

# X INTERNATIONAL GUIDE CONFERENCE



# 2015

Optimizing Higher Education for the Professional Student:  
A balance of flexibility, quality and cultural sensitivity.

## CONFERENCE PROCEEDINGS ABSTRACT



**X International GUIDE Conference**

**Optimizing Higher Education for the Professional Student:  
A balance of flexibility, quality and cultural sensitivity**

**Vienna, Austria  
September 16-18, 2015**

**Conference Proceedings  
Abstracts**

**Edited by  
Yulia Ulgina on behalf of the GUIDE Association  
GUIDE, 2015**



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## Introduction

GUIDE Association – **G**lobal **U**niversities **I**n **D**istance **E**ducation - was founded in 2005 by Marconi University (Rome, Italy) with the aim to develop and support international cooperation and open and distance learning worldwide. By strengthening the role of higher education institutions as innovation and development drivers, GUIDE promotes the implementation of innovative results, insights and best practices in order to identify present, emergent and future needs of regional and international stakeholders and highlight potential areas for strategic partnership and transnational cooperation.

The International GUIDE Conferences aim at encouraging cooperation between the member universities, providing fruitful exchange opportunities on global research issues.

The X GUIDE International Conference reflected the latest worldwide trends in e-learning, addressing topics such as the evolution and transformation of MOOCs, the creation and implementation of virtual laboratories in teaching and learning and the importance to develop distance education programs that can effectively respond to corporate training needs.

Significant attention was also given to gamification, with its crucial role in making the learning experience more attractive and stimulating through the use of simulation, animations and narrative-based learning and to BYOD (Bring your own device) policies that are becoming an overwhelming trend both in the academic field and in the business world where they are having a significant impact on day-to-day operations.

Finally, a major focus was placed on the always relevant aspects related to quality assurance and on its crucial role in the rapid development of methodologies applied to formal, non-formal and informal learning. The demand for standards and accreditation is growing globally as well as the need to define international quality criteria for comparing the diverse educational systems.



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## *Keynote Speeches*

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### **Envisioning a Learner-Centered Future**

*David Guralnick (Kaleidoscope Learning, USA)*

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For many years, a large percentage of education and training has been delivered using an "instructor-centered" format, such as a classroom setting or, in more recent times, a webinar or a lecture-focused MOOC. Yet the online world offers the potential for educational experiences that go far beyond those of the traditional instructor-led model. By integrating new technology with a learning-by-doing educational approach, we can create learner-centered online education that is engaging, effective, and integrated into the lives of students and employees.

In this session, we will discuss underlying themes that can help us create interactive online experiences that are built around a learner's needs. A learner-centered approach allows us to create educational experiences that learners emotionally connect with, and that facilitate the acquisition of skills, a goal that is particularly relevant for professional students and corporate employees. Via a learner-based approach that creatively uses technology, we have the ability to greatly improve the effectiveness of education and training.

Keywords : online learning, design, simulation, learning by doing, skill acquisition, MOOCs



Keynote Speeches

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## **Formal Education and Job: digital revolution and strategic role of the curriculum**

*Prof. Alessandra Briganti* (GUIDE Association General Secretary; Rector, Università degli studi G. Marconi, Italy), *Prof. Marco Rimanelli* (GUIDE Association; Saint Leo University, USA)

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For quite some time we have been witnessing an evident crisis of the education national systems as consequence of the changed relationship among the job division on global scale, the change in the productive specialization and the employment and professional requirements, which have to deal with the new different reality of the globalized competition.

Furthermore, the educational systems have to adapt to the impetuous growth of the demand for education at all levels and they have to tackle with the competition, which is becoming more and more intrusive, and the non-formal education (both external to the institutions responsible for the formal-education).

This troubled context has generated frequent re-design attempts at several education levels by the governments which, nevertheless, have not yet succeeded in focusing on a shared inspiring concept able to imprint a global direction to the reformatory process. In the absence of the above mentioned concept it has been preferred merely an occasional support to the problem of the increasing distance between formal education and employment, with partial and poor solutions.

In fact, the failure of the reformatory impulse essentially comes from a basic choice which had the scope of preferring the myth of a new reference model business-type, disregarding the inescapable and structural problem related to the process of the knowledge creation. Nonetheless, the resource "knowledge" represents the foundation of the competitive advantage, generated by the modalities with which the acquired knowledge are stored, used, shared and increased in order to be conveyed to the future generations.

The third millennium University has to aim for the training of talented persons who have knowledge, rules, cognitive organizer and metacognitive orientation and adequate competence to discover and re-build knowledge and experience types. Moreover, the impact of the digital revolution imprints also in the knowledge production process the typical speed intensification which represents an essential source for the competitive success.

Therefore, it seems to be obvious that, even in the persisting lack of a global reformative concept, also in the entirety of the structures, application and organization policies which converge to create the knowledge management system, the identification and the management of formative interventions able to operate for a connection, at least partial, of the separation between formal education and employment might have a fundamental role.

In this viewpoint and thanks to the potentialities generated by the digitalization processes, the university can proceed to a revision of the curricular organization in order to set on new basis the building process of the professional completion according to modalities able to connect the theoretical knowledge to the practices related to the specific implementation context.



Indeed, the procedures made possible by the virtualization, firstly the simulation one, can favour the building process of a new professional competition, appropriate for the needs of an open, segmented, mobile and flexible labour market.

Taking for granted the priority of the problem of a re-composition between the formal education area and the professional operating contexts, it becomes possible to elaborate a curricular planning focused on the procedure of imitation ("simulation") as result of the comprehension/ conjecture path of the way of acting of the systems detected as imitation object.

On this basis, and through an appropriate curricular planning, it results possible to integrate a knowledge merely technical with the operative awareness of the several functioning aspects of the context definable as the capacity of evaluating, selecting opportunities, interacting with others, dealing with complex problems, acting in applicative adjacent fields in order to obtain in the learner an appropriate experience in order to achieve a full control of the simulated environment.

