic program, is carried out according to Tables 2 and 3.

Establishments that support orchestras and artistic programs are entitled to charge an additional surcharge on the regular prices of drinks and meals. When orchestras (and artistic programs) are a random occurrence, the additional surcharges are noted separately in the price list. However, when orchestras are a permanent feature, new prices are recorded in the price list, formed by increasing the regular prices by the percentage of the additional surcharge.

An exemplary calculation scheme for kitchen production is presented in Table 4.

Table 2. Price calculation without artistic program

	Purchase value of input products
+	... % markup for production and sale (of the purchase price)
+	Acquisition costs
	Price for the category
+	... % VAT (calculated from the price for the category)
	Price for the population (without program)

Table 3. Price calculation with artistic program

	Purchase value of input products
+	... % markup for production and sale (of the purchase price)
	Price for the category

	... % additional markup for the program (from the price for the category)
+	Acquisition costs
	Price for the category with music and program
+	... % VAT (calculated from the price for the category with music and program)
	Price for the population (with program)

Table 4. Calculation scheme for kitchen production (rice with vegetables)

440007	Rice with vegetables			
	Yield:	300,00 gr.	3.46	
	Serving size:	300,00 gr.	3.46	
	Number of servings:	1		
No		Nomenclature	Cost rate	Cost price
20	41	Canned peas	0.030	0.12
20	50	Tomatoes	0.050	0.15
20	105	Dried onions	0.020	0.04
20	121	Carrots	0.015	0.03
20	122	Parsley	0.003	0.02
20	140	Oil	0.015	0.06
20	141	Rice	0.035	0.09
20	155	Canned roasted peppers	0.080	0.40
20	191	Fine salt	0.003	0.003
20	240	Black pepper	0.003	0.02
20	241	Red pepper	0.0005	0.02
20	257	Corn	0.050	0.20
Actual cost (price for the category)				1.15
Markup 150 %				1.73
VAT charged 20 %				0.58
Final price for population				3.46

At present, it is possible to apply alternative approaches to determining the selling price of kitchen products [3]. The price of a dish is increasingly determined by the selling price of kitchen products offered by competing companies. Furthermore, when entering the market, newly established tourism companies may offer lower prices for meals than their competitors in order to attract more customers and seize a higher market share.

The prices at which meals and beverages are sold are communicated to customers via price lists.

CONCLUSION

Although Bulgarian legislation does not provide an explicit definition of “catering”, the term encompasses activities related to the preparation and serving of food and beverages for consumption outside the home, including restaurants, canteens, cafés, and similar establishments. Catering enterprises may operate within tourism (restaurants or restaurant complexes and hotels), the or-

ganized recreation and healthcare systems (holiday homes, sanatoriums), or the trade sector. They function through restaurants, fast-food outlets, pubs, cafés, and bars.

The study concludes that accounting in catering enterprises has distinctive characteristics not found in other economic sectors. Although not governed by sector-specific legislation, establishments are authorised to develop their own accounting procedures, provided they comply with current legal requirements and consider industry recommendations and accumulated professional practice.

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OPPORTUNITIES FOR OVERCOMING SEASONALITY IN BULGARIAN TOURISM

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ABSTRACT

It is well known that tourism in Bulgaria is predominantly seasonal. Seasonality has a negative impact on the country's overall economic development. The main influencing factors are natural conditions, which create more favourable climatic characteristics in summer and increased precipitation and cloudiness in winter. From a climatic perspective, however, this situation also places the country in a favourable position for adopting new managerial decisions for development.

The aim of this article is to highlight opportunities for overcoming seasonality through the development of new alternative forms of tourism, enabling Bulgaria to position itself as a four-season destination on the global tourism market.

Key words: *seasonality, alternative types of tourism, untapped potential*

INTRODUCTION

Seasonality in Bulgarian Tourism: Challenges and Opportunities

In Bulgaria, mass seaside tourism predominates, gradually enriched by various specialised forms of tourism. This activates the pre-season and post-season periods (October, November, April, May). During the remaining months (December–March), health tourism and its various forms can be more strongly developed.

For many alternative forms of tourism, the condition of flora and fauna is essential, even when it is not the primary purpose of travel. This is particularly true of medical tourism, especially climatotherapy, where air quality depends on existing vegetation, its type, condition and characteristics. Sports tourism also falls within this category, including sports-recreational and sports-health tourism.

FACTUAL FRAMEWORK

On the territory of the Southern Black Sea coast — a representative area of Bulgarian tourism — in addition to marine recreational tourism, other forms can be practised, such as balneotherapy, mud therapy, ecotourism, cultural tourism, religious tourism, climatotherapy, route-based educational tourism, and newer forms such as geocaching tourism. Across Europe, alternative forms are developing dynamically, especially ecotour-

ism, cycling tourism and golf tourism. Some traditional and emerging forms that continue to evolve include:

➤ *Ecotourism* originated in North America in the mid-1980s as a result of travel to remote areas with preserved natural environments. It refers to tourism in areas minimally affected by human activity and should contribute to environmental protection and the well-being of local communities. It is based primarily on observation and represents a new stage of development requiring partnership between tour operators, incoming agencies, local communities, protected-area associations and the scientific community. All stakeholders commit to minimising impacts on visited territories, informing travellers about local rules and regulations, participating in regional environmental programmes, and managing visitor flows to the area responsibly.

The emergence of the term “Ecotourism” and its growing popularity reflects a fundamental shift in attitudes towards nature, driven by global concern for environmental conservation. Its goal is to minimise negative impacts on natural ecosystems. Ecotourism is one of the types of tourism most often classified as an alternative to traditional mass tourism. Alternative tourism, and in this case ecotourism, has the following distinctive characteristics:

- Striving to preserve, protect, and enhance the quality of tourism
- Improving infrastructure without disrupting natural conditions

- Encouraging efforts to reduce environmental impact
- Promoting ecological and cultural sustainability

When considered independently, ecotourism includes “visiting pristine natural areas, where participants are motivated to satisfy their needs for natural, social, and cultural knowledge and their concern for nature”. Prior to 1990, ecotourism was not only seen as a form of tourism but also as a means of sustainable development.

In 1991, the International Ecotourism Society proposed one of its first definitions: “Ecotourism is responsible travel to natural areas that conserves the environment and sustains the well-being of local people.”

According to researchers, well-planned and well-managed ecotourism is considered one of the most effective means of long-term biodiversity conservation, provided that certain conditions and circumstances exist, such as a viable market, local management capacity, and clear links between ecotourism development and environmental conservation.

Ecotourism is a small but rapidly growing industry governed by market laws and regulations. As a form of tourism, it consists of four main elements:

1. Travel from one place to undisturbed or protected natural areas, with ecotourism primarily focusing on experiences arising there
2. Ecotourism is environmentally friendly
3. Ecotourism is driven by the idea of conservation. The goal is to minimize environmental impact in protected areas. Ecotourists are generally more conscious of their impact on the surrounding environment than mass tourists. As a more specialized form of tourism, ecotourism promotes “greater understanding and respect for culture, heritage, and the natural environment, and people tend to protect what they respect”

4. Ecotourism has an educational role. Ecotourists typically have a strong desire to learn more about nature and local communities during their visits. This makes ecotourism a valuable source of knowledge for environmental protection and the sustainable development of local communities.

