Chinese universities are striving to integrate new educational elements such as student-centered learning, group learning, active learning, and learning by doing into current traditional curriculum systems for creativity development among young generations. However, the concept of creativity by its very nature is a complex term of many perspectives. It is necessary to clarify what creativity is, how creativity can be fostered in learning environments, and what universities should do in order to foster creative young talents. Introducing Problem-Based Learning (PBL) for Creativity and Innovation in Chinese Universities: Emerging Research and Opportunities is a critical scholarly resource that provides a multidimensional understanding on both challenges and opportunities of fostering creativity and PBL in Chinese universities and particularly discusses this implementation in a Chinese cultural context. Though related to a Chinese cultural context, the book can inspire other universities in other cultures, particularly in Asian areas, to learn why PBL is a potential strategy for creativity development and to rethink how to facilitate the innovation capability of universities in the future. Featuring a wide range of topics such as course design, educational technology, and curriculum development, this book is ideal for education professionals, academicians, teaching professors, researchers, administrators, and students.

The latest edition of the Educational Media and Technology Yearbook, from the Association for Education, Communication and Technology (AECT), notes the most current trends in the field of learning design and technology, taking into account the implications for both formal and informal learning. Pivotal research and discussion surrounding educational trends, leadership, organizations and programs have all been updated from volume 37. Chapters train their focus on graduate and professional goals, including an analysis of doctoral programs in educational technology and new collaborative learning platforms. Library science is a featured component of this analysis and Library Science programs are featured prominently in this analysis. This edition also features new content on mediagraphy.

This inclusive cross-cultural study rethinks the nexus between engineering education and context. In so doing the book offers a reflection on contextual boundaries with an overall boundary crossing ambition and juxtaposes important cases of critical participation within engineering education with sophisticated scholarly reflection on both opportunities and discontents. Whether and in what way engineering education is or ought to be contextualized or de-contextualized is an object of heated debate among engineering educators. The uniqueness of this study is that this debate is given comprehensive coverage – presenting both instrumentally inclined as well as radical positions on transforming engineering education. In contextualizing engineering education, this book offers diverse commentary from a range of disciplinary, meta- and interdisciplinary perspectives on how cultural, professional, institutional and educational systems contexts shape histories, structural dynamics, ideologies and challenges as well as new pathways in engineering education. Topics addressed include examining engineering education in countries ranging from India to America, to racial and gender equity in engineering education and incorporating social awareness into the area. Using context as “bridge” this book confronts engineering education head on. Contending engineering ideologies and corresponding views on context are juxtaposed with contending discourses of reform. The uniqueness of the book is that it brings together scholars from the humanities, the social sciences and engineering from Europe – both East and West – with the United States, China, Brazil, India and Australia.

Rapid advances in computer technology and the internet have created new opportunities for delivering instruction and revolutionizing the learning environment. This development has been
accelerated by the significant reduction in cost of the Internet infrastructure and the easy accessibility of the World Wide Web. This book evaluates the usefulness of advanced learning systems in delivering instructions in a virtual academic environment for different engineering sectors. It aims at providing a deep probe into the most relevant issues in engineering education and digital learning and offers a survey of how digital engineering education has developed, where it stands now, how research in this area has progressed, and what the prospects are for the future. This book examines how business, the social sciences, science and technology will impact the future of ASEAN. Following the ASEAN VISION 2020, it analyses the issues faced by ASEAN countries, which are diverse, while also positioning ASEAN as a competitive entity through partnerships. On the 30th anniversary of ASEAN, all ASEAN leaders agreed to the establishment of the ASEAN VISION 2020, which delineates the formation of a peaceful, stable and dynamically developed region while maintaining a community of caring societies in Malaysia, Indonesia, Singapore, Brunei, Vietnam, Thailand, the Philippines, Myanmar, Laos and Cambodia. In keeping with this aspiration, Universiti Teknologi MARA (UiTM) Perlis took the initial steps to organise conferences and activities that highlight the role of the ASEAN region. The Second International Conference on the Future of ASEAN (ICoFA) 2017 was organised by the Office of Academic Affairs, Universiti Teknologi MARA Perlis, to promote more comprehensive integration among ASEAN members. This book, divided into two volumes, offers a useful guide for all those engaged in research on business, the social sciences, science and technology. It will also benefit researchers worldwide who want to gain more knowledge about ASEAN countries.

