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Abstracts

Accepted Papers 2023

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Abstracts

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The editorial team of the TE&ET Journal, together with the Postgraduate Administrative Secretariat, presents in this publication the Abstracts in English of the papers accepted and published in the 2023 issues of the TE&ET Journal.
We consider that this publication increases the visibility of papers and ther authors..

In total there are 39 abstracts corresponding to numbers 34, 35 and 36 of the Journal. The 39 contributions mentioned have as authors teachers-researchers from Universities of Argentina, Brazil, Chile, Cuba, Ecuador, Mexico, Peru, Uruguay, United States, Spain and also from Science and Technology Institutions of these countries, linked to the topic. of the Journal.

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degiusti@lidi.info.unlp.edu.ar
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90046-060 - Porto Alegre, RS – Brasil
liane@penta.ufrgs.br
https://orcid.org/0000-0002-5669-588X

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ETSE Telecomunicación - Rua Maxwell s/n - Campus Universitario - 36310 Vigo – España
ddocampo@uvigo.es

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sandra@unizar.es
https://orcid.org/0000-0002-9315-6391

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luque.monica@gmail.com

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Facultad de Informática – Instituto de Investigación en Informática LIDI
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ldgiusti@lidi.info.unlp.edu.ar
https://orcid.org/0000-0003-2850-801X

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Departamento de Tecnologías y Sistemas de Información - Escuela Superior de Informática
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Universidad Autónoma de Barcelona - España
Departamento de Arquitectura de Computadores y Sistemas Operativos
Campus Bellaterra, 08193 Barcelona, España
https://orcid.org/0000-0001-5500-850X

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Universidad de Alicante – España
Facultad de Educación – Dpto. de Didáctica General y Didácticas Específicas
Ap. Correos 99 03080 – Alicante
https://orcid.org/0000-0002-9731-430X

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Sanz Cecilia
Universidad Nacional de La Plata – Argentina
Instituto de Investigación en Informática LIDI – Facultad de Informática
50 y 120 2do. Piso (1900) La Plata – Argentina
https://orcid.org/0000-0002-9471-0008

Analysis of the educational functions of art museums in social networks: an approach from the confluence of neuroeducation, pedagogy and museology

Arturo Moreno Medrano [1]

[1] Universitat Obreta de Catalunyam Barcelona, España

jipiguarro@uoc.edu

ORCID ID: https://orcid.org/0000-0001-5565-670X

Educational posts on the social networks of art museums are usually the most neglected within their educational function. Based on the uneven development of educational ICT in art museums, publications on social networks have little connection with other types of ICT or even with face-to-face educational activities. On the other hand, the problem of educational ICT in museums has traditionally been treated from a single disciplinary point of view, be it museology, pedagogy or even anthropology. Introducing neuroeducation in this equation as a motor to build an epistemological bridge that creates synergies between the various disciplines should serve to characterize and detect the shortcomings in these educational publications; to later be able to develop efficient and effective techno-pedagogical designs that take advantage of their full potential.

Keywords: Museology; Social networks; Neuroeducation; Educational ICT; Museum pedagogy.

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User satisfaction on the use of hypermedia in a health-education mobile device application

Dauster Souza Pereira[1], José Valdeni de Lima[2], Simone Cristina Oliveira da Conceição[3], Raquel Salcedo Gomes[2], Paulo Santana Rocha[4], Rafaela Ribeiro Jardim[5], Nicolau Calado Jofilsan[6], Priscilla Perez da Silva Pereira[7]

[1] Instituto Federal de Educação, Ciência e Tecnologia de Rondônia, Porto Velho/RO, Brasil
[2] Universidade Federal do Rio Grande do Sul, Porto Alegre/RS, Brasil
[3] University of Wisconsi-Milwaukee, Milwaukee/WI, EUA
[4] Instituto Evandro Chagas, Belém/PA, Brasil
[5] Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul, Bento Gonçalves/RS, Brasil
[6] Universidade de Pernambuco, Recife/PE, Brasil
[7] Universidade Federal de Rondônia, Porto Velho/RO, Brasil

daustersp@gmail.com, valdeni@inf.ufrgs.br, simonec@uwm.edu, raquel.salcedo@ufrgs.br, rochap01@gmail.com, rafa.rjardim@gmail.com, nicolaucalado@gmail.com, priperez83@gmail.com

ORCID ID: https://orcid.org/0000-0002-8586-3600 https://orcid.org/0000-0002-7266-4856 https://orcid.org/0000-0001-6485-1080 https://orcid.org/0000-0001-9497-513X https://orcid.org/0000-0002-1350-3497 https://orcid.org/0000-0002-1226-704X https://orcid.org/0000-0002-5227-7998 https://orcid.org/0000-0001-8900-6801

The use of technology in healthcare has been growing more each day. Mobile devices make it possible for anyone to learn anywhere, anytime. OBJECTIVE: to investigate user satisfaction regarding the use of hypermedia for learning health education through mobile devices. METHODS: It consisted of 4 parts. At first, a pre-test questionnaire was applied, then there was the interaction with the hypermedia, later the post-test questionnaire was conducted. Finally, participants rated their satisfaction in regard to the use of hypermedia. RESULTS: findings showed that the participants considered the hypermedia appealing, desirable, promoted a feeling of integration and closeness, and had an enormous value in their application. CONCLUSIONS: this study demonstrated that the use of hypermedia on mobile devices for learning in healthcare is a creative, appealing, and effective solution. Also, it improves the teaching-learning process.

Keywords: Hypermedia; Usability; Mobile device; Application.

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Assessment of the pattern of use of digital technologies by preschool children

Karla Cervantes-Bazán[1], Benilde García-Cabrero[1], Yolanda Guevara-Benítez[1]

[1] Universidad Nacional Autónoma de México, Ciudad de México, México

karla_cervantes@outlook.com, benildegar@gmail.com, yolaguevara@hotmail.com

ORCID ID: https://orcid.org/0000-0001-7069-2493 https://orcid.org/0000-0002-8208-5284 https://orcid.org/0000-0001-5659-7246

In recent years, various benefits of a safe and regulated use of digital technologies by children have been documented. On the other hand, excessive use involves diverse risks for cognitive, socio-emotional and physical development. The difficulties in defining the parameters that would imply excessive use, raise the need to create valid and reliable instruments that would allow making decisions to promote an appropriate use of digital technologies. The objective of this study was to design and obtain evidence of reliability and validity of an instrument to measure the Pattern of use of digital technologies by preschool children. The design of the instrument and the content validation were carried out through expert judgment; subsequently, the instrument was applied to 341 mothers and fathers of Mexican preschool children. The results indicate that the instrument meets the necessary psychometric criteria to be considered a reliable and valid measurement tool to evaluate the time of use and the purpose or activity that is carried out through technological devices.

Keywords: Use of digital technologies; Preschool children; Evaluation instruments; Psychometric properties.

