

## The impact of the SIMPLE strategy on word problem solving, a case study

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**Abstract:** This study is based on research on effective word problem solving interventions, focusing on two factors: visual representations and metacognitive training. Based on these factors a specific teaching strategy named the “SIMPLE” strategy was designed with the aim of enhancing pupils’ ability to solve word problems. In this case study, we present a pilot case study with three 8<sup>th</sup> grade pupils of Kosovo. Its aim was to see whether the SIMPLE strategy helped the pupils to solve word problems with understanding and master the block model method within a short time and to pilot the main intervention study. The results are encouraging, showing that a brief introduction to the SIMPLE strategy helped the pupils to improve their performance in solving word problems.

**Keywords:** Block model, metacognition, SIMPLE strategy, visualization, word problems

## How kindergarten mathematics textbooks align with the National Kindergarten mathematics curriculum in Ghana

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**Abstract:** Implementing the standard-based curriculum by the National Council for Curriculum and Assessment (NaCCA) in Ghana necessitated publishers to publish new school textbooks. This study compared the list of contents and the tasks in the national kindergarten (KG) mathematics curriculum and government-approved KG mathematics textbooks in Ghana. Qualitative content analysis was done using the KG Curriculum and the five KG 1 and KG 2 mathematics textbooks approved by NaCCA. The study revealed that out of the five approved mathematics KG 1 and KG 2 textbooks by NaCCA, the list of contents of one of the textbooks aligned with the national KG 1 and KG 2 curricula in its approach and exactness in how the thematic contents were presented. The contents of the four other textbooks did not comply with the national curriculum. Publishers of these four books used different approaches (non-thematic approach) in their presentation. Therefore, it is recommended that publishers of mathematics textbooks adopt the thematic approach used by NaCCA by incorporating the storytelling and play approaches in the KG mathematics textbooks.

**Keywords:** Kindergarten, mathematics, Textbook, thematic

## Learner's profile as a crucial element in the personalized learning approach and compares the one-size-fits-all in the digital era. Can we finally move on to the next education era?

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**Abstract:** Israel, as part of the OECD, through the Ministry of Education in the Israeli educational system (schools, universities), uses 16 fundamental indicators to diagnose gaps in personal study in the context of final exam preparation in high school and higher education institutions (faculties, universities). The diagnosis is made by a psychologist or psychiatrist with the approval of the school and the national committee, being integrated into a learning framework that has been used for more than 150 years - a teacher in front of a class during school hours and at a set time. This system is called "One Teacher-One Class," "One-size-fits-all," or even "Sit and get." The digital age allows a leap forward by being able to create a personalized path for the learner by getting to know his personality, dreams, hobbies, interests, strengths, and weaknesses that need to be improved to face the challenges of the 21st century in the digital age and develop the skills necessary for lifelong learning. Today's student must learn based on what he will encounter tomorrow. All student abilities matter. The compilation of student profile data is a significant component alongside the others regularly used in the digital age, especially today, after the COVID-19 pandemic, even at a state of national emergency, and for the future. The article presents the effect of defining the student's learning profile in order to create his learning path in the REVODUCATE system in groups or independently. The Personal Learning Profile paints a holistic picture of the learner at the start of their personalized learning journey. It contributes significantly to the student's ability to achieve their learning goals. It is a powerful tool in the personalized approach to learning. The personalized learning system deviates from the accepted diagnosis of external factors. It regulates basic parameters of learning, such as extra time, reading, level of handwriting (legible or illegible), learning aids for those with difficulties, etc. It makes it possible to listen to and prioritize the student's wishes for a suitable learning environment tailored to Generation Z, often ignored by today's teachers, who are always a generation behind. Parents play an essential role in building the student's learning profile, as they know the student best in pre-school, during school, and later in life. Using the personalized learning system as a central and critical component for student success also changes the role of the teacher. It defines a new type of responsibility for the learners and the teacher simultaneously.

