

4th IITEE

4th INTERNATIONAL INSTRUCTIONAL TECHNOLOGIES IN
ENGINEERING EDUCATION SYMPOSIUM

ABSTRACT PROCEEDINGS



CHETPROJECT

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Latif Emre BULUT, Ege University

SCHEDULE (Face to Face - Online)

February 7, 2022

09:30 – 10:00	Opening Ceremony
10:00 – 10:45	KEYNOTE ERASMUS+ 2021-2027 Opportunities: Cooperation Partnerships in the Field of Higher Education (KA220-HED Projects) <i>Bevran ALHAS ROSAS, Turkish National Agency Higher Education Unit</i>
10:45 – 11:00	BREAK

Session 1

	Face to Face Presentation Chair: Dr. Alev Ateş Çobanoğlu	Virtual Presentation Chair: Dr. Onur Dönmez
11:00 – 11:15	Innovative Teaching Applications Samira Hasanova, Ulviyya Nasirova	Bibliometric Mapping Analysis of Studies on the Use of Artificial Intelligence in Education Sciences Ferhat Bahçeci, Semih Dikmen
11:15 – 11:30	A Technological Perspective for eLearning Systems Nikolaos Skarmeeas, Georgios Binas, Dimitra Briana	Analysis of Student Mentoring Scale in Higher Education and Its Investigation in Terms of Various Variables Tuğba Tümen
11:30 – 11:45	Assessing The Role of Government's Education Spending on the Local Competitiveness: Study Case Indonesia's Local Government Moch Bambang Sulistio	Creativity and Innovation in Higher Engineering Studies: CHET Project Approach and Findings César García-Aranda, Agustín Molina-García
11:45 – 12:00	Developing Learning Environments for Enhancing Digital Literacy of University Students Yasemin Kahyaoğlu Erdoğan, Ercan Akpınar, Bahar Baran, Kürşat Arslan	New Approaches to SME Service Innovation Education, Research and Practice Katarzyna Łobacz, Renata Szanter, Roman Tylzanowski, Ingrid Waikkee, Burcu Kor, Judith Helmer and Sue Rossano

12:00 – LUNCH
13:00

13:00 – KEYNOTE The Changing Face of Universities and Their New Missions
13:45 Prof. Dr. Buket AKKOYUNLU, *Çankaya University*

Session 2

Face to Face Presentation Chair:
Dr. Esra Telli

Virtual Presentation Chair: Dr. Beril Ceylan

13:45 – Online Teaching Readiness of Engineering Faculty in Post-Covid Times: Ege University Sample
14:00
Murat Kılıç, Alev Ateş Çobanoğlu

Chargers of Electric Vehicles in Learning
Tímea Baranyi, Anett Papanitz, Pal Boza

14:00 – Medical Teacher’s Acceptance of Social Media Based-Assessment Tools During the COVID-19
14:15
Muhammad Zaheer Asghar, Elena Barbera

Order Through Chaos: How Can Millennials Thrive Through Learning Methodologies That “Speak to Their Heart”
Dimitris Raftopoulos, Vana Karagianni, Jana Bielikova, Aysun Dermirdögen Şener

14:15 – The Higher Education Engineering Teachers’ Perspectives on Creativity Teaching: Instructional Design and Learning Platform of CHET Project
14:30
İbrahim Halil ÖZDEMİR, Fırat Sarsar, Özge Andiç Çakır, Alper Başbay

14:30 – Creativity in Engineering: Analysis of User Experiences
14:45
Hüseyin Ekrem Ulus, Fırat Sarsar, Özge Andiç Çakır, Patricia Wolf, Marianne Harbo Frederiksen, Christoph Kunz, Kathryn Cormican, Manon van Leeuwen

14:45 – 15:30 – **KEYNOTE Grand Designs: From Challenges to Possibilities**
Kathryn Cormican, School of Engineering, National University of Ireland

15:30 – 15:45 – **BREAK**

Session 3

Face to Face Presentation Chair:
Dr. Aylin Şendemir

Virtual Presentation Chair: Dr. Gülben Çalış

15:45 – 16:00 – **Biodesign Education for Architects: Curriculums in International Scale**
Seçil Yağlı, Didem Akyol Altun, Feyzal Avcı Özkaban, Ayça Tokuç

Öğretim Teknolojileri Alanında Yayınlanan Dergi Makalelerinin Özet ve Anahtar Kelimelerinden Araştırma Eğilimlerinin TF-IDF Anahtar Kelime Çıkarım Yöntemiyle Belirlenmesi
Adem Mehmet Yıldız

16:00 – 16:15 – **Curriculum Design for Biodesign Applications in Engineering Education**
Tuğçe Doğan, Özge Andiç Çakır, Aylin Şendemir, Elif Esin Tuna, Gültür Gülden Köktürk

Introducing Soft Skills and Entrepreneurial Competence into University Technical Curricula – A Research Perspective
Paweł Głodek, Özge Andiç Çakır, Fırat Sarsar, Aysun Demirdöğen-Şener, Katarzyna Łobacz, Magdalena Malinowska, Muhammad Mustafa Kamal, Benny Tjahjono, Panayiota Sofokleous, Nynke de Jager, Tomasz B. Kalinowski

16:15 – 16:30 – **Creative Thinking as an Art: Creativity for Engineering Students**
Elif Tunalı Çalışkan, Özge Andiç Çakır

Mühendislik Eğitiminde Sanal Gerçeklik Teknolojilerinin Kullanımı: Karşılaşılan Zorluklar ve Çözüm Önerileri
Murat Çoban

16:30 – 16:45 – **Enhancing (Tech) Teachers and Students Motivation and Learning Outcome: Integration of Entrepreneurial and Soft Skills into Teaching: Techster Project**
Fırat Sarsar, Özge Andiç Çakır, Aysun Demirdöğen-Şener, Muhammad Mustafa Kamal, Benny Tjahjono, Paweł Głodek, Tomasz B. Kalinowski, Katarzyna Łobacz, Magdalena Malinowska, Nynke de Jager, Panayiota Sofokleous

Mimarlık Lisans Öğretiminde Verilen Şantiye Yönetimi ve Organizasyonu Dersinin Getirileri
Latif Onur Uğur

Session 4

Virtual Presentation Chair: Dr. Fırat Sarsar

17:00 – 17:15 – **Creating an Authentic Learning Experience in the Engineering Classroom**
Desland Robinson, Yvonne Earnshaw