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Leveling Plan for students articulated by recognition of previous learning. Chilean experience of academic progression between high schools towards technical careers

Katherine Roberts Sánchez[1], Matilde Basso Aránguiz[1]

[1] Universidad Católica de la Santísima Concepción, Concepción, Chile

kroberts@ucsc.cl, matildebasso@ucsc.cl

ORCID ID: https://orcid.org/0000-0003-4353-1082 https://orcid.org/0000-0002-0710-0640

This article analyzes the effectiveness and relevance of the Leveling Plan that the Technological Institute of the Catholic University of the Santísima Concepción implements for some novice students, who enter technical careers, via special admission for recognition of prior learning (RAP). The study was mixed and the descriptive design considered the participation of two groups of research subjects: teachers and students of the 2020 cohort. Once the results of the discussion group and satisfaction surveys were analyzed, both groups agreed in a favorable assessment of the Plan. The derivations of this research agree that the RAP articulation mechanism favors in the student body the development of skills for the world of work, based on abbreviated training itineraries that integrate and value the educational and/or work trajectories of people throughout their careers his life.

Keywords: Permanent education; Long distance education; Learning by experience; Upper Secondary Transition.

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An Educational Software using Problem-Based Learning with Augmented Reality

Ronaldo Ronaldiño Rupay Palomino[1], Marco Coral Ygnacio[1]

[1] Universidad Católica Sedes Sapientiae, Facultad de Ingeniería,
Programa de Ingeniería de Sistemas. Lima, Perú

2017100179@ucss.pe, mcoral@ucss.edu.pe

ORCID ID: https://orcid.org/0000-0001-8905-3835 https://orcid.org/0000-0001-6628-1528

Augmented reality is a technology capable of superimposing virtual content on the physical world, this can be implemented together with problem-based learning (PBL), which is a teaching-learning method that consists of the application of problems for the development of learning critical in the student. The implementation of this technology together with the educational method manages to increase motivation and academic performance in the student. Currently, the strategies used in Educational Institutions are inefficient with respect to History issues, which is negatively reflected in the academic performance of students. The research develops an augmented reality teaching-learning software based on PBL, which will be used as a support tool in the development of the educational process. The proposal shows that the solution manages to improve academic performance and increase the interest of students in the subject.

Keywords: Problem-based learning; Augmented reality; Teaching-learning; Educational software.

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Potentialities in learning Technological Education in childhoods and teens

Yanina Ferreyra[1], Susana Leliwa[1]

[1] Instituto Superior del Profesorado Tecnológico. Córdoba, Argentina

yani.ferreyra83@gmail.com, susanaleliwa@gmail.com

ORCID ID: https://orcid.org/0000-0002-6093-6041 https://orcid.org/0000-0003-1724-1639

This work aims to account for how Technological Education, as a general training curricular space, enables the development of certain potentialities in childhoods and teens under current epochal conditions. We will focus on some of these potentialities such as: categorization, representation, design and problem solving, specifically socio-technical. We are aware that there are others that can be developed, but in this article, we select the ones that we consider most relevant. The intention is to make them explicit. To develop the theme, we resort to epistemological loans from authors such as Lev Vigotsky, Howard Gardner and Jerome Bruner, representatives of the psycho-socio-cultural approach to learning. The development of potentialities in the Technological Education curricular space entails a pedagogical challenge that implies proposing significant school contents and activities, and thus contribute to the training of citizens capable of acting in the complex technological world, avoiding invisibility and familiarity uncritical of technology in individual and social life. Identifying these potentialities will be the responsibility of the Technological Education teacher training institutes according to the contents and activities selected and according to situated teaching and learning.

Keywords: Technological education; Learning; Potentialities; Technology; Childhoods; Teens.

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Evaluation of Little Red Riding Hood Unplugged: a game for the development of Computational Thinking aimed at students with Visual Impairment

Ana Paula Rodrigues Machado[1], Ana Cláudia Oliveira Pavão[1], Ana Cristina Martinelli[1], Andre Zanki Cordenonsi[1], Christian Brackmann[2], Francis Mallmann Schappo[1], Julio Modesto[1], Roseclea Duarte Medina[1], Vinícius Maran[1]

[1] Universidade Federal de Santa Maria, Santa Maria, Brasil
[2] Instituto Federal de Educação, Ciência e Tecnologia Farroupilha (IFFAR), Santa Maria, Brasil

anapaulaeducespecial@gmail.com, anaclaudiaoliveira.pavao@gmail.com, pedagogaanacristina@gmail.com, azcordenonsi@gmail.com, christian.brackmann@iffarroupilha.edu.br, francismallmann@gmail.com, julio26modesto@hotmail.com, roseclea.medina@gmail.com, viniciusmaran@gmail.com

ORCID ID: https://orcid.org/0000-0002-7419-1060 https://orcid.org/0000-0002-9914-3700 https://orcid.org/0000-0002-5120-3866 https://orcid.org/0000-0002-1811-671X https://orcid.org/0000-0002-3761-2268 https://orcid.org/0000-0002-8725-7647

This study aims to evaluate the potential offered by the Red Riding Hood Unplugged game as a didactic resource for the development of computational thinking in students with visual impairments. The methodology consists of a qualitative approach, with exploratory/descriptive objectives. The subjects are three students with congenital visual impairment. The research instrument used was participant observation, through a field diary. To analyze the data, categorical analysis was used, based on four categories, decomposition, pattern recognition, abstraction and algorithm. From the discussion of the results found, it is possible to conclude that the Unplugged Little Red Riding Hood board game has potential for the development of concepts of computational thinking, with an activity that promotes the Unplugged Programming Language, through the use of accessible didactic resources, favoring cognitive development, logical/mathematical reasoning in problem solving and inclusion.

Keywords: Teaching; Computational thinking unplugged; Visual impairment; Non-plagiarized games; Little Red Riding Hood

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From telecourse to Lives: the potential of video classes in Distance Education and Emergency Remote Teaching

Luciana Tavares Perdigão[1], Neuza Rejane Wille Lima[1], Edicléa Mascarenhas Fernandes[2]

[1] Universidade Federal Fluminense, Niterói, RJ, Brasil
[2] Universidade do Estado do Rio de Janeiro, Rio de Janeiro, RJ, Brasil

lucianaperdigao@id.uff.br, rejane_lima@id.uff.br, professoraediclea.uerj@gmail.com

ORCID ID: https://orcid.org/0000-0002-5662-212X https://orcid.org/0000-0002-5191-537X http://orcid.org/0000-0003-3998-2016

This study presents a reflection on the evolution of information and communication technologies and their influence on distance education, more specifically on the resource of video classes. It is a position paper that uses the methodology of bibliographic research. Therefore, it begins with a brief analysis of the concept of technology and its direct relationship with the evolution of this teaching modality, which has been historically categorized into five generations. It proposes the current existence of a sixth generation of distance education with the advent of mobile learning and emergency remote teaching, evidenced in 2020 with the consequences of the COVID-19 pandemic in education. At the end, it presents the characteristics, differences and potentialities in the use of video classes in distance education and remote teaching and the reflection on the teaching workload.

Keywords: Distance education; Emergency remote teaching; Synchronous; Asynchronous.