The largest and most diverse ecotourism programs are found in countries with high biodiversity, where nature has impressive dimensions, national parks, and local communities that have preserved their traditions. Programs defined as ecotourism include:

- Around the world: Observing large animal species in their natural savannah or jungle habitats (rhinoceroses, lions, gorillas, etc.), large marine basins and oceans (whales, turtles, etc.), and in polar regions (polar bears, seals, etc.), where civilization is still barely felt

- In Bulgaria: Sites worth visiting by global standards include observing brown bears in the Balkan Mountains, Rila, and Pirin, pelicans in Lake Srebarna, and visits to the Boatin, Parangalitsa, and Bayuvi Dupki–Dzhindzhiritsa reserves due to the quality and age of compact forest sectors

This form of tourism has the following main objectives:

- To isolate or eliminate the negative impact on the natural environment and population
- To visit relatively isolated, unspoilt locations with the aim of preserving and developing them
- To improve the economic situation of local communities
- To develop a non-commercial attitude toward nature in ecotourists and encourage them to preserve it
- To foster responsibility among local communities in their relationship with nature by educating them and highlighting the dangers of excessive exploitation of natural resources and unlimited tourist visits
- To stimulate new initiatives such as the production and sale of local eco-friendly products, the development of crafts, herbal medicine, and so on
- To ensure overall control over natural resources
- To allocate part of the tourism revenue for the development of the area rather than enriching individuals
- To develop and encourage a sense of pride among local residents by preserving and promoting their traditional activities that could attract tourists to the region
- To target an already-formed niche of potential consumers – people with above-average incomes from all age groups

Bulgaria offers excellent opportunities for ecotourism. The network of three national parks, eleven nature parks, 89 reserves and 2,234 natural landmarks provides favourable conditions for recreation and leisure.

Activities include hiking, cycling, horse riding, wildlife photography, wildlife observation, mountaineering and caving. In the parks, hiking tourism is primarily encouraged to protect nature.

Our mountains are easily accessible. National park administrations maintain tourism infrastructure and develop educational routes. Nature conservation centres provide training programmes and information on eco-trails.

➤ *Cultural tourism* combines the concepts of culture and tourism. In a narrow sense, culture refers to historical and artistic heritage: architectural monuments, museums and similar sites in a region, as presented in classical tourist catalogues. In a broader sense, it includes traditions, crafts, technical heritage, cuisine, language and everyday life, all of these define our identity. They shape everything we do, influencing both public and private life, our daily routines, celebrations, and beliefs.

Cultural tourism provides opportunities to explore history, arts, religion, and the lifestyles of people from different geographical regions. It encompasses landmarks, events and intangible heritage.

As a result, the following definition can be proposed: cultural tourism refers to travel with the purpose of visiting cultural landmarks, exploring foreign cultures, or attending cultural events.

In his book *Cultural Tourism*, Professor Encho Kostov defines cultural tourism as a “specialized tourist journey motivated by the fulfilment of socio-cultural needs through the consumption of cultural values.”

As a socio-economic phenomenon, cultural tourism has a complex nature. It represents a unique combination of business and cultural attractions. Cultural values are a fundamental condition for the development of cultural tourism. Essentially, they comprise a collection of objects and phenomena whose cognitive and emotional impact aims to satisfy socio-cultural needs. These values can be grouped into three main categories:

1. Cultural and historical monuments and landmarks. This category includes archaeological sites, architectural monuments and complexes, monasteries and churches, ethnographic sites, museums, and so on. Collectively, they represent the country’s cultural heritage.

2. Works of art from antiquity to the present day. These include all movable cultural heritage, such as collections of artistic objects, paintings, sculptures, folk art crafts, embroidery, national costumes, and so on. The exhibition of this cultural heritage can attract cultural tourists.

3. Periodic and occasional events showcasing achievements in spiritual culture. These include festivals, performances, exhibitions, congresses, fairs, and commemorative celebrations.

Their level of prestige determines the degree of tourist interest they generate.

Bulgaria offers excellent conditions for the development of cultural tourism due to its rich historical and cultural heritage. The country boasts over 40,000 cultural monuments, nine of which are included in UNESCO’s World Heritage List, 36 cultural reserves, 160 monasteries, and 300 museums and art galleries. The most visited monasteries today include the Rila Monastery, Bachkovo Monastery, Rozhen Monastery, Troyan Monastery, Preobrazhenski Monastery, etc. Approximately 20 of them offer accommodation for pilgrims and tourists.

Visitors can also experience traditional economic activities, such as winemaking and rose oil production, participate in workshops on traditional Bulgarian crafts, such as embroidery, knitting, woodcarving, and pottery, or enjoy authentic Bulgarian folklore.

The Richness of Bulgaria’s Folklore and Religious Tourism

Bulgaria’s folklore calendar is rich and diverse, featuring traditional festivals and customs deeply rooted in Bulgarian life and culture, along with numerous folk gatherings and celebrations.

The stunning variety of colours and forms, the intricate masks, and the mesmerizing rhythm of hundreds of bells and folk instruments attract an increasing number of people eager to experience the magic of Bulgarian folklore. Some of the most renowned folk gatherings take place in Koprivshitsa, Shiroka Laka, Rozhen, and Predela, but there are also numerous folk festivals across the country. Notable events include:

- The Festival in Burgas, held annually in the second half of August
- The Rose Festival in Kazanlak, held annually in early June
- The Folklore Festival in Koprivshitsa, organized every five years
- The International Festival of Kukeri and Masquerade Games in Pernik, held in January every even-numbered year

For art lovers, Bulgaria offers a rich cultural calendar, including prestigious international theatre, cinema, opera, and ballet festivals, as well as concerts by world-famous musicians, orchestras, and ensembles, along with various exhibitions.

➤ *Religious tourism* is considered a branch of cultural tourism. More specialized forms include cult tourism and pilgrimage tourism. Religious tourism is the oldest type of cultural tourism. As experts emphasize, defining religious tourism

does not simply mean combining religion and travel but rather understanding the connection between culture and tourism, as religion is essentially spiritual culture.

Religious tourism is one of the oldest and most authentic forms of tourism. It involves specialized travel, either entirely or partially motivated by the visitor's desire to fulfil religious needs. While it is often regarded as a distinct category of tourism, it can also be seen as a subtype of cultural tourism.

On one hand, religious tourism (sometimes incorrectly referred to as sacred or pilgrimage tourism) includes visits to ancient religious and cult sites: religious centres, sacred places, monuments, buildings, and locations many of which hold exceptional historical and architectural significance.

On the other hand, it encompasses travels related to major religious events, such as attending religious celebrations, processions, church services, patron saint feasts, festivals, and so on.

Religious tourism integrates the spiritual meaning of religion (worship) with tourism (travel), directly linking the traveller's needs and motivations. It consists of two core elements: "religion" and "tourism," both of which are complex concepts. This is why understanding the essence of this specialized type of tourism requires analyzing the motives behind its appeal.

Religion (from the Latin *Religio*, meaning sacred duty, reverence) is most commonly defined as "a form of social consciousness, a system of beliefs, attitudes, and customs based on faith in supernatural forces, as well as a set of moral norms, practices, values, institutions, and rituals accompanying this system."

Millions of tourists travel worldwide today to honour the most significant religious holidays in the church calendar. Some of the most famous pilgrimage routes, past and present, include the journeys to Jerusalem, Rome, and Santiago de Compostela. These routes pass by invaluable religious sites but also lead travellers to other remarkable cultural landmarks.

In its German-language version, several definitions of religious tourism are present. According to K. Berkemann, it is a "spiritually and physically motivated tourist journey for individuals seeking union with God, the meaning, and values of life." A similar definition is provided by theologian N. Poensgen: "A form of tourism motivated by the pursuit of immaterial values, spiritual healing, the unity of the material and the spiritual, and perceptions of the afterlife." The content of religious tourism is presented more generally in the definition of psychologist Ch. Melchers, for whom the

range of tourism extends from "the family photo in front of the statue of the saint to perceptions related to the meaning of existence."