17:15 – 17:30 – **Increasing Access to Graduate Education via Open Learning Pathways**
David E. Stone

17:30 – 17:45 – **Product Life Cycle Management (PLM) in Higher Education**
Aysun Demirdöğen-Şener, Safiye Nur Dirim

17:45 – 18:00 – **The Engineering Education Research Trends in Turkey: A content analysis of the Covid Pandemic in March, 2020- December, 2021**
Deniz Ercan, İbrahim Halil Özdemir, Ali Kaya, Berrin Köseoğlu, Ezgi Türk, Gözde Zabzun, Sevinç İlgün Çerçi, Tuğrul Durak, Fırat Sarsar

18:00 – 18:30 – **Closing Ceremony**

Innovative Teaching Applications

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Abstract

The article is devoted to topical issues of the use of innovative technologies in real and virtual educational space in order to develop modern education around the world. The main directions of this article are virtual educational space - the introduction of distance technologies in the educational process, electronic technologies in educational activities, real educational space - new educational technologies in a pandemic and innovative teaching methods.

The new educational standards presuppose a competence-based approach, which means project-based teaching methods, approbation of various forms of work, which are based on the independence and responsibility for the learning outcomes of the students themselves. The technology of innovation is understood as a certain complex of methods and measures that allow to ensure innovative activity. The functioning of innovative methods is aimed at maintaining and increasing the information and research array capable of generating scientific, applied ideas and developments that ensure the innovative development of the relevant areas of knowledge. Innovative applications in their activities are becoming an integral part of the general information-educational and organizational-structural space of a specialized university. Thus, innovation today is the most important factor in the development of education and allows it to survive and develop in the context of the growing dynamics of social change all over the world.

Keywords: Innovative Technologies, Modern Education, Electronic Technologies, Educational Activities, Innovative Teaching Methods

A Technological Perspective for e-Learning Systems

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Abstract

Elearning platforms come with the need of an extensive set of functionalities which spans across many domains including the educational, customer relationship management, ecommerce, analytics, content management and authoring, digital asset management, etc. Educational content can be of various forms and must be easy to manage and present.

In addition, integration with additional systems is required to enhance the educational experience and range of content. We will present an analysis of those requirements and how those dimensions can be addressed as a single platform but modular platform from the technology and system architecture point of view.

The presentation will also be from a practitioner's approach and we will consider some existing implementations in the context of European projects.

Keywords: E-Learning, E-Learning Platforms, Education

Assessing The Role of Government's Education Spending on the Local Competitiveness: Study Case Indonesia's Local Government

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Abstract

Competitiveness is one of the factors used to assess a region's performance and attainment of a higher objective in terms of wealth and economic growth. In this study, the author examines the relationship between government spending on education and local competitiveness, mediated by human resource capacity. We analyze 157 local governments in Indonesia based on their competitiveness index. The result of this study shows that government spending on education has a positive effect on human resources capacity and directly influences local competitiveness. However, the effect will be reduced to a very minimum value ($B=0,008$ to human resource capacity, and $B=0,002$ to local competitiveness) if we put other influential factors such as fiscal capacity, institutional capacity, economic stability, innovation, and employment capacity with 4% estimated mediation effect. In terms of innovation, it should be noted that due to wicked effect of pandemic, all the conventional learning should be suddenly shifted to online learning. Thus, government should also focus to apply the latest innovation in instructional learning such as AI-aided High Tech High Touch (HTHT), and optimalization of MOOCs to improve the human capital and innovation ecosystem.

Keywords: Education Spending, Local Competitiveness, Human Resource, Indonesia's Education Spending

Developing Learning Environments for Enhancing Digital Literacy of University Students

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Abstract

With the rapid development of technology, processes such as accessing information, deciding on the accuracy of information, and producing content have experienced transformations. Digital literacy, considered as the most important basic skill that all individuals should have in this digital age. The European Commission has brought digital literacy skills to the agenda as one competency that information societies should have. Likewise, the Turkey Council of Higher Education has worked on the development of digital literacy skills in digital transformation in higher education. From this point of view, researchers from Turkey, Croatia, United Kingdom and Spain developed the E-DigiLit project to enhance digital literacy of university students. Within this project, Five factors of digital literacy were considered: Handling information, data & work processes, Sharing, communicating & collaborating, Creating digital media & content, Keeping safe & well-being and Problem solving. Project team developed course content, videos, presentations, and assessment tools for each sub-components of Digital Literacy in four languages (English, Turkish, Spanish and Croatian) . All learning materials shared on Moodle learning management system supported by gamification. In addition, the project team prepared a guidebook for instructors to help the use of learning materials in the teaching and learning process. In this study, it is aimed to give information about the development process of the learning environment and to introduce the content of lms.edigilit.eu.

Keywords: Digital Literacy, ERASMUS + Project, Learning Environment

Online Teaching Readiness of Engineering Faculty in Post-Covid Times: Ege University Sample

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Abstract

All over the world, Covid-19 pandemic has forced educators to apply online teaching since face-to-face education has become inconvenient. At that time, several problems for teachers, learners arise in that emergency remote teaching process which we made an unplanned transition to. The level of readiness of the instructors for online teaching is a factor that should be considered while planning online education. This ongoing study aims to find out if instructors at higher education are ready for online teaching. Specifically, readiness levels of engineering education instructors and students are discussed with the help of current literature and the data at hand. It is considered that the study can help determining quality standards in online education by collecting data on the readiness variable and come up with solutions on the problems in engineering education. The study group consists of Ege University faculty members for online teaching. The data collection tools include demographic background form and the Readiness to Online Teaching Scale (ROTS) of Chi (2015) which was adapted by Adnan and Hoşgorur (2016). The factors of the ROTS are Social and Student Engagement, Faculty and Technology Support, Course Development and Instructional Design, and Evaluation and Assessment. On the other hand, a literature review was conducted to address the problems encountered in adapting engineering sciences, which is an applied field of study, to online education. The preliminary findings are generally positive for both instructors' and university students' readiness levels. The participant instructors generally feel sufficient for online teaching, have a positive perspective towards online teaching, use online tools and methods respectively, and receive sufficient technical support. They implied that the most powerful aspects of online education are time and place independency, practicality, reusability and richness of digital content and resources, variety in communication channels for teacher and learner interaction, and affordability. On the other hand, the instructors reported that the weakest aspects of online education are infrastructure problems and other technical problems, lack of active participation and communication problems with some students, digital divide, feedback, lack of control and motivation, inefficiency in applied fields. Secondly, the literature on online learning readiness of engineering students is generally positive. However, there are problems that cannot be ignored in terms of applied subjects, the suitability of the home environment for online lessons, and the performance in remotely oriented work etc. It is suggested to carry on further mixed studies on staff online learning readiness of specific engineering science disciplines.re research.