Keywords: digital revolution, education, employment, distance learning



*Assuring Quality, Flexibility and Access in Distance Education*

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## **Economic Engineering. Remarks on Financial Mathematics and its mathematical models arising from Engineering. Short didactic guide**

*Prof. Fabio Rinaldi (Università degli Studi Guglielmo Marconi, Italy)*

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Aim of this Project is to introduce the students and the academic people, interested both in Financial Mathematics and Engineering, on how to use the principal mathematical models on the pricing of derivative instruments.

Further, students in computer science, using the Laboratory, are able to exploit and study, from the informatics point of view, programs that are able to evaluate European Options, American Options, Spreads and Straddle Options. Of particular importance are the “Implied Volatility Calculators”, because these programs are built using specific algorithms.

The Laboratory here presented provides a solid instrument to improve the mathematical background for each student interested. From the strictly theoretical point of view, it represents an optimal tool to build a robust Mathematical Analysis knowledge.

Finally, all the mathematical models presented in this Laboratory can be used and studied by all the students in Engineering and Economics.

Full paper available in GUIDE journal “[Digital Universities: International Best Practices and Applications](#)”  
ISSUE 2015/2

**Keywords:** Option pricing, Physics, Mathematics, Mathematical models in Economics, Computer Science, Black-Scholes Equation

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## **Virtual Laboratory of “Infrastructures Roads & Territory**

*Prof. Valerio Veraldi (Università degli Studi Guglielmo Marconi, Italy)*

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Technological innovation and the progress made in information technology, has allowed the spread and consolidation of many methods in the field of education, in particular for “distance learning”. In addition to the traditional techniques, such as, video lessons, are spreading many other teaching tools to support teachers and students to implement and improve teaching methods and scientific knowledge. In this context, the laboratory of “Construction of road infrastructure”, has been developed.

The two mains objectives of the laboratory are: from one hand to provide a method of designing a road infrastructure, on the other hand to provide students an example of application to better understand the importance of interdisciplinary in road design, and, more in general, in civil engineering.

The road project can be considered as a moment of synthesis for the knowledge of the aspects involved in the resolution of issues related to mobility. Hence it represents an excellent tool for controlling the economic and territorial dynamics.

Consequently the laboratory represents a perfect example to encourage the student to put into practice all the different skills learned during degree course, that must be used in professional application.

The dual propose of the laboratory therefore results in an incentive to avoid the use of “single matter knowledge”, but, on the contrary to use the combination of all different knowledge to achieve an even better road design.

In the present paper will be presented the objectives and strategies to be pursued, the techniques developed, the general structure of the laboratory and interdisciplinary ideas proposed.

Keywords: Road Design, Virtual Laboratory,

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## **The restoration virtual lab of architectural heritage: an interactive learning/teaching experience**

*Prof. Cinzia Barbara Bellone (Università degli Studi Guglielmo Marconi, Italy)*

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Marconi University's "Urban Design" course represents an opportunity to apply an innovative and interactive remote learning/teaching model based on the latest technologies.

The urban discipline is one of the most fundamental in Italian culture: it deals with the urban transformation, the pursuit for quality of life, environmental protection and safeguarding the identity values of the historical evolution of the population. In this sense, the restoration virtual lab of architectural heritage is aimed at forming specialized techniques in preserving the rich and imposing heritage, which is different in terms of time, type and regional context.

The aim of the laboratory is to give students the knowledge and suitable scientific references to intervene in the conservation of the architecture. Much is also attributed towards researching the past and present in an integrated approach and aimed at the transformation in a more interrelated dimension.

The method used makes the students the protagonists: through choices and interactive interventions, they can build their restoration project on a hypothetically articulated building by keeping the relations which exist between formal and structural/static restoration into account, as well as considering the respect of various types of materials used throughout the historical ages.

**Keywords:** Urban Design, Restoration of architectural heritage, Formal restoration, Structural/static restoration, Interactive didactics, Virtual Lab

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## **Quality assurance implementation in higher education within the European southern neighboring area: the example of EQTEL project in Jordan**

*Dr. Arturo Lavalle (Università degli Studi Guglielmo Marconi, Italy)*

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This paper gives an overview of the potential of a quality culture applied to e-learning in higher education and of the importance of creating common standards and guidelines for QA of TEL in the EU and Neighbouring areas. It draws on the objectives of the EQTel project (Enhancing Quality of Technology-Enhanced Learning at Jordanian Universities) funded with support of the EC. 13 partners are involved in this project and they come from three EU countries and Jordan.

There is a vast literature on quality in HE, with a profusion of terms and concepts. It often identifies a tension between two roles of QA: a means of accountability and a route to quality improvement. At the same time a quality culture in and for e-learning is growing fast and quality assurance is becoming increasingly important as TEL is more and more widespread in the higher education environment all over the world.

Hence, quality in e-learning is a field which is currently growing in importance while at the same time there are no or few professional standards and qualifications for professionals in this field. This leads to the situation where quality development and quality assurance are often delegated to persons with little or no direct experience in the field of quality for e-learning. There is therefore a need to define objective standards for the delivery of efficient quality learning paths applicable at international level.

Keywords: E-learning quality, Higher education



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## **Assuring Quality, Flexibility and Access in Distance Education**

Prof. Arthur Yamada (Honolulu University, USA)

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During the past twenty years, experience has shown that education has life-time value and is a very sound investment into one's well-being. Time has also shown that students who learn more earn more. Hence many higher education institutions are striving to develop systems in order to deliver education at lower costs while still maintaining quality. They are very aware of the enhancement of distant-learning that benefit students, especially adult learners, who save money and time by being able to acquire quality education while still managing family and work. These innovative measures allow for a very literate, productive, motivated society.