**Keywords:** Personalized Learning, digital era, learner's profile, teacher, learning style, role, component

## How is STACK useful for learning about linear equations?

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**Abstract:** Solving linear equations is an essential skill for secondary school and older students. Authors have reported and classified common difficulties and mistakes related to this task (e.g., Pérez Istúriz et al., 2019). In this study, we offer students formative feedback to overcome their difficulties with linear equations. To do that, we use STACK (System for Teaching and Assessment using a Computer algebra Kernel), a software that allows analysing algebraic expressions and providing specific feedback to each mistake (Pinkernell et al., 2023). For instance, to the input ' $3(-2x+1)=-x \rightarrow -6x+1=-x$ ' we provide a brief explanation on the distributive property while to the mistake ' $5x=3 \rightarrow x=5/3$ ' we remind students about the inverse operation rules. A sample of 132 high school students was selected to solve Pérez-Istúriz et al.'s. (2019) battery of equations. We examined how the provided feedback was useful for the students to understand their mistakes and improving their performance in solving equations. Our results reveal that feedback was especially useful for student mistakes related to distractions and procedural difficulties, rather than conceptual misunderstandings.

### References:

Pérez-Istúriz, M., Diego-Mantecón, J.M., Polo-Blanco, I., & González, M.J. (2019). Causas de los errores en la resolución de ecuaciones lineales con una incógnita. *PNA*, 13(2), 84-103. <https://doi.org/10.30827/pna.v13i2.7613>

Pinkernell, G., Diego-Mantecón, J.M., Lavicza, Z., & Sangwin, C. (2023). AuthOMath: Combining the Strengths of STACK and GeoGebra for School and Academic Mathematics. *International Journal of Emerging Technologies in Learning*, 18(3), 201-204. <https://doi.org/10.3991/ijet.v18i03.36535>

**Keywords:** Linear equations, STACK, computer-aided assessment, formative feedback

### To line or not to line, that is the question

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**Abstract:** In this paper, we will discuss two conflicting understandings in respecting and interpreting nature. Hundertwasser who was pursuing a nature-friendly life, refused to use straight lines in his work, because he thought rectangle and straight line are ugly and even sin to the nature. Meanwhile, in mathematics, the golden ratio and Fibonacci sequence are considered beautiful, it is because it represent the nature perfectly. The both position admire nature, but not to the straight lines. What did straight line do wrong? A straight line of a particular slope represents a particular proportion. mathematical point of view the order of nature represented to ratio or line was usually considered to amazing foundation. In this paper, we will deal with the differences and commonalities between the two interpretation of viewing nature with respect of the line and look for educational implications.

**Keywords:** straight line, ecology, Fibonacci ratio, taste of beauty, Hundertwasser, ugliness to the nature

## Gamification in Mathematics Education: learning in the teaching of game-based mathematics

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**Abstract:** This doctoral research presents a proposal for developing games with automatic feedback for the study of affine functions through GeoGebra, using the fundamentals of gamification. As a theoretical framework, Duval's Semiotic Representation Registers is employed; it allows assessing significant learning when moving through different registers of the same mathematical object. The games direct the student to recognize the algebraic, textual, tabular, and graphical forms of the related function and if the student makes mistakes, they provide instructions to advance in the resolution process and achieve success. The initial results reveal suggest that gamification may be a significant tool that helps in the process of building students' mathematical knowledge, increasing their levels of engagement, and motivation.