Keywords: Online Learning Readiness, Distance Education, Higher Education

Medical Teacher's Acceptance of Social Media Based-Assessment Tools During The COVID-19

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Abstract

Social media tools helped higher education teachers and students to continue teaching and learning process during the pandemic. This study aimed to find out the medical teachers' acceptance of social media-based assessment tools during the COVID-19. We used Unified theory of acceptance and use of technology (UTAUT) in our research. 150 medical teachers filled the questionnaire. Partial least square structural equation model helped in data analysis. Results revealed that medical teachers accepted the social media tools for the assessment of students. The performance expectancy, effort expectancy, social influence and facilitating conditions influenced teacher's intentions to accept social media tools for assessment. We also collected data from 150 medical students to confirm the fact about the use of social media tools for assessment by medical teachers. The results confirmed the influence of teachers' intentions to accept social media tools for assessment on their technology use behavior. The findings of study has practical implications for medical institutions to use social media tools for assessment during crisis. Future studies may be conducted to find the different types of social media tools for formative and summative assessment.

Keywords: Social Media Tools, Medical Teachers, UTAUT, Assessment

The Higher Education Engineering Teachers' Perspectives on Creativity Teaching: Instructional Design and Learning Platform of CHET Project

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Abstract

Higher education institutions need to create learning environments for their students to adapt to global, competitive, diversified, well designed and complex environments. In addition, creativity, innovation, entrepreneurship and the willingness to continue learning are as important as the basis information on the subject in these environments (Livingston, 2010; Wu & Wu, 2020). Although creativity is a critical skill for engineering, lack of knowledge on creativity in engineering education is often cited in the literature (Charyton, 2015). In light of this situation, it is essential to use creativity in engineering education to make it sustainable (Higuera Martinez, Fernández-Samacá, & Serrano Cárdenas, 2021). In this context, The Creativity for Higher Education Engineering Teacher (CHET) Project focuses on contributing to the professional development of higher education engineering teachers in Europe. This study aims to investigate the views of engineering teachers about the CHET learning design and learning platform. The study was designed with a mixed-method pattern. The participants of this study consists of 15 teachers working at Ege University Engineering Faculty. According to project results, 80% of the higher education engineering teachers participating in the study stated that they were very satisfied with the CHET learning program, while 20% stated that they were satisfied. All of the participants mentioned that the educational content was appropriate in adopting and increasing the use of creativity in engineering education. In addition, all of the participants stated that their creative skills and competencies increased in line with the teaching activity within the scope of the CHET Project. When the satisfaction levels were examined in the context of the modules in the CHET learning program, 47% stated that modules were very sufficient with the introductory creativity module, and 47% stated that they were good. While 67% of the participants stated their satisfaction level for the creativity and technology module in education as good, 67% of them stated their satisfaction level for the creativity techniques toolkit module as good. All participants highlighted that the additional references available on the CHET learning platform were useful. In addition, all of the participants found the classification and search options of creativity techniques practical. The participants scored an average of 8.5 out of 10 to what extent they could apply the innovative approaches they learned from the CHET learning content in their teaching activity. While 60% of the engineering teachers participating in the study stated that they were highly satisfied with the CHET e-learning platform, 40% of the participants stated that they were satisfied. 80% of the participants stated that they would recommend the CHET e-learning platform to their colleagues. According to survey results, it can be stated that the teachers highly favoured the CHET e-learning platform and the activities carried out on creative teaching.

Keywords: Creativity, Innovation, Engineering Education

Creativity in Engineering: Analysis of User Experiences

H. Ekrem Ulus¹, Fırat Sarsar², Özge Andıç-Çakır³, Patricia Wolf⁴, Marianne Harbo Frederiksen⁵, Christoph Kunz⁶, Kathryn Cormican⁷, Manon van Leeuwen⁸

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Abstract

Creativity is lauded to be an essential skill in engineering. Despite its importance, recent research shows that current engineering curricula fall short of teaching and rewarding creativity adequately. What is more, from a pedagogical point of view, there is a dearth of studies relating to teaching creativity in higher education institutions particularly after the compulsory shift to hybrid and online teaching all over the world. In other words, teaching creativity online requires further research on the systematic approaches to enable engineering teachers to integrate creativity with online teaching settings. In this context, the TICON project aims to identify and overcome the barriers in teaching creativity in hybrid and online engineering programs through relevant pedagogical approaches and tools. As a multinational and interdisciplinary project, TICON sets out to enable teachers across several disciplines in engineering to teach creativity, while boosting the innovative capabilities of students from different regions and countries.

The TICON project uses the ADDIE Instructional Design method to design and implement the targeted learning environment. In the first phase of the project, comprehensive experience interviews (n=32) and focus groups (n=58) were conducted with higher education engineering teachers from various engineering disciplines in Turkey, Germany, Denmark and Ireland. This paper provides a comprehensive analysis of the findings from a detailed synthesis of the relevant literature and the data gathered in the experience interviews and focus group meetings.

Keywords: Teaching Creativity, Engineering, Higher Education, Instructional Design

Biodesign Education for Architects: Curriculums in International Scale

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Abstract

Today, the irreversible destruction on our world is a main discussion topic in many fields, including the architecture and engineering community. Within the framework of global problems, nature-inspired and ecological solutions compatible with nature are becoming increasingly important for the discipline of architecture. While nature has been guiding humanity for centuries, the effect of modern technology and scientific progress has carried the study of natural processes and mechanisms to a different point in the 21st century. Especially advances in computer technologies and a better understanding of methods in nature, biology and related sub-disciplines have encouraged interdisciplinary research between architecture and engineering. In this direction, to comprehend the processes of nature, to understand the ways of production and being inspired by nature are good ways for creating designs, materials and components that are sustainable, conserve energy, and have low environmental impact. In today's world where the boundaries in the integration of biological data into design are decreasing, the relationship between nature and design is also evolving and a new design paradigm called "biodesign" is being introduced. In this sense, biodesign can go beyond being inspired by nature in design practices and go as far as the integration of nature with structure. Interdisciplinary studies are very important during this process.