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On-line Instrumental Orchestration articulated with the Theory of Didactical Situations for the teaching of Plane Analytic Geometry

Francisco Eteval da Silva Feitosa[1]

[1] Universidade Federal do Amazonas, Amazonas, Brasil

sfeitosa@ufam.edu.br

ORCID ID: https://orcid.org/0000-0003-0913-3427

This article aims to describe a didactic situation for the teaching of Plane Analytic Geometry that was modeled and based on the Theory of Didactical Situations - TDS with the support of the software GeoGeobra in which the didactic sessions were substantiated in the theoretical model of Instrumental Orchestration - IO. In addition, we investigated the evolutionary indications of teachers' professional knowledge, taking as references authors who take into account the specificity of teaching in mathematics and who recognize the teacher's knowledge and the necessary competences for the incorporation of ICT in schools. As for the nature of the research, it is qualitative with a descriptive design. As for the data collection technique, it is an action research in which the data were collected from observation, questionnaire and video records. The participants were 12 undergraduates in Mathematics from a public University in Amazonas. The study showed that it is possible, with the help of the theoretical model of IO and having the GeoGebra software as the main resource, to apply the dialectics of TDS, promoting not only the logical-deductive development to solve problems of Plane Analytic Geometry but also professional teaching knowledge to teach mathematics.

Keywords: Instrumental orchestration; Didactic situation; Plane Analytic Geometry.

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Inclusive teaching of road safety education. A proposal based on the construction of interactive stories

Gisela Lucila Forlin[1], Emilia Gabriela Bruquetas Correa[1], Sonia I Mariño[2], Romina González[1], Ingrid Melis[1], Liliana Díaz[1], Gastón de los Reyes[2], Eugenio Broll[2]

[1] Instituto de Ciencias Criminalísticas y Criminología, Universidad Nacional del Nordeste, Corrientes, Argentina
[2] Facultad de Ciencias Exactas y Naturales y Agrimensura, Universidad Nacional del Nordeste, Corrientes, Argentina

giselaforlin21@hotmail.com, gabrielabruquetas@gmail.com, simarinio@yahoo.com, rominabelen683@gmail.com, ingrid.melis@comunidad.unne.edu.ar, silviadiaz30@hotmail.com, mu_gas@hotmail.com, ebroll@hotmail.com

ORCID ID: https://orcid.org/0000-0003-2279-297X https://orcid.org/0000-0001-5179-0418 https://orcid.org/0000-0003-3529-7003 https://orcid.org/0000-0003-1823-2670 https://orcid.org/0000-0001-5795-3599 https://orcid.org/0000-0003-3164-5103 https://orcid.org/0000-0002-0876-8992 https://orcid.org/0000-0001-9642-9378

The article is developed from an interdisciplinary approach that mediates between educational informatics, road safety education and educational inclusion. It presents the process of developing a software that promotes inclusive educational actions aimed at achieving the learning of essential knowledge of road safety education based on the use of pictograms. This is an applied research, with primary sources, preeminently qualitative, whose field research is justified by the evidence gathered from the reality under study. The results revolve around a playful software designed for deaf and hard of hearing children and teenagers to learn about road safety education. This software allows participants to construct their own story based on choices they make among a set of possibilities. The software solution was validated with a sample of 25 students between 6 and 14 years old. The evaluation revealed the different assessments of the users, which contributed to adaptations and improvements in the selection of the pictograms used in the contextualized stories. Therefore, feedback allowed to include the perceptions of potential recipients in the development of this educational device, with a view to progressively achieving a good user experience.

Keywords: Computer education; Inclusive environments; Educational games; Road safety education.

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Dynamic Geometry Collaborative: an analysis with the VMTwG environment

Renata Cezar Pinto[1], Márcia Rodrigues Notare[1]

[1] Universidade Federal do Rio Grande do Sul, Porto Alegre/RS, Brasil

rehpinto@hotmail.com, marcia.notare@ufrgs.br

ORCID ID: https://orcid.org/0000-0002-0058-0071 https://orcid.org/0000-0002-2897-8348

This article analyzes how students interact when inserted in a Virtual Learning Environment (VLE) that integrates the Virtual Math Teams with GeoGebra (VMTwG) as features of GeoGebra (VMTwG), for the collaborative learning of Geometry. VMTwG allows students to solve problems collaboratively and for the teacher to follow the construction and collaboration process that took place during the resolution of the proposed activity. In order to analyze the collaboration processes between students at VMTwG and the learning of geometric concepts, qualitative research was carried out with undergraduate students in Mathematics during Emergency Remote Teaching in the discipline of Geometry I. Interactions in environment were analyzed in the light of the five-stage online learning model, looking for clues that would show collaborative learning. The results show that the process of thinking together collaboratively provided an appropriation of geometric concepts by students, evidencing actions such as negotiations of meanings and shared construction of knowledge.

Keywords: Collaborative dynamic geometry; Geometry learning; Collaborative learning; GeoGebra; VMTwG.

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Strategy to strengthen work practice with the use of ICT from the University – Enterprise relationship

Carlos Rafael Fernández Medina[1], Boris Pérez Hernández[1], Jasiel Felix Ferreiro Concepción[1]

[1] Universidad Agraria de la Habana "Fructuoso Rodríguez Pérez", Mayabeque, Cuba

cmedina@unah.edu.cu, boris_perez@unah.edu.cu, jasiel@unah.edu.cu

ORCID ID: https://orcid.org/0000-0002-9599-2625 https://orcid.org/0000-0002-5155-704X https://orcid.org/0000-0002-0831-0375

The article proposes in its objective to design a strategy with the use of virtual teaching-learning environments (VTLE), electronic rubrics and electronic portfolios, to strengthen the work practice from the university – enterprise relationship (U-E). It is based on the need to strengthen the exercise of work practice with a look around the relationship between the university and the enterprise, in the current context of transformations in society, marked by the processes of research, development and innovation and where technologies play a leading role in training processes. Strengthening the exercise of work practice focused on this U-E relationship, supposes growth and mutual benefits where the university finds spaces in which to insert students to interact in real scenarios and develop in competencies the theoretical knowledge and skills acquired, while at the same time The enterprise allows him to prepare him for the specific functions of his future profession and the position he will hold. From the use of the VTLE, e-portfolios and e-rubrics, it is possible to narrow the gap caused by distances in the territory, a problem that arises in this relationship U-E, creating a virtual space where both will converge for the design, orientation, monitoring and evaluation of the work practice exercise.

Keywords: Higher education; Enterprise; Virtual teaching-learning environment; E-rubrics; Evaluation; Work practice.

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Learning of it Derives through tutorials. Tutorials from the Mathematics

Lissette Rodríguez Rivero[1], Niurka de las Mercedes González Acosta[1], Neisy Caridad Rodríguez Morales[1]

[1] Universidad "José Martí Pérez", Sancti Spíritus, Cuba

lrrivero66@gmail.com, nmgonzalez@uniss.edu.cu, ncrodriguez@uniss.edu.cu

ORCID ID: https://orcid.org/0000-0002-8557-9781 https://orcid.org/0000-0002-1591-7212 https://orcid.org/0000-0002-3623-9051

The information and communication technology in the teaching process are a necessity instead of a novelty. In Mathematics are used software called "mathematical assistants". From the educational point of view, some of them are used as teaching means. Traditionally, they are introduced from the specific matters, being aided of user manuals and of examples developed in classes. In the previous way, it have been detected that exists low levels of learning, the students are not able to conclude tasks and the "assistants" are only use when it was indicated. Due to this, the current work has as objective to apply tutorials of Derive to contribute their learning from the own curriculum subject "Recursos informáticos para el aprendizaje de la Matemática", achieving a bigger level and independence in this learning. Using a qualitative methodology, by theoretical and empiric methods to identify and to characterize the problem, the applied proposal achieves better results. The tutorials contain mathematical tasks, they are explicit, force to an entirely digital work, motivate the independent study and achieve bigger acting levels.