In our opinion religious tourism includes:

1. **Pilgrimage Travel.** Visits to holy places motivated by piety, fulfilment of spiritual needs, and worship

2. **A type of tourism to religious sites or places** (a variation of cultural tourism).

Religious tourism is also often combined with business, cruise, hiking, medical, and recreational tourism. Based on the definitions and characteristics of religious tourism, a tourist product specific to this type of specialized tourism can be created.

According to some authors, the product of religious tourism includes countless religious attractions that can be grouped into the following categories:

a) **Sacred places and religious centres** serving the purposes of religiously motivated pilgrimage visits;

b) **Religious buildings and monuments** that hold both historical and architectural-artistic value;

c) **Religious events and holidays** (festivals, processions, rituals, services, etc.);

d) **Cult objects**, souvenirs, sound recordings, books, and other items with religious themes.

Religious tourism often intertwines to varying degrees with other types of tourism. It is most strongly combined with cultural tourism (due to the nature of the sites visited), which is why it is often defined as its subpart. Given the substantial information it provides, religious tourism also includes elements of knowledge.

Religion is part of spiritual culture, both in anthropological and humanistic aspects. While in the first former religion is a collection of spiritual values, in the latter, it is considered a process. Through religion (or faith), national identity and personal resilience are upheld, whether in an individual, a specific group, or an entire nation. This is particularly evident in the preservation of faith and language during periods of imprisonment and subjugation.

"Formally considering the two concepts, religion and tourism, we highlight their dual meaning, which connects them substantively. This raises the question of the approach. Religion is a part of cultural expression."

- Culture, in its essence, is a set of spiritual, material, intellectual, and emotional characteristics of every society and social group

- Culture is an expression of the way of life, the fundamental human rights of existence, value systems, traditions, and beliefs

Therefore, the starting point for clarifying the essence of religious tourism is the essence of cultural tourism.

➤ *Cycling Tourism.* Cycling is part of ecological tourism, which is supported by the increasing number of cycling routes and bike lanes. The EuroVelo network, developed by the European Cyclists' Federation, promotes long-distance cycling routes across Europe and contributes to economic development, health promotion and sustainable mobility. The European Cycling Federation (ECF), founded by cycling organizations in 1983 and based in Brussels, currently represents the interests of 51 national cycling associations across 36 countries in Europe and other continents.

➤ *Geocaching Tourism.* Geocaching is an unconventional form of tourism, not yet sufficiently developed in Bulgaria, but well-known in Europe. It is a tourist navigation activity that combines cultural, sports, and recreational elements, with the premise of becoming part of recreational tourism. It was founded at the beginning of the century in the United States by Dave Ulmer, who placed the first cache, a container containing a notebook for recording notes and possibly items to be exchanged. The development of Geocaching is closely linked to GPS technology, which aligns it with new trends in tourism. Its essence is based on an adventurous journey aimed at finding a hidden box (cache) according to precise geographic coordinates. Each cache includes descriptive information about the location, often highlighting natural or cultural attractions. The box may contain a journal – a notebook where the participant records the "treasure" found in the cache and lists items (figurines, pins, etc.) exchanged in the box. Some cached items are not meant for exchange but are used for travelling around the world and are called "trackables". These are so-called travel bugs and geocoins. Two factors are decisive in the search: task difficulty and terrain. The complexity corresponds to how well the cache is hidden, and the terrain conditions correspond to the level of alpine climbing. The execution of these parameters is measured in stars, ascending from one to five. Search variants also include multi-stage caches, where the first cache points to the coordinates of the next one. Each country may also have its own website dedicated to Geocaching (e.g., geocaching.de, geocaching.at, geocaching.cz, geocaching.hu), where various articles, interesting facts,

discussions, or information about meetings of Geocaching participants are published. This innovative form of tourism is rapidly gaining traction, with an ever-growing number of interested parties.

In tourism, the main localizing factors necessary for the formation of recreational processes are primarily natural resources (relief, climatic conditions, water, flora, and fauna), cultural-historical conditions (cultural-historical monuments, cultural and sports events), and conditions for implementation (transport, accommodation, meals). Geocaching, as an innovative form of tourism, combines all these factors, with the central element being its execution in a natural environment. Geocaching is directly linked and dependent on the natural resources of the region but also on cultural and historical characteristics. The region around Strandzha Mountain, as well as the Southern Black Sea coast, possesses a rich cultural-historical heritage, including numerous megalithic structures (dolmens), medieval ruins, churches, chapels, monasteries, tombs, architectural reserves, ethnographic museums, and so on. The cache is usually based on a natural or cultural attraction, so the participant's search is linked to travelling to explore the local landmarks. This new form of combined tourism influences the choice of destination where the participant will spend their vacation and, thanks to it, can feel the adrenaline of the search year-round, as well as engage in health prevention or recovery after respiratory illnesses.

The managerial decision of tourism managers to initiate such an unconventional form of tourism, combining it with health tourism, can lead to economic benefits, a positive image, and the development of the destination. With the development of Geocaching, it would be beneficial for a given destination to create a cache related to its tourist attractions, which would attract interested visitors. Such unconventional forms need to be supported, further developed, supplemented, or even combined with classical forms of tourism, for example, with health tourism: climatotherapy.

➤ *Shinrin-yoku* is a Japanese term meaning "forest bathing". This unconventional form of tourism is not related to bathing in a river but to the metaphorical "immersion" in the calming atmosphere of the forest. The harmony and natural scenery (views, sounds, touch, and scent of the forest) affect human senses, achieving a mental balance. As a result of the negative influences of everyday life, unhealthy lifestyle, aggressive ur-

ban influences on the human psyche, lack of physical activity, chronic stress, medication, pandemics, isolation, poor eating habits, and other destructive factors for the body, people are seeking ways to restore their well-being. Shinrin-yoku is emerging as a complex form of tourism that combines hiking and climatotherapy. Other forms of health tourism, such as holistic treatments, yoga and meditation, New Age therapies, detox programs, and relaxation can be connected with it. Walking through forests, hiking along forest trails, using the rich climatic resources of the Strandzha region and the Southern Black Sea coast, surrounded by greenery, forest sounds, and clean air, enriched with phytoncides, all contribute to the restorative powers of the body, especially when recovering from a COVID-19 infection. As with other combined forms of tourism, this type also helps reduce stress to a minimum, thereby aiding its preventive and therapeutic function. Shinrin-yoku improves concentration and sleep quality, which is part of the main list of healthy practices. “There is no medicine that has the same impact directly on health as walking in a beautiful forest,” says the Bulgarian Association for Climatotherapy and Health Tourism.

In addition to treatment, the region promotes healthy active tourism with its numerous trails and rich road network, a variety of landmarks, and, especially for those interested in forest therapy, the opportunity to observe animal and plant wildlife.

➤ *Terrain Therapy* involves walking on designated trails with specific gradients (3–20°) to improve tolerance to physical exertion. The trails should be developed to make full use of the climatic and landscape features of the mountains and the seashore. Terrain therapy routes are typically classified as: light, up to 500 meters and an incline of 3–8°; medium, up to 1,500 meters and an incline of 5–15°; and heavy, up to 3,000 meters and an incline of 5–20°.

CONCLUSION

Bulgaria possesses remarkable recreational resources that generate significant interest among domestic and international tourists.