With this awareness, the importance of biodesign education that can examine nature with appropriate techniques, be inspired by nature, learn from it, and include nature in designs has emerged for students studying in architecture and related design disciplines. Hence, curriculums about biodesign have been developed at different scales with interdisciplinary study opportunities, in various universities around the world. In Turkey, biodesign education for architecture or engineering disciplines is limited to a few courses, and there exists no curriculum in this field.

In this context, this study will investigate curriculums, courses and education programs on biodesign in the universities, especially in design and related disciplines. Selected examples will be classified according to the education level and analysed their contents. The findings will be evaluated in order to apply contemporary approaches that meet international criteria in Turkish universities. As a result, the biodesign approach, in which interdisciplinary studies are absolute, supports the production of original solutions and designs based on scientific research, which develops critical / creative thinking in harmony with nature and in cooperation with it. Considering the crucial problems of our planet, it is imperative to review the responsibilities of architecture and engineering education, to think and produce different educational processes and it is important to disseminate biodesign education.

Keywords: Biodesign, Biodesign Education, Architecture Education

Curriculum for Biodesign Applications in Engineering Education

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Abstract

Nature has affected all civilizations on earth from past to present in every aspect, has shaped the life of humanity and continues to shape it. As a matter of fact, the importance given to concepts, such as energy efficiency and sustainability also points to the return to nature. The observation of solutions in nature developed against the problems faced by living things have led designers to approaches like learning from and imitating nature. In this direction, biodesign has emerged, which is a field of study that analyzes nature and synthesizes findings with an interdisciplinary approach, enabling the production of nature-friendly, useful and harmless product and system designs. Biodesign has become frequently used as a process in which problem solving is handled with a nature-inspired approach in many different fields, such as engineering, industrial design, medicine, electronics, robotics, mathematics, and art.

Considering the importance of biodesign practices in terms of economic and environmental awareness, it should be expanded and new products should be developed. Students studying in various departments need to be educated on biodesign in order to properly examine nature and mimick it in their product designs. For this reason, it is of great importance to integrate the techniques of inspiration from nature into the higher education curriculum.

Various programs and courses related to biodesign are available in various countries. In these programs, students work with faculty members from different disciplines, take courses from various majors and interact with students from a diversity of undergraduate programs. When we look at the universities in our country in general, there is a lack of studies on this subject. In this direction, a 'curriculum for biodesign applications in engineering education' will be created in accordance with international standards in order to raise awareness on biodesign issues, to get accustomed to using this basic approach in education and scientific thinking systems, and to ensure the use of innovative educational practices by academics. Through the created curriculum, it will be possible for the students to examine nature appropriately and apply its principles in their respective fields. In addition, through the curriculum, students will be able to connect with nature, and it will be ensured that they can develop environmental friendly solutions inspired by nature in accordance with their needs and requirements.

The curriculum for biodesign applications in engineering education is complementary to the programs currently in use. In addition to the nature and biomimicry in the existing programs, a course program

will be created in full compliance with the international standards in which various sample applications on the subject will be included in accordance with the needs and requirements. The curriculum will cover various topics, such as information about biodesign, engineering applications inspired by nature, biomimicry, what kind of paths should be followed during the design phase.

A digital platform will be created for the curriculum to be created for biodesign applications in engineering education, and the course contents will be transferred to this platform. Education will be constructed so as to be provided both in-class and online through course materials. Students studying in different areas and locations will be able to easily access the course content through online education. Integrity in education will be ensured through online education. Thus, students studying in different places will be able to interact and jointly produce solutions through the curriculum. In addition, it will be possible to benefit from the hybrid education model when desired. Students may be able to access the theoretical part of the course online, and may join application classes face-to-face. Related to the subject, course materials such as presentations, videos, animations will be shared online. In this way, students will be able to learn the subject before coming to the lesson. In the face-to-face education environment, they will have the opportunity to discuss the incomprehensible parts of the subject and seek common solutions to the problems. Both educational models encourage learners to question, communicate, research and experiment. Learners will be able to examine nature with a scientific point of view, find solutions to their problems and use it in their designs.

Keywords: Biodesign, Engineering, Educational Program

Creative Thinking as an Art: Creativity for Engineering Students

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Abstract

Engineering education uses technical knowledge to find solution for real world problems. Therefore, it requires multidimensional thinking. While the competition in the world is getting tougher, the importance of using the information by analysing it correctly is increasing. The expectations of the companies from the engineer candidates are also changing in this direction. Combining hard skills with soft skills is becoming crucial day by day. At this point creativity emerges as a solution. Integrating creative thinking methods into engineering education allows engineering candidates to practice solving real world problems.

By the help of technological developments accessing to information has become much easier. However, considering the tough competition conditions, it is more important to analyse information correctly rather than accessing it. In these conditions, the learning methods of students inevitably changed. Being surrounded by a constant flow of information shortened the attention span of students. They need more visual subject in order to learn efficiently. They want to be part of the lecture. Therefore, there is a need for more effective and technology-compatible teaching methods. For this aim, in order to enhance the problem-solving capabilities of the students, help them to solve a specific problem and learn a technique for discussing an issue while looking from different perspectives, we design “Creative Thinking as An Art” course as online. We add this course into university elective course pool so that different students in different departments can take it.

In this course, creative thinking methods are explained by using more visual objects. Also, the course includes a group study with the students to understand and apply one selected creative technique to solve a problem. At the beginning of the course, we presented students many of the creative thinking techniques such as Brain Storming, Decision Matrix, Story Board, The Six Thinking Hats, Swot, Catwoe, Mind Mapping, Scamper etc. Then we selected The Six Thinking Hat technique to apply during the lecture, because it is easy to show and apply, suitable for group working and can be applied in online courses. We explained technique with using more colourful presentation and described the meaning of the hat colours. After that we gave a specific problem and divided students into random groups and put them into breakout rooms. While they were discussing in the group, we just monitored them. Then selected group leaders presented group ideas. After finishing lecture, we took the feedback of students. They thought that they learn how to solve problems looking from different perspectives and this widens their vision.

The benefits of using this technique In this classroom Is that It enhances the problem-solving capabilities of the students, help them to solve a specific problem and learn a technique for discussing an Issue while looking from different perspectives.

Keywords: Teaching Technics, Creative Thinking

Enhancing (Tech) Teachers and Students Motivation and Learning Outcome: Integration of Entrepreneurial and Soft Skills into Teaching: Techster Project

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Abstract

Future professionals, whether hired or self-employed, will be expected to be able to work in challenging multicultural business situations. The entrepreneurial behavior of students is given minimal consideration in technical education. Even if educational systems are able to provide a traditional education with high-quality content but insufficient attention on 21st-century skills. It shows through the fact that when the European selected industries' employers brainstormed about the ideal employee skills, 76% of these skills consisted of soft skills (Flynn, K., Wahnstrom, E., Popa, M., Ruiz-Bejarano, B., & Quintas, M. A. C., 2013).

