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PREFACE

We are pleased to present the **Book of Abstracts** of the 5th International Congress on Science, Innovation and Education (ICSIE 2026), scheduled to take place on November 5–6, 2026, in Travnik, Bosnia and Herzegovina.

ICSIE 2026 brings together academics, researchers, and professionals from diverse disciplines and countries to share scientific knowledge, discuss contemporary challenges, and explore innovative approaches to research and education. The Congress aims to provide an international platform for scholarly exchange, interdisciplinary dialogue, and academic collaboration, fostering the development of new perspectives across scientific fields.

This book brings together the abstracts accepted for presentation at the Congress, reflecting a broad spectrum of research interests, methodological approaches, and disciplinary perspectives. To facilitate access to these contributions and highlight their thematic connections, the abstracts are organized into five sections: **Education and Educational Sciences; Social Sciences, Humanities and Management; Engineering, Technology and Applied Sciences; Health, Life and Environmental Sciences; and Arts, Design and Architecture**. This thematic structure reflects the interdisciplinary scope of the Congress while providing a systematic framework for exploring the research presented in this volume.

Beyond documenting the scientific contributions to ICSIE 2026, this publication seeks to support the dissemination of research findings, encourage critical academic discussion, and promote opportunities for future interdisciplinary and international collaboration.

We extend our sincere appreciation to the members of the Scientific Committee for their contributions to the evaluation process, to the Organizing Committee for coordinating the Congress, and to all contributing authors for sharing their research. We also thank the participating institutions for their support and cooperation.

We hope that this book will serve as a valuable academic resource and contribute to the continued exchange of knowledge, ideas, and innovative perspectives across disciplines and institutions.

Editors

ICSIE 2026 – Book of Abstracts

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SECTION I

EDUCATION AND EDUCATIONAL SCIENCES

EDUCATIONAL OUTCOMES OF VIRTUAL REALITY-SUPPORTED MAMMOGRAPHY TRAINING AMONG MEDICAL IMAGING TECHNIQUES STUDENTS

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ABSTRACT

This study aimed to compare 360° virtual reality (VR)-supported mammography training with conventional classroom-based education in terms of knowledge gain, educational satisfaction, perceived learning, and professional readiness among Medical Imaging Techniques students. The study was conducted using a two-group, controlled, pretest–posttest quasi-experimental design and included a total of 61 students. Of these, 34 were in the VR-supported education group and 27 were in the conventional education group. Both groups completed a 14-week mammography training program. In addition to theoretical instruction, the VR group received 360° immersive educational content covering Introduction to Mammography, Craniocaudal (CC) Positioning, and Mediolateral Oblique (MLO) Positioning. Knowledge levels were assessed before and after the training using a 25-item knowledge test, while educational experience, satisfaction, perceived learning, and professional readiness were evaluated after the training using structured assessment forms. No significant difference was found between the groups in baseline knowledge scores ($p=0.945$). After the training, the knowledge score was significantly higher in the VR group than in the conventional education group (20.29 ± 2.08 vs. 17.81 ± 2.76 ; $p<0.001$). Knowledge gain was also greater in the VR group (6.00 ± 2.92 vs. 3.59 ± 3.08 ; $p=0.003$). Overall educational satisfaction (4.53 ± 0.17 vs. 3.81 ± 0.26), perceived learning gain (4.56 ± 0.43 vs. 3.80 ± 0.41), and professional readiness scores (4.46 ± 0.45 vs. 3.80 ± 0.59) were significantly higher in the VR group (all $p<0.001$). The findings indicate that 360° VR-supported content can complement mammography education by improving knowledge gain and supporting students' educational experience and perceived professional readiness.

KEYWORDS

Immersive learning, mammography, medical imaging, virtual reality, vocational education.

EXAMINING PRE-SERVICE TEACHERS' SELF-EFFICACY PERCEPTIONS REGARDING DIFFERENTIATED INSTRUCTION ACROSS VARIOUS VARIABLES

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ABSTRACT

This study aimed to examine pre-service teachers' self-efficacy perceptions regarding differentiated instruction across various demographic and academic variables. Differentiated instruction refers to the systematic adaptation of instructional content, process, products, and learning environments in accordance with learners' readiness levels, interests, and individual learning characteristics. The study was conducted using a quantitative research approach and a descriptive survey design. The participants consisted of pre-service teachers enrolled in undergraduate teacher education programs. Data were collected through a personal information form and a valid and reliable Differentiated Instruction Self-Efficacy Scale. Descriptive statistics were used to determine the general level of self-efficacy perceptions, while appropriate inferential statistical analyses were conducted to examine whether self-efficacy scores differed according to variables such as gender, grade level, academic program, previous coursework or training related to differentiated instruction, and experience with inclusive educational settings. The findings indicated that pre-service teachers generally perceived themselves as moderately to highly efficacious in implementing differentiated instruction. Self-efficacy perceptions did not differ significantly for some demographic variables, whereas meaningful differences emerged in favor of participants who had previously received relevant coursework or training and who had experience in inclusive or diverse classroom environments. The results suggest that direct exposure to differentiated instruction practices and opportunities to apply instructional adaptations may contribute more strongly to self-efficacy development than demographic characteristics alone. It was concluded that teacher education programs should provide systematic, practice-based, and reflective learning opportunities that enable pre-service teachers to plan, implement, and evaluate differentiated instruction. Strengthening these experiences may enhance teachers' preparedness to respond effectively to learner diversity and support more inclusive and individualized teaching practices.

KEYWORDS

Differentiated instruction, pre-service teachers, self-efficacy, teacher education.

THE EFFECT OF FAMILY TRAINING REGARDING THE SEXUAL DEVELOPMENT OF CHILDREN WITH AUTISM ON PARENTS' LANGUAGE OF SEXUAL COMMUNICATION AND ATTITUDES

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ABSTRACT

This study aimed to examine the effects of the Sexual Education Program for Parents of Children with Autism (OCEP), developed to address the sexual development of children with autism, on parents' language of sexual communication and attitudes toward sexuality education, and to determine parents' views of the program. A one-group pretest-posttest quasi-experimental design was employed and supplemented with qualitative social validity data. Participants were 22 parents (19 women and 3 men) of children with autism aged 6-22 years. Ten volunteer parents also participated in the social validity interviews. OCEP was implemented over five weeks, with two sessions per week, for a total of 10 sessions. Each session comprised 45 minutes of instruction followed by a 15-minute question-and-answer period. The program addressed the circle of trust, privacy, menstruation, masturbation, protection from abuse, and digital risks, and incorporated role-play, social stories, visual supports, and homework assignments. Data were collected using a Demographic Information Form, the Sexual Communication Language Scale for Parents, and the Attitude Toward Sexual Education Scale. Quantitative data were analyzed using the Wilcoxon signed-rank test, while interview data were analyzed descriptively. Following the program, the mean score on the Sexual Communication Language Scale for Parents increased from 75.91 to 84.41, and the mean score on the Attitude Toward Sexual Education Scale increased from 123.23 to 137.77; both increases were statistically significant. Social validity findings indicated that parents considered the program useful, understandable, acceptable, and applicable. Parents also reported increased awareness of sexuality, privacy, and appropriate behavior management, as well as greater confidence when communicating with their children about sexuality-related issues. The findings demonstrate that structured family training can improve parents' communication skills and attitudes concerning the sexual development of children with autism. Expanding such programs and incorporating them into family support services may contribute to providing children with autism with systematic sexuality education tailored to their developmental characteristics.

KEYWORDS

Autism spectrum disorder, family training, sexual communication, sexuality education, social validity

THE PSYCHOSOCIAL DIMENSION OF DIGITAL TRANSFORMATION IN CONTEMPORARY HEALTH EDUCATION: DIGITAL STRESS AND STUDENT MENTAL HEALTH

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ABSTRACT

Digital transformation has become a central component of health education through the growing use of online learning platforms, artificial intelligence-supported tools, virtual simulations, mobile applications, and digital assessment systems. Although these technologies improve accessibility, flexibility, and personalized learning, they may also create psychosocial burdens through technology overload, constant connectivity, information intensity, technical problems, and multiple-platform use. This narrative review aimed to synthesize the effects of digital transformation on student mental health within the framework of digital stress, protective factors, and digital mental health interventions. Peer-reviewed studies, systematic/scoping reviews, and randomized controlled trials published between 2021 and 2026 were examined thematically. Findings were integrated under four themes: sources of digital stress, psychological and academic outcomes, individual/institutional protective factors, and the supportive role of digital interventions. The literature suggests that technostress may be associated with academic burnout, mental fatigue, attention difficulties, and reduced psychological well-being, while digital literacy, internet self-efficacy, cognitive flexibility, self-regulation, instructor support, and institutional support may serve protective roles. In health sciences students, the simultaneous demands of theoretical education, clinical practice, skills assessment, and digital tasks may create a distinctive psychosocial burden. Digital interventions, including online mindfulness-based and psychoeducational approaches, appear promising, although effectiveness and evidence quality vary across studies. Digital transformation in health education should therefore be evaluated not only in terms of technological and pedagogical gains but also in relation to student mental health and digital well-being.

KEYWORDS

Digital stress, digital transformation, health education, psychological well-being, student mental health.

AN EXAMINATION OF SUSTAINABILITY-THEMED ANIMATED FILMS FROM THE PERSPECTIVE OF PHILOSOPHY FOR CHILDREN APPROACH

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ABSTRACT

The main purpose of this study is to examine, within a qualitative framework, the potential of sustainability-themed animated films to be used as stimuli for philosophical inquiry and thinking within the Philosophy for Children (P4C) approach in a detailed and comprehensive manner. Four animated films, WALL-E, The Lorax, Happy Feet, and Bee Movie, which address global environmental problems, ecological balance, and the multidimensional problems arising from consumer society from different perspectives, were selected as the objects of analysis. These films were analyzed holistically with a focus on the environmental, social, and economic dimensions of sustainability and the critical, creative, caring, and collaborative dimensions that constitute the foundation of the P4C approach. The study was conducted within a qualitative research framework using document analysis, and the data obtained were analyzed through descriptive analysis. The findings revealed that important themes such as excessive consumption, the unconscious and unsustainable use of natural resources, the transformative relationship between humans and nature, the right to life of non-human living beings, individual and social ethical responsibilities, environmental justice, and the preservation of ecosystem balance were prominent in the films. These themes were found to create meaningful areas for philosophical inquiry by enabling children to evaluate different perspectives, defend their own ideas with consistent justifications, engage in in-depth inquiry into complex problems, generate alternative solutions, and consider the needs of living beings in nature. In particular, issues such as human attempts to dominate nature, the tension between economic interests and environmental responsibility, the intrinsic value of living beings, and the interdependence between humans and nature were identified as rich areas for discussion within P4C communities. These findings indicate that the films have the potential to relate sustainability-related issues to philosophical questions concerning responsibility, justice, rights, and human-nature relationships. These findings indicate that, in addition to traditional sustainability education, sustainability-themed animated films can be evaluated in educational settings as P4C stimuli to support children's higher-order thinking skills.