To strengthen Bulgaria’s position as a four-season destination, it is necessary to: activate cooperation between local and national organisations, improve the quality of the integrated tourist product, engage in powerful advertising through online media, including social networks, use the services of professional journalists, bloggers, vloggers, and influencers, and, most importantly,

train and retain qualified, motivated personnel under favourable working conditions. The diversification of tourism through alternative forms offers a realistic opportunity to reduce seasonality and ensure sustainable development.

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THE EVOLVING ROLE OF SUPPORT SERVICES IN LONG-TERM CARE FACILITIES IN BULGARIA: FROM OPERATIONAL SUPPORT TO STRATEGIC RESOURCE

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ABSTRACT

This paper examines the evolving role of support services in Bulgarian long-term care facilities, highlighting their transformation from operational necessities to strategic resources in healthcare management. It analyzes current structures, trends in outsourcing, digitalization, and quality improvement, and explores challenges related to workforce, regulation, and financing. The study argues that integrating support services into strategic planning enhances efficiency, care quality, and patient outcomes, positioning them as vital components of sustainable healthcare delivery.

Key words: support services, long-term care facilities, healthcare management, strategic resource

INTRODUCTION

Support services in healthcare – often referred to as facility management – encompass non-clinical functions such as cleaning, catering, maintenance, security, logistics, IT, and administrative support. Traditionally viewed as back-office or operational necessities, these services are increasingly recognized as strategic resources that underpin quality care and patient outcomes.

In long-term care (LTC) settings, where residents often depend entirely on facility provisions, the impact of support services on comfort, safety, and health is particularly significant. This paper examines the evolving role of support services in Bulgarian long-term care facilities, analysing their current structure, recent trends (outsourcing, digitalization, and quality improvement), and the challenges of elevating them to a strategic level. It also considers Bulgarian policy and regulatory context and implications for workforce development, patient outcomes, and cost-efficiency, drawing on academic and industry sources from Bulgaria and comparable EU countries.

DEFINING SUPPORT SERVICES AND FACILITY MANAGEMENT IN HEALTHCARE

“Facility Management” (FM) integrates diverse support processes to maintain and improve an organization’s buildings, infrastructure, and work environment. In healthcare, FM traditionally includes cleaning, maintenance of buildings and equipment, environmental services, and systems infrastructure (space, utilities, security), as well as

“people and organizational” functions such as catering, IT, human resources and administration.

By definition, these are services *not directly related to patient care* but essential to it: “all services that are not directly related to the patient care can be defined as facility services.” According to the European Committee for Standardization (CEN), FM is the “integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary activities” [1]. In other words, support services in healthcare should be aligned with the core mission of clinical care, ensuring safe, hygienic, and efficient conditions for both patients and staff.

FM is inherently strategic: its primary function is to provide strategic management advice on the efficient operation of buildings and life-cycle cost minimization [2]. Well-managed support systems contribute to productivity and quality, positively affecting clinical outcomes. For example, rigorous hygiene protocols (cleaning, waste disposal, infection-control) are directly linked to reducing hospital-acquired infections, while reliable catering and nutrition services support patient recovery. Energy-efficient infrastructure and preventive maintenance prevent interruptions in care delivery. Recognizing this, modern healthcare FM emphasizes the use of key performance indicators (KPIs) and alignment with organizational strategy [3]. In summary, the scope of healthcare support services is broad and, by integrating with core processes, they can transition from cost centres to strategic enablers of safe and effective care.

SUPPORT SERVICES IN BULGARIAN LONG-TERM CARE FACILITIES: CURRENT STRUCTURE

In Bulgaria, formal long-term care remains relatively underdeveloped and fragmented. An EU report observes that “Bulgaria’s long-term care (LTC) system is underdeveloped” with an uneven mix of institutional and home-based services [4]. Public spending on LTC in Bulgaria (about 0.4% of GDP in 2013) is far below the EU average, and services for the elderly are often delivered through state or municipal institutions (e.g. nursing homes, hospices). These facilities are typically funded by a combination of state budgets, social insurance, and municipal funds, and they often operate with limited resources and staffing. The Bulgarian National Strategy for LTC (2014) and its action plans (2018–2021, 2022–2027) aim to expand community-based services and improve coordination, but historically the system has focused on inpatient settings [5].

Within an LTC institution in Bulgaria, support services (cleaning, meal preparation, laundry, maintenance, etc.) are usually managed at the facility level by the management team or local authorities. Municipal nursing homes may employ their own maintenance and cleaning staff or contract them externally. For example, the Aleksandrovska University Hospital in Sofia (a large hospital used for student internships, albeit acute-care) has recently outsourced preventive maintenance of its 360+ air-conditioning units to an external facility management firm. Such cases indicate that even in Bulgaria, outsourcing of technical and building-related services is becoming more common. However, in LTC settings overall, published data on outsourcing rates remain limited. It is likely that many smaller care homes still perform housekeeping and catering in-house due to budget constraints.

In terms of scale, LTC facilities in Bulgaria vary: national statistics indicate around 100-200 institutional homes for the elderly (each with tens to hundreds of beds) across the country. Support departments in each facility are typically lean. For example, cleaning staff may consist of only a few employees per ward, and kitchens often operate on limited budgets. These roles are often undervalued relative to clinical staff: the healthcare sector in Bulgaria has long faced chronic understaffing and low resources, and this extends to support roles. An analysis of a major Bulgarian hospital noted that utilities and facility costs can exceed one-third of total expenses, implying that in many

facilities, support services are a significant budget item despite their often underestimated priority. As Bulgaria modernizes its healthcare system, clarifying the structure and scope of support services in LTC settings (and improving their integration with care teams) will be essential.

EVOLUTION OF SUPPORT SERVICES: FROM OPERATIONAL TO STRATEGIC

Support services in healthcare have traditionally been viewed as operational overhead, secondary to direct patient care. In many hospitals and care homes, these functions were siloed: cleaning done by janitors, catering by kitchen staff, IT by a small tech team, with limited integration into medical management. However, a shift is occurring where hospitals recognize that neglect of these areas can compromise patient safety and experience. The literature emphasizes that inadequate hygiene and maintenance directly affect clinical outcomes. For instance, an industry analysis notes that “inadequate hygiene along with insufficient maintenance causes thousands of hospital-acquired infections” each year, whereas robust facility management (with rigorous cleaning protocols and safe infrastructure) “decrease[s] infection risks” and supports safe care [6].

In long-term care facilities, these stakes are even higher. Elderly residents in nursing homes or hospice wards are often more vulnerable to infections, falls, malnutrition, and environmental discomfort. Thus, support services in LTCFs have a clear strategic impact: they help prevent harm and promote well-being. Cleaning staff, for example, “deal with hospital waste removal including garbage, blood and body fluids... and perform procedures to maintain infection control”. Likewise, food service workers prepare meals according to health and dietary restrictions, directly influencing patient nutrition and satisfaction [7]. When these services are understaffed or under-resourced, patient care deteriorates.

Recognition of this nexus between support services and outcomes is causing healthcare leaders to treat facility management more strategically. Rather than merely contracting out the cheapest service, they ask: How can cleaning and maintenance be used to improve quality and efficiency? European facility management standards explicitly endorse this: by integrating planning and maintenance with organizational strategy, FM contributes to the productivity and profitability of building occupants and improves return on investment. In practical terms, this means that support

services are increasingly linked to key performance indicators (KPIs) aligned with hospital goals. For instance, KPIs might include reduction in infection rates, energy consumption per bed, or patient satisfaction scores related to cleanliness [3]. Thus, support services are transitioning from cost centres to strategic enablers that create the conditions for safe, efficient care and help the institution achieve its mission.