Keywords: Tutorial; Active learning; Educative innovation; Mathematic.

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Augmented reality and literacy: an exploratory study in regular teaching and specialized educational attendance

Damaris Ramson Fuhrmann Seling[1], Felipe Becker Nunes[1], Martha Luiza Streck[2], Mayara Leal Reis Fernandes[1], Vanessa Ribas Fialho[1]

[1] Universidade Federal de Santa Maria (UFSM)
[2] Universidade Federal do Rio Grande (FURG)

damarisfuhrmann@gmail.com, nunesfb@gmail.com, martha_streck@yahoo.com.br, mayaralleal@gmail.com, vanessafialho@gmail.com

ORCID ID: https://orcid.org/0000-0002-0014-4819 https://orcid.org/0000-0002-8827-8570 https://orcid.org/0000-0002-6432-6136 https://orcid.org/0000-0002-4512-4256

This article was developed by an exploratory research accomplished with students from specialized educational attendance (SEA) and regular teaching, analyzing their interest by a story told with the resourse of the augmented reality (AR) and its contributions for the literacy. Some students were selected in literacy process, intending to encourage the interest by reading through a children's story named "Animaizinhos do Safári" – (Safari Little Animals), from Todolivro publisher, told with the augmented reality resources, also analyzing the contributions of this resource in that level. Furthermore, the authors mention the teacher's opinions and experiences in comparison with the use of augmented reality for educational purposes. As results, we notice that the use of augmented reality can help the teachers providing more interactive classes and the students can have a better interest by the school subjects and an encouragement for reading.

Keywords: Augmented reality; Literacy; Regular teaching; Specialized educational teaching; Google 3D.

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Kahoot evaluation as a resource for Enviromental and Soil Education practices

Daiane Padula Paz[1], Edilson Pontarolo[1], Nilvania Aparecida de Mello[1]

[1] Universidade Tecnológica Federal do Paraná, Câmpus Pato Branco, Paraná/Brasil

daiane.paz@ifpr.edu.br, epontarolo@utfpr.edu.br, nilvania@utfpr.edu.br

ORCID ID: https://orcid.org/0000-0003-2658-9426 https://orcid.org/0000-0002-6382-6403 https://orcid.org/0000-0002-5371-0554

This paper aims to evaluate the Kahoot resource as a digital game for Environmental Education and Soil Education practices in m-learning, from three aspects: player experience; game structure and learning perception. For that, a game practice was performed in the Quiz model with questions previously elaborated and, subsequently, a questionnaire to evaluate the practice was applied. Nineteen students from the Biological Sciences Degree Course at the Instituto Federal do Paraná, Campus Palmas participated in the research. The results indicated great acceptance in the three aspects evaluated, denoting the potential of Kahoot as a strategic resource for Environmental and Soil Education. It was also confirmed that there is interest and motivation on the part of students for innovative pedagogical practices that include game-based learning and m-learning.

Keywords: Environmental education; Soil education; Game based learning; Mobile learning.

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Digital Transformation in Higher Education. Possibilities and Challenges

Armando E. De Giusti[1]

[1] Universidad Nacional de La Plata, Facultad de Informática, La Plata, Argentina

degiusti@lidi.info.unlp.edu.ar

ORCID ID: https://orcid.org/0000-0002-6459-3592

This paper analyzes the panorama that Universities must face with the fast advance of digital transformation in all areas of society. Aspects that define the digital transformation, its technological axes and the steps that higher education institutions are taking to adapt to this transformation are discussed, considering thar Universities try to maintain and improve student learning and quality of graduates. We try to present a comprehensive view, which goes beyond the classroom environment and considers critical aspects in an University such as the required infrastructure, the changes in management, the training of teachers, administrative and technical personal and also the aspects that lead to a "pedagogical-technological" model that adopts different tools and methodologies to enhance the teaching and learning process. Finally, positive aspects and open challenges are analyzed for digital transformation of Higher Education.

Keywords: Digital transformation; Higher education; New technologies; Pedagogic-technological model; Digital university.

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Qualitative analysis of autonomy, learning and communication competences in university students

José Mª Martínez Marín[1,2]

[1] Universidad Católica de Ávila, Ávila, España
[2] Universidad Nacional de Educación a Distancia (UNED), Madrid, España

jmaria.martinez@ucavila.es

ORCID ID: https://orcid.org/0000-0002-4321-0310

The virtual forum is one of the technological resources that has proven most useful in the construction and management by university students of their own knowledge, since it facilitates the implementation of participation, collaboration and self-learning strategies. In this research we have tried to carry out a content analysis and have codified through a deductive process the interventions of the students in the virtual forums of a subject in the second year of the Degree in Computer Engineering. The main results show that there seems to be a relationship between participation in the forum, its quality, and obtaining a grade of passing or higher. This relationship is even more pronounced if only students who participated more than once in the forum are counted, since more than 85% of them managed to pass the subject at least.

Keywords: Digital competences; Virtual forums; Qualitative research; Content analysis.

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Flipped classroom in mathematics mediated by video creation using the YouTube platform for engineering students

Marco Antonio Ayala Chauvin[1]

[1] Universidad Técnica Particular de Loja, Loja, Ecuador

maayala5@utpl.edu.ec

ORCID ID: https://orcid.org/0000-0002-0084-6773

The present study describes a didactic experience carried out in the Department of Education Sciences of the Technical University of Loja, Ecuador, for the Multivariate Mathematical Analysis component. For one semester, the flipped classroom methodology was implemented as a teaching-learning approach. The teacher produced class videos and hosted them on the YouTube platform so that students could review them asynchronously during their independent work. In addition, workshops were developed so that students could work on them during synchronous meetings with the teacher. At the end of the semester, a survey was conducted to evaluate students' perception of the use of original videos and the completion of workshops. The results indicated a positive assessment of the flipped classroom methodology, especially in terms of the use of time in the classroom and interest in the component. There was also a preference for the flipped classroom approach compared to the traditional system and the use of videos as a complement to the teacher's explanation. Finally, the videos were considered a useful support for catching up on the component, demonstrating that this methodology can improve students' academic results.

Keywords: Flipped Classroom; Calculus; Teaching/learning strategies; Technological educational tools; YouTube.

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Digital skills and uses of technologies in physical education students before and after virtuality forced by Covid-19

Analía Claudia Chiecher[1,2], Ana Elisa Riccetti[1]

[1] Universidad Nacional de Río Cuarto, Río Cuarto, Argentina
[2] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina

achiecher@hotmail.com, ariccetti@hum.unrc.edu.ar

ORCID ID: https://orcid.org/0000-0002-5421-6865 https://orcid.org/0000-0002-9333-9833

Article purpose is to inquire about the digital skills and uses of technologies Physical Education students of a public university in Argentina, before and during the virtuality forced by the pandemic. A non-experimental, longitudinal panel study is presented, in which changes over time in the variables studied after the occurrence of an event (pandemic) are analyzed. 32 students of the Physical Education participated, who started the career before the start of the pandemic, in February 2020 (moment 1) while in 2021 they were studying the second year (moment 2). A self-report questionnaire was administered. The data was statistically analyzed using the SPSS version 21 software. The results show that students have Internet access, connectivity and devices. There is also an increase in the use of technologies for academic purposes and an improvement in self-perceptions of ability to carry out activities that require the use of digital tools and that were frequently developed in the pandemic context. The evidence obtained shows the importance of designing academic tasks capable of providing opportunities for the development of digital competence.