KEYWORDS

Animated films, philosophy for children, sustainability, sustainability education.

THE AI-NATIVE UNIVERSITY: DECONSTRUCTING AND REBUILDING HIGHER EDUCATION FOR THE 21ST CENTURY

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ABSTRACT

Higher education institutions worldwide are responding to generative artificial intelligence (GenAI) primarily through the additive logic of the "tool paradigm"-procuring licences, issuing acceptable-use policies, revising academic integrity procedures, and piloting chatbot-based tutoring. This paper argues that such responses are structurally inadequate because they leave the university's core architecture, epistemics, and governance untouched. Drawing on design science research (DSR) and sociomaterial theory, the paper advances three contributions. First, it deconstructs five constitutive functions of the university-pedagogy, assessment, credentialing, research, and administration-and demonstrates that each is destabilised not by AI as a discrete technology but by the ubiquity of intelligent systems that dissolve previously stable institutional boundaries. Second, it proposes a five-layer reference architecture for the AI-native university comprising an identity and trust fabric, a governed institutional data estate, a model orchestration and inference layer, an agentic service layer, and an experience layer, underpinned by a cross-cutting governance and observability plane. Third, it advances a pedagogical reconstruction model termed cognitive apprenticeship at scale, which reframes the professorial role from content delivery to epistemic mentorship, and it proposes a five-level AI-Native Maturity Model to support institutional self-assessment. The paper concludes that the AI-native university is not one that uses more AI, but one whose institutional design has been re-founded on intelligent systems without surrendering its human epistemic core. The argument is situated within the congress theme of internationalisation and transformation, with particular attention to the risk of a new institutional stratification between well-resourced and under-resourced systems.

KEYWORDS

AI, university, research, architecture, transformation, internationalisation.

DIGITAL COMPETENCES OF TEACHERS IN KYRGYZSTAN

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ABSTRACT

Kyrgyzstan, as a young and prospering country in Central Asia, has increasingly emphasized the integration of digital technologies as part of its broader educational modernization agenda. Within this context, strengthening teachers' digital competence has emerged as a crucial priority to ensure effective teaching and learning in the 21st century. In an era of rapid digitalisation, teachers are expected to integrate technology into classroom practices developing pedagogical strategies that foster students' digital literacy. This study explores the digital competence of teachers in Kyrgyzstan, with a particular focus on the challenges and opportunities of teacher education. Using a qualitative survey design, data were collected through semi-structured interviews with twenty-five participants from different schools of Kyrgyzstan. The survey, guided by five research questions examined teachers' self-perceived digital skills, the institutional support they receive, and their professional development needs. Findings provided insights into how teacher education and professional development can be strengthened in Kyrgyzstan, highlighting both the existing practices and the areas requiring further investment. The study contributes to the ongoing discourse on teacher training in the digital age by offering context-specific evidence and recommendations. The findings of this study contribute to a deeper understanding of educational quality, not only from a knowledge-based perspective but also in relation to the management and regulation of teacher education in the digital era. As the results reflect teachers' attitudes, they offer valuable insights that can inform the enhancement of teacher education standards across the country.

KEYWORDS

Digital pedagogy, digital competence, Kyrgyzstan, professional development, school.

ALIGNING FASHION AND TEXTILE HIGHER EDUCATION WITH GLOBAL INDUSTRY NEEDS

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ABSTRACT

The fashion and textile industry increasingly requires professionals to work across creative, technical, commercial, and manufacturing functions. Product decisions connect design, materials, sourcing, manufacturing, quality, compliance, and sustainability, while AI, digitalisation, data, and new regulations are transforming established roles and workflows. This raises an important question for higher education: are graduates adequately prepared for current industry practices? This study examines the competencies required of future fashion and textile professionals and considers how higher education can better respond to these needs. The research combines a literature review with semi-structured expert interviews. Fourteen professionals from across the international fashion and textile value chain participated, representing design, product development, merchandising, quality, sales, manufacturing, and management. Interview responses were analysed thematically to identify recurring competency gaps, cross-functional challenges, and emerging requirements. Findings indicate that one of the strongest recurring needs is cross-functional understanding. While specialist knowledge remains essential, professionals are increasingly expected to understand how decisions within their own function affect cost, product feasibility, quality, lead time, commercial performance, and other parts of the value chain. Participants also identified a gap between theoretical knowledge and its application under real industry constraints. Digital, data, and AI competencies are considered increasingly important, but these capabilities need to be combined with critical judgement and a sound understanding of products, materials, and processes. The results suggest that the challenge is not to replace specialist education with generalist education, but to connect specialist knowledge more effectively to the wider product creation system. Stronger practical and cross-functional learning may help graduates understand not only their own role, but also the consequences of their decisions across the value chain. The findings provide a basis for developing a competency framework linking higher education with current and emerging industry needs.

KEYWORDS

competencies, fashion education, higher education, industry needs, textile education.

THE ROLE OF THE EDUCATIONAL SYSTEM IN THE SECTOR OF GRAPHIC INDUSTRY, DESIGN, AND MULTIMEDIA IN BOSNIA AND HERZEGOVINA

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ABSTRACT

The modern sector of graphic industry, packaging, design, and multimedia in Bosnia and Herzegovina is undergoing rapid transformation driven by digitalization and the application of new technologies. This paper analyzes the role and capacity of the formal educational system in BiH in monitoring contemporary developments in this sector, with a specific focus on learning outcomes defined within the Qualifications Framework in BiH (QF BiH). The research is based on an analysis of the institutional and legal framework, curricula, and available sector indicators and trends (official bulletins, market analyses, and empirical data). The paper identifies key professional profiles and competencies provided within the educational system, examines mechanisms of cooperation with the economic environment, and offers guidelines for the future enhancement and alignment of educational programs with modern technological and market trends.

KEYWORDS

educational system, graphic industry, design, multimedia, Qualifications Framework in BiH (QF BiH), competencies.

FROM THE INDIVIDUAL TO SOCIETY: A COMPARISON OF PIAGET'S AND VYGOTSKY'S APPROACHES TO COGNITIVE DEVELOPMENT

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ABSTRACT

Cognitive development is one of the fundamental areas of developmental psychology, explaining changes in individuals' ways of thinking, problem-solving, making sense of information, and adapting to their environment. Jean Piaget's theory of cognitive development and Lev S. Vygotsky's sociocultural approach occupy important positions in this field, offering different theoretical perspectives on children's cognitive development. The aim of this study is to comparatively examine Piaget's and Vygotsky's approaches to cognitive development in terms of the individual, social interaction, language, culture, and the relationship between learning and development. This study was designed as a theoretical review based on a qualitative research approach. Piaget's and Vygotsky's seminal works on cognitive development, together with relevant contemporary academic literature, were examined to conduct a comparative analysis. The theories were evaluated in terms of the sources of cognitive development, the child's role, the influence of the social environment, the function of language, the relationship between learning and development, and the roles of adults and peers in the educational process. The review indicates that Piaget primarily explains cognitive development through the individual's active interaction with the environment and the subsequent reorganization of cognitive structures. Assimilation, accommodation, and equilibration constitute the fundamental components of this approach. Vygotsky, in contrast, emphasizes that cognitive development is shaped by social interaction, culture, and language. Through the concepts of the zone of proximal development and the more knowledgeable other, his approach explains the role of learning in promoting development. Accordingly, Piaget places greater emphasis on individual cognitive construction, whereas Vygotsky gives greater prominence to social and cultural mediation. Although Piaget's and Vygotsky's approaches differ in important theoretical respects, both regard the child as an active agent in cognitive development. Piaget's emphasis on individual discovery and cognitive construction, together with Vygotsky's focus on social interaction, language, and cultural context, demonstrates that cognitive development cannot be adequately explained through a single dimension. Therefore, considering both approaches together may contribute to a more comprehensive understanding of development by illuminating the reciprocal relationship between individual cognitive processes and the sociocultural environment.

KEYWORDS

Cognitive development, constructivism, Piaget, Vygotsky, sociocultural development, social interaction.

CHILDREN’S DIGITAL SAFETY, DIGITAL RIGHTS, AND DIGITAL CITIZENSHIP IN THE AGE OF ARTIFICIAL INTELLIGENCE: A REVIEW OF CURRENT APPROACHES

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ABSTRACT

As artificial intelligence (AI) technologies become part of children’s everyday lives, educational experiences, and digital interactions at increasingly younger ages, there is a growing need to reconsider children’s safety, rights, and participation in digital environments. Digital games, smart toys, socio-emotional robots, recommender systems, and various digital applications designed for children can interact directly with them and process their personal data. Alongside the opportunities these technologies offer, they also raise new concerns regarding privacy, data security, discrimination, algorithmic transparency, and developmental appropriateness (Charisi et al., 2022; United Nations Committee on the Rights of the Child, 2021). This study aims to review recent national and international literature on children’s digital safety, digital rights, and digital citizenship in the age of AI, and to provide an integrated assessment of the main approaches identified in light of children’s rights and developmental characteristics. Relevant studies were searched in ScienceDirect, SpringerLink, Google Scholar, and DergiPark using Turkish and English keywords related to artificial intelligence, AI literacy, children, early childhood, digital safety, online safety, digital rights, digital privacy, and digital citizenship. The publications identified were assessed according to predefined inclusion and exclusion criteria. Specifically, the review examined peer-reviewed academic studies published in Turkish or English that directly addressed children and adolescents aged 0–18 and related to at least one of the following topics: AI, AI literacy, digital safety, online safety, digital privacy, digital rights, or digital citizenship. Studies focused on adults or exclusively on higher education samples, those that did not directly address children, and those concerned solely with technical AI development processes were excluded. Recent reports, guidelines, and policy documents from international organizations such as UNICEF and UNESCO were considered complementary sources supporting the academic literature (UNICEF, 2025; UNESCO, 2024). The thematic review identified four key dimensions: (1) protecting children’s personal data and digital privacy; (2) promoting safety, fairness, and transparency in AI systems and preventing discrimination; (3) supporting AI and digital literacy skills appropriate to children’s ages and developmental stages; and (4) strengthening children’s informed, critical, ethical, and responsible participation in digital environments. Current child-centered approaches to AI emphasize that children should be viewed not merely as users who need protection from digital risks, but also as rights-holders, active participants, and members of the future digital society. UNESCO’s AI Competency Framework for Students likewise highlights the importance of supporting students in understanding and using AI systems critically and ethically, and in participating in their development (UNESCO, 2024). In conclusion, children’s digital experiences in the age of AI should be assessed through a comprehensive framework that considers safety and risk reduction alongside the child’s best interests, developmental characteristics, privacy, rights, autonomy, and participation. The limited number of theoretical and applied studies on AI literacy, digital citizenship, and developmentally appropriate AI interactions—

particularly in early childhood—points to an important research gap. Accordingly, interdisciplinary collaboration among caregivers, educators, child development professionals, and policymakers is essential to developing approaches that are developmentally appropriate and grounded in children's rights.