**Keywords:** Games; Gamification; Automatic feedback; Affine function; GeoGebra

## A Comparison of the Effects of Vocabulary Portfolio Methods on Vocabulary Production of Elementary Students

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**Abstract:** Effective use of appropriate vocabulary learning strategies enhances vocabulary range of EFL learners. Portfolios illustrate students' best assignments, their progress and learning over an educational term. In this regard, the aim of the present study is to examine the effects of vocabulary portfolio methods including word map and visual thesaurus on vocabulary production of 6th graders in an EFL context. To this end, a sample of 64 male EFL students from one public elementary school in Tehran, Iran was selected. They were divided into two experimental groups (vocabulary portfolio groups) and one control group. The vocabulary portfolio groups received word map and visual thesaurus techniques. Fill-in-the-blanks vocabulary tests were utilized to assess vocabulary production of the students. One one-way ANOVA procedure was run to analyse the obtained results. Findings of the present study revealed that there were statistically significant differences between the groups, implying that the participants of the word map outperformed their classmates in the other two groups on the vocabulary production test.

**Keywords:** Vocabulary Learning Strategies, Portfolio, Word Map, Visual Thesaurus

## Mapping the Culture of Education in Virtual Reality via 3A Methodology and Video Recordings

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**Abstract:** This study aims to explore the educational potential of virtual reality (VR) as a technology that has undergone exponential growth in both hardware and software in recent years. However, this technology has not yet been widely adopted in schools in the Czech Republic. Therefore, this study seeks to introduce several empirically tested educational programs to middle and high school teachers. To achieve this objective, the study outlines specific goals. First, building on previous experiences, to create an adaptation of the 3A methodology (Janík, Slavík, Najvar, Češková, 2022) which enable the analysis of Information and Communication Technology (ICT) utilization in the field of education (with a primary focus on mathematics). Subsequently, a set of educational programs (mainly in mathematics) within virtual reality will be prepared and practically tested with students (12-18 y.o.) from selected middle and high schools. Video recordings of these programs will be made and then analyzed via the 3A methodology. Additionally, the collected data will be supplemented by interviews with teachers. The results of this study could contribute to the development of digital literacy among students and teachers in selected Czech middle and high schools. Simultaneously, a reflective tool for the integration of new ICT into education would be created. This tool could be continuously utilized and applied to any emerging technology. In conclusion, this study aims to bridge the current gap in the adoption of VR technology in Czech schools by providing practical insights and tools for teachers. The exploration of VR's educational potential, coupled with the development of a reflective tool, can pave the way for the effective incorporation of new technologies into the educational landscape.

**Keywords:** Virtual Reality, Education, 3A Methodology, Video Recordings, Cultural Mapping, Immersive Learning



## Understanding the child during the integration phase

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**Abstract:** In this study, we present a foster and child protection research through a case study, which points out behavioural symptoms during the integration process that foster parents may experience as crises. Our primary objective is to improve foster families and child support, which is key to family relationships, the relationship between foster parents and their children, and the children's optimally matched needs. This includes vulnerable and neglected children, as well as children and young people who are only temporarily placed (not yet admitted to protection care). The study presents in detail the main elements of the case, its psychological background and proposes the introduction of new complementary methods based on a complex holistic approach. Explaining the possible background of behavioural symptomatology and their treatment. We also discuss the professional difficulties foster parents face in their work.

**Keywords:** foster parent, child, child protection, case study, psychology

## The difficulties learners have in learning the derivative concept

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**Abstract:** In this research, I study the difficulties learners have in learning the derivative concept and work on deciphering the enigma of the main obstacles hindering students' understanding. According to the results, students' images are closely linked to institution choices in introducing the derivative at a point through instantaneous speed.