Engineering education methods and standards are important features of engineering programs that should be carefully designed both to provide students and stakeholders with valuable, active, integrated learning experiences, and to provide a vehicle for assessing program outcomes. With the driving force of the globalization of the engineering profession, standards should be developed for mutual recognition of engineering education across the world, but it is proving difficult to achieve. The Handbook of Research on Engineering Education in a Global Context provides innovative insights into the importance of quality training and preparation for engineering students. It explores the common and current problems encountered in areas such as quality and standards, management information systems, innovation and enhanced learning technologies in education, as well as the challenges of employability, entrepreneurship, and diversity. This publication is vital reference source for science and engineering educators, engineering professionals, and educational administrators interested in topics centered on the education of students in the field of engineering.

The Cambridge Handbook of Engineering Education Research is the critical reference source for the growing field of engineering education research, featuring the work of world luminaries writing to define and inform this emerging field. The Handbook draws extensively on contemporary research in the learning sciences, examining how technology affects learners and learning environments, and the role of social context in learning. Since a landmark issue of the Journal of Engineering Education (2005), in which senior scholars argued for a stronger theoretical and empirically driven agenda, engineering education has quickly emerged as a research-driven field increasing in both theoretical and empirical work drawing on many social science disciplines, disciplinary engineering knowledge, and computing. The Handbook is based on the research agenda from a series of interdisciplinary colloquia funded by the US National Science Foundation and published in the Journal of Engineering Education in October 2006.

The engineering profession is at a critical juncture that requires reforming engineering education. The supply of engineers is declining whereas the nature of the demand is changing. Formulating a response to these challenges demands the adoption of new and innovative tools
and methods for promoting the expansion of the community while supporting these evolving requirements. Initiatives to entice and retain students are being employed to support growth objectives. Modern technologies are reshaping reform efforts. This book discusses the state of affairs in the field of engineering education and presents practical steps for addressing the challenges in order to march toward a brighter future. Features Covers the latest state of engineering education in the North America, Europe, Middle East, North Africa, and Far East Asia Discusses advances in science, technology, engineering, and mathematics and community engagement Outlines applications of digital technologies to enhance learning Provides advances in remote and online instructions for engineering education Presents discussions on innovation, leadership, and ethics

Problem-Based Learning (PBL) and Project-Based Learning are teaching methods based on principles of student-centred learning, which target an interdisciplinary engineering curriculum. The transition from strictly traditional approaches in engineering education represents significant opportunities for change.

This book provides a collection of the latest advances in engineering education in the Middle East and North Africa (MENA) region and sheds insights for future development. It is one of the first books to address the lack of comprehensive literature on undergraduate engineering curricula, and stimulates intellectual and critical discourse on the next wave of engineering innovation and education in the MENA region. The authors look at recent innovations through the lens of four topics: learning and teaching, curriculum development, assessment and accreditation, and challenges and sustainability. They also include analyses of pedagogical innovations, models for transforming engineering education, and methods for using technological innovations to enhance active learning. Engineering education topics on issues such as construction, health and safety, urban design, and environmental engineering in the context of the MENA region are covered in further detail. The book concludes with practical recommendations for implementations in engineering education. This is an ideal book for engineering education academics, engineering curriculum developers and accreditation specialists, and deans and leaders in engineering education.