KEYWORDS

AI literacy, artificial intelligence, children, children's rights, digital safety, digital privacy, digital citizenship.



SECTION II

SOCIAL SCIENCES, HUMANITIES AND MANAGEMENT

WHOSE HADİTHS? TRACING ISLAMIC CORPORA IN THE TRAINING DATA OF LARGE LANGUAGE MODELS

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ABSTRACT

Because the companies that build large language models do not disclose their training data, it is not known which sources give these models their knowledge in a given field. This question has not yet been raised for the Islamic sciences, and whether ḥadīth knowledge reaches these models through Arabic source texts, English translations, or secondary retellings remains untested. This study uses probing to test how much large language models have memorized ḥadīth texts and from which source layer that memorization comes. For this purpose, the OWL memorization-probing framework, built for world literature, was adapted to ḥadīth texts in a small-scale pilot. Six narrations were selected from Ṣaḥīḥ al-Bukhārī according to how widely each one circulates, and three probe types, direct probing, name-cloze, and prefix probing, were applied to four Claude models from the same family: Haiku, Sonnet, Opus, and Fable. In the first round some trials showed models checking answers via external tools; memory alone could only be measured after tool use was blocked and session logs audited. The main finding is that the Arabic original of Ṣaḥīḥ al-Bukhārī is actually present in the training data: Fable, the most advanced model, reproduced all six narrations with high fidelity, including the lesser-known ones, while Haiku, the smallest model, failed to produce any of them in full; Opus and Sonnet fell between these two. This finding does not support the assumption that ḥadīth knowledge reaches these models solely through English translation. Opus and Sonnet independently gave the same wrong transmitter name for the same isnād; that name does not appear in al-Bukhārī's own arrangement but is documented directly in the text of Faṭḥ al-Bārī, suggesting such shared errors may act as a fingerprint for a commentary layer in the training data. No one-sided fidelity gap was found between the Arabic original and the English translation, but the design could not tell whether the two layers entered separately or, as with a bilingual source such as sunnah.com, as one combined block. These pilot findings give the debate on data sovereignty concrete grounding, though their generalizability is limited by sample size.

KEYWORDS

Ḥadīth, large language models, memorization probing, Ṣaḥīḥ al-Bukhārī, training data.

ENTERPRISE RESOURCES PLANNING ADOPTION IN BUSINESS SECTOR IN BOSNIA AND HERZEGOVINA: AN EMPIRICAL ANALYSIS

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ABSTRACT

Enterprise Resource Planning (ERP) adoption remains an underexamined dimension of digital transformation in Bosnia and Herzegovina, where prior evidence has come only from self-selected samples of already digitally engaged managers. This study examines ERP adoption among 171 enterprises in Bosnia and Herzegovina, selected through stratified random sampling by sector and geographical location, to establish a more representative picture of adoption across the business sector. The findings show that adoption remains concentrated among larger, more established enterprises: firm-level characteristics, particularly enterprise size and organizational maturity, significantly shape whether ERP systems are actually adopted and used, while micro and small enterprises continue to face substantial barriers to full integration even where basic digital infrastructure is present. Statistical analysis confirms that enterprise size and length of continuous operation are significantly associated with ERP adoption, pointing to resource availability and organizational capability as central drivers of digital technology integration in the business sector. These results indicate that ERP adoption cannot be reduced to a purely technological question; it depends on the structural and organizational conditions that determine whether enterprises can translate digital opportunity into practice. The study contributes to the limited body of evidence on digital transformation in emerging economies and offers practical insights for policymakers, service providers, and business leaders working to accelerate digital integration in the business sector.

KEYWORDS

Bosnia and Herzegovina, digital transformation, enterprise resource planning (ERP), ERP adoption.

EPISTEMOLOGICAL RELIABILITY OF LARGE LANGUAGE MODELS IN HADITH RESEARCH: A COMPARATIVE ANALYSIS OF GPT-4, GEMINI, CLAUDE, AND DEEPSEEK

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ABSTRACT

As artificial intelligence use in hadith research becomes routine, the question of how reliable large language models (LLMs) are in this field has emerged as an epistemological necessity. This study evaluates four large language models-GPT-4, Gemini, Claude, and DeepSeek-through a comparative qualitative analysis across the core axes of hadith methodology: isnad (chain-of-transmission) analysis, narrator criticism (jarh wa ta'dil), authenticity assessment, and contextual interpretation. A test set of six narrations was constructed by selecting one report from each of the Six Books (Kutub al-Sittah), ranging in authenticity grade from sound (sahih) to weak (da'if); four identical question types-source verification (takhrij), isnad analysis, authenticity status, and contextual interpretation-were posed to each model. The findings reveal a clear performance hierarchy. ChatGPT showed the highest hallucination risk, generating an unverifiable narrator link in the second narration's isnad that does not exist in Muslim's actual chain of transmission. DeepSeek, aided by web search, achieved partial superiority in source-verification accuracy but showed a repetitive, templated pattern in narrator evaluation, applying the same undifferentiated judgment ("saduq") without distinguishing degrees of reliability. Gemini and Claude demonstrated the strongest performance in isnad analysis and narrator criticism. A common ceiling persisted across all four models: none provided a complete citation-work title, volume, and page number-to foundational biographical (rijal) works such as Tahdhib al-Kamal or Mizan al-l'tidal. By contrast, contextual interpretation was the domain in which all four models performed most strongly, indicating that LLMs are more reliable at synthesizing broad Islamic intellectual history than at verification-dependent technical isnad analysis. The study concludes that artificial intelligence (1) holds a legitimate place as an auxiliary tool in hadith research, (2) cannot, at the current level of technology, function as an independent epistemic authority, and (3) carries a serious risk of illusion for users not yet grounded in the field's methodological culture. Researchers are advised never to treat AI outputs as primary sources, to select models with awareness of their differing epistemic tendencies, and to incorporate AI literacy into hadith methodology curricula.

KEYWORDS

artificial intelligence, context analysis, hadith methodology, isnad, Jarh Wa Ta'dil.

THE DIGITAL TRANSFORMATION OF FLAVOR PERCEPTION: THE RELATIONSHIP BETWEEN ARTIFICIAL INTELLIGENCE AND NEUROGASTRONOMY

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ABSTRACT

The increasing use of digital technologies in gastronomy is transforming not only the preparation and presentation of food but also consumers' expectations and perceptions of food experiences. In particular, the use of generative artificial intelligence in gastronomic image generation, plate design, menu development, and digital food presentation has created a new research area for understanding the sensory dimensions of gastronomic experiences. From a neurogastronomic perspective, flavor cannot be explained solely by taste and smell; rather, it emerges through the interaction of visual, olfactory, gustatory, auditory, tactile, and cognitive processes. The aim of this study is to examine the relationship between artificial intelligence technologies and neurogastronomy, with particular emphasis on the potential effects of AI-supported gastronomic visuals on visual expectations, flavor expectations, mental imagery, and multisensory flavor perception. The study was designed as a conceptual research study based on a literature review, examining academic studies on gastronomy and generative artificial intelligence. It constitutes a conceptual literature review based on existing research on neurogastronomy, multisensory flavor perception, visual food presentation, sensory expectations, generative artificial intelligence, and digital gastronomy. The studies reviewed indicate that the visual characteristics of food can influence consumers' flavor expectations and evaluations of food, while also contributing to the formation of visual, auditory, olfactory, tactile, and taste experiences. Recent research on artificial intelligence further suggests that AI-generated gastronomic visuals may influence aesthetic evaluations, mental imagery, and the desire to consume. The findings of the study indicate that AI-supported gastronomic content can be associated with multisensory flavor experiences through visual appeal, mental imagery, and flavor expectations. In this context, artificial intelligence is considered not as a technology that replaces the gastronomic experience, but rather as a tool that supports and shapes the stage preceding the consumer's direct encounter with the experience. The conceptual framework proposed in this study is expected to contribute to future research examining the role of artificial intelligence in flavor perception and gastronomic experiences.

KEYWORDS

Artificial intelligence, neurogastronomy, flavor perception, gastronomic experience, dijital gastronomy.

AN ANALYSIS OF FACTORS INFLUENCING THE ADOPTION OF TECHNOLOGY IN DISASTER AND EMERGENCY LOGISTICS

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ABSTRACT

The logistics sector is undergoing significant transformations alongside the rapid development of technology. These transformations offer various benefits, such as increasing efficiency in business processes, reducing costs, improving delivery processes and enhancing service quality. The role of technology in the logistics sector spans a wide range of areas, from supply chain management to warehousing and distribution. Technologies such as automation systems, artificial intelligence, big data analytics, the Internet of Things (IoT) and robotics hold significant potential for enhancing the efficiency and flexibility of logistics operations.

The use of technological applications in disaster and emergency logistics operations is also important in terms of conducting operational processes more effectively, coordinating resources and improving logistics activities. However, there are various factors that influence the technology adoption process. These include high costs, incompatibility of existing infrastructure with technological systems, security concerns, data integrity and compliance issues, as well as cultural and organisational resistance to technology adoption. Accordingly, the adoption of technological applications in disaster and emergency logistics depends not only on the availability of technological infrastructure but also on organisational, financial, strategic and human resource factors.

The aim of this study is to examine the factors influencing the adoption of technology in disaster and emergency logistics. The research aims to identify the factors influencing the technology adoption process through assessments of the existing technological infrastructure and technology usage, and to provide recommendations for improving the effectiveness of disaster and emergency logistics operations.

In this study, a literature review was first conducted, followed by the use of in-depth interviews as part of a qualitative research methodology. Through in-depth interviews with managers of logistics companies and sector representatives involved in disaster and emergency logistics activities, views were obtained regarding the strategic, organisational, technological, financial and human resource-related factors influencing technology adoption. The aim is to identify the factors influencing the adoption of technological applications in disaster and emergency logistics and to develop recommendations for promoting the wider use of technology, based on the evaluation of the data obtained.

KEYWORDS

Disaster logistics, emergency logistics, in-depth interview technology adoption, technology use,

ARTIFICIAL INTELLIGENCE, COPYRIGHT, AND SCIENTIFIC WORK: REAFFIRMING HUMAN AUTHORSHIP AND THE INCENTIVE TO CREATE IN THE AGE OF GENERATIVE AI

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ABSTRACT

The rapid integration of generative artificial intelligence into scientific research is transforming not only how knowledge is produced, but also the conditions under which scientific creativity is recognized and protected. Researchers increasingly employ AI systems in their work while at the same time, scientific research outputs form part of the vast body of human-created material being used in the development and operation of generative AI systems. This paper examines that relationship from three interconnected perspectives. First, it considers the use of copyright-protected scientific works as inputs in the development and operation of AI systems, particularly in relation to reproduction, text and data mining, licensing, and the fundamental distinction between scientific facts, ideas, methods, and their copyright-protected expression. Second, it examines the growing use of generative AI in producing scientific outputs and asks when AI-assisted research remains an expression of human intellectual creation and when the human contribution becomes insufficient to justify claims of authorship and subsequent copyright protection. Particular attention is devoted to the increasingly blurred boundary between AI as an instrument and tool of human creativity and AI as the immediate generator of expressive content. Third, the paper situates these questions within the underlying rationale of copyright protection. Copyright is not merely a legal mechanism for allocating exclusive rights over valuable outputs. At its core lies a human-centered purpose: to recognize, valorize, and incentivize the investment of human intellectual effort, time, expertise, and resources in creative activity that contributes to cultural, scientific, and social development. AI system requires neither legal recognition nor economic incentive to generate new outputs. Extending copyright or other type of legal protection to autonomous AI-generated content would therefore risk separating copyright protection from the very human activity that justifies its existence. The paper argues that the emergence of generative AI provides an opportunity to reaffirm copyright's human purpose. AI may become an increasingly powerful instrument of scientific inquiry, but copyright should continue to protect the human intellectual contribution expressed through scientific work. Preserving this distinction is essential to maintaining incentives for meaningful human participation in the creation, verification, and communication of scientific knowledge.