Tech-STER aims to enhance the international entrepreneurial and soft skills and attitude of teachers and students in Higher Education (HE) by creating an entrepreneurial dimension to technical education and strengthening the local and European industry network of HE institutions with multinational partner participation. With this aim, Tech-STER Project has three major objectives which are strengthening technical education in HE, equipping HE students with the necessary mindset, skills, and competencies, raising the awareness, motivation, and knowledge level of the entrepreneurial dimension, and aims to develop five main outputs. With the inclusion of tech teachers and students in HE to the Tech-STER project, an interdisciplinary approach will be used to enhance entrepreneurial and soft skills, and to bring innovation to traditional teaching and learning practice.

This research aims to provide project steps which are defining the skills and competencies for tech teachers and students, developing entrepreneurial tools, validating methodologies and processes, and free access to the online platform, information to discuss.

Keywords: Entrepreneurial Skills, Soft Skills, Tech Education

Acknowledgment

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Bibliometric Mapping Analysis of Studies on The Use of Artificial Intellience in Education Sciences

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Abstract

Educational sciences, as a field of study, has always been in contact with all disciplines. The main reason for this interaction is that the concept of education, by definition, has an integrative meaning that continues from prenatal to death. The concept of artificial intelligence, the effectiveness of which we feel more and more every day, makes its effectiveness felt in the field of educational sciences. Although the thesis studies on the use of artificial intelligence in education seem to be limited in our country, there are academic studies on this subject in the world. In this study, it is aimed to make a systematic map of the research trends of the studies on the use of Artificial Intelligence in the field of Educational Sciences by analyzing 293 publications filtered according to the post-2000 criteria with the keywords "Education" and "Artificial intelligence" from the Web of Science (WOS). Analyzes were made with the WOSviewer 1.6.17 package program. In the analyzes made, it is seen that the use of artificial intelligence in the field of education is intensified in China, the USA and the UK, respectively. 36.86%(108) of the published studies are scanned in SCI-E, 22.18%(65) CPCI-S, 20.14%(59) ESCI indexes. A total of 944 citations were made to 293 studies included in the study, and an average of 3.22 citations per publication was calculated. It has been observed that the density of the studies has increased over 50 publications annually in the last 5 years, and the citations have increased in the last 5 years depending on the number of publications. Bucharest Polytechnic University, Harvard University and California University seem to be at the center of the studies. While 130 of the 293 studies were presented as Articles, 16 as Book Chapters, 4 as Books, 16 as Review studies, and 7 as Abstracts, 12 of them were accepted early. The study reveals the importance of the study as it is a guide for researchers who will work on the use of Artificial Intelligence in Educational Sciences.

Keywords: Educational Sciences, Artificial Intelligence, Bibliometrics

Analysis of Student Mentoring Scale in Higher Education and Its Investigation in Terms of Various Variables

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Abstract

The aim of this study is to determine the perspectives of students on mentoring practices in higher education, to ensure the use of higher education student mentoring scale in universities in Turkey, and to determine its validity and reliability. The Higher Education Student Mentoring Scale developed by Crisp (2009) was used. 270 university students studying at Bitlis Eren University participated in the study. In the analyzes made, it was understood that female students' perception of mentoring is higher than male students and the perception differs according to the variable of education.

Keywords: Mentoring, e-Mentoring, Higher Education

Creativity and Innovation in Higher Engineering Studies: CHET Project Approach and Findings

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Abstract

Today, creativity and innovation are crucial skills to meet the challenges of the economy, the environment, and the social context. University engineering studies play a key role in leading the global labor market and steering our economic system towards a more sustainable and fairer model. However, there is a lack of qualification in creativity and innovation techniques among engineering professors and students.

In this context, the CHET project (Creativity for Higher Education Engineering Teachers) project supported by Erasmus+ (Key Action 2), focuses on providing HE teachers with the pedagogical skills and competences to integrate innovation and creativity in their teaching activities.

The CHET project is made up of six partners, four universities: Technical University of Madrid (Spain), Ege University (Turkey), University of Southern Denmark (Denmark) and Vilnius Gediminas Technical University (Lithuania), together with two methodological and technological support companies: Avaca Technologies Consulting, Informatics AE (Greece), and EOLAS S.L. (Spain).

The project is structured in four intellectual outputs (IO): IO 1 CHET curriculum design and development; IO 2 CHET learning content; IO 3 CHET e-learning environment; and IO 4 piloting with students and recommendations.

Since December 2019, the partners have been working on these objectives and in February 2022 the CHET project will end. This communication shows the main results and findings focusing on faculty and students, and recommendations for university institutions and higher education policy makers.

Keywords: Creativity, Engineering Studies, Erasmus, Higher Education, Soft Skills

New Approaches to SME Service Innovation Education, Research and Practice

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Abstract

From retail to real estate, transport to tourism, services provide 150 million EU jobs and their role in driving smart, sustainable and inclusive growth is undisputed. The growing importance of innovation for SMEs competitive advantage means, that increasing the effectiveness of innovation process can be a deciding factor for their success in the market or even survival. Digitalization strongly influenced numerous fields and it also starts to change the innovation management process. The main aim of newly appearing digital tools and platforms is to structure innovation process, thus making it more predictable and quantifiable. Still digital innovation management is not well included in innovation related university programs. Therefore and international initiative Digital Innovation for the Service Sector has been undertaken, to help gaining a better understanding of how small service companies currently undertake new product development so that it can be improved how innovation in services is taught. Here it will be presented how science, education and practice can be jointly utilised to change innovation management practices.

Keywords: Service Innovation, Innovation Management, Innovation Related Education

Chargers of Electric Vehicles in Learning

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Abstract

The number and rate of electric vehicles (EV) is continuously growing all over the world. International Energy Agency predicts that EV stock will globally reach 145-230 million by 2030. However, one of the main factors that hinder the penetration of EVs, is the availability of EV chargers. Charging infrastructure, either at public places, at home or at work is indispensable for operating EVs. Thus, due to the potential exponential growth of EV sector, there is an increasing need for experts specialized in EV charging infrastructure.