More than ever, our time is characterised by rapid changes in the organisation and the production of knowledge. This movement is deeply rooted in the evolution of the scientific endeavour, as well as in the transformation of the political, economic and cultural organisation of society. In other words, the production of scientific knowledge is changing both with regard to the internal development of science and technology, and with regard to the function and role science and technology fulfill in society. This general social context in which universities and knowledge production are placed has been given different names: the informational society, the knowledge society, the learning society, the post-industrial society, the risk society, or even the post-modern society. A common feature of different characterisations of this historic time is the fact that it is a period in construction. Parts of the world, not only of the First World but also chunks of the Developing World, are involved in these transformations. There is a movement from former social, political and cultural forms of organisation which impact knowledge production into new forms. These forms drive us into forms of organisation that are unknown and that, for their very same complexity, do not show a clear ending stage. Somehow the utopias that guided the ideas of development and progress in the past are not present anymore, and therefore the transitions in the knowledge society generate a new uncertain world. We find ourselves and our universities to be in a
transitional period in time. In this context, it is difficult to avoid considering seriously the challenges that such a complex and uncertain social configuration poses to scientific knowledge, to universities and especially to education in mathematics and science. It is clear that the transformation of knowledge outside universities has implied a change in the routes that research in mathematics, science and technology has taken in the last decades. It is also clear that in different parts of the world these changes have happened at different points in time. While universities in the "New World" (the American Continent, Africa, Asia and Oceania) have accommodated their operation to the challenges of the construction in the new world, in many European countries universities with a longer existence and tradition have moved more slowly into this time of transformation and have been responding at a less rapid pace to environmental challenges. The process of tuning universities, together with their forms of knowledge production and their provision of education in science and mathematics, with the demands of the informational society has been a complex process, as complex as the general transformation undergoing in society. Therefore an understanding of the current transitions in science and mathematics education has to consider different dimensions involved in such a change. Traditionally, educational studies in mathematics and science education have looked at changes in education from within the scientific disciplines and in the closed context of the classroom. Although educational change in the very end is implemented in everyday teaching and learning situations, other parallel dimensions influencing these situations cannot be forgotten. An understanding of the actual potentialities and limitations of educational transformations are highly dependent on the network of educational, cultural, administrative and ideological views and practices that permeate and constitute science and mathematics education in universities today. This book contributes to understanding some of the multiple aspects and dimensions of the transition of science and mathematics education in the current informational society. Such an understanding is necessary for finding possibilities to improve science and mathematics education in universities all around the world. Such a broad approach to the transitions happening in these fields has not been addressed yet by existing books in the market.

International Handbook of Inquiry and Learning is an overview of scholarship related to learning through and engagement in inquiry. Education takes on complex dimensions when learners solve problems, draw conclusions, and create meaning not through memorization or recall but instead through active cognitive, affective, and experiential processes. Drawing from educational psychology and the learning sciences while encompassing key subdisciplines, this rigorous, globally attentive collection offers new insights into what makes learning through inquiry both possible in context and beneficial to outcomes. Supported by foundational theories, key definitions, and empirical evidence, the book’s special focus on effective environments and motivational goals, equity and epistemic agency among learners, and support of teachers sets powerful, multifaceted new research directions in this rich area of study.

While the PSE community continues its focus on understanding, synthesizing, modeling, designing, simulating, analyzing, diagnosing, operating, controlling, managing, and optimizing a host of chemical and related industries using the systems approach, the boundaries of PSE research have expanded considerably over the years. While early PSE research was largely concerned with individual units and plants, the
current research spans wide ranges of scales in size (molecules to processing units to plants to global multinational enterprises to global supply chain networks; biological cells to ecological webs) and time (instantaneous molecular interactions to months of plant operation to years of strategic planning). The changes and challenges brought about by increasing globalization and the common global issues of energy, sustainability, and environment provide the motivation for the theme of PSE2012: Process Systems Engineering and Decision Support for the Flat World. Each theme includes an invited chapter based on the plenary presentation by an eminent academic or industrial researcher. Reports on the state-of-the-art advances in the various fields of process systems engineering addresses common global problems and the research being done to solve them.

This book introduces recent global advances and innovations in industry integrated engineering and computing education to academics, program managers, department heads, and deans, and shares with readers a critical perspective on future potentials in industry integrated engineering education. It covers topics and issues such as integrated engineering and computing education, part-time engineering masters programs, secure BIM learning, ethics, and IT workforce development. The book concludes with detail information on summarizing and extracting different frameworks, cases, and models into a practitioner toolkit, along with pragmatic recommendations for engineering education academics to quickly utilize, adopt, and adapt the toolkits for their own curricular development activities.

The world's fresh water supplies are dwindling rapidly—even wastewater is now considered an asset. By 2025, most of the world's population will be facing serious water stresses and shortages. Aquananotechnology: Global Prospects breaks new ground with its informative and innovative introduction of the application of nanotechnology to the remediation of contaminated water for drinking and industrial use. It provides a comprehensive overview, from a global perspective, of the latest research and developments in the use of nanotechnology for water purification and desalination methods. The book also covers approaches to remediation such as high surface area nanoscale media for adsorption of toxic species, UV treatment of pathogens, and regeneration of saturated media with applications in municipal water supplies, produced water from fracking, ballast water, and more. It also discusses membranes, desalination, sensing, engineered polymers, magnetic nanomaterials, electrospun nanofibers, photocatalysis, endocrine disruptors, and Al13 clusters. It explores physics-based phenomena such as subcritical water and cavitation-induced sonoluminescence, and fog harvesting. With contributions from experts in developed and developing countries, including those with severe contamination, such as China, India, and Pakistan, the book's content spans a wide range of the subject areas that fall under the aquananotechnology banner, either squarely or tangentially. The book strongly emphasizes sorption media, with broad application to a myriad of contaminants—both geogenic and anthropogenic—keeping in mind that it is not enough for water to be potable, it must also be palatable.