TRENDS IN SUPPORT SERVICES

Outsourcing

Outsourcing has become a major trend in healthcare support services worldwide. Many health systems turn to private firms to provide cleaning, laundry, catering, and maintenance, aiming to cut costs or improve flexibility. For example, in Canada a large health authority outsourced its food and cleaning services to external contractors to focus financial resources on core healthcare delivery activities. The advantages often cited include access to specialized expertise, economies of scale, and the ability to shift variable costs off the hospital's balance sheet.

In Bulgaria, outsourcing is gradually increasing. Some large hospitals routinely contract external providers for technical services: a recent example is the Aleksandrovska University Hospital in Sofia, which began outsourcing all air-conditioning maintenance to an external company in 2025. The contract covers monthly inspections and repairs for over 360 AC units across the hospital's clinics and wards.

Similarly, some hospitals use external cleaning firms or caterers for part of their services, especially when budgets or personnel shortages make in-house staffing difficult. However, outsourcing also presents risks: it can create coordination issues and concerns about quality or worker safety. A Canadian study found out that after outsourcing, injury costs for cleaning staff initially decreased, but noted instances of under-reporting of injuries among outsourced workers [7]. This underscores that outsourcing must be managed carefully: hospitals need strong contracts and oversight (e.g. SLAs and KPIs) to ensure outsourced services meet the facility's strategic goals.

For Bulgarian LTCFs, outsourcing remains uneven. Smaller care homes often lack the administrative capacity or budgets to outsource major services, so they may continue to handle cleaning, laundry and meals internally [8]. In urban areas, however, there are more vendor options: private cleaning companies and catering services can bid

for contracts. Another visible trend is centralization: some regional health authorities or municipal networks may try to consolidate support contracts across multiple facilities to gain scale. Indeed, an international study of a French region showed that centralizing hospital support services (food, laundry, transport) was associated with a reduction in patient readmission odds. While specific Bulgarian case studies are scarce, the global pattern suggests that outsourcing will grow, and with it, the need for LTCF managers to adopt strategic contracting and performance monitoring.

Digitalization

Digital technologies are transforming support services across healthcare. Innovations range from simple (digital cleaning checklists, RFID-tagged medical equipment) to advanced (Internet of Things, or IoT, sensors, AI-driven maintenance systems). The goals of digitalization include improving efficiency, traceability, and responsiveness. For instance, digital cleaning management systems use barcodes or beacons to track whether rooms have been cleaned, who cleaned them, and when. One literature review notes that digital tracking systems stand out for monitoring cleaning processes: e.g. QR-code-based logs and Bluetooth beacons have been deployed to increase efficiency. By capturing data in real time, these systems enable managers to identify delays or gaps (e.g. a dirty room) before they become problems. Similarly, IoT sensors can monitor equipment performance (e.g. air handlers, refrigerators), alerting staff to maintenance needs before a breakdown occurs [9].

The benefits are clear: digital cleaning processes allow a *proactive* approach to potential issues, minimizing waste and reducing costs. They also improve quality control: by recording exactly when and how hygiene tasks are performed, hospitals can provide transparent audit trails (important for infection control). Blockchain and secure data systems have even been proposed for hygiene tracking, ensuring an immutable record of cleaning protocols [10]. Moreover, digital facility management can integrate with broader hospital information systems, tying support metrics to patient outcomes or satisfaction scores. In short, digital tech turns support services into data-driven systems.

In Bulgaria, the digital transformation of healthcare has been slow. A 2013–2017 survey of Bulgarian hospital professionals found that three-quarters rated the state of digital health as underdeveloped [11]. While much of that reflects medical IT (electronic records, telemedicine), it also

implies that backend systems (including FM software) lag behind. There are successes: some Bulgarian hospitals have adopted maintenance management software to schedule repairs and log work. However, comprehensive digital tools for cleaning and catering are still rare. This gap is significant: as one study notes, “the lack of digital support in cleaning processes poses certain risks in terms of patient safety and operational efficiency,” hindering optimal care outcomes. Thus, Bulgarian LTCFs may increasingly look to digitize their support services, adopting simple steps (e.g. digital temperature logs for food storage, mobile apps for task lists) up to sophisticated solutions (IoT maintenance, RFID inventory tracking). Over time, such digitalization will be essential for quality assurance and cost control.

Quality Improvement

Quality improvement (QI) frameworks are bringing support services into sharper focus. Whereas the past measure of success in healthcare was often the volume of clinical services, modern systems are embracing patient-centred and outcome-oriented metrics. Support services now form part of these quality initiatives. For example, Joint Commission International (JCI) accreditation and ISO 9001 quality systems for hospitals explicitly include standards for cleanliness, food safety, equipment maintenance, and administrative processes. In Bulgaria, a small percentage of hospitals have obtained ISO 9001 certification [9], and many are working to meet European patient-safety protocols that cover environmental hygiene.

Practically, QI efforts may involve training and protocols for support staff (e.g. updated cleaning techniques to reduce pathogens, use of antimicrobial surfaces), process audits, and cross-functional teams that include administrative leaders in care planning. A recent Bulgarian analysis emphasizes that improving healthcare quality means moving from process-oriented checks to tracking real patient outcomes [12]. In this vein, support services are evaluated by their contribution to outcomes: Has improved ventilation (through maintenance) reduced respiratory infections? Has better nutrition (through catering) improved recovery times? Has energy-efficient lighting freed up budget for more nursing staff? Organizations are implementing key performance indicators (KPIs) in FM tied to strategic goals [2]. Furthermore, health technology assessment is beginning to include support interventions (e.g. evaluating the cost-effectiveness of robotic cleaning versus manual labour). Overall, the trend is integration of

support service quality metrics into the hospital’s overall QI program, ensuring these functions receive managerial attention and continuous improvement efforts.

CHALLENGES IN ELEVATING SUPPORT SERVICES

Several barriers hinder the strategic elevation of support services in Bulgaria. Cultural and managerial attitudes can be an obstacle: for decades these services were viewed as peripheral, and some clinicians and administrators may resist dedicating budget or management attention to them. Workforce issues are also critical: support jobs often carry lower pay and prestige, leading to high turnover and skill gaps. For example, cleaning staff in Bulgaria may not receive the same infection-control training as in top hospitals, and qualified biomedical technicians are scarce. As a Bulgarian facility analysis notes, the health sector suffers from “understaffing, supply shortages, brain-drain, huge debts and chronic lack of money” [1]. Such conditions undoubtedly hamper investment in support-service quality.

Regulatory constraints are mixed. Bulgarian health law specifies staffing ratios and safety standards for clinical services, but detailed mandates for facility services are few. Some technical standards (e.g. for water quality, medical gas safety, building codes) do apply, but enforcement can be poor. There is also ambiguity over funding: support services in public LTCFs may not be directly reimbursed by health insurance, relying instead on general budgets. This creates limited incentives for LTCFs to innovate or improve these services, since they rarely generate additional revenue.

Financial pressures loom large. As noted, support services can account for a substantial portion of a facility’s budget. For many Bulgarian LTCFs operating on tight public funds, reallocating money from personnel or direct care to, say, a digital monitoring system is difficult. Outsourcing, while attractive for potential savings, introduces transition costs and requires careful oversight to avoid service disruptions. Also, while digital tools promise efficiency, they often need upfront investment (hardware, software, training) that may not be immediately recouped. The largely subpar digital infrastructure in Bulgarian hospitals [13] means many facilities must first build IT capacity before adding IoT or analytics layers.

Finally, coordination and integration of support services pose a challenge. In LTC, where care

often bridges medical and social domains, there are multiple stakeholders (health ministry, social services, municipal authorities). Ensuring that support functions operate seamlessly across departments requires strong leadership and clear chains of command. The fragmentation of Bulgaria's LTC governance (with separate streams for health insurance and social assistance) complicates the adoption of system-wide standards for support services.