The spread of such infrastructure not only depends on technical, financial and legal matters but also on human resources. Installation and maintenance of an EV charger requires special knowledge and skills such as assessing possible location of EV chargers, or understanding the functions of the key elements of an EV charger.

The main objective of C-Evil (Chargers of Electric Vehicles in Learning) Erasmus+ project was to provide a complex and competitive knowledge base for VET students and electricity professionals by developing practice-orientated training materials and an e-learning platform, supporting distance learning. The project wanted to provide an opportunity for professional development by improving electricity professionals' skills and competitiveness to overcome employment barriers and increase their competences. Another objective was to develop innovative learning materials which can align with technology development, furthermore, diminishing sector barriers in electric mobility. Electricity professionals are able to gain knowledge which can be used in Europe, therefore, materials can support the mobility of professionals in the EU. The project included e-learning courses which are open educational resources for professionals who would not have the opportunity to learn about state-of-the-art technologies otherwise. Since more and more electricians will be able to install and operate EV chargers due to the project results, they can boost the spread of electric cars, and indirectly contribute to meeting the EU 20-20-20 targets. Providing teaching methodology and guidance to ensure high-quality education in the classrooms all over Europe was also a basic goal to realize.

The C-Evil partnership identified seven major learning objectives for the learning materials on EV chargers: provide students with specific knowledge that will enable them to handle EV chargers; develop students' personal/professional skills; develop training materials and assessment methods and tools; take the necessary steps to have EV chargers included in the national curriculum; train specialists in the area among teachers; make use of European instruments to recognize and validate the learning results; enhance cooperation with local or national entrepreneurs in order to create a common framework.

C-Evil materials cover the main areas related to EV chargers. The first module introduced the history of EVs, an overview on the EV and battery technology, and the environmental effects of EVs. The second module focuses on installation, namely battery characteristics, charging modes and charging plugs. The third module continued the installation topic with the selection of EV charger point location, key

elements of chargers, general safety concerns along with maintenance issues. In the fourth module, general and smart management were detailed with an outlook on EVs' connection to smart cities and energy management. The platform and the materials are free of charge, registration is required to follow one's progress.

The global spread of electric mobility and the rapid technology progress can lead to major disadvantages if electricians cannot keep pace with the growth of development. Besides providing unified learning materials which can be used in any country, collecting country-specific information were also emphasized. The C-Evil training and learning materials have been developed by the involvement of the expert partners from seven countries, validated by VET trainers and made available on the developed C-Evil online platform.

Keywords: Electric Mobility, Electric Vehicles, Charger Infrastructure, Erasmus+, Vocational Education And Training

Order Through Chaos: How Can Millennials Thrive Through Learning Methodologies That "Speak To Their Heart"

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Abstract

Rapid digitization as a result of the Covid-19 pandemics, as well as technical skill obsolescence, have created many concerns about the EU workforce's readiness for the fourth industrial revolution. According to Cedefop's (2020) report "Empowering adults through upskilling and reskilling pathways", Europe's workforce is falling well short of expectations. While unemployment rates are at an all-time high, four out of ten EU firms reported trouble finding qualified individuals. This is mostly due to the fact that millennials (who are seen as innovators) either refuse to work on existing SMEs or resign in less than three months. And the reasons are: a) they feel their workplaces aren't smart enough; b) technology in the office lags significantly behind what people have at home (as shown during the Covid-19 problem); and c) co-creation, which leads to innovation, isn't occurring as quickly as they would want.

According to the 2018 Deloitte Millennial survey, which included over 10,000 millennial respondents, one of the top objectives that millennials want from future employers is a culture of cooperation on work initiatives. Technology plays a role in this, allowing for a free flow of ideas and communication, and they see autonomy and reciprocity as essential to the future of company leadership.

However, the big question raised is how can today's workplace strategies combine the culture and practices of old firms with "new" employees? The solution might come from the "chaordic" leadership style, which is a mix of the terms "chaos" and "order," referring to a condition that combines the principles and features of both. The chaordic organization or system is one that is constantly learning and adapting to its surroundings, and as a result, it is adaptable. To guarantee the necessary level of order, a basic set of rules and procedures are developed. This is framed by a shared sense of purpose and a set of six lenses shared by the chaordic method.

Keywords: Millennials, Chaordic Leadership, Business Leaders, MILC

Determination of Study Tendencies Published in The Field of Instructional Technologies by TF-IDF Keyword Extraction Method

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Abstract

In this study, the keywords were extracted from the abstracts and keywords of 265 articles from the journals publishing in the field of instructional technologies by TF-IDF method. In the findings, it was observed that theoretical studies were not given priority as in the studies in the world and in Turkey. However, the teaching methods draw attention. Especially blended learning, web-based learning, lifelong learning, computer assisted learning, mobile learning are at the forefront. In the education focus, programming education, language education, science and mathematics education are among the trends.

The concept of "distance education" is a research area that takes place in the first place. This situation does not change in the world and in our country and is one of the most popular topics. The concepts of data mining and educational data mining draw attention to the importance of data sources. Trends by year are presented in tables.

Keywords: Instructional Technologies, Research Trends, TF-IDF

Introducing Soft Skills and Entrepreneurial Competence Into University Technical Curricula - A Research Perspective

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Abstract

A challenge for teaching in technical faculties of European universities is the high level of specialisation of graduates within a given field of study. On the other hand, several studies indicate that there is a need for a good balance between technical and non-technical skills when recruiting for jobs in the modern economy (Fernández-Sanz, L., Villalba, M. T., Medina, J. A., & Misra, S., 2017; Flynn, K. Ho, P., Vieira M., Pittia, P. & Dalla Rosa, M., 2017). Soft skills are complementary to hard skills (which are needed for a specific job) and are related to living and working with other people. The training of soft skills and entrepreneurial competences in technical universities is a task for universities requiring actions of different management levels. One of them is to modify existing courses curricula without introducing some kind of revolutionary actions into the system. Thus, the aim of the article is to analyse the possibility of enriching the existing (tech field) curricula at Universities with elements of education of entrepreneurship and soft skills. The results of a survey of 62 tech-teachers working at universities were used to analyse this issue. The survey was carried out using the Computer-Assisted Web Interview (CAWI) methodology. University tech teachers from Cyprus, Poland, The Netherlands, Turkey and UK participated in the survey.