KEYWORDS

Artificial intelligence, copyright, human authorship, scientific work, originality.

FROM TRANSLATION TO MEASUREMENT TESTING: A TWO-SAMPLE PILOT STUDY OF THE SCALES OF PARTICIPATIVE LEADERSHIP, TEAM COMMUNICATION, AND PERCEIVED SOCIAL LOAFING IN TÜRKİYE

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ABSTRACT

Employee participation in decision-making may strengthen information sharing and collaboration within teams. However, its implications for employee effort may not be uniform across conditions. Building on this premise, the main study examines the mediating role of team communication behaviors in the relationship between participative leadership and perceived social loafing. The proposed model suggests that participative leadership improves team communication, makes individual contributions more visible, and thereby reduces perceptions of social loafing. Power distance orientation is expected to shape the relationship between participative leadership and team communication behaviors, whereas felt accountability is expected to influence the relationship between team communication behaviors and perceived social loafing. The study thus aims to explain how and for whom the indirect effect of participative leadership on social loafing may vary.

Before testing the main model, this pilot study focused on preparing and preliminarily evaluating the Turkish-language measurement framework. The participative leadership, team communication behaviors, and perceived social loafing scales were reviewed against their original English versions and available Turkish applications. The intended meanings of the items were preserved, while wording was revised where necessary to improve clarity for employees in the banking and tourism sectors. The resulting instrument was pilot-tested in two independent samples, each comprising approximately 120 employees from the banking and tourism sectors. Because the items used ordinal response formats, preliminary confirmatory factor analyses were conducted using the diagonally weighted least squares estimator. Factor loadings, internal consistency, model fit indices, residuals, and modification indices were considered together in the analysis.

Preliminary findings indicated that the five-item participative leadership scale exhibited a generally consistent structure in both samples. For the nine-item team communication behaviors scale, the three-factor structure produced more defensible results than the single-factor alternative. A residual association between the seventh and eighth items emerged in both samples, whereas an additional association between the fifth and sixth items appeared in only one sample. Finally, the four-item perceived social loafing scale yielded a measurement structure requiring more cautious evaluation. Accordingly, no items were removed solely on the basis of the pilot modification indices, and definitive confirmatory decisions were deferred to the larger main-study samples.

Overall, the findings underscore the importance of sector-specific pilot evaluation before testing relationships among constructs and provide a basis for the measurement and analysis plan of the main study.

KEYWORDS

Measurement validation, participative leadership, perceived social loafing, pilot study, team communication behaviors.

DIGITALIZATION IN PSYCHOLOGY: THE GROWING ROLE OF CYBERCHONDRIA

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ABSTRACT

This study examines the effects of digitalization on individuals' health behaviors from a health psychology perspective, with a particular focus on the phenomenon of cyberchondria. Cyberchondria is a rising psychological issue in the digital age, characterized by increased anxiety and psychological distress experienced during the process of seeking health-related information online. The research provides a comprehensive analysis of the etiology of cyberchondria, its psychological and social impacts, coping strategies, and measurement tools. Findings indicate that cyberchondria negatively affects not only individual anxiety levels but also interactions with the healthcare system and social relationships. In this context, the importance of intervention strategies offered by health psychology—such as cognitive behavioral therapy, psychoeducation, and health literacy—is emphasized. By highlighting the impact of online health information-seeking behavior on individuals' psychological well-being in the digital era, the study aims to raise awareness at both individual and societal levels.

KEYWORDS

Cyberchondria, health psychology, internet addiction, health anxiety, digitalization

THE PATIENT'S RIGHT TO REFUSE MEDICAL TREATMENT UNDER FRENCH LAW: A CASE STUDY OF JEHOVAH'S WITNESSES

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ABSTRACT

The right to refuse medical treatment places patient autonomy in tension with healthcare professionals' obligations to provide care and protect life. Drawing on French legislation, international legal instruments, case law, and medical ethics, this dissertation examines the recognition, exercise, and limits of this right. The analysis begins with free and informed consent and the duty to inform, before considering treatment refusal as an expression of autonomy and respect for bodily integrity. It then addresses the obligations and potential liability of healthcare professionals, including the duty to assist a person in danger. Emergency intervention, legally mandated treatment, and conflicts between patients and professionals are examined to assess how French law reconciles respect for individual decisions with the requirements of medical care.

Within this broader framework, the case of Jehovah's Witnesses illustrates the difficulties associated with refusing blood transfusions on religious grounds. The analysis of judicial decisions explores how different courts address conflicts between patients' expressed wishes and the protection of life, distinguishing between adults capable of making informed decisions, patients unable to express their wishes, and minors whose parents oppose treatment. These situations highlight the significance of information, previously expressed wishes, and the necessity and proportionality of medical intervention. Overall, the analysis highlights the strengthened protection of patients' wishes while identifying the circumstances in which treatment may lawfully be provided despite opposition. It concludes that the duty to preserve life does not establish a general entitlement to override refusal, the lawfulness of intervention depends on the applicable legal safeguards and the circumstances of each case.

KEYWORDS

French health law, informed consent, medical liability, patient autonomy, refusal of treatment, Jehovah's Witnesses.

THE PROFESSIONAL ROLE AND ETHICAL BOUNDARIES OF PSYCHOLOGIST IN AI-ASSISTED PSYCHOLOGICAL COUNSELLING

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ABSTRACT

The use of artificial intelligence (AI) in psychological counselling offers new opportunities to improve access to psychological support while raising important questions regarding psychologists' professional roles and ethical responsibilities. Existing literature suggests that AI-assisted applications have the potential to support counselling processes; however, concerns remain regarding their reliability, client privacy, and limitations in establishing therapeutic relationships.

This review article aims to examine the professional role of psychologists and the ethical boundaries of AI-assisted psychological counselling based on existing scientific literature. The review focuses on professional responsibility, confidentiality, data security, informed consent, the psychologist–client relationship, and human oversight. It also addresses the limitations of AI systems in demonstrating empathy, establishing therapeutic relationships, and supporting professional decision-making.

Based on the literature reviewed, the article argues that AI should be considered a supportive tool operating within established professional ethical principles and under human oversight, rather than an independent substitute for psychologists. In this context, strengthening psychologists' digital competencies, clearly defining professional responsibilities, and protecting client rights are essential for the ethical and safe implementation of AI-assisted psychological counselling.

KEYWORDS

Artificial intelligence, psychological counselling, psychologists, professional role, ethical boundaries, client rights.

DIGITAL TECHNOLOGIES IN SPORT AND PHYSICAL ACTIVITY PRACTICES FOR INDIVIDUALS WITH DISABILITIES: A SCOPING REVIEW OF ACCESSIBILITY AND INCLUSION

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ABSTRACT

This study aimed to map digital technologies used in sport and physical activity practices for individuals with disabilities in terms of application areas, target groups, research designs, main outcomes, accessibility, and inclusion. The study was designed as a scoping review guided by the PRISMA-ScR approach. Original research articles published in Turkish or English between 2015 and 2026 were searched in PubMed, Web of Science and ERIC. Searches addressed three technology categories: virtual reality and exergaming, wearable technologies, and mobile or remote exercise applications. Publications focusing solely on clinical rehabilitation, using digital technologies only for measurement, or not reporting original research were excluded. Of 861 records identified, 32 that did not meet the year or publication-type criteria and 54 duplicate records were removed, leaving 775 unique records for title screening. Following detailed title and content assessment, 32 studies were included in abstract-based data extraction. The findings showed that 22 studies investigated virtual reality or exergaming, nine examined mobile or remote exercise, and two addressed wearable technologies; one study was assigned to more than one category. The most frequently studied populations were individuals with intellectual or developmental disabilities and Down syndrome, autism spectrum disorder, cerebral palsy, and mobility disabilities. Twelve studies used randomized or controlled intervention designs, whereas 11 employed pilot, feasibility, case-series, or pretest–posttest designs. Digital applications showed potential to support motor skills, physical fitness, exercise intensity, motivation, enjoyment, self-efficacy, and physical activity participation. Remote applications reduced transportation, scheduling, and facility-access barriers. Personalization, visual support, virtual coaching, participatory design, and ability-balancing algorithms emerged as important components of inclusive practice. However, small samples, short follow-up periods, and heterogeneous intervention protocols limited the generalizability of the evidence. In conclusion, digital technologies may improve access to sport and physical activity among individuals with disabilities. Sustainable and inclusive implementation requires user-centred design, appropriate technical support, and larger, long-term studies that assess participation and real-world use.

KEYWORDS

Accessibility, digital technologies, exergaming, individuals with disabilities, physical activity.

THE TRANSPARENCY CRISIS OF GENERATIVE AI VIDEO PLATFORMS AND DIGITAL GRASSROOTS MOVEMENTS

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ABSTRACT

This study examines the deepening crisis of algorithmic transparency accompanying the widespread adoption of AI-based video generation tools (such as Sora, Runway, and Kling), the mechanisms through which platforms evade accountability, and the grassroots social movements emerging in opposition to this form of digital authoritarianism from a critical political economy perspective. By taking refuge behind the shields of “trade secrets” and “intellectual property,” major technology companies engage in unauthorized scraping of the shared cultural knowledge and creative output of users and creators, thereby contributing to the exploitation of creative labor and the reproduction of visual hegemonic norms. Adopting a qualitative approach, this study interrogates the “black box” structure of AI systems and maps emerging forms of digital civil disobedience, including artist strikes, data-poisoning collectives, transnational class-based mobilization among data annotators, and advocacy for Indigenous data sovereignty. The findings demonstrate that the struggle for algorithmic transparency is not merely a matter of technical oversight; rather, it constitutes a new struggle over class, autonomy, ownership of the digital public sphere, and its democratization. In conclusion, the study opens up a discussion on the need to redefine platform accountability within the AI ecosystem and examines the constitutive role of grassroots movements in this process.

KEYWORDS

Artificial intelligence, algorithmic transparency, digital civil disobedience, digital labor, platform capitalism.