In these times of economic crisis, Innovative Institutions are allowing students to save time and money by using the following methods:

- a) students may challenge courses through exams to earn credit for respective courses
- b) students may take exams for credits through: CLEP, ACT, Excelsior, Dantes, College Board of NY, Ohio University final exams and
- c) students may perform internship with companies
- d) through portfolio evaluation processes
- e) student may also earn credits by participating in group interactive programs, partnering with students from other institutions with the same 'study focus' or discipline

Keywords: distant learning, adult learners, quality education, Innovative Institutions, economic crisis



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## **Next-Generation Gamified Virtual Laboratories for STEM online, on-campus and distance education**

Mr. MaarooF Fakhri (Labster, Denmark)

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Imagine if your students could have unlimited access to multi-million dollar Harvard-quality laboratory facilities anywhere in the world, anytime, for the cost of lunch.

Simulations have long been known to improve learning, motivation and engagement while reducing costs in fields such as aviation. These benefits now extend to online laboratory simulations, with next-generation gamified Labster virtual laboratories showing the same kinds of improvements (Nature Biotechnology, July 2014) when used along-side or in replace of traditional teaching methods.

While many distance education technologies focus on taking the physical university experience of lectures and textbooks and digitizing them, we show what technology can provide to complement or supplement the physical experience - incorporating 3D-molecular animations, self-paced enquiry-based lab courses, immediate access to fully simulated versions of the latest lab equipment, real-world scenarios, story-telling, and immersive virtual environments. Labster virtual labs are now being used by universities world-wide, including Harvard Extension School, MIT, UC Berkeley, Stanford OHS, and many more.

By leveraging the power of technology, we have created a rich virtual laboratory learning experience that will empower the next generation of scientists around the world.

Keywords: Innovation, flipped classroom, laboratory, simulations, gamification, online learning, ICT, technology

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## **Development of low-cost, open-source measurement equipment for courses dedicated to Embedded Systems**

Roman Beneder (FH Technikum Wien, Austria)

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The competence team Open Lab deals with the development of dedicated lecture notes, demo examples, open source measurement equipment, scripts and other course materials as well as prototype and test environments, in order to provide students low-cost, powerful and open-source measurement equipment. This low-cost measurement equipment enables the student to analyze their applications more time- and location-independent.

Due to the usage of open-source software, and low-cost components and the portability of the developed measurement equipment the university is able to offer the technology to more groups of persons (e.g. low income earners, developing countries, etc.). Furthermore the competence team results (e.g. system software,  $\mu$ C software, PCB design data, etc.) will be published within a project-wiki, which can be accessed by students and interested parties in order to provide a baseline for further development of the components (either software or hardware). Due to the public availability of these project results, the university could establish international collaborations with other universities or to the open-source community.

Finally, due to various accompanying measures (e.g. dissemination of the project results) via different channels or activities in the field of gender- and diversity management within the sponsored period of the project, it is possible to enhance the sensitivity for technology and natural science. Hence, these measures lead to an increase of the amount of students attending the university of applied science.

Keywords: open-source, low-cost measurement equipment, distance learning, embedded systems

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## **The Influence of “Massive Online Open Courses” (MOOCs) on the internationalization process of Higher Education**

Helena Boal, Prof. Luciane Stallivieri (Universidade Federal de Santa Catarina, Brasil)

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The discussion about the internationalization of higher education has grown in importance since 90s. Much more than a trend, globalization and internationalization are realities that affect the economic, social, cultural and educational sectors of all countries. Specially in Brazil, it is more common the offer of bilingual courses in elementary and high schools, preparing children for a new global reality by teaching them to respect and value different cultures and languages. This new scenario instigates reflections and stimulates the debate about the influence and the impact of MOOCs in the internationalization process and it conducts to a question: through the significant expansion of virtual environments, provided by MOOCs, the internationalization process can be accelerated? In order to discuss that, an exploratory research was conducted, by interviewing students from 44 countries enrolled in MOOCs. The result analysis led to the conclusion that MOOCs facilitate the dissemination of knowledge on a large scale and influence the internationalization process. The results also pointed towards the necessity of many actions that still need to be done. More internationalized curriculum, courses offered in languages other than the global language, keep wide diversity and focus on intercultural interaction among students are some of the items that deserve immediate attention.

Full paper available in GUIDE journal “[Digital Universities: International Best Practices and Applications](#)”  
ISSUE 2015/2

**Keywords:** Internationalization, Higher Education, Distance learning, Online Courses, MOOCs

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## **Future of MOOCs – fears and hopes**

*Prof. Krzysztof Gurba (Pontifical University of John Paul II in Krakow, Poland)*

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History of MOOCs, even if quite short, already invokes various adversative visions of their future. For some of the enthusiasts, MOOCs seem to be “the end of history” in modern e-learning. For others, more critical, like for example authors of Porto Declaration from 2014 about the future of MOOCs in Europe, this new wave in distance education should be observed with caution. One can already see a rich set of arguments against and in favor of MOOCs in general and of respective types of MOOCs in particular. Goal of this paper is to present, systematize and discuss these arguments, which express more or less common fears and hopes for further development of MOOCs. Conclusion of the paper will express the theses that MOOCs revolution is still in statu nascendi and there is still room for innovations and improvements, exploiting unquestionable potential of massively open online courses, especially in their connectivistic and self-regulating version.