Keywords: Digital skills; Technologies uses; Pandemic; University students; Physical education.

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Digital Educational Resource (RED) to teach functions in secondary school: teachers' opinions

María Paz Gazzola[1,2], María Rita Otero[1]

[1] Universidad Nacional del Centro de la Provincia de Buenos Aires, Facultad de Ciencias Exactas, NIECyT, Tandil, Argentina
[2] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Tandil, Argentina

mpgazzola@niecyt.exa.unicen.edu.ar, rotero@niecyt.exa.unicen.edu.ar

ORCID ID: https://orcid.org/0000-0002-6115-0817 https://orcid.org/0000-0002-1682-9142

This work intends to survey the opinion of 36 mathematics teachers in service and their interest in using the Digital Educational Resource (RED) Função Resgate. This resource adopts the modality of a game to teach mathematical functions in secondary school, which can be used on mobile devices with or without internet. First, a questionnaire was designed and administered to find out what functions these teachers teach and how they do it. Then, they played through all the levels of the game and then were given a second questionnaire, specifically designed to discover out what teachers thought of RED, if and how they would integrate it into their teaching. Here, the results of both questionnaires are presented and it is highlighted that, on the one hand, teachers value the RED positively because they consider it motivating, and at the same time, they are reticent about the possibility of using it in class as a resource to teach.

Keywords: Mathematics education; ICT; Digital educational resource; In-service mathematics teachers; Math functions.

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The use of mobile phone-based instant messaging apps in higher education

Daniela Abrigo [1], Melisa Mandolesi [2,3], Ana Borgobello [2,3]

[1] Universidad Tecnológica Nacional, Rosario, Argentina.
[2] Universidad Nacional de Rosario, Instituto Rosario de Investigación en Ciencias de la Educación (UNR-CONICET), Rosario, Argentina.
[3] Universidad Nacional de Rosario, Facultad de Psicología, Rosario, Argentina.

danielacabrigo@gmail.com, mandolesi@irice-conicet.gov.ar, borgobello@irice-conicet.gov.ar

ORCID ID: https://orcid.org/0009-0002-0385-4389 https://orcid.org/0009-0002-0385-4389 https://orcid.org/0000-0002-2340-8127

This study investigates the ways in which mobile phone-based instant messaging applications have been progressively incorporated into educational practices in Higher Education and what happened to this process during the COVID19 pandemic. The objectives of this work were to inquire about the use of messaging applications in the teaching and learning processes during the years 2020 and 2021 in university-level teachers in the city of Rosario; examine reasons, representations and assessments of teaching experiences in relation to the use of these applications; and compare opinions about the possible implications of using the applications. A questionnaire with closed and open questions was applied to a sample of 201 teachers from public and private universities. A descriptive statistical analysis of the closed questions and a content analysis of the open questions were performed. It is concluded that although instant messaging applications were an important means of communication before and after the pandemic, the use made of them cannot be required educational in constructivist terms, however, with appropriate training and institutional support they could become a privileged educational tool.

Keywords: ICT; University; Apps; Teaching.

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Remote laboratories in high school education: A systematized bibliographic review

Ángel Villalobos M.[1], Rosa Romero A.[1]

[1] Instituto Profesional IACC, Santiago, Chile

angel.villalobos@iacc.cl, rosa.romero@iacc.cl

ORCID ID: https://orcid.org/0000-0002-2957-5786 https://orcid.org/0000-0003-2800-5092

The use of teleoperated laboratories is a reality in several higher education institutions. They are an alternative to the physical impossibility of attending in person and their use has spread in recent years. There are few works (two) of reviews that systematize the investigations in this regard, these cover a short period of time. A study of the type systematic bibliographic review [1] is developed, with the purpose of studying the tendencies in the use of remote laboratories for learning in higher education. It is possible to analyse 53 works found in the WOS and ERIC databases, published between 2011 and 2021. It covers works from different geographical locations on 6 continents, most of which correspond to articles published in scientific journals and presentations at congresses, the main methodological approach of the studies is quantitative. The main topics addressed in the analysed corpus correspond firstly to the creation of remote laboratories and secondly their contribution to the teaching processes based on experiences in different disciplines. It is shown that they have a series of advantages over their physical counterparts and their contribution to the enrichment of technical and scientific learning.

Keywords: Remote laboratory; Engineering education; Real experiment; Actuators; Educational laboratory; Online education; Educational technology.

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Analysis of Factors that Affect the Sustainability of Repositories for Open Educational Resources

Robson da Cruz de Mesquita[1], Tel Amiel[2]

[1] Universidade de Brasília, Brasília, Brasil
[2] Universidade de Brasília, Cátedra UNESCO em Educação a Distância, Brasília, Brasil

robsoncruz.dacruz88@gmail.com, amiel@unb.br

ORCID ID: https://orcid.org/0000-0001-7102-7743 https://orcid.org/0000-0002-1775-1148

The provision of Open Educational Resources (OER) is done through various services, such as repositories and referatories, that require significant efforts to be created and sustained. Sustainability for these services is usually evaluated from the perspective of securing financial resources. In this study we sought to understand, through a systematic literature review (SLR) of peer reviewed publications in Spanish and Portuguese, what factors impact the sustainability of OER services. The SLR unearthed a paucity of studies, pointing to a gap in research. Based on an extended literature, a group of 13 factors were evaluated by maintainers of five OER service providers, and used for self-assessment of the sustainability of their services. The factors were evaluated by participants, who indicated that most were found to be relevant to sustainability, and supports a wider perspective on OER service sustainability which include, but go beyond, financial considerations.

Keywords: Open educational resources; Sustainability; Repositories.

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Technological resources in mathematics: transparency, visibility and invisibility in solving a problem

Nicolás Rosbaco[1], Verónica Parra[2,3], Patricia Sureda[2,3]

[1] Universidad Nacional del Comahue, Centro Regional Zona Atlántica (CURZA), Viedma, Argentina
[2] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Tandil, Argentina
[3] Universidad Nacional del Centro de la Provincia de Buenos Aires (UNCPBA), Tandil, Argentina

nicolasrosbaco@curza.com.ar, vparra@exa.unicen.edu.ar, psureda@exa.unicen.edu.ar

ORCID ID: https://orcid.org/0009-0008-9282-4360 https://orcid.org/0000-0002-6956-0052 https://orcid.org/0009-0004-6223-4424

This paper presents results of the analysis of a resource that is a mathematical problem. We use Adler's definition of resource, particularly the notions of transparency, visibility and invisibility of its uses in mathematics education. We focus on the analysis of the problem based on mathematics and the potential of some technological resources such as wxMaxima, GeoGebra, Scratch and ChatGPT for its resolution. We show how the use of the first three allows us to solve the problem in its most general form that otherwise would not be possible, and the limitations of ChatGPT to solve the problem. This is a problem that teachers can use to promote teaching sequences in the study of functions in one, two or more variables and also allow the study of unconventional functions (different, for example, to paraboloids, saddles, etc., very common in books), stimulating teachers to incorporate new resources for school mathematics in the classroom. We conclude in the transparency of these resources, in the potentiality of the problem and in the limitations of ChatGPT for its resolution.