ARTIFICIAL INTELLIGENCE AND ADVERTISING CREATIVITY WITH A FOCUS ON CHATGPT AND GEMINI: A REVIEW OF ACADEMIC STUDIES IN TÜRKİYE

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ABSTRACT

Generative artificial intelligence applications are now used in many stages of advertising production, from copywriting to visual design, and they have called established assumptions about advertising creativity into question. According to Statcounter data, as of December 2025, ChatGPT and Gemini rank first and second among the most widely used AI assistants in Türkiye. Turkish-language studies on artificial intelligence and advertising have increased in recent years. However, holistic evaluations that bring these studies together around creativity and specific tools remain limited. This study aims to review academic research on the role of ChatGPT and Gemini in advertising creativity in Türkiye and to identify the trends, key findings and research gaps in the field. The study is significant because it synthesises the Turkish literature from a tool-oriented perspective and offers direction for future research. It adopts a qualitative research design, and data were collected through document analysis. Taking 2022, the year ChatGPT was released to the public, as the starting point, peer-reviewed articles and graduate theses published between 2022 and 2026 were searched in the DergiPark and TR Dizin databases and the Google Scholar search engine. Of the studies retrieved, 47 met the inclusion criteria and were selected. The data were analysed using qualitative content analysis. The studies were coded by method, sample and findings and then classified under themes.

KEYWORDS

Artificial intelligence, advertising creativity, ChatGPT, Gemini, Türkiye.



SECTION III

ENGINEERING, TECHNOLOGY AND APPLIED SCIENCES

SUSTAINABLE CAMPUS TRANSFORMATION THROUGH AN ENERGY–WATER NEXUS PERSPECTIVE: THE CASE OF BALIKESIR UNIVERSITY ÇAĞIŞ CAMPUS

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ABSTRACT

University campuses are complex environments where energy demand, water use, building infrastructure, transportation, and waste generation interact on a daily basis. For this reason, they provide a practical setting for testing and implementing sustainability strategies at a manageable scale. Yet, a sustainable campus cannot be defined solely by the presence of individual environmental initiatives. A more meaningful assessment requires an understanding of current resource consumption patterns and the extent to which future improvements can be supported by measurable and spatially informed evidence.

This study aims to assess the sustainability performance and transformation potential of Balıkesir University Çağış Campus from an energy–water nexus perspective. The main dataset is derived from the Balıkesir University Sustainability Report 2023, which provides information on campus energy and water consumption, physical infrastructure, and ongoing sustainability practices. The analysis will examine the temporal variation of electricity, natural gas, and water consumption, identify periods of relatively high demand, and develop resource-use intensity indicators where the available data allow. Alongside the consumption-based assessment, the renewable energy, energy-efficiency, and rainwater-harvesting potential of the campus will be investigated using spatial analyses supported by Geographic Information Systems (GIS).

Rather than treating energy, water, and environmental actions as separate components, the proposed framework considers their potential interactions within a common campus transformation strategy. Alternative scenarios will be developed around solar energy utilization, water recovery, and improved resource efficiency, allowing different pathways toward a more sustainable campus to be explored. The study is expected to provide a practical framework for converting institutional sustainability-reporting data into decision-support information. It may also help identify priority areas for future campus investments and provide a transferable approach for higher education institutions seeking to move from reporting sustainability activities toward measurable and evidence-based campus transformation.

KEYWORDS

Geographic information systems, energy–water nexus, energy efficiency, sustainable campus, renewable energy.

CROSS PLATFORM HOME SCREEN WIDGET DATA SYNCHRONIZATION IN OFFLINE-FIRST MOBILE WORK TRACKING APPLICATIONS: THE WORKTRACK ARCHITECTURE

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ABSTRACT

The value generated by mobile work-tracking applications largely depends on the continuous, low-latency availability of critical status information. Maintaining data consistency and currency is crucial in field conditions where reliable network connectivity cannot be guaranteed. This study proposes an offline-first architecture that treats network access as an optional resource rather than a prerequisite. In the proposed approach, the local relational database on the device serves as the single source of truth, feeding both in-app screens and operating system-level home screen components. The study's primary contribution is the design of a lightweight synchronization pattern that bridges the fundamentally different Android and iOS operating environments using a single aggregator function and a unified event-driven entry point. This pattern ensures that the summary is consistently recalculated after every data-modifying operation, resulting in an identical presentation across both platforms. The architecture has been implemented—incorporating both the data model and the user interface—within a real-world application named WorkTrack. The consistency guarantees and limitations of data continuity achieved through portable backups are also discussed.

KEYWORDS

Mobile data management, offline-first architecture, SQLite, cross-platform development, data synchronization, home screen widget, React Native

DEVICE-FREE MOTION DETECTION VIA WI-FI RSSI AND MOBILE APP: WIFIAREASEARCH

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ABSTRACT

Device-free motion and presence detection using Wi-Fi signals is a cost-effective approach for smart space monitoring applications, as it requires no additional hardware. Most approaches capable of motion detection via Wi-Fi signals rely on specialized hardware that provides access to Channel State Information (CSI); consequently, they do not function on smartphones lacking such hardware. This study presents a motion detection architecture (WifiAreaSearch) that operates entirely on-device and offline, utilizing the Received Signal Strength Indicator (RSSI) time series of the connected access point as read via the standard Android operating system. The study is motivated by the goal of detecting environmental motion without hardware requirements by training on signal data using machine learning methods. A practical constraint identified during field measurements is that, since Android devices refresh RSSI values approximately every 3.1 seconds, high-speed sampling at 10 Hz yields nearly redundant samples, rendering window-based discriminative features unnecessary. Transforming this constraint into a design principle, the study proposes a sampling scheme that applies a 3-second greedy causal downsampling to 1 Hz raw polling and operates on windows of approximately 90 seconds. Features are extracted across three channels and classified using a one-dimensional convolutional neural network (CNN). The CNN model was trained using the TensorFlow library and embedded within the application. This trained model operates in conjunction with a hysteresis gate and accelerometer-based stationarity validation. The WifiAreaSearch architecture is detailed through a functional Android application, screenshots, and a Leave-One-Room-Out (LORO) cross-validation protocol. Preliminary findings obtained using synthetic data and the practical requirements revealed by multi-room real-data collection are reported.

KEYWORDS

Wi-Fi sensing, device-free motion detection, RSSI, on-device inference, 1D convolutional neural network, model quantization.

DEVELOPMENT AND FUNCTIONAL VERIFICATION OF A DIGITAL DECISION SUPPORT FRAMEWORK FOR STANDARDIZED TESTING OF TEXTILE LEATHER AND FOOTWEAR MATERIALS

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ABSTRACT

Selecting a standardized test requires more than matching a property name to a document identifier. Material identity, specimen form, the intended endpoint, product requirements and the edition basis can change the appropriate route. This study develops a digital decision support framework for selected textile, leather and footwear testing questions and examines its functional behaviour through a reproducible reference implementation. A structured knowledge model separates test methods, preparation and exposure procedures, product requirements, and edition metadata. Deterministic rules return an advisory route, request further information, identify an unsupported application, or require edition review. The prototype contains 20 routing profiles and 25 dated metadata records derived from public standard catalogues. Functional verification used 20 constructed development scenarios, comprising seven textile, six leather and seven footwear cases, together with 12 boundary cases and six targeted single-guard mutations. All 20 nominal scenarios matched their predefined document-role fixtures. The 12 boundary cases produced the expected seven scope exclusions, three requests for information and two edition-review outcomes. All six deliberately disabled guards were detected by their targeted checks. Every nominal and boundary output retained an instruction to verify the complete applicable standard before testing. These results demonstrate consistency of the implemented rules with the finite development specification; they do not establish independent expert agreement, laboratory performance or general selection accuracy. The contribution is a traceable application-specific model that distinguishes method selection from protocol approval and conformity assessment, while making unresolved scope and edition questions visible. The framework provides a reproducible basis for subsequent evaluation with independently labelled laboratory requests and qualified users.

KEYWORDS

Decision support, footwear, leather, standardized testing, textiles.

PREDICTIVE MODELING AND CLINICAL RISK ASSESSMENT OF PATHOLOGICAL ALPHA-FETOPROTEIN (AFP) LEVELS USING MACHINE LEARNING ALGORITHMS

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ABSTRACT

In an era of increasing application of artificial intelligence (AI) and machine learning in modern medicine, the integration of laboratory data with predictive analytical models offers new opportunities for more efficient identification of potentially clinically significant biomarker findings. Alpha-fetoprotein (AFP), an important serum biomarker used in the clinical assessment of various pathological conditions, provides a suitable basis for the application of such approaches. In this context, the present study investigates the applicability of supervised machine learning for classifying normal and abnormal AFP results based on available demographic and administrative characteristics. The study is based on a longitudinal, retrospective laboratory dataset, with data processed using appropriate procedures for validation, pseudonymization, and privacy protection. Random Forest and Multi-Layer Perceptron (MLP) algorithms were employed to develop predictive models and assess their ability to identify abnormal AFP levels. The results indicate that, despite achieving high overall classification accuracy, the models exhibit limited ability to detect rare abnormal findings. This observation highlights the need for careful interpretation of model performance in the presence of substantial class imbalance, as high accuracy alone does not necessarily indicate clinically meaningful predictive performance. Furthermore, the findings suggest that demographic and administrative characteristics, when considered in isolation, do not provide sufficient information for the reliable prediction of abnormal AFP results. This study provides a foundation for further integration of laboratory and clinical parameters into more sophisticated predictive models, with potential applications in the development of intelligent Clinical Decision Support Systems (CDSS).

KEYWORDS

Artificial intelligence, machine learning, alpha-fetoprotein, AFP, biomarkers, predictive modeling, random forest, multi-layer perceptron, class imbalance.

METHODOLOGICAL APPROACHES TO THE EVALUATION AND SELECTION OF MEASURING DEVICES

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ABSTRACT

Measuring devices serve to directly and indirectly determine physical and electrical quantities. They are technical tools used for the quantitative determination of physical quantities across sectors such as the process industry, science, medicine, the military industry, and others. While manufacturers and vendors currently offer methodological procedures for evaluating and selecting measuring devices, none of these fully account for the key evaluation and selection factors—described, weighted, and categorized by importance. The aim of this research is to develop a mathematical model, a graphical representation, or a software application based on established evaluation and selection criteria to assist users of this equipment during procurement processes. Every instrument comes with specifications regarding accuracy or maximum permissible error, and some manufacturers also provide user ratings (e.g., on a scale of 1 to 5 or higher). The objective is to determine whether a device yields accurate results, whether it is suitable for a specific application, and whether it possesses the parameters required for high-quality measurement. The capabilities of measuring device manufacturers are reflected in the quality of their industrial products—including logistical support (maintenance, spare parts, upgrades, and improvements)—and their ability to address all types of process measurements and varying levels of technical system complexity.

When developing a methodological approach for evaluating measuring devices (instruments), a range of technical, metrological, and operational characteristics are assessed. These include operating and functional ranges; operational and environmental criteria; legal and economic factors (such as calibration and traceability); compliance with standards; and the possession of appropriate certifications and documentation. Selection criteria are partly based on technical specifications and economic factors—such as price and the terms for maintenance, servicing, and routine calibration—as well as user satisfaction and the results of both control and actual measurements.