Keywords : MOOC, e-learning, massive online open course, connectivist self-regulating distance learning

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## **Recognition Management for Promoting and Accelerating the Academic Careers of Professional Learners**

Prof. Dr. Christian-Andreas Schumann (West Saxon University of Zwickau, Germany)

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The challenge for the future of teaching and training is the development of the competence-oriented output of educational processes qualifying learners for professional fields. One of the key aspects for planning and implementing educational models of increasing efficiency and accelerated academic careers is the recognition management. The knowledge and skills acquired by the professionals outside the formal teaching and training in the universities and schools by non-formal procedures have to be included in the processes of learning and should be recognised as part of the course assessments. Thus, the motivation of professional learners to continue their academic career by studies as well as further education will be promoted. The inclusion of the professional and informal absorbed experiences and skills in the course work and assessments will increase the quality and practical relevance as well as accelerate the processes of graduation. Approved models of recognition management of different course offers in the national and international context will be described and evaluated. The future of recognition management as part of the course development will be explained and discussed.

Full paper available in GUIDE journal "[Digital Universities: International Best Practices and Applications](#)"  
ISSUE 2016/1

Keywords: Recognition Management, Acceleration of Professional Careers, Models for Increasing Efficiency, Education for Working Professionals

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## **Personal Learning Environments (PLEs) of Spanish university students: Project CAPPLE**

*Prof. Paz Prendes-Espinosa, Prof. Isabel Gutiérrez (University of Murcia, Spain)*

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The CAPPLE Project is a three years national funding project (2013-2016. project reference EDU2012-33256) that is centered on the exploration and understanding of the Personal Learning Environments (PLEs) of the future professionals of Spain, or what we believe is the same, the last year university students. The project includes the analysis of these PLEs in technical, functional and graphical terms, and for this purpose, the project is using a mixed methodological approach in which is going to apply a variety of research methods (expert discussions, survey, workshops, diagram analysis, and so on) in order to provide a strong research perspective that could guarantee the more solid research as possible.

In this paper we present, the project itself, the entire methodology planned and the results of the first part of the project where we have developed the theoretical model that supports it, the first draft of questionnaire that is going to be used for collecting the data and the validation of this questionnaire that includes a panel of experts, cognitive interviews with students from universities all over Spain and a piloting that has been done with a sample of 400 students from all the knowledge areas (Sciences, Social Sciences and law, Engineering and Architecture, Health Sciences and Humanities and Arts), from 8 universities around the country.

Keywords : PLE, university, students, research



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## **A Perception of Task Complexity by Teachers and Students**

*Prof. Christian Kollmitzer (University of Applied Sciences Technikum Wien, Austria)*

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Learning Tasks are elementary parts of learning and teaching processes. Especially in technical and natural science subjects students and teachers spend most of the learning and teaching time on designing, solving and correcting tasks. The optimal learning success is achieved with tasks whose degree of complexity correspond to the learners abilities. These tasks should be slightly more complex than the current state of knowledge of the students. This study provides suggestions to define and adjust the complexity of learning tasks. Students have been filmed during the task solving process and the analysis of these observations should help to detect the complexity of tasks. Teachers are able to test their tasks for different criteria such as the complexity for students, the number of breaks and the types of learning activities.

It turns out, that the duration of the task processing is a good indication for the complexity of a task. The teacher should not only rely on the assumption for the task complexity but observe the task processing time of various students to get a profound insight of the task complexity for the relevant group. The comparison between the actual task processing time and the assumed complexity, often represented by the weighting of the individual task in an assessment, gives a good overview of tasks in relation to each other and of tasks in comparable subjects.

Keywords : task complexity, video study, students didactics

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## **Certificates – Benefits for Students, Companies and Universities**

*Prof. Robert Pucher (University of Applied Sciences Technikum Wien, Austria)*

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During the last years the number of job vacancies in computer science in Austria and Germany is constantly increasing. In Germany the estimated number presently is around 41000 vacant jobs (November 2014) [1]. As a result of that situation, companies start seeking employees among computer science students who did not finish their study yet.

In many cases companies in the wide field of information technology value certificates a lot. Certificates are a way to ensure, applicants for a job share a common knowledge, are able to understand and use standardized expression when communication and thus it is more likely that holders of the same certificate are able to work together in very efficient way. Many areas of expertise exist where certificates proved to be valuable (see table 1 as example in Software Engineering).

Scheme Owner	Area of Expertise	Name of Certificate
ISTBQ	Software Test	Certified Tester
IBUQ	Usability and User Experience	Certified Professional for Usability and User Experience
UXQB	Usability and User Experience	CPUX
IREB	Requirements Engineering	CPRE
REQB	Requirements Engineering	REQB
iSAQB	Software Architecture	CPSQ
OMG	UML	OCUP2

Many benefits for students, companies and universities can be assumed, if certifications exams can be acquired during or beside a study program. Universities have an additional way to show their curricula in computer science meet the requirements of the industry. Students gain higher value in the labour market. Companies know applicants for a job share a common knowledge with holders of the same certificate.

Keyword: Certificates



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## **eLearning – Organisational Diversity or Standardized Approach?**

*Andreas Hörfurter (Common Sense Elearning & Training Consultants, Austria)*

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Many universities and other training/education-related organisations have been using eLearning for a number of years now. Very often there is a wide range of experiences and approaches within these institutions. Different units of the same organisation are using eLearning in very different ways and formats. There is mostly no organisation-wide approach or standard when it comes to eLearning. Streamlining the eLearning and blended learning activities is a sensitive issue, due to different needs and demands of organisational units and their perceived autonomy. This presentation is discussing a re-organisation process which has been developed for and with an academic educational institution in Austria. This process aims at the development of joint standards and a modular template system which allows for the necessary diversity and freedom of eLearning activities at one hand, but on the other hand streamlines these activities and supports efficient center-wide eLearning standards.

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Keywords: eLearning, strategy, implementation, standardization, quality



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## **Paradigm Shift to Contemporary Education: Reframing Outcomes to Online Learning**

Dr. Neysa Hatcher (University of Phoenix, USA)

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Diverse pedagogical methods of on-line learning approaches have justified sustainable online learning outcomes in the 21st Century learning environment. Past studies have found the obligatory approach needed for viable online learning experiences does not exist. Standard teaching epistemologies could not meet a heterogeneous learning community of learners because it was assumed this type of learning platform suppressed student's problem-solving skills in future viable real-life practitioner settings.