POLICY AND REGULATORY CONTEXT IN BULGARIA

Bulgaria's national strategy for long-term care, adopted in 2014 and updated with action plans, aims to expand services and improve quality of life for the elderly. However, attention to specific policies regarding facility support services in LTC is minimal. There are general regulations (e.g. the Health Act, Public Health Act, and sanitary norms) that set minimum requirements for hospital infrastructure and hygiene, but these often focus on acute hospitals rather than residential care homes. For example, legislation might require certain heating standards or ventilation for patient wards, but not protocols for kitchen management in nursing homes.

At EU level, directives on infection control and waste disposal apply to all health institutions, including LTCFs. Bulgaria must comply with these (e.g. regulations on medical waste disposal, occupational safety for workers handling cleaning chemicals). Nationally, the licensing of nursing homes includes inspections of facilities and sanitation practices.

Bulgaria participates in EU initiatives such as the Joint Action on LTC and the European Semester, which emphasize integrated care models and workforce development. These encourage Member States to train and value all healthcare workers, implicitly including support staff. There are also funding programs (EU Social Fund, Bulgarian Development Bank loans) that LTC facilities have used to renovate infrastructure or upgrade equipment.

Overall, policy momentum is slowly building. The new Action Plan 2022–2027 for LTC envisages quality standards and integrated service networks, which could open the door to formalizing standards for facility management. However, until support services are explicitly prioritized in policy and budgets, their evolution will largely depend on local leadership and market forces.

IMPLICATIONS FOR PATIENT OUTCOMES AND COST-EFFICIENCY

The strategic uplift of support services should translate directly into better patient care. Clean, well-maintained environments reduce adverse events. For example, thorough cleaning protocols can significantly lower the incidence of hospital-acquired infections, thereby shortening hospital stays and improving survival rates. Similarly, attention to nutrition services means patients in LTC facilities receive appropriate diets, which can improve healing and reduce complications. Efficient logistics (timely delivery of medications, prompt repairs of equipment) supports continuity of care. High tech solutions (like real-time location of emergency equipment) can save lives. Patient satisfaction also rises when facilities are comfortable and safe – a nice waiting area, reliable lifts, or simply fresh linens make a difference in well-being. From a strategic perspective, these improved outcomes support the institution's mission and can enhance its reputation and reimbursement (in systems that link funding to quality).

Paradoxically, strategic investment in support services can lead to long-term cost savings. A poorly maintained hospital can incur higher expenses: breakdowns lead to costly emergency repairs, leaks cause water damage, energy waste hits the budget. The European HHM piece notes that “hospitals lacking proper management end up spending too much on operations” due to inefficiencies, while a strategic facility management approach “results in decreased total financial costs.” Examples include: switching to LED lighting and building automation reduces utility bills; preventive maintenance prevents the much higher costs of replacing a machine or repairing flood damage; using analytics to schedule staff by need avoids overstaffing or overtime. In terms of human resources, integrating support staff into quality teams can reduce turnover (fewer injuries, better morale) and improve productivity [2]. Outsourcing with well-designed contracts can also shift risks and capital expenses to vendors.

Cost-efficiency also ties into sustainability: green building practices (insulation, solar panels) not only save money but meet EU environmental targets. In Bulgaria's resource-constrained LTC sector, freeing up any funds through efficiency can allow more spending on direct care (e.g. hiring an extra nurse). But to make these savings, institutions need good data: hence the importance of digitalization and key metrics. When managers

see that “every dollar invested in a sensor yields X% reduction in maintenance calls,” it reinforces the strategic view of support services.

CONCLUSION

In Bulgarian long-term care facilities, support services have historically been taken for granted – the unseen infrastructure holding up daily operations. However, as healthcare moves toward value-based, patient-centred models, these services are rightly being reevaluated as strategic assets. Ensuring clean, well-maintained environments; efficient logistics; robust IT and administrative systems; and quality catering is integral to safe, effective care. Trends such as outsourcing and digitalization offer new tools and business models, but also require careful management to maintain quality and equity. Quality improvement initiatives are increasingly including support functions, and Bulgarian policies are gradually evolving to support integrated care.

For Bulgaria, the challenge is to translate strategy into practice. This means recognizing support services in regulation and funding, cultivating a skilled workforce in these fields, and holding support functions to high performance standards. The potential payoff is significant: better patient outcomes, higher staff morale, and more efficient use of limited healthcare budgets. Achieving this in Bulgarian LTCFs will take time and commitment, but the shift from viewing cleaning, catering, and maintenance as mere overhead toward viewing them as core to care delivery is both necessary and underway.

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SYNERGISTIC EFFECTS OF PHYSICAL EXERCISE AND YOGA ON THE PHYSICAL AND PSYCHOLOGICAL WELL-BEING OF ELDERLY PALLIATIVE CARE PATIENTS

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ABSTRACT

This study proposes a randomized controlled trial to examine the synergistic effects of physical exercise and yoga on the physical and psychological well-being of elderly patients in Bulgarian hospice care. The intervention aims to improve functional capacity, reduce fatigue and anxiety, and enhance overall quality of life through integrated mind-body rehabilitation.

Key words: *palliative care, elderly patients, physical exercise, yoga, quality of life*

INTRODUCTION

As populations age, the demand for high-quality palliative and hospice care in Europe is rising. In Bulgaria – currently classified as a country with isolated and limited palliative services – there are few standardized programs or policies for end-of-life care. As Bogoslovov notes, Bulgaria has no national palliative care standards or guidelines and relies on ad hoc cancer care pathways [1]. Addressing this gap is urgent: The International Association for Hospice and Palliative Care projects that by 2060 nearly half of all deaths globally will involve serious health-related suffering, mainly in low- and middle-income settings. European experts thus emphasize integrating rehabilitation with palliative care. A recent EAPC white paper calls for a “radical shift” to combine palliative, geriatric, and rehabilitative approaches to support frail older adults at the end of life [2]. In this context, non-pharmacologic interventions that preserve function and improve quality of life are critically needed.

Physical exercise and yoga – both accessible and low-cost interventions – show promise. The WHO recommends that older adults engage in regular multicomponent exercise (aerobic, strength and balance training) to maintain functional capacity and prevent falls. Yoga, a mind-body form of exercise, is similarly endorsed for older adults: for example, the UK health guidelines explicitly include yoga (alongside Tai Chi) as a balance exercise to reduce fall risk in older people. Despite these recommendations, frail older adults in hospice settings remain among the most inactive populations. Nevertheless, recent

reviews suggest that even gentle exercise programs can improve well-being in terminally ill patients. For instance, Tanriverdi et al. found that exercise interventions in advanced cancer patients receiving palliative care significantly improved physical outcomes (exercise capacity, pain, fatigue) and overall quality of life [3]. Likewise, yoga interventions have demonstrated benefits for mood, sleep, and quality of life in cancer care. These findings justify examining the synergistic effects of combining general exercise and yoga specifically for elderly hospice patients.

This proposal aims to evaluate how a combined exercise with a yoga program affects both physiological and psychological well-being in elderly palliative care patients in Bulgaria (with relevance to EU settings). The study reviews the literature on exercise and yoga in palliative contexts, formulates testable hypotheses, and proposes a methodology for a controlled trial. By targeting both body and mind, it seeks to advance integrated care strategies for one of Europe’s most vulnerable populations.