**Keywords:** rate of change, derivative at a point, praxeological analysis, concept image

## INCOLTS Framework and Workshop

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**Abstract:** The INCOLTS (Innovative Cooperative-Open-Learning in Technology-Enhanced Science Education) Model, addresses the integration of Computational Thinking (CT) into science education, particularly for life science and biology teachers at primary and secondary levels. Recognizing CT as a vital 21st-century skill, this framework emphasizes interdisciplinary approaches to enhance students' scientific and technical understanding and CT skills. To bridge the gap in support for science teachers incorporating CT, the INCOLTS Model promotes the use of web-based and mobile educational applications (apps) in science lessons. This model is designed to empower science teachers in fostering technology usage (e.g., Augmented Reality (AR) and Block-based Programming (BBP) and CT skills and approaches (e.g., algorithmic thinking (AT), pattern recognition, problem-solving, evaluation, and collaboration). Building upon the COOL Informatics Model by Sabitzer (2013), the INCOLTS Model extends its core pillars (Discovery, Individuality, Cooperation, and Activity) and introduces crucial elements such as Diversity, Learning by Creating, Innovative Learning, and Learning by Repetition. The theoretical foundations underscore the importance of learner-centered approaches, emerging technologies, and creative pedagogies. Workshops and trainings based on the INCOLTS Model, aim to support science educators in effectively utilizing educational apps, ensuring diverse and engaging learning experiences in technology-enhanced science education.

**Keywords:** CT, technology, science education, stem, educational applications

## Exploring the Relationship Between Virtual Learning Success and the Integration of Technology Pedagogy Content Knowledge (TPACK) into Pre-Service Teachers' Practice

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**Abstract:** Recent developments in the field of education reveal that considerable attention has been given to teacher competence in designing instructional activities for virtual learning environments that integrate technological, pedagogical and content knowledge (TPACK). The paper aims to provide a comprehensive overview of teachers' practice regarding the integration of TPACK in the teaching process, presenting the relationships between TPACK and learning success in the virtual environment. In a quantitative research approach, 102 pre-university teachers from Romania responded to an online questionnaire. The instruments used to collect the data are the TPACK questionnaire (Liu et al., 2015) and the Virtual Teaching Success Scale (Awang et al., 2018), both having excellent psychometric properties. The expected results of this study intend to shed light on the potential relationship between TPACK utilization and the success of virtual environment learning. The ongoing statistical analysis aims to provide insights into TPACK usage as a predictor of the success of virtual environment learning. Teachers with a higher level of TPACK skills achieving a higher degree of virtual environment learning success. The paper also discusses the differences regarding the success of learning in the virtual environment according to teachers of various age categories, teaching levels, specializations and status. Furthermore, since in-service training plays an essential role in developing TPACK skills and improving the quality of teaching in the digital age, this study conducts a comprehensive analysis based on the findings and empirical evidence, suggesting specific directions for both initial and continuous teacher training programs and recommendations for educational policies.

**Keywords:** TPACK, virtual learning, pre-university teachers

### **Dancing with Physics in STEAM Education**

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**Abstract:** This research aims to use dance's aesthetic characteristics as an exploratory tool for students to engage with physics from a different perspective, opening the possibility of enhancing their motivation and understanding of the latter. Through the introduction of a Physics Embodying Learning Lab into high school alternative spaces, teachers will have the opportunity to guide their students through Classical Mechanics concepts with an element of spiciness that the sensory experience of dance and movement brings to this innovative learning environment. The research methodology followed to develop this project is Design-Based Research. It will be implemented with high school physics teachers and students. In the current stage exploratory workshops for primary school students in summer camps have been implemented delivering optimistic results.

**Keywords:** Dance, Physics, Design-Based Research

## Unveiling Educational Comics Format for Classroom Learning

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**Abstract:** The integration of comics as an educational tool in classrooms has gained momentum in recent decades. Nevertheless, there lacks a standardized format for executing comic design in this context. This study explores various format for developing educational comics within classroom learning. The proposed format comprises four distinct sections: the introductory segment, the central narrative, the concluding portion, and an evaluative component integrated into the learning comic. The development of this format draws upon comprehensive research, encompassing literature reviews of previous studies and insights gathered through interviews with practitioners.