This research examined the perceptions of effective online learning methodologies and how this approach influenced sustainable learning. A panoramic study of the concepts associated with online learning platforms was explored. This study tested a set of hypotheses related to the interactive influences of three paradigms associated with sustainable online learning: technological influences and age, method of curriculum delivery and learning styles, and societal impacts.

The findings point out to the importance of online learning experiences associated with sustainable learning. In addition, a solid educational foundation was discovered among the students but it was not the determining constituent associated with sustainable online learning. This study found the need for a paradigm shift for those who believe that on-line learning is an easier way to obtain a degree.

Keywords: Online Education, Sustainable Learning, Higher Education



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## **Optimizing Higher Education for the Professional Student – The Example of Computer Science Education at the University of Applied Sciences Technikum Wien**

*G. Holweg, Th. Mandl and B. Salzbrunn, R. Pucher (University of Applied Sciences Technikum Wien, Austria)*

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During the last years the number of job vacancies in computer science in Austria and Germany is constantly increasing. In Germany the estimated number presently is around 41000 vacant jobs (November 2014). As a result of that situation, companies start seeking employees among computer science students, thus creating a pressure on students to start to work with companies while they are still studying.

At the same time many companies say, they need computer science education to be oriented more on practical needs instead of theoretical knowledge. This fact is well known in computer science education. Students who are perfect in answering theoretical questions in an exam not necessarily are able to apply the knowledge in real world projects. In many cases this is the reason why students from traditional programs in computer science show a rather poor performance when starting to work.

At the University of Applied Sciences Technikum Wien the authors developed a concept for the bachelor's degree in computer science and for the master's degree in software engineering to combine theoretical knowledge with application of that knowledge in real world projects. Furthermore the programs are optimized for students who just finished high school and guide them smoothly into full time work in the last semester of their study.

The most important features include:

- Bachelor's program in computer science
  - The first contact to real world problems is made early in the study, usually in the third semester, in selected cases even in the first semester.
  - BYOD (bring your own device) and mobile teaching. Most projects are realized using the own lap top computer or own mobile device of the student. This saves costs for the university and adds flexibility.
  - Carefully selection of allowed projects. A match has to be done between company needs and educational needs. This issue proved to be crucial for the success of the projects.
  - The study program computer science is a traditional face to face program, but includes elements of distant education in series of lessons to allow students to transform theoretical knowledge into practical skills.
  
- Master's program in software engineering
  - The master's program software engineering is especially designed for students who work beside their studies.



- In the master's program much care is taken to help students to gain theoretical knowledge needed for their practical work, but also to teach specific subjects in a project based learning environment.

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Keywords: computer science, BYOD, distant education



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## **Collaborative Problem Based Learning in Distance Education**

*Manfred Mühlfelder (SRH Mobile University Riedlingen, Germany)*

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Since the early 1970s, collaborative Problem based Learning (PBL) in small groups is a prominent and innovative didactic approach with multiple facets, good practices and demonstrated effectiveness in many countries, for many different subjects, and in various learning settings in primary schools, secondary and higher (tertiary) education). However, this concept is not so much perceived in distance learning programmes even though new technologies allow for real-time collaboration in virtual classrooms and workspaces. One reason for this might be the lack of conceptual frameworks and appropriate models for PBL in distance education. In this presentation, one prominent concept for designing PBL learning settings will be presented and its application in practice discussed: The 3C3R-Model of Hung (2006) defines a framework for the elements "Content", "Context" and "Connection" (3C), which are interlinked through learner activities such as "Researching", "Reasoning" and "Reflecting".

Practical implications and examples for the design of appropriate distance learning designs based on this model will be presented and discussed with the audience. (Source: Hung, W. (2006). The 3C3R Model: A Conceptual Framework for Designing Problems in PBL. *Interdisciplinary Journal of Problem-based Learning*, 1 (1), Available at: <http://dx.doi.org/10.7771/1541-5015.1006>

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**Keywords:** Problem based learning (PBL), 3C3R model, collaborative learning, distance learning methods, instructional designs, theory-practice transfer

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## **The I.C.E. model for job-place connection and International transferability of MingDao University in Taiwan**

*Prof. Da-Yung Wang (MingDao University, Taiwan)*

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Abstract There is a greater concern regarding the true value of university education in the every-changing world. The conventional education that requires students to spare entire 4 years in the classroom for the bachelor or higher degree is just not convincing for regular students, let alone those vast numbers of professional students who need to upgrade their knowledge level for work at a higher frequency these days. In addition to the non-conventional university education through distance learning, where education is delivered in-time and on-demand to fit the students' need, here at MingDao University, Taiwan, we take additional approach to better interpret what the modern practical education can be, how the faculty can improve their quality of teaching, and how to attract students back to the academia they need. The model of approach is the integration among Internship, Curriculum, and Entrepreneurship. This ICE model takes advantage of the well-trained interns from the program, research and development endeavor from faculties, and the coordination of these two valuable assets to fuel the entrepreneurship within the university. In return, through the participation of faculties in the ICE model, a valuable gain in curriculum improvement can be achieved. The excellence in education can only be reached through the excellence in teaching, which relies on ever-improvement of teachers. A case study of a practical learning and teaching through the ICE model during 2011-15 in China provided by MingDao University, Taiwan will be presented for reference.

Keywords: internship, entrepreneurship, incubation, curriculum

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## **Collaborative Online Learning: Experiences from the VocTEL Project**

*Prof. Alex Bell, Prof. Louise Emanuel (University of Wales Trinity Saint David, UK)*

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VocTEL (Vocational Technology Enhanced Learning) is a Lifelong Learning Programme Leonardo da Vinci Transfer of Innovation project, which aims to promote key competences in delivering vocational technology, enhanced collaborative learning throughout Europe. Within the project, which involves participants from Wales, Bulgaria, Greece and Cyprus, Higher Education Universities have been working with the vocational training industry to develop a Masters in Technology Enhanced Learning (TEL) for the vocational training industry.