LITERATURE REVIEW

Exercise training has gained traction as an adjunct in palliative oncology. A 2023 systematic review and meta-analysis by Tanriverdi et al. of 14 studies (n=1034) found that aerobic and/or resistance exercise significantly improved physical capacity, reduced fatigue and pain, and enhanced quality of life in cancer patients receiving palliative care [3]. These interventions were generally well-tolerated and often included simple activities (walking, cycling, light weights) under supervision. Similarly, Oldervoll et al. demonstrated in a

small trial that a twice-weekly moderate exercise program increased walking distance, reduced fatigue, and improved emotional functioning in patients with incurable cancer [4]. These findings align with broader evidence that physical activity counteracts deconditioning and improves symptom burden in advanced illness. For example, rehabilitation experts emphasize that tailored exercise can reduce physical symptoms and preserve autonomy even in patients approaching end-of-life.

Despite this potential, most hospice patients remain sedentary. Barriers include pain, fatigue, and lack of structured programs. However, studies report high adherence to gentle exercise when offered safely. For instance, a UK feasibility trial found that a 6-week tailored exercise intervention was safe and acceptable to palliative patients with diverse cancer diagnoses. Importantly, international guidelines underscore that *any* activity is better than none: the WHO 2020 guidelines explicitly encourage even frail older adults to remain as active as possible, adapting exercises to their capabilities [5]. Overall, evidence suggests that exercise therapy is feasible and beneficial for elderly patients in palliative care, improving endurance, reducing symptom severity, and thereby indirectly supporting psychological well-being.

Yoga, a gentle mind–body discipline, offers physical benefits (strength, flexibility, balance) alongside breathwork and meditation targeting mood and stress regulation. Yoga-based exercise produces moderate improvements in health-related quality of life and small-to-moderate gains in mental well-being in adults 60+. In practice, yoga programs for seniors (often “chair yoga” or restorative styles) have been shown to reduce anxiety and depression and improve sleep. In oncology settings, Danhauer et al. reviewed yoga therapy during cancer treatment and consistently observed improvements in psychological outcomes (depression, anxiety) as well as better sleep and overall quality of life [6]. Moreover, a meta-analysis by Dong et al. showed that yoga significantly alleviated cancer-related fatigue. These findings highlight the holistic impact of yoga by addressing both the body (through movement) and the mind (through mindfulness).

In palliative contexts specifically, qualitative reports and small trials suggest yoga is well-received. A commentary on palliative yoga notes its core aim: “to empower the patient to accept and face illness and death by holistic experience with physical, mental, emotional, and spiritual dimensions.” For example, a pilot program of chair yoga

for hospice patients reported improved relaxation, mood, and pain tolerance, while caregivers also noted reduced stress. Although few large trials exist, such promising results (coupled with low risk from yoga) justify further study. Importantly, yoga may directly address psychological needs: in chronically ill elders, mind–body exercises (including yoga) have been shown to significantly reduce anxiety and depression. Thus, yoga appears to offer unique benefits that complement conventional exercise.

Despite individual benefits, few studies have examined combined exercise + yoga regimens in palliative settings. Given their complementary yet distinct mechanisms, synergistic effects are plausible. Physiologically, both modalities improve strength and flexibility, potentially yielding greater gains in mobility when integrated. Psychologically, exercise elevates endorphins and combats fatigue, while yoga fosters relaxation and coping skills; together they may amplify improvements in quality of life. The WHO guidelines advocate multicomponent physical activity (aerobic + strengthening + balance) for older adults [5], and yoga can serve as a multicomponent session (it includes stretching, strengthening, and balance poses). The 2025 EAPC consensus underscores such integration, recommending that palliative care “support their capacities” via combined palliative, geriatric, and rehabilitative (exercise) care [2].

While direct evidence for exercise + yoga synergy in hospice is lacking, some related research is encouraging. In community-dwelling elders, combined programs (e.g. yoga plus walking) generally outperform single modalities on both physical and mental outcomes. Similarly, for cancer survivors, interventions blending aerobic or resistance exercise with mind–body components improve fatigue and well-being more than either alone. The proposed study will address this gap by empirically testing whether a structured hybrid program yields additive or synergistic benefits for elderly patients in hospice care. Given the known deconditioning and psychological distress in this population, even modest gains could be clinically important.

RESEARCH QUESTIONS AND HYPOTHESES

Primary Research Question: *Does a combined physical exercise and yoga intervention improve physical function and psychological well-being in*

elderly patients receiving palliative or hospice care compared with usual care?

Hypotheses:

1. Physical outcomes: Patients receiving the combined intervention will demonstrate greater improvements (or slower decline) in physical performance (e.g. walking distance, chair-stand ability), muscle strength, and symptom scores (pain, fatigue) than controls. This is grounded in evidence that exercise programs enhance capacity and reduce fatigue in palliative patients, while yoga also improves flexibility and balance.

2. Psychological outcomes: The combined intervention will produce greater reductions in anxiety and depression and greater improvements in quality-of-life measures compared with usual care. Prior studies indicate exercise can reduce mood disturbances in the chronically ill, and yoga specifically mitigates depression/anxiety. The synergy of both is expected to more fully address emotional and existential distress.

3. Synergy: Where feasible, a secondary hypothesis is that the combined group will outperform either modality alone, suggesting a synergistic interaction. For example, improvement in overall well-being in the combined group might exceed the sum of improvements seen with exercise-only or yoga-only interventions. (If resources allow, a factorial design could test this; otherwise, we will primarily compare combined vs usual care.)

We will also explore qualitative feedback to understand acceptability and implementation in the Bulgarian hospice context. The study is exploratory in synergy effects but is powered to detect clinically meaningful changes in function and mood.

PROPOSED METHODOLOGY

Study Design

A randomized controlled trial (RCT) will be conducted in Bulgarian hospice and palliative care centres. Eligible participants ($n \approx 80-100$) will be elderly (≥ 65 years old) patients receiving palliative or hospice care for life-limiting illnesses (cancer or other), who are medically stable and able to consent. Exclusion criteria include acute instability (e.g. uncontrolled pain, recent events), cognitive impairment precluding participation, or contraindications to mild exercise. After screening, participants will be randomly assigned to either (1) Combined Exercise + Yoga Intervention or (2)

Control (usual palliative care). If resources permit, additional arms (exercise-only, yoga-only) could be included for synergy testing.

Intervention

The experimental group will receive a 12-week program combining physical exercise and yoga sessions. Exercise components may include gentle aerobic activity (e.g. indoor walking or stationary cycling), light resistance (elastic bands), and balance training, supervised by a physiotherapist. Yoga will consist of modified Hatha or chair-based yoga, incorporating gentle stretching, posture holds, breathing and relaxation, led by a certified instructor. Sessions will occur twice weekly, each lasting ~60 minutes (30 min exercise + 30 min yoga), with intensity adapted to individual capacity. Home practice (simple stretching or mindfulness audio) will be encouraged on non-session days. Attendance and adherence will be tracked. All sessions will be conducted in small groups or one-on-one, ensuring safety (pulse/oximetry monitoring, medical clearance).

Control

Participants in the control arm will receive standard palliative care (medication, symptom management, psychosocial support) without the structured exercise program. They will be offered the intervention after the study finishes if they desire.

Outcome Measures

Assessments will occur at baseline, post-intervention (12 weeks), and potentially at a short follow-up (e.g. 4 weeks post-study) to gauge durability.

– *Physical outcomes:* We will measure functional mobility (e.g. 6-minute walk test, Timed Up and Go), muscle strength (handgrip or chair-stand test), and balance (functional reach). Symptom scales will include validated measures of fatigue (FACIT-Fatigue or Brief Fatigue Inventory) and pain intensity. Activities of Daily Living (Katz ADL) will be recorded.