Keywords: Mathematics; GeoGebra; wxMaximum; Scratch; ChatGPT; Transparency; Visibility; Invisibility.

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Development and analysis of an algorithmic board game to favour computational thinking

Martin Mariano Julio Goin[1], María de la Trinidad Quijano[2]

[1] Universidad Nacional de Río Negro, Centro Interdisciplinario de Estudios sobre Derechos, Inclusión y Sociedad (CIEDIS), Río Negro, San Carlos de Bariloche, Argentina
[2] Universidad Nacional de Río Negro, Universidad Nacional del Comahue, Río Negro, San Carlos de Bariloche, Argentina

mgoin@unrn.edu.ar, mquijano@unrn.edu.ar

ORCID ID: http://orcid.org/ 0000-0002-3573-8115 http://orcid.org/0000-0003-4874-0828

This work focuses on the design, development and analysis of a playful ludic proposal, with the aim of favouring logical reasoning through algorithms. Specifically, it is an educational game designed as part of an outreach project of the National University of Río Negro, accredited and financed by the Secretariat of University Policies. In particular, it is a board unplugged game created to foster skills that favour computational thinking in students in the last years of primary school, in educational establishments in the city of San Carlos de Bariloche. This playful activity consists of solving a problem in a cooperative manner, following an algorithm (sequence of instructions), according to pre-established rules. In each participating school, a quantitative-qualitative survey was also carried out, involving the protagonists, i.e. teachers, male and female students. The results indicate the importance of using a game as a didactic material to initiate and/or reinforce the development of a programming language.

Keywords: Algorithms; Board unplugged game; Primary level; Computational thinking.

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Fostering Entrepreneurial and Innovation Skills in an Information Systems Course in Distance Learning

Léo Manoel Lopes da Silva Garcia[1], Raquel Salcedo Gomes[2], Daiany Francisca Lara[1]

[1] Universidade do Estado de Mato Grosso (UNEMAT), Cáceres – MT – Brazil
[2] Universidade Federal do Rio Grande do Sul - Campus Litoral Norte (UFRGS), Tramandaí – RS – Brazil

leoneto@unemat.br, raquelsalcedo@ufrgs.br, dflara@gmail.com

ORCID ID: https://orcid.org/0000-0003-4861-8830 https://orcid.org/0000-0001-9497-513X https://orcid.org/0000-0002-0458-9196

This work presents an interdisciplinary experiment carried out in an Information Systems course, in order to encourage the development and application of entrepreneurship and innovation skills provided for in the course curriculum. We also sought to investigate the students' perception of the development of the profile characteristics, skills and competences as they progressed through the curriculum components. It was identified that there is little association between the skills provided for the graduate of the course and the curricular components taken, This pattern appears more pronounced when it comes to skills related to management, entrepreneurship and innovation.

Keywords: : Soft skills; Entrepreneurship; Innovation.

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Simulating ChatGPT: a Teenagers Teaching Programming Experience

Yoselie Alvarado[1], Emmanuel Andrada[2, 3], Roberto Guerrero[1]

[1] Universidad Nacional de San Luis, Laboratorio de Computación Gráfica, San Luis, Argentina
[2] Escuela N°5 Bartolomé Mitre, San Luis, Argentina
[3] Escuela N°313 Rosario Mercedes Simón, San Luis, Argentina

ymalvarado@unsl.edu.ar, emmanuelaandrada@sanluis.edu.ar, rag@unsl.edu.ar

ORCID ID: https://orcid.org/0009-0000-7552-2928 https://orcid.org/0009-0004-9652-4075 https://orcid.org/0009-0009-7602-3253

At a time when some say ChatGPT could change programming, it is important to properly educate students about its existence and capabilities. Additionally, including current topics within curricular content reveals a way to highlight and differentiate such content to reach students in a different way.
In particular, the teaching of programming is an area in which adolescents are usually not sufficiently motivated, since, despite its closeness to technology, programming appears to be somewhat complex and for the exclusive use of a select few.
The present work carries out a curricular activity that combines the use of the ChatBot concept as an introduction to the ChatGPT world, for the teaching of Programming contents such as conditional selection in the subject Algorithms in secondary level education. The proposal has been tested in two computer-oriented schools, with very positive motivational and academic results.

Keywords: Programming; Teaching; Conditional selection; ChatGPT.

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Methodological proposal for participation and academic performance assessment in discussion forums

Paula Dieser[1], Cecilia Sanz[2, 3], Alejandra Zangara[2]

[1] Universidad Nacional de La Pampa, Facultad de Ciencias Exactas y Naturales, Departamento de Matemática, Santa Rosa, Argentina.
[2] Universidad Nacional de La Plata, Facultad de Informática, Instituto de Investigación en Informática LIDI (III LIDI), La Plata, Argentina.
[3] Comisión de Investigaciones Científicas de la Provincia de Buenos Aires, La Plata, Argentina

pauladieser@exactas.unlpam.edu.ar, csanz@lidi.info.unlp.edu.ar, alejandra.zangara@gmail.com

ORCID ID: https://orcid.org/0000-0002-2066-0183 https://orcid.org/0000-0002-9471-0008 https://orcid.org/0000-0001-6013-9790

Discussion forums are usually used to promote interaction in distance and digital technology mediated education. Activities developed in those spaces could cognitively engage students during their learning. Participation and performance assessment requires multiple instruments for capturing several aspects of both constructs. This paper proposes a methodology that includes different protocols aimed to inquire participation and academic performance in a forum activity. They are based on the quantitative and qualitative analysis of the log data, the transcription of the posts and their metadata. The methodology is applied and validated in a group of 62 postgraduate students from an Argentine university. This process makes it possible to identify its possibilities and limitations.

Keywords: Discussion forums; Participation; Academic performance; Statistical indicators; Content analysis; Social network analysis; Rubric; Critical thinking index.

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Usability evaluation of the Cerebrum conversational agent with teachers in training: an educational approach applied to algebraic equations

Lucieli Martins Gonçalves Descovi[1], Marcio Gabriel Dos Santos[1], Fabrício Herpich[2], José Alencar Philereno[3], Clóvis Silveira[1], Liane Margarida Rockenbach Tarouco[1]

[1] Universidade Federal do Rio Grande do Sul, Porto Alegre, Brasil
[2] Universidade Federal de Santa Catarina, Araranguá, Brasil
[3] Faculdades Integradas de Taquara, Taquara, Brasil

lucielidescovi@faccat.br, phd.marcio@gmail.com, fabricio.herpich@ufsc.br, philereno@sou.faccat.br, csclovis@gmail.com, liane@penta.ufrgs.br

ORCID ID: https://orcid.org/0000-0003-4946-348X https://orcid.org/0000-0002-5485-447X https://orcid.org/0000-0002-1575-0512 https://orcid.org/0000-0002-8783-8150 https://orcid.org/0000-0001-6670-1043 https://orcid.org/0000-0002-5669-588X

This paper presents a study involving the conversational agent prototype developed on the Watson Assistant (IBM) platform. The objective of the investigation is to analyze the usability of the conversational agent as a tool for learning mathematics in algebraic equations. For the evaluation, an evaluation system of conversational agents, called ChatAval, was used. The methodology used is exploratory qualitative, as it consists of analyzing the data obtained by the technological applications Cerebrum and ChatAval. The results of the Cerebrum usability investigation, with undergraduate Mathematics students, allow us to conclude that the usability of the conversational agent showed effectiveness, efficiency, and user satisfaction, above the score, in the use of the Cerebrum, therefore, it is possible to qualify positively its performance and continue its development, implementing improvements in the tool under study.