This paper looks at results from the delivery of this course and in particular attempts in the learning design to build a collaborative online learning space. Wenger (1999) describes a community of practice as groups of people who have a common concern, a passion for something they do every day. He places learning in the context of participating in our lived experiences and knowing as a display of competencies of practice within the professional community in which we co-exist. In this situation, knowledge or content in a course context goes beyond existing cultural representations from the community of practice and instead collaboratively interrogates the past with the present through learners' professional contexts, their every day. McConnell (2000) suggests that learners have a considerable amount to bring to their formal learning.

We report here on the learners' experiences of engaging with each other online and their experiences of becoming a learning community of practice. Empirical evidence provides significant insights that inform our discussion.

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**Keywords:** Innovation, Learning, Technology, VocTEL, European Project

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## **Continuing Education for the Public Sector Through Massive Open Online Courses (MOOCs)**

*Prof. Juvy Lizette Gervacio (University of the Philippines Open University, Philippines)*

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The growth in the use of Information and Communication Technology (ICT) has led to the development of online courses, and consequently the use of Massive Open Online Courses (MOOCs) in continuing education. MOOCs provide access to education because it's free and/or almost free and designed to be interactive so as to engage each participant in every activity.

Online learning is not only important in upgrading the skills of the workforce but also in making them more innovative in delivering public services. Given the flexibility of e-learning and availability of online resources, public servants, in particular, can study at their own pace and time and are able to deliver more efficient and effective public service.

This paper is a descriptive study and aims to present the importance of MOOCs in continuing education for the public sector. Specifically, it will discuss the design of the course and the implementation strategy. Moreover, it will also present the assessment of the participants on the MOOCs. Finally, the paper will also discuss the issues on sustainability as well as opportunities of MOOCs for the public sector.

Keywords: Continuing Education through Online Learning; MOOCs for the Public Sector

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## **UX Professionals - skills, expertise and experience**

*Prof. Benedikt Salzbrunn (University of Applied Sciences Technikum Wien, Austria)*

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How to become a UX professional? Which educational background, skills, expertise and experiences are necessary? The talk is based on these two vital questions regarding User Experience, Usability and User Centered Design Education. Best practice approaches are being discussed and several examples presented.

Keywords: UX, Usability, User Experience, Education



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## **Carbon Footprint Lab: a didactical tool for the assessment of the environmental sustainability of a food product**

*Prof. Lucia Recchia (Università degli Studi Guglielmo Marconi, Italy)*

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The present work aims to explain how it is possible to teach a specific operative approach for evaluating the carbon footprint of a food product. The students of the Agronomist degree deal with the environmental sustainability in different courses with various approaches and suggested methodologies. Therefore, this lab can be considered like a multidisciplinary tool leading the assessment of the impacts due to the extra-virgin olive oil from different points of view. For this reason the students have to use the knowledge acquired in different courses: they have to apply the theoretical concepts of soil and fertilisation management, field mechanisation, olive oil extraction, etc. Moreover, the lab was elaborated starting from a simplified tool able to support the technicians working in the olive groves and mills for a preliminary environmental self-assessment. Therefore, a small producer company is presented asking the students to perform the role of a technician and/or an external consultant which should analyse the production chain and verify if alternative scenarios can decrease the carbon footprint of the oil assuring however a certain economic sustainability. The lab includes a specific section with a video presentation, some slides and a references' list for supporting the learning process of the students and highlighting the current relevance of the treated topics for the food sector.

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**Keywords:** Virtual lab, operative calculation tool, carbon footprint, food products sustainability

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## **The PSSC didactic movies, some "old friends" revisited through modern teaching technologies**

*Prof. Matteo Martini, Prof. Fontana Fabrizio (Università degli Studi Guglielmo Marconi, Italy)*

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The physics films made under the auspices of the Physical Science Study Committee (PSSC) are still considered landmarks in the genre of the classroom science academic documentary. During a period ranging from 1958 up to 1970 roughly 64 films on a large variety of topics on basic physics were prepared bearing a strict rigor, a firm approach to the scientific method and the amazement for the scientific discovery. Therefore, despite time gone, they can still activate academic students attention for a real physics laboratory and to the activities therein done, being still useful for the didactic of basic physics. Obviously, they deserve some special attention and a heavy post-production work to make them suitable to the expectations and sensitiveness of contemporary students. We propose here an example of rebuild of one of the original movie (on harmonic motion) that is used to create a virtual laboratory completely realized in Green Screen. This product has been also enriched with additional contents and exercises exploiting the potentialities of the interactive environment to make students active parts in their own learning process.

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**Keywords:** innovation methodology, virtual lab of Physics, e-learning, old highlights revisited/restored, interactive activities

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## **Blended Learning In Action: Up-To-Date Teaching Mathematics**

*Prof. Nataliya Losyeva, Dr. Daria Termenzhy (Donetsk National University, Ukraine)*

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Blended learning is becoming a rather popular term nowadays. It is part of the ongoing convergence of two archetypal learning environments. On the one hand, we have the traditional face-to-face learning environment that has been around for centuries. On the other hand, we have distributed learning environments that have begun to grow and expand in exponential ways as informational technologies have afforded the possibilities for distributed communication and interaction. The goal of blended learning is to provide the most efficient and effective instruction experience by combining delivery modalities.

The features of up-to-date teaching mathematics in Donetsk National University (Ukraine) will be considered in the paper. To implement the ideas of blended learning we have designed the educational interactive Analytical Geometry Portal ([agportal.org.ua](http://agportal.org.ua)) for teaching of pre-service mathematicians. It was built on the basis of requirements for online courses offered at Stanford University and includes schedule, curriculum, e-lectures, slide lectures (programmed in Notebook for SmartBoard), recommended books, online quizzes module, online consultation module, library of scientific student projects.