– *Psychological outcomes:* Standardized instruments will assess anxiety and depression (e.g. Hospital Anxiety and Depression Scale, HADS), spiritual well-being (if relevant, e.g. FACIT-Sp), and overall quality of life. Given the palliative context, a palliative-specific QOL tool (such as the McGill Quality of Life questionnaire or EORTC QLQ-C15-PAL) may be used. Caregiver or staff observations (Distress Thermometer) could supplement self-report.

– *Other*: Demographics, clinical variables (disease status, ECOG performance), and adverse events will be recorded. Feasibility indicators (recruitment rate, session attendance, dropouts) will be tracked.

Data Analysis

Intention-to-treat analyses will compare change scores between groups. Continuous outcomes (e.g. walk distance, HADS scores) will be analysed with mixed-effects linear models adjusting for baseline values. Binary/ordinal outcomes (e.g. ADL independence) with appropriate models. Effect sizes will be calculated. If a factorial design is used, interaction terms will test synergy. Qualitative feedback (patient interviews) will be thematically analysed to supplement quantitative findings.

This methodology follows ethical and methodological standards for palliative research. All participants will provide informed consent (or assent via proxy if capacity fluctuates) and may withdraw at any time. Exercises will be tailored to avoid harm. Physiotherapists will screen for contraindications, and sessions can be paused if a patient becomes fatigued.

EXPECTED OUTCOMES

Based on existing evidence, we anticipate modest to moderate improvements in both domains in the intervention group. Physiologically, we expect slower functional decline or slight gains in walking distance, balance and strength relative to control. Reduced fatigue and lower pain scores are also likely, paralleling Tanriverdi et al.'s findings of improved fatigue and pain control [3]. Psychologically, we expect decreased anxiety/depression and higher quality-of-life scores in the exercise + yoga group. Danhauer et al. reported that yoga participants during cancer therapy experienced less depression and better sleep [6]; combined with exercise mood-lifting effects, the intervention should similarly improve mood and emotional well-being.

If synergy occurs, the combined group might yield greater benefits than reported for exercise or yoga alone. For example, we might see a particularly strong improvement in overall QOL or existential well-being that exceeds sums of individual parts. However, we should remain cautious: frail patients may exhibit only small changes over 12 weeks. Even maintaining baseline function (versus expected decline) would be a significant ben-

efit. Secondary outcomes (e.g. caregiver satisfaction, healthcare utilization) may also appear positive if patient well-being is enhanced.

The study will thus quantify both clinical significance (e.g. how many patients experience a meaningful symptom improvement) and statistical significance of the combined therapy. These results would fill a literature gap: while meta-analyses confirm that exercise or yoga individually help (HRQOL improved, mood improved), to our knowledge, no recent RCT has tested their integrated impact in an EU hospice setting.

Beyond the anticipated physiological and psychological gains, the proposed intervention is likely to generate favourable economic effects within hospice systems, particularly through reductions in indirect costs. Improved physical functioning and emotional stability may lead to fewer secondary complications (e.g., falls, pressure ulcers, sleep disturbances), which are among the most frequent and costly adverse events in long-term and hospice care [7]. Enhanced mobility and mood could reduce reliance on pharmacological symptom management, especially sedatives, analgesics, and antidepressants, thereby lowering medication expenses and mitigating side effects that require further intervention. Moreover, by preserving patients' autonomy and reducing caregiver burden, the intervention may decrease the need for intensive staff supervision or emergency hospitalizations. Cost analyses in geriatric rehabilitation indicate that non-pharmacologic interventions improving mobility and well-being yield significant savings in indirect costs associated with lost staff time, hospital transfers, and family caregiving demands [8]. In Bulgaria, where hospice funding is limited and often privately supplemented, even modest reductions in indirect expenditures could substantially improve institutional sustainability and resource allocation, making combined exercise–yoga programs not only clinically beneficial but also economically viable components of end-of-life care.

SIGNIFICANCE OF THE STUDY

This research has important implications for public health and geriatric care. First, it addresses the “silver tsunami” challenge: the rising numbers of elderly with complex needs [1]. Demonstrating an effective, low-cost intervention to improve end-of-life well-being aligns with WHO/EU priorities on healthy ageing and palliative care. Specifically for Bulgaria, our study could pioneer

structured rehabilitation in hospices where such services are scarce. Positive findings might motivate policymakers to include exercise/yoga in palliative care packages, helping to overcome current gaps.

Second, integrating physical and mind-body therapies exemplifies the holistic care advocated by international palliative guidelines. The EAPC emphasizes maintaining dignity and function in old age [2], and our approach directly operationalizes this by empowering patients to remain active and engaged. If successful, our model could be adopted across the EU, especially in regions with ageing populations.

Third, the study advances gerontology and palliative research by elucidating mechanisms of synergy. We will explore how combined therapy influences multi-dimensional quality of life (physical, psychological, social, spiritual). This could identify which components (e.g. breathwork vs. aerobic exercise) lead to improvements, informing future integrative therapy designs.

Finally, the results are publishable in public health and gerontology journals, contributing to evidence-based practice. Even null findings would be informative, clarifying limits of rehabilitative interventions in advanced illness. In sum, this study promises to benefit a traditionally underserved group and to guide resource allocation in EU hospice care.

ETHICAL CONSIDERATIONS

Research involving terminally ill elderly patients requires special ethical care. Key principles will be rigorously applied. Participation will be voluntary and informed: patients (or their legal proxies) will be clearly informed that the interventions are optional and can be discontinued at any time without affecting clinical care. Cognitive impairment will be assessed, and assent sought from capable patients.

We will ensure beneficence and non-maleficence: exercises are designed to relieve symptoms (e.g. stiffness, breathlessness) and not to overexert. Physiotherapists will conduct medical screening to prevent risks (e.g. avoiding exertion beyond abilities). Monitoring during sessions will quickly identify any adverse reactions (pain, dizziness) so activities can be modified or stopped. Since the interventions are low-intensity and supervised, risks are minimal; nevertheless, an independent data safety monitor will oversee any events.

Psychological safeguarding is also essential. Discussing illness or engaging in therapy might

evoke emotional distress. Instructors will be trained to notice discomfort, and a counsellor will be available if needed. All data will be kept confidential; patients' identities will be anonymized in reports.

Given the growing use of computerized and AI-based analytical tools in healthcare research, the proposed study will carefully address the ethical implications of employing such technologies in data analysis. If digital systems or AI-assisted software are used to process clinical or psychological data, strict adherence to EU General Data Protection Regulation (GDPR) standards will be maintained to ensure transparency, fairness, and privacy. All algorithms or analytical platforms will be validated, and only anonymized, non-identifiable datasets will be processed through computational methods. Researchers will maintain full interpretative oversight to prevent algorithmic bias, misclassification, or overreliance on automated outputs in clinical interpretation. Any AI-assisted statistical or pattern-recognition tool (for example, for natural language processing of qualitative feedback) will be treated as a decision-support system, not as an autonomous decision-maker [9]. Furthermore, the research team will document and disclose all digital methods used, allowing reproducibility and ethical scrutiny in accordance with the principles of accountability, transparency, and human oversight outlined in the EU's forthcoming AI Act. In this way, the study will uphold both patient dignity and research integrity while responsibly integrating modern computational methodologies.

In summary, strict ethical safeguards (informed consent, personalized adaptation of therapy, ongoing monitoring, confidentiality) will uphold participants' dignity and comfort. Our team will remain responsive to patient needs, ensuring that research activities do not conflict with the primary goal of comfort in end-of-life care.

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