Keywords: Cerebrum; Algebra; ChatAval; Watson assistant; Teaching; Usability.

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Testing an interactive material for teaching accentual patterns in Compound Nouns

Noelia Daniela Eraña Bonacchi[1, 2]

[1] Pontificia Universidad Católica Argentina, Facultad de Filosofía y Letras, Capital Federal, Argentina.
[2] Universidad del Museo Social Argentino, Facultad de Lenguas Modernas, Capital Federal, Argentina.

noeliaerana@uca.edu.ar

ORCID ID: https://orcid.org/0000-0002-7517-5185

There exist two clear approaches to teaching stress patterns of English Compound nouns to students of this language. On the one hand, students read specific bibliography written by specialists of this topic, learn about examples of each pattern and apply them in other Compound Nouns. On the other hand, you can find informal articles which present general notions of this topic and audios with examples but do not have any clear theoretical background. In this article, we present the motivation behind our creation of an interactive material created specifically for teaching the accentual patterns in Compound Nouns using the spiral learning technique. We also present some notions analysed in the planning of activities such as the use of cognitive clues to prompt metacognition and learning self-regulation. Furthermore, we analyse the data collected from a pilot test carried out with 5 students at Universidad del Museo Social Argentino who had not been formally presented with this topic before. We used a phenomenological mixed method. At the end of this paper, we present an analysis of the results and its implications within this ongoing project.

Keywords: Interactive teaching and learning material; Stress patterns; Compound nouns; English phonetics; Spiral learning technique; Congnitive clues; Self-regulation; Metacognition; Pronunciation.

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Web accessibility focused on manual reviews. Study of an EVA of continuous teacher education

Verónica K. Pagnoni[1], Sonia I. Mariño[2]

[1] Ministerio de Educación, Corrientes, Argentina.
[2] Universidad Nacional del Nordeste, Facultad de Cs. Exactas y Naturales y Agrimensura, Corrientes, Argentina.

vero_pagnoni@hotmail.com, simarinio@yahoo.com

ORCID ID: https://orcid.org/0000-0001-9966-9801 https://orcid.org/0000-0003-3529-7003

Web Accessibility deals with engineering and social issues. This article focuses on analyzing the measured AW through manual testing, by a developer, using alternative browsers and an ad-hoc designed review guide. The method followed is described and for validation purposes, tests were carried out on three pages of the selected site in the period between the months of August-October 2018. The results show the need to address this issue throughout the life cycle that involves the construction of educational platforms and incorporate manual reviews. Finally, a strategy is proposed to retrieve valuable information from experts and continue with inquiries such as the one exposed.

Keywords: Web accessibility; Inclusive education; Educational environments; Manual review; WCAG 2.0

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Classroooms, restorative teaching spaces, in 2022. Continuity about analytical reconstruction of the didactics during the transition processes in the AFTER YEAR to the pandemic (AÑO D in Spanish)

Priscila Primerano[1]

[1] Universidad Nacional de La Plata, Facultad de Arquitectura y Urbanismo, Planificación Territorial II TDM, LPGE, La Plata, Argentina.

priscilaprimerano@gmail.com

ORCID ID: https://orcid.org/0000-0002-0053-7778

An analytical-reflective circuit is carried out through the reconstruction of didactics in the annual post-pandemic period. It covers from the moment of transition from virtuality to face-to-face mode during the Territorial Planning course, in the higher cycle of the Faculty of Architecture and Urbanism. The analysis takes place in the classrooms transformed by the implementation of ICTs from the lockdown, during the transition and after the pandemic. It intends to account for the last classes of the 2021 period and the return to face-to-face courses. The moment of return to the bi-modal classroom, a combination between virtuality and shared physical space, is called "YEAR D", which refers to the first letter of the Spanish word "después" (after), indicating the period after the mandatory lockdown. Perceptions and readjustments were evaluated during the uncertainty, as well as the challenges overcome through the implementation of disruptive didactic strategies that used technological resources and valued the flipped classroom. The contribution lies in documenting the evolution, continuities and discontinuities of the online to the face-to-face c, bi-modal, synchronous and asynchronous workshop during the transition and comeback to the post-pandemic annual course.

Keywords: Post-pandemic; Classrooms; Bi-modal; Didactic; Adaptation; Resources; Blending learning; Educational technologies.

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Development and Evaluation of a Digital Board Game for Project Management Knowledge Review

Giani Petri[1], Vinicius Losekann[1]

[1] Universidade Federal de Santa Maria, Santa Maria/RS, Brasil

giani.petri@ufsm.br, vinicius.losekann@ufsm.br

ORCID ID: https://orcid.org/0000-0002-9884-8151 https://orcid.org/0009-0000-5722-8020

Studies demonstrate the benefits of using educational games, especially physical board games, to simulate activities and/or review concepts in a motivating and attractive way for students. A challenge, however, is to create, in a remote teaching context, the social interaction that physical board games intrinsically create. The objective of this article is to present the development and evaluation of a digital version of the PMMaster board game to help project management disciplines in undergraduate courses in the computing area. The digital version of the developed game stands out for being an educational, multiplayer, turn-based game, with questions and answers and presented in the form of a digital board. Results of a systematic evaluation indicate that the game contributed to reinforce and fix concepts about the areas of project management knowledge, in addition to creating an environment of fun, challenge and social interaction among students. Study results can help project management teachers and instructors explore the use of digital board games in their educational activities.

Keywords: PMMaster; Educational game; Project management.

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Gamification assessment: a case study in Duolingo supported by framework Gamiefects

Wendel Souto Reinheimer[1], Roseclea Duarte Medina[1]

[1] Universidade Federal de Santa Maria (UFSM), Santa Maria, RS, Brazil

wsreinheimer@inf.ufsm.br, rose@inf.ufsm.br

ORCID ID: https://orcid.org/0000-0001-6142-6572 https://orcid.org/0000-0003-0888-6961

This article presents the report of a gamification assessment on the Duolingo platform supported by GAMIEFECTS, a framework composed of five dimensions whose purpose is to support the construction of gamification assessments for educational contexts. Based on the recommendations of the framework, an intrinsic analysis of the game elements present in Duolingo was carried out. A heuristic evaluation was also developed through an inspection tool developed to evaluate gamified systems. The results showed that Duolingo is a platform rich in gamification elements that, however, is subject to improvement. Finally, the framework used proved to be a useful and effective tool in the elaboration of an evaluation focused on gamification design for gamified systems.

Keywords: Gamification; Assessment; Framework; Learning; Duolingo.