The established methodological approach for the evaluation and selection of measuring devices will enable technical practitioners to optimally and comprehensively select and assess devices based on manufacturer-defined material, electrical, and digital performance characteristics (including accuracy, reliability, durability, usability, compatibility with other equipment, and adaptability to the measurement environment).

KEYWORDS

Selection, methodological approaches, measurements, evaluation, devices.

COMPARATIVE ANALYSIS OF AI-BASED VOICE MODELS: A MULTI-LLM CONSENSUS APPROACH

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ABSTRACT

Speech processing technologies have undergone an unprecedented transformation, surpassing traditional statistical methods following the deep learning revolution and the emergence of Large Language Models (LLMs). This study objectively evaluates the performance of Text-to-Speech (TTS) and Speech-to-Text (STT) models across three distinct linguistic typologies: high-resource (English), agglutinative morphological (Turkish), and low-resource (Macedonian). To eliminate single-evaluation biases, a five-way global artificial intelligence consensus architecture was developed, comprising ChatGPT, Gemini, Perplexity, Alibaba Qwen, and Claude Sonnet 5.5. The generated qualitative data were transformed into a quantitative decision matrix via Python using Canonical Entity Resolution and Borda Count algorithms. Machine learning analyses (Random Forest and MLP Regressor) mathematically demonstrated that Word Error Rate (WER) is the most decisive factor in industrial model selection, carrying a weight of 91.96%. The findings indicate that in the STT domain, open-source systems (e.g., Whisper Large-v3) have reached commercial quality and become industry standards; whereas in the TTS domain, commercial models (e.g., ElevenLabs, Azure) maintain their leadership through superior natural prosody capabilities. Furthermore, the study presents an independent, Python-based local engineering architecture (utilizing jiwer and Small Language Models) that circumvents the reliance on massive LLMs, and highlights the critical importance of regional datasets in mitigating the zero-shot failure encountered in low-resource languages such as Macedonian.

KEYWORDS

Borda count, , Large Language Models (LLMs), low-resource languages, machine learning, Speech Recognition (STT), Speech Synthesis (TTS).

COMPARATIVE ASSESSMENT OF GEOMETRIC CHARACTERISTICS, MECHANICAL BEHAVIOR, AND ENERGY DISSIPATION PERFORMANCE OF CURVED METALLIC SEISMIC DAMPERS

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ABSTRACT

Improving the seismic performance of steel structures subjected to earthquake loading depends not only on structural strength but also on the mechanical behavior of materials, ductility, and energy dissipation capacity. Metallic seismic dampers contribute to limiting damage to primary structural members by dissipating seismic energy through controlled plastic deformation mechanisms. The effectiveness of these systems is directly related to the geometric characteristics of damper elements, the post-yield behavior of materials, and structural stiffness properties. This study aims to comparatively evaluate the relationship between the geometric configurations and mechanical behavior of curved metallic seismic dampers used in steel frames, as well as the influence of this relationship on energy dissipation performance. Within the scope of the research, different geometric configurations of curved yielding plate dampers and curved parallel plate dampers were investigated. A comparative evaluation was conducted using load–displacement, hysteresis, stiffness, and energy–displacement results obtained from previously published finite element analyses. The evaluation focused on the effects of plate geometry, plastic deformation mechanisms, stiffness variations, and the incorporation of mesh plates on structural performance. The reviewed findings indicate that curved yielding plate dampers exhibit high ductility and stable hysteretic behavior through controlled plastic deformation. Significant differences in energy dissipation capacity were identified among different yielding plate geometries. For curved parallel plate dampers, the incorporation of mesh plates was found to enhance lateral load-bearing capacity and stiffness while producing fuller hysteresis loops, thereby improving energy dissipation performance. Furthermore, variations in stiffness and the development of plastic deformation were identified as important factors influencing cyclic stability in the investigated systems. The findings highlight the importance of considering geometric characteristics and material mechanical behavior simultaneously in the design of metallic seismic dampers. By clarifying the relationships among geometric configuration, ductility, and energy dissipation performance, this study provides insights relevant to performance-based seismic design and future research on geometric optimization.

KEYWORDS

Energy dissipation, geometric characteristics, mechanical behavior, metallic seismic dampers, steel structures

FIRE PERFORMANCE ASSESSMENT OF STEEL-CONCRETE COMPOSITE STRUCTURAL ELEMENTS IN MULTI-STOREY BUILDINGS ACCORDING TO EUROCODE

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ABSTRACT

This study investigates the fire behavior and fire resistance of steel-concrete composite structural elements used in multi-storey buildings. Composite beams, columns, and floor systems were evaluated according to Eurocode provisions, while the influence of elevated temperatures on the mechanical properties of steel and concrete was analyzed. A real multi-storey building was selected as a case study, and several fire scenarios were investigated by comparing unprotected composite members with gypsum board-protected and concrete-encased structural elements. The results indicate that increasing temperature significantly reduces the load-bearing capacity of both steel and concrete. However, appropriate passive fire protection systems considerably improve the fire resistance and structural safety of composite members. Fully and partially concrete-encased steel sections, together with composite slabs incorporating profiled steel decking, demonstrated superior fire performance compared with unprotected elements. The findings confirm that Eurocode-based design procedures provide reliable predictions of fire resistance and emphasize that fire safety should be integrated with architectural and structural design during the planning stage. The study contributes to the optimization of fire-resistant composite structural systems for modern multi-storey buildings.

KEYWORDS

Composite structures, steel-concrete composite members, fire resistance, Eurocode, multi-storey buildings.



SECTION IV

HEALTH, LIFE AND ENVIRONMENTAL SCIENCES

THE POTENTIAL ROLE OF BIOACTIVE COMPOUNDS DERIVED FROM FOOD BY-PRODUCTS IN POSTBIOTIC PRODUCTION IN FERMENTED DAIRY PRODUCTS

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ABSTRACT

The valorization of food by-products into value-added compounds is important for improving resource efficiency, reducing waste generation, and supporting sustainable food systems. Rather than using bioactive compounds derived from food by-products solely as direct food ingredients, their potential to influence fermentation processes and microbial metabolite production represents an innovative approach. This study aimed to evaluate the potential role of bioactive compounds derived from food by-products in postbiotic metabolite formation in fermented dairy products. For this purpose, recent literature concerning the incorporation of phenolic compounds, dietary fibers, polysaccharides, and other bioactive compounds obtained from fruit and vegetable, cereal, coffee, tea, and other plant-based food by-products into dairy fermentation systems was reviewed. Particular attention was given to their potential effects on starter culture growth, fermentation kinetics, organic acid and free amino acid production, exopolysaccharide synthesis, and the formation of other microbial metabolites. The available evidence indicates that appropriately selected bioactive compounds may function not only as nutritional and functional ingredients but also as fermentation modulators capable of influencing microbial metabolic activity. In particular, phenolic compounds and fermentable polysaccharides may affect microbial metabolism in a strain- and food matrix-dependent manner, potentially modifying the production profiles of organic acids, short-chain fatty acids, bioactive peptides, and other postbiotic metabolites. These interactions suggest that the functional properties of fermented dairy products containing bioactive compounds derived from food by-products may depend not only on the compounds initially present but also on their transformation during fermentation. Therefore, the use of bioactive compounds derived from food by-products in fermented dairy products may represent an innovative and sustainable strategy integrating circular economy principles with postbiotic production. This approach may contribute to the valorization of underutilized food resources and support the development of next-generation fermented foods with enhanced functional potential.

KEYWORDS

Circular economy, fermented dairy products, food by-products, postbiotics, sustainability.

ACUTE BRONCHIOLITIS IN CHILDREN UNDER TWO YEARS: RISK FACTORS FOR SEVERE DISEASE AND CLINICAL MANAGEMENT

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ABSTRACT

Acute bronchiolitis is a viral lower respiratory tract infection affecting children under two years of age and an important cause of hospitalization during infancy. This narrative review aims to evaluate risk factors for severe disease and approaches to diagnosis, treatment, and monitoring. Diagnosis primarily relies on clinical history and physical examination; routine laboratory investigations and chest radiography are not recommended in typical cases. Hospital admission decisions should integrate respiratory distress, oxygenation, feeding and hydration status, and the family's capacity to provide care at home.

Young age, prematurity, chronic lung disease, hemodynamically significant congenital heart disease, and immunodeficiency warrant consideration when assessing severity risk. Apnea, marked respiratory distress, persistent hypoxemia, and inadequate fluid intake are key findings requiring close monitoring and hospital assessment. Management centers on adequate nutritional and fluid support, with supplemental oxygen when indicated. Bronchodilators and corticosteroids are not recommended routinely, and antibiotics should be reserved for suspected concomitant bacterial infection. In conclusion, early risk identification, individualized supportive care, and repeated clinical assessment should guide bronchiolitis management. Educating caregivers about signs of deterioration is a fundamental component of safe discharge planning.

KEYWORDS

Acute bronchiolitis, child, risk factors, hospitalization, supportive care.

INGUINAL HERNIA SURGERY ACCORDING TO BASSINI AND SHOULDICE METHODS: A COMPARATIVE EVALUATION OF RESULTS

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ABSTRACT

The main objective of this study is to examine clinical experiences in cases surgically treated for inguinal hernia and to comparatively evaluate the advantages and weaknesses of the Bassini and Shouldice surgical techniques. The research was conducted on a total of 103 patients who underwent surgery for inguinal hernia in the General Surgery Department of Gostivar "Ferid Murad" Hospital between March 1, 20016, and March 1, 2026. The Bassini technique was applied to 71 patients (69%), while the Shouldice technique was applied to 32 patients (31%). Cases were analyzed in terms of age, gender, intraoperative and postoperative complications, and recurrence rates during a 1-year follow-up period. Males accounted for 97.1% of the patients, with the highest incidence observed in the 50–60 age group (34.9%). Recurrence developed in 3 out of the 103 patients (2.9%) during the one-year follow-up period. Postoperative complications were observed in 12 cases (11.6%), consisting of 1 purulent abscess, 1 hematoma, and 10 cases of serous inflammation. While the Bassini technique is frequently preferred in small hernia cases, the Shouldice technique offers a more sophisticated approach for repairing posterior wall defects. The Shouldice method yields more successful outcomes with lower recurrence and complication rates, standing out as a more advantageous and superior standard compared to the Bassini method and other tension-bearing techniques.

KEYWORDS

Inguinal hernia, bassini technique, shouldice technique, surgical repair, recurrence rate, postoperative complications.