**Keywords:** comics, format, education

## Development of A Research Based Learning Model in A Local History Course To Improve The Historical Thinking Skills of Prospective History Teachers

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**Abstract:** Research-based learning models can be developed for social sciences such as local history studies in history learning. The concept of learning local history is required to think scientifically based on historical research methods. Studying local history increases students' ability to actualize their historical thinking and engage in self-reflection. This is developed in the research-based learning model on local history to improve historical thinking which is increasingly popular in research on history education. Historical thinking is a cognitive activity of individual historical awareness through the experience of time giving meaning on the basis of past events that have an impact on present and future life (Heuer, 2020). The development of a research-based research model in local history courses can hone students' affective and cognitive abilities through local history research assignments and change learning from teacher oriented to student oriented. Students engaged in activities of the kinds just considered will draw upon skills in the following five interconnected dimensions of historical thinking: Chronological Thinking, Historical Comprehension, Historical Analysis and Interpretation, Historical Research Capabilities, Historical Issues-Analysis and Decision-Making. The type of research is research and development with experimental research methods to determine the improvement of the quality of local history learning related to historical thinking skills as prospective history teachers. The form of experiments conducted in this study is using Quasi Experiment Methode type Two-Group Pretest-Posttest Design. This research-based learning model development research uses the ADDIE model, namely Analysis, Design, Development or Production, Implementation or Delivery and Evaluations.

**Keywords:** Development, Research-Based, Learning, Local History, Historical Thinking

## Using Function Art to Promote Transdisciplinarity in STEAM Education

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**Abstract:** This paper explores the integration of Science, Technology, Engineering, Arts, and Mathematics (STEAM) through a transdisciplinary approach focused on "function art." While previous STEAM studies have often emphasized science and engineering, neglecting mathematics and arts, this research aims to fill these gaps by using technology to highlight the integration among art, technology, and mathematics. The study engages Grade 11 students from the Philippines in creating function art using GeoGebra, a freely available mathematics software. The theoretical framework of constructionism is adopted to investigate the processes involved in function art creation, emphasizing hands-on learning and meaningful artifact creation. The paper addresses two key questions: the types of functions students use and the strategies employed in their creations. Data analysis involves a mixed-methods approach, combining content analysis for quantitative data and thematic analysis for qualitative insights. The results reveal that quadratic, linear, and sine/cosine functions are prevalent in student artwork. Noteworthy strategies include vertical and horizontal translations, transforming conics into functions, utilizing symmetry and reflection, employing the Fitpoly command, combining functions with other objects, and coloring regions. The findings contribute to understanding how students creatively merge mathematical concepts with technology in a transdisciplinary STEAM setting, shedding light on effective pedagogical strategies for fostering engagement and meaningful learning experiences.

**Keywords:** STEAM integration, Function art, constructionism, GeoGebra, Transdisciplinary education





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## Innovations in German Teacher Training Platforms: A Comprehensive Analysis of OERs and AI Integration

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**Abstract:** While still a work in progress, this research delves into the landscape of German teacher training platforms, aiming to provide a thorough examination of the features and offerings related to Open Educational Resources (OERs) and artificial intelligence (AI). The methodology for this research involves the creation of a systematic approach for platform analysis. A special emphasis is placed on the incorporation of AI-driven tools within these platforms, exploring the ways in which these technologies enhance the teaching and learning experience.

**Keywords:** teacher training, OER, artificial intelligence, platform

## Geogebrization of mathematical texts: definition and an example of activity

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**Abstract:** In this talk, a teaching-learning activity focused on a process called geogebrization (GGBZ) is described and exemplified. This process, which is the subject of my doctoral research, starts with a portion of a printed (static) mathematical text and leads to an appropriate combination of resources from the GeoGebra Service Platform (GSP, [www.geogebra.org](http://www.geogebra.org)) that unpacks the mathematics embedded in the text. More precisely, GGBZ comprises three phases: analyzing text excerpts, visualizing mathematical content dynamically within GSP, and integrating text into resulting visualizations, synchronized to enhance the communicative potential. This culminates in the creation of an online artifact that can be used for communication, popularization, or educational purposes to facilitate the understanding of others. Thus, GGBZ requires the effective use of all features of the GSP, such as the dynamization and animation of mathematical content and the ability to share resources.