Keywords: University, Soft Skills, Entrepreneurial Competence, Education

Use of Virtual Reality Technologies in Engineering Education: Challenges and Solution Suggestions

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Abstract

Virtual Reality (VR), in its most basic terms, is a computer-simulated environment that allows the user to interact and change his perception as a result of a mixture of sensory information sent to the human brain. VR is defined as a computer simulation technology that allows users to experience different kinds of sensory and emotional experiences by participating in an interactive and three-dimensional world. In this context, VR is an interactive computer-based application that provides users with a synthetic digital environment. It is striking that VR technologies are increasingly used in many disciplines. It is seen that the use of these technologies is becoming more and more widespread in medical education, foreign language teaching, disciplines such as geometry, geography, astronomy, anatomy, and security education. However, when compared to these disciplines, it is seen that VR technologies are used more in the fields of architecture and engineering after safety training. It can be said that many features offered to users by these technologies are effective in the process of spreading the use of VR technologies in these areas. VR offers the opportunity to create learning experiences that are not possible in traditional classrooms or the real world. For example, navigating the surface of a star like a sun, circulating in a vein like a blood cell circulating in a vein, or performing actions that cannot be explained or performed by real-life physical rules can be shown among these experiences. In addition, users can interact with objects, move around, communicate verbally or non-verbally with other users, create objects or play games in the designed VR environment. Thanks to these features of VR, which can achieve experiential learning, learning activities can be made more fun, effective and motivating. However, research is needed in terms of the effectiveness of these new technologies in architecture and engineering education. In particular, the advantages, limitations, difficulties, and coping strategies of the use of these new technologies in engineering education should be determined. Because it is stated that academic institutions need to develop strategies for recognizing and using new technologies such as VR and meeting their professional expectations in addition to improving their computer knowledge and skills to successfully prepare the new generation of engineering students for the industry. There is also a need for further research into areas of technical education, such as engineering, which are affected by technologies such as VR. In this context, academic institutions need many different requirements to effectively use these new technologies such as VR in education. This study aims to reveal the problems and solution proposals for the use of VR technologies in engineering education. This study presents a literature review of VR applications in engineering education. Within the scope of the study, SCOPUS, Web of Science, and ERIC databases were scanned. The literature review covers the years 2018-2022. The search process was started by entering the keywords "virtual reality" and "engineering education" in the search section of the relevant database. A total of 266 studies were reached. The studies were examined and classified using the content analysis method. When the studies are examined, there are problems such as cost, simulator crash, cognitive load, various usability problems, programming, and content production related to VR technologies. Considering the findings obtained from this study, various solutions are offered for the effective use of VR technologies in engineering education. The results obtained can contribute to educators and researchers for engineering students to use new technologies such as VR effectively and efficiently in learning environments.

Keywords: Engineering Education, Virtual Reality, Learning Environments, Material Development

Returns of The Site Management and Organization Course Given in Architecture Undergraduate Educationi

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Abstract

The construction industry is an environment in which there are many actors from raw material suppliers, material producers to transporters, employers to contractors, workers, masters, foremen, technicians, engineers and architects. In this environment, real persons, organizations and the public are in conflict and conflict in many areas. The subject is a technical and artistic subject and has a critical economic importance. Investments, both in our country and in the world, require construction works that are directly affected by world politics and economy. 8-12% of general revenues in the world and in Turkey are directed to investments and channeled to the construction sector. Both infrastructure and superstructure investments are planned, tendered, executed and completed by qualified technical personnel. In this study, the returns of the "Construction Site Management and Organization" course given during the undergraduate education of the Department of Architecture at Düzce University were evaluated. For this course, which is given as a fourth year elective course in the 2021-22 fall semester, has been specially designed. The course covers real business life and comprehensive homework, online courses in addition to classroom lessons, learning different scientific methods and applying them to the subjects within the course, applications for individual research, learning and applying different computer software. By establishing a WhatsUp group including lecturers and students; A course aimed at achieving maximum gain was taught by sharing a large number of documents, news, reports, event announcements, sharing periodic course attendance and homework submission reports, and the application of online surveys at the beginning and end of the semester. One of the most intricate relationships in the construction industry is between Civil Engineers and Architects. In addition to having an important intersection in terms of job definitions and responsibilities, the practitioners of these two professions, who experience many debates, conflicts and conflicts as they constitute different sides of the same project, are also an issue in itself. When the subject is a stage where these professionals can take different roles on different sides at different times, things can get complicated. A booklet was prepared, shared with the students and evaluated in order to provide a broader knowledge on this subject, to understand the manifestation of the construction/construction site phenomenon from different perspectives, and to understand the common and different aspects of two different professions. The study includes the aims and details of this application and the evaluations of the students with the help of two survey data.

Keywords: Architectural Education, Construction Site Management and Organization Course, Online Education

Creating An Authentic Learning Experience in The Engineering Classroom

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Abstract

According to the U.S. Bureau of Labor Statistics Occupational Outlook Handbook (n.d.), a projected 146,000 new engineering (and architecture) jobs are to be added to the U.S. workforce from 2020 to 2030, a 6% projected growth. In engineering programs, undergraduate courses typically focus on learning the content, working on assignments or projects, and taking exams. However, this may lead to students becoming disinterested in the topic and having difficulty in finding relevancy in the topic due to the approach. Additionally, it may also lead them unprepared for the workforce.

Employers require that their employees not only have the subject matter expertise, but also that they can work with diverse teams of people in terms of ethnicity, gender, and experience levels to solve complex problems. The current ABET competencies also align with this notion. They include competencies such as having the ability to work on multidisciplinary teams, solve engineering problems, and communicate effectively (ABET, 2018). Therefore, the goal of engineering education should work to satisfy the needs of the employers by incorporating more meaningful projects. Additionally, engineering courses should include sociocultural perspectives of learning (Polly et al., 2018), which can be achieved by collaborating on a team to solve real-world problems (Reeves, 2002).

One solution is to implement the use of more authentic learning or “learning by doing,” where students are working on tasks to solve a problem (Anzai & Simon, 1979). This requires students to apply the knowledge and skills from the classroom to work on a real-world problem (Herrington & Herrington, 2006; Lombardi, 2007). Through these authentic learning experiences, students are gaining valuable skills through a meaningful and collaborative experience with individuals and thinking critically by engaging in real-world challenges (Polly et al., 2018). These experiences help students to develop more positive attitudes toward engineering and higher levels of satisfaction with collaborative learning techniques (Doolen & Biddlecombe, 2014).

This session will describe a solution called Project Lab that was an optional course developed by faculty and staff at the University of Alabama at Birmingham’s School of Engineering. Since the Summer of 2015, Project Lab has been providing opportunities for engineering students to work on authentic projects from the local healthcare industry. It is managed by an engineering professor and career services specialist.