THE ROLE OF ULTRASONOGRAPHY IN THE DIAGNOSIS AND TREATMENT OF DYSTOPIC TESTICLES: CLINICAL AND SURGICAL PERSPECTIVE

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ABSTRACT

The main objective of this study is to evaluate the role of ultrasonography in the diagnosis, surgical planning, and treatment of dystopic testicles (cryptorchidism and ectopia), which are congenital anomalies in children, from a clinical and surgical perspective. The research was conducted using retrospective and prospective methods on 150 pediatric patients aged 1–10 years at the Surgery Department of Gostivar Medical Center over the last 10 years. Preoperative and postoperative clinical examinations were performed, 123 patients underwent ultrasonographic evaluation, and the cases were subjected to surgical verification and histopathological analysis. The majority of the 150 operated patients were children aged 1–7 years, with unilateral dystopia observed in 89.3% (134 cases) and bilateral dystopia in 10.7% (16 cases) of the patients. Regarding anatomical localization, 54.6% of the cases were high dystopias, 32.6% were superficial inguinal, 10.6% were canalicular, and 2% were intra-abdominal. Recurrence was confirmed in 4.4% (6 cases) of the evaluated group of 137 patients. Ultrasonography is a non-invasive primary imaging method that offers high accuracy and reliability in the diagnosis of testicular dystopia. Early diagnosis and surgical intervention (orchidopexy) performed around the age of 2 ensure the preservation of testicular functions while reducing future fertility issues and tumor risks.

KEYWORDS

Cryptorchidism, diagnostic imaging, dystopic testicle, testicular ectopia, ultrasonography.

MAVROVO CASE STUDY OF URBAN ECOLOGY AND NATURAL LANDSCAPE AND CONTRIBUTING WITH SUGGESTIONS

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ABSTRACT

By examining the relationships between urban ecology and natural landscape through the Mavrovo region, this study aims to investigate sustainable development models without damaging the natural and cultural assets of the region. In addition to being a region rich in biodiversity, Mavrovo is a destination that stands out with its winter tourism potential. In this context, the design approaches proposed in line with the principles of urban ecology and landscape planning aim to support tourism-oriented economic development while maintaining environmental balance.

The study presents a comprehensive analysis in which the natural and structural elements in the region are evaluated from an ecological perspective; It develops strategic recommendations on the protection of the existing landscape, the maintenance of ecosystem services and the integration of urban development and natural landscape. Especially during periods when winter tourism is concentrated, the necessary precautions to prevent the ecological balance from being disrupted are supported by planning and design suggestions. In this context, land use policies focusing on the protection of the natural landscape, positioning of buildings and the use of environmentally friendly building materials have been shaped in line with sustainable tourism and the needs of the local people.

The study emphasizes that sustainable management of urban ecology and natural landscape plays a critical role in protecting ecosystems in the region and ensuring local development. The suggestions developed based on the Mavrovo example will serve as a model for similar ecological and tourism-oriented regions in the future.

KEYWORDS

Environmentally friendly design. natural landscape, urban ecology, sustainable development, tourism and ecosystem balance.

DIGITAL HEALTH AND ARTIFICIAL INTELLIGENCE IN HEALTH PROFESSIONS EDUCATION: AN ANALYSIS OF NURSING AND FIRST AND EMERGENCY AID CURRICULA

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ABSTRACT

Health professions education is facing new challenges arising from pedagogical changes, limited curricular space, and the rapidly expanding body of knowledge and technological developments accompanying the growing use of digital technologies and artificial intelligence (AI) applications. This study aimed to examine the extent to which digital health and AI-related content is incorporated into the curricula of undergraduate Nursing and associate degree First and Emergency Aid programs that prepare health professionals at different educational levels in public universities in Türkiye, with particular attention to the purposes and competencies associated with these contents.

The study was conducted using a document analysis design. Five public universities in Türkiye that had active Nursing and First and Emergency Aid programs as of 2026 and provided access to official curricula and course information packages were included in the analysis. Thus, a total of 10 programs preparing health professionals at different educational levels were examined. Data sources consisted of course plans, course information packages, course syllabi, program competencies, and learning outcomes published through the universities' official education information systems. Digital health- and AI-related content was examined in terms of its curricular placement, whether the course was compulsory or elective, ECTS credits, type of content, connection to healthcare and professional practice, learning outcomes, ethical and data security dimensions, and assessment and evaluation components. Institutional policies, events, and project-related information were not considered direct evidence of curricular integration and were kept analytically separate from curriculum-level evidence.

The findings indicated that digital health and AI-related content was not incorporated into the curricula in a uniform manner. In some programs, AI or digital health was explicitly structured as a course title, whereas in others, these topics were addressed within the contexts of research, productivity, or general information and communication technologies. Overall, the findings showed that digital technologies are beginning to gain visibility within the curricula examined; however, variations were observed across programs in terms of technology awareness, professional use in healthcare, clinical contextualization, ethics and data security, and measurable competency levels.

The curricula examined demonstrate that digital health and AI are becoming increasingly visible in health professions education, while the ways in which these contents are incorporated into curricula vary across programs. The findings suggest that the presence of a course addressing AI or digital technologies alone does not necessarily indicate the development of digital health competencies. For digital transformation to be meaningfully addressed within educational programs, technological knowledge should be connected to healthcare and professional practice; ethical and data security dimensions should be explicitly addressed; learning outcomes should be clearly defined; and relevant competencies should be reflected in assessment and evaluation processes. Accordingly, digital health and AI education should extend beyond the addition of standalone courses and be addressed from a competency-based curriculum design perspective.

KEYWORDS

Artificial intelligence, curriculum, digital health, digital health competencies, First and Emergency Aid, health professions education, nursing.



SECTION V

ARTS, DESIGN AND ARCHITECTURE

ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: FROM DIGITAL TRANSFORMATION TO GENERATIVE CREATIVITY

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ABSTRACT

Artificial intelligence is reshaping higher education by changing how knowledge is accessed, created, assessed and applied. This presentation examines the transition from digitization and digital transformation to AI-enabled teaching and research, with particular emphasis on the interdisciplinary profile of the University of Zagreb Faculty of Graphic Arts. Drawing on the faculty's strategic reflections and the author's teaching and research areas, it explores the relationship between deterministic graphics programming, data-driven visual design and generative AI. Practical examples include programmable graphics, generative typography, intelligent prepress workflows, computer vision for print-quality inspection, color management, multimedia production and adaptive visual communication. The presentation also considers how AI changes student assignments, assessment methods and scientific workflows, while highlighting the continuing importance of domain expertise, reproducibility, critical thinking and human creativity. Finally, it outlines strategic priorities for responsible institutional adoption: pedagogical integration, staff development, academic integrity, ethical governance, evaluation and infrastructure. The central argument is that AI should extend—not replace—human understanding and creative responsibility in higher education.

KEYWORDS

Artificial intelligence, academic integrity, digital transformation, generative graphics, graphic technology, higher education, visual communication.

SPORTSPACE: SPATIAL EVIDENCE FOR PLANNING ACTIVE URBAN ENVIRONMENTS IN ILIDŽA-STUP

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ABSTRACT

Urban planning and public-space design can support opportunities for sport and recreation, but mapped proximity alone does not establish usable access or health benefit. This study presents SportSpace as a preliminary spatial screening workflow linking recreation candidates, network accessibility, vegetation and historical environmental context in Ilidža–Stup. Twenty synthetic origins and twelve mapped candidates define 240 pairs, of which 228 are routable in the baseline model. Within activity categories, the workflow compares straight-line and network proximity, cumulative opportunities and travel-time–vegetation Pareto sets. Regional hourly data support separate pollutant-specific comparisons of three departure times across 2021. Network distance changes the nearest playground candidate for four of nineteen routable origins and the nearest sports-centre candidate for three. Changing vegetation buffers from 100 to 500 metres changes the playground Pareto set in twenty of fifty-seven cases. Paired temporal comparisons differ between particulate matter, nitrogen dioxide and ozone. An additional audit shows that removing directional restrictions shortens 125 modelled connections, while grouping two unresolved candidate pairs changes opportunity counts in fifteen of fifty-seven cases. These sensitivities make the quality of the spatial representation part of the planning finding. The indicators are linked to questions about route continuity, the spatial scale of green context and candidate review for recreation programmes, including physical education. They support structured preliminary investigation, not investment priorities, certified activity venues or safe exercise prescriptions. The contribution is a reproducible connection between calculation, planning question and evidence requirement, with explicit separation of modelled opportunity, actual participation and health outcomes.

KEYWORDS

Active recreation, environmental context, spatial accessibility, urban design, urban planning.

AN EXAMINATION OF THE POTENTIAL OF OUTDOOR PLAYGROUNDS TO SUPPORT CHILD DEVELOPMENT AND THEIR PHYSICAL CHARACTERISTICS: THE CASE OF ANKARA

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ABSTRACT

This study examined the role of outdoor playgrounds in child development, and analyzed their design criteria and physical features in Ankara. The study is a cross-sectional study conducted using the survey model, one of the quantitative research methods. The population of the study consisted of outdoor playgrounds in Ankara. The sample consisted of 45 outdoor playgrounds selected using criterion sampling. The "Outdoor Playground Checklist," developed by the researchers based on a literature review and expert opinions, was used as data collection tool. The checklist includes: characteristics of the; playground equipment, playground's surface, information regarding the presence of green and natural areas in the playground, information on the distribution of spatial features, information on the playground's potential to support developmental areas, information on the playground's compliance with universal design principles, and information on the playground's accessibility and safety. Data was collected by both researchers through on-site visits to the playgrounds, and the data was coded separately by each researcher using the "Outdoor Playground Checklist." Since this was a cross-sectional survey study and the sample was a census, the findings are presented using descriptive statistics. Equipment and damage rates were calculated only among parks where the relevant equipment was present; location distributions were calculated only among parks where the relevant equipment was present. In the damage assessment, Damage ≥ 1 was considered "damaged." The findings indicate that most outdoor playgrounds feature a traditional design and have the greatest potential to support gross motor development; however, they fall short in supporting areas such as cognitive development, fine motor skills, and creativity. Playgrounds also significantly lack the accessibility and inclusivity features needed for children with special needs. Considering the design criteria for children's play areas, the findings highlight the need to implement measures to ensure playgrounds meet accessibility and inclusivity standards, as well as the necessity of increasing the number of contemporary, adventure-oriented playgrounds designed by a team of experts that includes landscape architects.

KEYWORDS

Outdoor playgrounds, child development, inclusivity, playground.

EXPLORING PRESCHOOL CHILDREN'S PREFERENCES FOR KINDERGARTEN INTERIORS USING AI-GENERATED VISUALISATIONS

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ABSTRACT

This exploratory study examines preschool children's preferences for kindergarten interiors and the use of artificial intelligence (AI) to generate visual material for eliciting these preferences. Five visual surveys designed for this study were administered to separate groups comprising 67 children aged three to six years (mean age 5.00 years) from one kindergarten. Parents read the questions, reviewed the images with their children and recorded the children's selections in anonymous Google Forms questionnaires. The visualisations varied in spatial organisation, natural elements, colours, materials, lighting and opportunities for play and rest. In this study, prompts describing spatial features were used to generate AI visualisations for five surveys in which children selected their preferred images; spatial terms in the prompts and descriptions of the most frequently selected images, including ties, were then coded into 11 categories, and each category's share of all coded occurrences was calculated. The Children's Spatial Preference Coefficient (DKP), a descriptive indicator developed for this study, summarised 135 coded feature occurrences. Nature, greenery and organic elements accounted for 26.67% of occurrences, followed by exploration, movement and motor activity (20.74%) and retreat, privacy, rest and safety (11.11%). These percentages represent shares of coded occurrences. In one survey, 17 of 18 children (94.4%) selected a corridor offering opportunities for play, reading and exploration. Recurrent patterns suggest considering natural elements and a balance between active areas and smaller spaces for retreat in kindergarten design. The findings also demonstrate the practical use of AI-generated visualisations to enable children to express spatial choices. Interpretation is limited by the sample from one institution, differences between survey groups, multiple features occurring together within images and unequal exposure to individual features. DKP is an unvalidated descriptive indicator, and the findings concern visual choices. Further studies should standardise visual stimuli and examine whether these patterns persist in real environments.