More detail of our experience of implementing the ideas of blended learning in math teaching will be covered in the paper.

Keywords: blended learning, teaching mathematics, face-to-face learning, distance learning, educational interactive portal, pre-service mathematicians



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## **Strategies and Tips for Effective Teaching for the 21st Century Learner**

*Prof. Veronika Ospina-Kammerer, Prof. Theodora Christine Gordon (Saint Leo University, USA)*

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Problem based learning (PBL) is relatively new in the realm of learning. Textbooks and lectures are often barriers to learning for many students. Critical thinking is the benchmark in determining the success of teaching techniques in a course. The “Table Of Contents” structures student learning. An experimental study, a trilogy of articles was designed to test for (no) preferences of student course aids with respect to critical thinking, learning and assessment. The aids included the text, lectures, subject handouts, specific end of course paper table of contents, and sample (rubric) paper. A survey questionnaire was administered to cohort groups of business/health care undergraduate and graduate students. The course delivery format was on the ground for under graduate and on line/computer for graduate students. The text book was definitely considered an outlier. The Chi Square Goodness of Fit test results suggested there is a significant difference in student learning aid preferences/assessments at alpha a priori.

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**Keywords:** Problem based learning, critical thinking, table of contents, service learning, strategies of effective teaching, higher education, cultural sensitivity

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## **“Learning 4.0” - Virtual immersive engineering education**

*Prof. Anja Richert (RWTH Aachen University, Germany)*

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The 21st Century is driven by the enrolment of the industry 4.0 to a society 4.0. Moreover the concept of being digitally connected in human-machine-networks is more and more spread over the entire society. Smart Cities, eGovernment and quantified-self movements are only some of the key phrases. The vision of “industry 4.0” is characterized by highly individualized and at the same time cross-linked production processes. Physical reality and virtuality increasingly melt together and international teams collaborate across the globe within immersive virtual environments. In the context of the development from purely document based management systems to complex virtual learning environments (VLEs), a shift towards more interactive and collaborative components within higher educational e-learning can be noticed, but is still far from being called the state of the art.

Those environments bear a huge potential to support the student lifecycle by situated learning, problem based learning and immersion as a key resource for high transfer achievements of developed knowledge and skills. The paper focusses on the potential of VLE for engineering education and reports about three different studies, designed and conducted to increase the success of engineering education.

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Keywords: industry 4.0, society 4.0, immersion, flow, natural user interfaces, situated learning, problem-based learning, engineering education, massive open online labs

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## **Preferred Learning Environment, Level of Engagement and Academic Performance of Professional Students**

*Prof. Sheila Bonito* (University of the Philippines Open University, Philippines)

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The University of the Philippines Open University offers an online master's program in nursing making quality education available, accessible, and affordable to professional nurses from different countries. Many of these professional nurses work in hospital settings where work shifts and a demanding work load are common. They also carry with them a lot of experience in the field. It is important to meet the learning needs of professional students who balance pursuit of higher education and work. It also emphasizes the importance of social constructivism underpinning the teaching-learning experience.

This study describes the preferred learning environment of these professional students and their level of participation in various activities that use new tools and technologies to improve the online learning experience. The study also explores the correlations between socio-demographic profile, preferred online learning environment, level of engagement and academic performance of professional students.

In the beginning of the course, students (n=232) enrolled in a course were asked to answer a survey on preferred learning environment using the Constructivist Online Learning Environment Survey. This survey is based on social constructivism which emphasizes the learner as an active conceptualizer within a socially interactive learning environment and focuses on learners collaborating reflectively to co-construct new understanding, especially in the context of mutual inquiry grounded in their personal experience (COLLES, 2000). At the end of the course, the students' level of engagement in various activities were measured using the built-in analytics found in MOODLE (2015). This includes participation in assessment activities and discussion forums reflecting communicative competence. Correlations were then determined between preferred online learning environment, level of engagement and academic performance. Factors such as age, sex, civil status, location and work status were also determined if they affect level of engagement and academic performance.

Around 89% of enrolled students participated in the study. In a scale of 1-5 (with 5 as highest), professional students preferred online learning experience that are: relevant (4.67); reflective (4.39); interactive (3.68); with tutor support (4.41); with peer support (3.75); and with good interpretation of messages (4.16). This means that professional students put highest value on relevance of the course and lowest value on interactivity. It also appeared that they value tutor support more than peer support. Professional students were shown with following levels of engagement: assessment activity (62%) and forum activity (70%). Academic performance based on final grades was mostly high (36%) to average (60%).

No significant correlations were found between preferred online learning environment dimensions and engagement in forums and assessment activities. However, there were significant correlations between tutor support and academic performance ( $p = 0.04$ ) and peer support with academic performance (0.03). No significant associations were found between age, sex, civil status, location and work status with level of engagement and academic performance.



This study concludes that professional students put more value on relevance of courses, tutor support and reflective learning. Tutor support and peer support were also found to be significantly correlated with academic performance. There is a need to consider these aspects when designing learning activities to ensure better academic performance.

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Keywords: professional students, learning environment, level of engagement, academic performance

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## **Motivation and learning modes: towards an automatic intelligent evaluation of learner motivation**

Douadi Bourouaieh (Universite 8 Mai 1945 Guelma, Algeria)

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This paper presents an experimental learning environment to analyze research questions related to learner's motivation. Three learning modes are available for the learner's; all of them are about the same topic: designing entity-relationship data models. The first learning mode is a hypermedia, the second a set of navigable learning videos with an annotated timeline, and the third one is a graphical design environment offering a range of social activities including assessment of peers' solutions. Our goal is to study the motivational aspects that come into play in different learning modes to design an intelligent system for automatic evaluation of the learner motivation. We are currently exploring the HMM (Hidden Markov Models) from artificial intelligence techniques.