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Digital Gender Divide in Secondary Mathematics Teachers before and during the COVID-19 pandemic in Uruguay

Eduardo Rodríguez Zidán[1], Gustavo Bentancor Biagas[1], Martín Solari1, Marina Melani[1], Lucía Saldombide[1]

[1] Universidad ORT Uruguay, Montevideo, Uruguay

cerzidan@yahoo.com.ar, bentancor.gustavo@gmail.com, martin solari@gmail.com, marinamelani.r@gmail.com, lu.saldombide@gmail.com

ORCID ID: https://orcid.org/0000-0002-6437-578X https://orcid.org/0000-0001-7531-8169 https://orcid.org/0000-0001-5532-3227 https://orcid.org/0000-0002-4533-4026 https://orcid.org/0009-0007-1153-5894

The Uruguayan education system, faced with the crisis and school closures caused by COVID-19, quickly moved towards a model of platformization of education. This article examines whether this process had an impact on the gender digital divide before and during the pandemic in five features of the Schoology platform used by secondary school mathematics teachers. Using a quantitative, non-experimental methodology of the descriptive correlational type that focused on data mining —data were provided by CEIBAL— digital records of access to 4,418 Mathematics courses from 2019 and 2020 were analyzed. The results indicate that there is a digital gap in use and access in favor of female teachers of Mathematics in Secondary Education. Statistically significant differences were found in the variables Posted Comments (x2=12.73, p=.000), Total Actions (x2=6.64, p=.010), Total Login Days and Content Creation, but not in the variable Total Likes. The gap in favor of female teachers was intensified during 2020 in the group of teachers who use the platform more frequently, mainly in the variables Total Actions and Posted Comments (25 and 16 pp respectively).

Keywords: Digital Divide; Gender Divide; Schoology Platform; Secondary Education; Mathematics Education, COVID-19.

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Design of a research project in Chemistry and Physics in Secondary Education. Analysis from an ecological perspective

Rebeca Mariel Martinenco[1], Rocío Belén Martín[2,3], Macarena Mariel Mari[2], Leticia Garcia-Romano[2,3]

[1] Consejo Nacional de Investigaciones Científicas y Técnicas, Centro de Investigaciones y Transferencia Villa María, Villa María, Argentina.
[2] Universidad Nacional de Córdoba, Facultad de Ciencias Exactas, Físicas y Naturales, Departamento de Enseñanza de la Ciencia y la Tecnología, Córdoba, Argentina.
[3] Consejo Nacional de Investigaciones Científicas y Técnicas, Centro de Conocimiento, Formación e Investigación en Estudios Sociales, Córdoba, Argentina.

rebecamartinenco@gmail.com, rbmartin@unc.edu.ar, macarena.mari@unc.edu.ar, leticia.garcia@unc.edu.ar

ORCID ID: https://orcid.org/0000-0002-2781-3381 https://orcid.org/0000-0003-3172-0070 https://orcid.org/0000-0002-8193-9532 https://orcid.org/0000-0003-3552-0287

Research on the use of technologies in education does not always have a strong impact on ways of teaching that go along with the skills needed today. For this reason, a study is proposed, which contribution is in two ways: on one hand, it promotes the improvement of practices and on the other, it tries to increase pedagogical knowledge based on the sequence implemented. In this framework, the notion of learning ecologies makes it possible to consider all the contexts in which people learn, recognizing them as flexible, dynamic, permeable, open and connected. This work presents a research created with Physics and Chemistry teachers of sixth year of secondary education to carry out researches in these areas during the isolation and pedagogical exceptionality caused by the Covid-19 pandemic in Argentina. As categories of analysis of the implemented design, three dimensions of the ecologies are proposed: activities and learning resources, emotions and socio-emotional skills, and hybridization of contexts. As a final reflection, it is proposed to consider these experiences in a complex context to work on the education that is wanted in the future

Keywords: Learning ecologies; ICT; Design-based research; Natural sciences.

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ICT in education during the covid-19 pandemic

Ticlia Hernández[1], Gladis Rodríguez[1], Juan Siccha[1]

[1] Universidad César Vallejo, Peru

autorscientific8632@outlook.com, rglaadisaidde@outlook.com, jsizayya@outlook.com

ORCID ID: https://orcid.org/0000-0001-7711-7723 https://orcid.org/0000-0001-9857-9433 https://orcid.org/0000-0003-1381-6212

The social confinement caused by the covid-19 pandemic directly harmed educational systems, especially educational institutions, students and teachers, and caused an acceleration in online education plans. Therefore, this research aimed to describe the effect of information and communication technologies (ICT) on education during the period of social isolation resulting from the covid-19 pandemic through a systematic review methodologically using the principles of the PRISMA statement. The results of the search and application of the inclusion and exclusion criteria allowed us to identify 30 papers that were analyzed from a quantitative perspective. The use of ICTs during the pandemic highlighted a digital divide that prevents the maximum use of these digital tools, which affects not only students but also teachers and is the result of various factors. In addition, teachers and students accept the presence of the digital world in their educational training, since they consider that they have the right to be educated by taking advantage of the technological advances that are being developed, but they must also learn to be aware of the abuses and negative aspects that ICTs entail.

Keywords: ICT; Virtual education; Covid-19; Virtual learning-teaching.

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Web Accessibility. A bibliometric study

Pedro Luis Alfonzo[1], Sonia Itatí Mariño[1]

[1] Universidad Nacional del Nordeste, Facultad de Ciencias Exactas y Naturales y Agrimensura, Departamento de Informática, Corrientes, Argentina

plalfonzo@hotmail.com, simarinio@yahoo.com

ORCID ID: https://orcid.org/0000-0001-5447-8518 https://orcid.org/0000-0003-3529-7003

The objective of this review article is to know the evolution of Web Accessibility as a research object. A bibliometric analysis was carried out, based on the indicators of citations, journals and authors' networks, of scientific productions focused on Web Accessibility in the period from 1998 to 2022, published in indexed journals of the Scopus database. In particular, the "bibliometrix" R package is used to generate the metrics. The paper shows highly cited documents, main publication sources, countries of origin of the publications and others variables. Results demonstrate the many articles presented in congresses and, the publications have been concentrated in the last 24 years. The findings show the need to continue these studies that support empirical development about the subject.

Keywords: Web accessibility; Access to information; Scientific and technological research; Publication; Bibliométrics.

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Perception of digital education of students and teachers of a Havana high school

Alberto Antonio Carballo Soca[1], Ana Fernanda González Fernández[1], Liz Yaniela Montes de Oca Toledo[1]

[1] Universidad de La Habana, Facultad de Psicología, La Habana, Cuba

alberto.carballo@psico.uh.cu, anafernandagonzalezfernandez@gmail.com, lizyanielamontesdeocatoledo@gmail.com

ORCID ID: https://orcid.org/0000-0001-6146-2709 https://orcid.org/0000-0001-6173-2326 https://orcid.org/0000-0002-2140-152X

Digital technologies are effecting numerous transformations that represent a challenge for educational institutions. One way to explore the way in which they are being integrated into educational settings is through perception studies. That is why the objective of this research is to characterize the perception of digital education of students and teachers of a Havana high school. A two-stage sequential mixed design was carried out between the months of June and September 2022, in which 267 subjects participated in the quantitative phase and 56 in the qualitative phase. The techniques used were a questionnaire on the perception of digital education and interviews. The results point to a notion of digital education focused on instrumental aspects and to the predominance of social networks in its implementation. The vision tends to be favorable, which is why an increase in the desire for it to be inserted is identified. Regarding the subjects, in almost all of them they state that digital education can be used. They mainly recommend improving and facilitating access to digital technologies. There are few statistically significant relationships according to sex or age, contrary to school grade.

Keywords: Digital education; High school education; Educational technology; Digital literacy; Perceptions.

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