KEYWORDS

Artificial intelligence; interior design; kindergarten; spatial preferences; visual surveys.

DIGITAL PARTICIPATION IN THE ERA OF ARTIFICIAL INTELLIGENCE: RECONFIGURING PARTICIPATORY ART IN POSTDIGITAL CULTURE

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ABSTRACT

The development of digital technologies has significantly transformed the relations between artists, artworks, and audiences, enabling viewers to move from the position of passive recipients to active participants in the creative process. As algorithmic systems become active mediators in the production and shaping of artistic content, the emergence of generative artificial intelligence (AI) further reconfigures these relations. This paper draws on theoretical approaches to participatory and interactive art and examines them in relation to contemporary generative AI practices. It aims to investigate how AI transforms modalities of participation, with particular attention to the relationship between the audience's creative action, authorial intention, and algorithmic mediation. Special attention is paid to the ambivalent character of this transformation: while generative AI can democratize creative expression and enable new forms of collaboration, audience emancipation remains situated within algorithmically structured, non-transparent, and corporately controlled frameworks. Through a critical and methodologically structured analysis of selected contemporary art projects, the paper examines new forms of interaction among artists, audiences, and AI systems, considering algorithmically mediated participation as a potential evolutionary extension of participatory art in postdigital culture.

KEYWORDS

Algorithmic mediation, digital participation, generative artificial intelligence, participatory art, postdigital culture.

THE TRANSFORMATION OF TEXTILE MATERIALS IN INSTALLATION ART

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ABSTRACT

Throughout human history, textiles have served not only as essential components of everyday life but also as significant means of transmitting cultural identity, collective memory, and aesthetic values. Traditional production practices such as weaving, knitting, felting, carpet and kilim making, and embroidery have gradually moved beyond their functional purposes to become forms of artistic expression. Particularly in the second half of the twentieth century, textiles became increasingly integrated into the experimental and spatial approaches of contemporary art, emerging as an influential medium within installation art, which redefined the relationship between the viewer, the object, and space. During this period, installation art gained prominence as a multidimensional mode of artistic expression that situates the artwork within a specific spatial context while emphasizing the viewer's physical, sensory, and perceptual engagement. This study examines the transformation of textiles from traditional craft practices into contemporary installation art from historical, aesthetic, and sociocultural perspectives. Through the artistic practices of Sheila Hicks, Magdalena Abakanowicz, Lenore Tawney, Chiharu Shiota, and Ernesto Neto, the study evaluates the potential of textiles to transform space, foster viewer interaction, render cultural memory visible, and create sensory experiences. The works examined demonstrate how materials such as fiber, yarn, and fabric can establish new relationships with the architectural environment through scale, texture, permeability, and movement. In addition, the future possibilities of textiles within installation art are discussed in relation to smart textiles, sustainable materials, and participatory art practices. Ultimately, textiles are positioned within installation art as a powerful medium capable of integrating aesthetic, conceptual, and sensory dimensions.

KEYWORDS

Contemporary art, installation art, cultural identity, fiber art, textiles.

SPONTANEITY AS A DESIGN PRINCIPLE: RETHINKING THE SOCIAL POTENTIAL OF RESIDENTIAL STREETS

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ABSTRACT

Residential streets are traditionally designed as functional components of urban circulation, primarily intended to accommodate movement, accessibility, and infrastructure. However, everyday urban life demonstrates that streets frequently acquire additional social and spatial meanings through spontaneous human activities. Informal gatherings, children's play, temporary occupation of sidewalks, and everyday interactions transform residential streets into dynamic environments that extend beyond their predetermined functions. These practices suggest that spontaneity should not be understood merely as an unintended consequence of urban development, but as a potential design principle capable of informing more adaptable and socially responsive urban environments. This paper investigates the relationship between spontaneous spatial practices and the architectural potential of residential streets, drawing upon qualitative field research conducted in Gostivar, North Macedonia.

The methodological approach combines direct observation, photographic documentation, spatial and morphological analysis, and behavioral mapping to examine how residents appropriate and reinterpret existing street environments. Particular attention is given to the interaction between Street configuration, architectural edges, accessibility, spatial flexibility, and patterns of everyday social occupation. Building upon these observations, the study proposes a conceptual framework for interpreting spontaneity as an active component of architectural and urban design. Rather than attempting to formally reproduce spontaneous activities, the framework emphasizes the creation of spatial conditions that allow unanticipated uses, temporary adaptations, and social encounters to emerge. The discussion identifies spatial flexibility, accessible interfaces between private and public domains, and opportunities for informal collective occupation as relevant considerations for residential street design. The paper argues that recognizing spontaneous practices as meaningful architectural evidence can contribute to a shift from rigid, function-oriented street planning toward more inclusive and adaptable urban environments. In this perspective, spontaneity becomes not the opposite of design, but a complementary principle through which residential streets can strengthen everyday communication, social interaction, and neighborhood identity.

KEYWORDS

Architectural design, public space, residential streets, social interaction, spontaneity.

LE CORBUSIER'S FREE PLAN RECONSIDERED: SELECTIVE OPENNESS AND THE PUBLIC/PRIVATE DIVIDE IN MODERN HOUSES, 1912-1975

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ABSTRACT

Le Corbusier's plan libre is usually described as freeing the whole house from the constraints of load-bearing walls. This study questions that reading and asks where, within the dwelling, the free plan was actually applied. It examines modern houses built between 1912 and 1975, including works by Le Corbusier and by architects of the same period such as Mies van der Rohe, Frank Lloyd Wright, Walter Gropius, Eileen Gray, Richard Neutra, Adolf Loos and Peter Eisenman. The plans are redrawn at a common scale from published sources, and each space is classified as communal, private or service. For each zone, the analysis looks at how much of the floor is continuously undivided space, how partitions relate to the structural grid, and where the zone sits in the sequence of circulation. Facade openings are examined to see whether openness in plan carries into the elevation. The study argues that the free plan worked less as a condition of the whole house than as a way of zoning it: spatial continuity was gathered in the shared rooms, while bedrooms and bathrooms stayed enclosed. Houses built on other spatial logics, such as Loos's Raumplan and Eisenman's House series, are read as contrasting cases that show where the concept stops applying. The method can be applied to other houses of the period, and the study aims to give the debate on privacy and openness in the modern house a basis in measured plans. It can also be used as a reading tool in planning analysis courses in architectural education.

KEYWORDS

Free plan, Le Corbusier, modern architecture, modern house, plan libre, public and private zoning.

THE TRANSFORMATION OF GRAPHIC DESIGN'S VISUAL LANGUAGE IN THE AGE OF GENERATIVE AI: CULTURAL REPRESENTATION, VISUAL HOMOGENIZATION, AND CULTURAL AUTHENTICITY

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ABSTRACT

The increasing use of generative artificial intelligence in visual production has transformed graphic design practices while raising new questions concerning how cultural signs are selected, interpreted, and reproduced. This study aims to examine which visual signs generative AI employs when representing different cultures, to what extent the repetition of these signs results in standardized cultural representations, and how visual homogenization emerges in AI-generated poster designs. The study adopts a qualitative research approach combining comparative visual content analysis with semiotic analysis. The visual dataset consists of 25 graphic design posters generated with artificial intelligence and representing the cultural identities of Türkiye, Japan, India, Mexico, and France. The posters were comparatively examined in terms of cultural symbols, traditional motifs, standardized cultural representation, cultural authenticity, visual similarity, local visual identity, and the relationship between traditional and contemporary visual language. Roland Barthes's concepts of denotation, connotation, and myth were employed in the semiotic analysis. The findings indicate that cultural identities are predominantly constructed through highly recognizable and recurring visual signs. Japan was strongly associated with Mount Fuji and cherry blossoms; France with the Eiffel Tower; India with the Taj Mahal and decorative motifs; Mexico with skull imagery and cacti; and Türkiye with the Istanbul skyline, mosques, and tulips. Although the cultures remained visually distinguishable from one another, the recurrence of similar signs across different representations of the same culture indicates a potential limitation in the diversity of cultural representation. The study concludes that generative AI can make cultural identities visually recognizable; however, its tendency to represent cultures through limited and readily identifiable sets of visual signs requires critical consideration in terms of cultural authenticity. These findings further emphasize the importance of cultural awareness and critical visual evaluation in AI-assisted graphic design processes.

KEYWORDS

Cultural authenticity, cultural representation, generative artificial intelligence, graphic design, visual homogenization.

THE BAUHAUS MOVEMENT AND LOGOS DESIGNED FOR ITS 100TH ANNIVERSARY

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ABSTRACT

Founded in Germany by Walter Gropius in 1919, the Bauhaus played a significant role in the development of modern design culture and design education by bringing together art, craft, design, architecture, and industry within an integrated educational approach. This study aims to examine the founding philosophy, educational approach, and design principles of the Bauhaus School within their historical context and to evaluate the contemporary reflections of these principles in the redesigned logos of well-known brands created to mark the 100th anniversary of the Bauhaus. The study adopts a qualitative research approach. National and international sources concerning the historical development, manifesto, educational model, and design approach of the Bauhaus were examined through document analysis. In addition, redesigned logos of well-known brands created within the context of the Bauhaus centenary were descriptively analyzed in terms of form, color, typography, geometric structure, simplicity, and functionality. The findings indicate that the Bauhaus sought to eliminate the distinction between fine and applied arts, integrate art and craft, and transform design education into a workshop-based, experimental, and production-oriented structure. The relationship established by the Bauhaus among art, craft, technology, and industry continued to influence art and design education in different countries even after the school was closed in 1933. The centenary logo redesigns of Apple, Ferrari, Adidas, Lego, Netflix, and other well-known brands examined in the study prominently reflect characteristics associated with Bauhaus design, including functionality, minimalism, geometric forms, simple typography, and the use of primary colors. The analyzed examples demonstrate how the existing visual identities of these brands were combined with formal characteristics associated with the Bauhaus, allowing a historical design approach to be reinterpreted within contemporary graphic design. In conclusion, the Bauhaus should be considered not merely a historical school of design but an influential design culture whose educational approach and design principles continue to shape contemporary graphic design practices and serve as a reference for current design thinking.

KEYWORDS

Bauhaus, design culture, design education, graphic design, logo design.