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**Keywords:** e-learning; motivation; social learning; artificial intelligence; HMM

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## **To an Education without distances**

*David Maria Mercedes Quevedo Fernandez (Universidad Nacional de Santiago del Estero, Argentina)*

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The National University of Santiago del Estero (Argentina Republic), public and independent, has a distance program, with the following majors: Bachelor of Elementary Education, Bachelor in Pre-school education, Bachelor in Educational Management and Educational Management Analyst. These careers emerged at a time as a highly innovative proposal intending to become a valid option be disregarded because it fulfills one of the purposes of distance education, which is a system accessible to a larger population. Apart from that the issue also came to meet a specific need of the population of teachers, it was the need for specific training. The mode of implementation of degree courses have the blended nature.

The character of blended learning has been modified to the extent that they were changing the underlying pedagogical models. In this last stage it is working hard to ensure that all activities carried out in the virtual classroom, can allow interactivity, communication, implementation and construction of knowledge, assessment and classroom management. Apart from this, it has initiated a program training aimed at optimizing the management of the virtual classroom, in pursuit of it a support for class attendance. And especially considering the student-centered education.

The role of teachers is a crucial point. The transformation was necessary since teachers that we promote at the School for Innovation, must be promotor of significant learning, knowledge builder and mediator in situations with pedagogical intention.

Prieto Castillo (2010) conceptualizes the role of teachers as an educational adviser, referring primarily as the one responsible for opening a space for dialogue and reflection that enable the construction of knowledge. His intention is to advance the construction of this role, so that the teacher is a true guide and learning mediator. The teacher must be prepared not only with regard to content, but also be competent in relation to communication and technology skills. In this way we are referring to more skills that teachers must be prepared to respond to. This model is a student-centered learning. The teacher uses and promotes the trial and error as a source of learning, encouraging learner autonomy, and being able to track the processes of teaching and learning, communication problems or difficulties.

The underlying concept of learning has to do with collaborative learning, because in this way not only the intergroup work will be encouraged, but also the individual.

It was also necessary to review how all these changes impacted on the construction of virtual classrooms, to really be learning spaces.

The program to strengthen the teaching role, seeking to quality education has promoted significant changes in the use of the virtual classroom, the teacher's role and strategies addressed by them, becoming true virtual learning communities, and the role of students have greater access to learning resources, they can control



them actively manipulate the information and turn it into knowledge to be applied in different situations. This paper will address how the changes were giving different levels of work and achievements so far.

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Keywords: Distance education, Teachers, specific training, blended-learning, pedagogical models, virtual classroom, student-centered education, transformation-significant learning, knowledge builder, mediator, guide-skills, student-centered learning, learning spaces, strategies, learning resources, information

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## **Technical School Board Impact On Collaborative Workspaces**

*Prof. Flores Talavera María de Carmen Gabriela* (Benemérita y Centenaria Escuela Normal de Jalisco, Mexico)

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This is a research of the Collaborative work during the TSB (Technical School Board). The aim is to describe the Teachers' Professional Development features in the Institutionalized TSB dynamic. It presents substantive elements for the TSB construction for the purpose to achieve the Teachers Professional development as: the conceptual definition, the features and the professional skills, the functions they perform, etc. The methodology used in it, it is qualitative with the "case study method" to the description of the attributes, performance and analytical categories of teachers in the school context. It contributes to look for options of improving education through the description of the performance, dynamics and operation of the TSB and the value of their impact on the teacher's professional development. The approach of the TSB is linked by the educational actors. It focuses on how the perspective is established by the education's authorities and how it has been translated and is structured into the daily life of the school community.

Keywords: School Board, Professional Development, Collaborative Workspaces, Professional Skills

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## **Individual hardware and tasks for better learning outcome**

Prof. Matthias Wenzl (UAS Technikum Wien, Austria)

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A primary objective when designing embedded systems (ES) curricula for professional students is to provide one development board for every student which can be used anywhere at any time throughout the semester.

The development of numerous cost effective embedded systems development boards in recent years, like Arduino, Raspberry Pi and the Launchpad series make this objective rather easy as they provide almost all necessary components to develop embedded software on a single development board. However, their advantage in price is opposed by a very limited amount of accessible peripheral devices which are a key component in the development of embedded systems. Even more unfortunate is the missing debug capability - while debugging is an essential aspect in ES education.

In this talk we will present a lecture design dealing with this issue by providing a large base of peripheral devices with a unified hardware interface to provide students with:

- the ability to choose the peripheral device they are most interested in
- the ability to offer a unique project for every student.

Furthermore, as every peripheral device is able to represent a self-contained assignment we are able to focus on group work related issues often appearing when software development is done in teams. This includes lack of specification, documentation and bad interface design for example. Moreover, we will present an evaluation of three distinct bachelor degree programs at the UAS Technikum Wien, where variations of the lecture design were held for the first time this year.

Keywords : embedded systems, microcontroller, debugging, distance learning, peripherals, unique tasks

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## **The implementation of ePortfolios in higher education**

*Prof. Daniela Waller (Technikum Wien, Austria)*

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The presentation of the progress of students learning paths is especially important in Distance Studies where students are not physically present on campus. The ePortfolio gives us the possibility to support and present the students learning lifecycle and to evaluate not only the created products of students, but also to support them during their learning processes.

This presentation will give you an introduction to the didactic Portfolio method, to different Portfolio types and to show you how an ePortfolio can be set up. Furthermore some best practices from a Distance Study Degree Program will show how an ePortfolio can be applied in eCourses to support Distance Students during their learning process and to show their learning outcomes after the successful completion of eCourses.

Keywords: ePortfolio, Portfolio, Distance Study, eCourse, learning path

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