In the light of Radford's Theory of Objectification, GGBZ is conceived as a learning experience in which learners engage with a communicative purpose in mind. The general research question I am addressing is: when one geogebrizes a mathematical text, what happens to one's way of thinking/reasoning in relation to the mathematical content of the text itself? In my doctoral research I focus on a case study where the starting point is the Castelnovo (1905) textbook, and the final product is a Geogebra Book. The activity that I present was carried out by 4 pairs of participants who, to consider different perspectives and levels of experience in the study, have different backgrounds.

**Keywords:** GeoGebra, Visualization, Mathematical text, Projective geometry

## Dance integration in math teaching in children with math difficulty

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**Abstract:** In math teaching and learning process, the problem of students' math difficulty [MD] may due to many factors as well as one important factor is students' working memory capacity [WMC]. To improve students' WMC so as to solve the MD problem, various of methods were explored by many scholars and also confirmed that imagination training can influence the memory. Due to the features of art which can cultivate students' imagination and creativity, the way of integrating art into math teaching has solved many problems in math education especially since the rise of the concept of STEAM Education. This study, as a STEAM research, aims to use both qualitative and quantitative approach to investigate and analyse the causal mechanism that whether integrating dance, a comprehensive art form that relies on movement, touch, listening, and observation, into math teaching can improve students' imagination, thereby enhancing their WMC and appropriately addressing the MD(dependent variables: Imagination, WMC, MD) by exploring the question how to integrate dance(independent variables: Math concept, Age group, Integration time) in elementary school math teaching in China. Therefore, specifically, the proposed research has the following questions:

Q: How to integrate dance into elementary school math teaching can improve students' MD?

and separated into 3 specific questions:

Q1: Which kinds of math concepts are suitable for DI by designing several cases?

Q2: Which period of students are most available for DI in elementary school?

Q3: How long is DI most effective in class?

To the methods of collecting data, both the data of independent variables and dependent variables will come from the literature analysis, observation, interview and questionnaire survey, and data analysis also based on these processes. Then, finally, the research questions and causal mechanism will be answered and confirmed respectively.

**Keywords:** Dance integration, math difficulty, Working memory capacity, Imagination

## **Unleashing "Dr Jekyll and Mr Hyde" of AI in Education**

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**Abstract:** AI has a great potential to transform Education. AI can be introduced into the educational system in (i) personalized learning; (ii) intelligent tutoring systems; (iii) virtual classrooms and remote learning; (iv) intelligent content creation; (v) inclusion education; and many more . Incorporating AI into Education demands meticulous planning, teacher preparation, infrastructure enhancements, and, most certainly, a substantial and deep reflection, specially, with respect to ethical considerations. Effective AI use requires collaborative efforts among educators, policymakers, technologists, and also stakeholders. The later is vital to endure through the challenges ahead, ensuring fair access to advanced learning opportunities, and maximizing AI's benefits in educational settings.

**Keywords:** AI, Education, Power, Foes

## The effects of teaching applications of mathematics in other disciplines in high school teachers and students in Israel

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**Abstract:** Teaching applications of mathematics is not a widely used in practice. Teaching applications of mathematics is very important, because it arise students' interest for mathematics, motivates students for learning and shows to students the importance of mathematics (Asli and Marchis, 2021) and change teachers' attitude towards teaching mathematics for better (Asli and Marchis, 2022).

The purpose of this study is to examine the effect of the intervention with teaching applications of mathematics in other disciplines on students' mathematics achievement and to examine students and teachers' attitudes towards mathematics.

The research was conducted in 2021-2022 in Israel. 4 classes and 4 teachers from High School participated in the study Each class was divided into 2 groups and are taught by 2 teachers at the same time, one group a control group and the other an experimental group. The research instruments are: interviews for teachers, and for students the translated and adapted version of Tapia's (1996) mathematics attitude scale and mathematics achievement tests.