Project Lab provides a collaborative space for students to work on an interdisciplinary team to design, develop, validate, and deliver a functional prototype and/or engineered device or application that meet a client or user specifications. Project Lab attracts undergraduate students from all levels (1st – 4th year), with a high participation of minority and women students.

At the beginning of the 14-week course, students select their teammates and then as a group, select a client from a list. They create a team performance plan which helps them to define their roles on the team. Such roles can be the primary contact for the client, the organizer, etc.

Prior to contacting the client, students are trained on the Stanford Design Thinking methodology (Raz, 2018), which is an iterative process that emphasizes innovative approaches to problem solving. Project Lab has also incorporated Universal Design for Learning principles (CAST, n.d.), where students are able to present their work in a variety of ways based on multiple means of expression, such as through reports, presentations, group activities, and client interactions (Lewis & Sullivan, 2018). Faculty and advisor maintain the role of facilitator and organizer as they direct students to specific knowledge resources.

The activities conducted within Project Lab demonstrate the importance of implementing an authentic, collaborative project, which aligns with the ABET competencies and better prepares students for the workforce.

Keywords: Authentic, ABET Competencies, Design Thinking, Collaboration, Problem-Solving

Increasing Access To Graduate Education via Open Learning Pathways

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Abstract

The University Michigan's School of Social Work has implemented an innovative pathway to a licensed Master of Social Work degree program. This presentation will describe how the School of Social Work selected and worked with an external Massive Open Online Course (MOOC) provider (Coursera) to develop a low cost and low risk entry pathway into a top ranked graduate program. The presentation will focus on the key considerations for selecting the Coursera platform, the alignment of the platform and delivery decision with the School of Social Work, as well as the lessons learned from implementing this solution in support of the academic program goals. Results of the first year of implementation, challenges faced, unexpected benefits, and student feedback about the experience will be shared. A discussion of the overall strategy for the University of Michigan's Open Learning eXperience portfolio strategy will be shared.

The School of Social Work sought to rapidly develop a part-time online version of the number one ranked (United States) graduate degree in Social Work. Goals for this degree program included increasing access for students who could not otherwise study full-time in a residential setting. As part of the Diversity, Equity, and Inclusion plan for the School of Social Work, the program sought to provide a low cost entry for students who have been historically underrepresented at the University of Michigan. The strategy selected resulted in a Massive Open Online Course as an entry to a low cost, multi-course certificate program (a Coursera MasterTrack) that can be used to gain entry to an advanced standing version of the Master of Social Work (MSW) program that is 15 credit hours shorter than the standard 60 credit hour MSW degree program. The School of Social Work has been able to rapidly expand the enrollment for the Social Work degree program, as well as reach a much larger audience for their program than could be achieved via local marketing efforts. The resulting pathway implemented by the University of Michigan provides an opportunity for those who have not otherwise considered a field in Social Work to explore the topics of the career, as well affirm their readiness for graduate study. This pathway has provided new opportunities for Social Work to reach new audiences, as well as to diversify the perspectives within their academic program, further enhancing the strength of their program.

School of Social Work MasterTrack: <https://sww.umich.edu/programs/msw/mastertrack>

Coursera Social Work: Practice, Policy and Research <https://www.coursera.org/mastertrack/social-work-umich>

Keywords: Virtual Learning Environment Platforms MOOCs

Product Life Cycle Management (PLM) in Higher Education

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Abstract

In the recent decade, global technology trends have driven changes in the design and engineering industries. One of the topics acquiring global importance in this setting is Product Lifecycle Management (PLM) which is a solution for managing the entire lifecycle of a product from its conception, through design, production, and delivery, to service, and disposal or recycling. This has also led to an increase in PLM applications and literature studies in related industries and universities.

Universities have a clear role in lifelong learning and continuing education, also universities are key players to provide opportunities for Small and medium-sized enterprises (SMEs) in the industry to improve their competitiveness, productivity, and efficiency, estimate total costs, do the Life Cycle Assessment (LCA) and the Life Cycle Management (LCM), and stay competitive on the global market for firms.

The research studies how Ege University Graduate School of Natural and Applied Science Institute has integrated PLM concepts and tools into its master degree curriculum and program. This study aims to provide a sample framework for higher education programs based on Product Lifecycle Management (PLM) concepts as well as use of related industry relevant PLM tools with comparison to other university programs.

Keywords: Product Life Cycle Management, PLM in Higher Education, Life Cycle Assessment (LCA) for Businesses

The Engineering Education Research Trends in Turkey: A content analysis of the Covid Pandemic in March, 2020- December, 2021

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Sevinç İlğün Çerçi, Tuğrul Durak, Fırat Sarsar**

Abstract

The up-to-dateness and effectiveness of engineering education programs are important for engineering students to receive a higher quality education. Studies to increase the quality of teaching will also help to engineer students to receive more qualified education.

Raising qualified graduates is only possible with a qualified education program. However, the transition from education-teaching processes to distance education, especially in practice-oriented disciplines in the Covid Period, brings some discussions on the effectiveness of teaching processes. The aim of this study is to examine the methodological dimensions of the studies on engineering education published in Dergipark between March 2020 and December 2021, the beginning of the Covid Period, and to reveal their general tendencies. For this purpose, 22 articles in Turkish published in the field of engineering education in 139 engineering journals published in Dergipark between March 2019 and December 2021 were analyzed by content analysis method. Educational Technologies Publication Classification Form (ETYSF) developed by Göktaş et al. (2012) was used as a data collection tool in the study.

In the light of the findings obtained as a result of the study, it has been observed that the type of studies published in journals on engineering education related to engineering education are mainly experimental studies and document analysis studies. Considering the tendencies of the articles according to their methods, it was concluded that the studies were mostly constructed according to the survey studies, which are quantitative methods. It was observed that the most commonly used data collection tool in the studies published in the journal on the subject of engineering was likert type questionnaires and the majority of the sample level was undergraduate level. In addition, studies with a sample size of 31-100 are in the majority. When we look at the sample selection methods, it is seen that the convenience sampling and the purposive sampling methods are equal in number. It was concluded that the most used data analysis method in the studies was the t-test. As a result of the content analysis, about engineering education, it has been seen that very few studies have been done in the literature on engineering education. As a result, it is thought that it is important to encourage more publications on engineering education, especially in engineering journals.

Keywords: Engineering Education, Research Trends, COVID-19