The results of the study showed that teaching applications of mathematics had a positive effect on teachers and students' attitudes towards mathematics, Teaching applications of mathematics enhance the learning atmosphere in mathematics classes and Turn a passive atmosphere into an active atmosphere for both teachers and students and led to a significant improvement in student achievement.

**Keywords:** teaching applications of mathematics is not a widely used in practice

## Teaching Stereometry with Physical and Virtual Models

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**Abstract:** The stereometry course for future mathematics teachers is designed to bring them to a higher level of spatial understanding. Most of our students have brought very superficial and formal knowledge from high school, which presents us with a difficult challenge: we have to deepen their geometric competence in a short time.

In classical drawing on a blackboard or on paper, the representation of 3D shapes uses display methods, most often free parallel projection. If the students have a low level of spatial imagination, they will not be able to see the real spatial object in this 2D image, so we need to strengthen this ability.

Physical models provide tactile feedback and a real-world perspective that can solidify abstract concepts and make them more understandable to learners. On the other hand, virtual models offer unparalleled customisation, allowing educators to create specific models that perfectly match their teaching objectives. In addition, using virtual models to teach stereometry significantly increases student engagement, especially among digital natives who are more comfortable with technology-based learning.

The combination of these two methods provides a comprehensive approach to understanding complex geometric concepts.

Our pilot observations show a deeper understanding of spatial relationships among our students.

**Keywords:** Stereometry, Spatial Imagination, Physical and Virtual Models



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## Changing students' attitudes toward mathematics through creative STEAM projects

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**Abstract:** The focus of this research is to develop an alternative approach to creating lesson plans for high-level mathematics education in 10th grade by empowering and collaborating with students. This innovative approach involves designing lesson plans that are inspired by student interests.

**Keywords:** lesson plans, STEAM, interests of the students, digital environment

## **An investigation of Teachers' Perception of STEAM Education through professional development**

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**Abstract:** This research contains a case study examining the perceptions of 42 primary and secondary school teachers, in Northeastern Romania, participating in a professional development program(PD) with a course component tackling science, technology, engineering, arts and mathematics ( STEAM) literacies.

The STEAM educational integration was approached through project based learning, involving real world thematics and situations offered by the local context. The participants had face to face courses and online interactions and contributions. Results suggest that teachers not only increased their understanding of STEAM teaching but also implemented STEAM educational experiences with their children, from whom received positive feedback. Teachers perceived the professional development program as an effective initial way to transform teaching practices, mentioning the importance of collaboration between colleagues and the practical aspect of the PD. This study offers teacher educators insights and considerations towards the development of successful STEAM PD.

**Keywords:** STEAM professional development; STEAM teaching; project-based learning; teacher education



## Empowering Educators: Advancing Teaching and Learning through Educational Technology

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**Abstract:** The "Specialization in Educational Technology" program at the Universidad Tecnológica del Uruguay is a pioneering initiative that merges advanced technology with pedagogical methods to enhance educational experiences. Targeting primary and secondary school educators, this program is designed to provide them with the necessary skills to effectively integrate digital tools and resources into their teaching practices.

Our comprehensive curriculum encompasses various areas such as digital literacy, instructional design, e-learning strategies, and the use of multimedia in education. The program balances theoretical knowledge with practical application, empowering educators to create and manage technology-enhanced learning environments that accommodate the diverse needs and learning styles of students.

A key highlight of our program is the final project, where educators develop and implement a project utilizing educational technology. These projects, designed and executed by our participants, showcase a wide range of innovative approaches and applications in educational settings. They include interactive e-learning modules, digital storytelling tools, gamified learning experiences, and virtual reality-based educational programs.

These projects not only illustrate the practical application of the acquired skills but also contribute significantly to the field of educational technology. They are exemplary of how digital tools can be utilized to enrich learning experiences, making education more engaging, inclusive, and effective.

**Keywords:** Educational Innovation, Teacher Development, Digital Technology, Practical Projects