International Conference on Industrial Engineering and Engineering Management is sponsored by Chinese Industrial Engineering Institution, CMES, which is the unique national-level academic society of Industrial Engineering. The conference is held annually as the major event in this area. Being the largest and the most authoritative
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international academic conference held in China, it supplies an academic platform for the experts and the entrepreneurs in International Industrial Engineering and Management area to exchange their research results. Many experts in various fields from China and foreign countries gather together in the conference to review, exchange, summarize and promote their achievements in Industrial Engineering and Engineering Management fields. Some experts pay special attention to the current situation of the related techniques application in China as well as their future prospect, such as Industry 4.0, Green Product Design, Quality Control and Management, Supply Chain and logistics Management to cater for the purpose of low-carbon, energy-saving and emission-reduction and so on. They also come up with their assumption and outlook about the related techniques' development. The proceedings will offer theatrical methods and technique application cases for experts from college and university, research institution and enterprises who are engaged in theoretical research of Industrial Engineering and Engineering Management and its technique's application in China. As all the papers are feathered by higher level of academic and application value, they also provide research data for foreign scholars who occupy themselves in investigating the enterprises and engineering management of Chinese style.

PBL in Engineering Education International Perspectives on Curriculum Change

This book presents the case for Project-Based Learning within Socio-Technical Systems in Engineering Education. The book highlights the importance of projects as Socio-Technical Systems as a means for supporting and enhancing international accreditation of engineering programs. Practical examples illustrate how Socio-Technical Systems are brought into the educational environment through Project-Based Learning. The book goes on to discusses the impact this may have on Engineering Education practice. The work presented will enable engineering educators to develop curricula that can respond to societal needs, while also enhancing teaching and learning. It offers an approach to engineering education that centers on engaging scholars in projects that are located within socio-technical systems. University, government and industry leaders will gain from this book as it provides insight into strategic planning and partnership-building for Engineering Education. We hope this book will further foster deep scholarship of research to ready engineering faculties for engaging responsibly with their surrounding communities. Features: Offers applications of Project-Based Learning (PBL) in Engineering Education Matches elements of Socio-Technical Systems in Higher Engineering Education, with the Exit Level Outcomes (ELOs) required by professional engineering bodies Provides practical examples for the establishment of project environments within an academic faculty Shows examples in the success of execution of projects involving engineering educators, researchers, program developers, government agencies and industry partners Presents a framework to develop Project-Based Learning in Engineering Education that addresses Socio-Technical requirements and will enable engineering educators to collaboratively develop engineering curricula with industry that will respond to societal needs This book provides the information that is required to start a small spacecraft program for educational purposes. This will include a discussion of multiple approaches to program formation and build / buy / hybrid decision considerations. The book also discusses how a CubeSat (or other small
spacecraft program) can be integrated into course and/or program curriculum and the ancillary benefits that such a program can provide. The assessment of small spacecraft programs and participatory project-based learning programs is also discussed extensively. The book presents prior work related to program assessment (both for a single program and internationally) and discusses how similar techniques can be utilized for both formative and summative assessment of a new program. The utility of these metrics (and past assessment of other programs) in gaining buy-in for program formation and funding is also considered.

People's competence has a strong influence on the strategy of human resource management, affecting daily aspects, thought patterns, and behavioral modes of executive management and employees. From a business perspective, there is a strong relationship between human capital and success and also an integral development of the human factor in all its dimensions, both personal and professional, and social competences must be a key factor to reach it. To help achieve this business excellence, it is necessary to transfer the demands of the labor market into education, and one of the ways is through methodological framework for Project Management and Management, specifically the IPMA Individual Competence Baseline, which is an essential tool for achieving economic growth, corporate development, and competitiveness.

Historically only Analytical Fluid Dynamics (AFD) and Experimental Fluid Dynamics (EFD) have been taught at the undergraduate level but inclusion of Computational Fluid Dynamics (CFD), which is commonly used to refer to analysis of fluids, and Finite Element Methods (FEM), which is commonly used to refer to analysis of solid materials, are now possible and desirable with the advancing improvements of computer resources. CFD and FEM have now major components of professional life in engineering practice. In the areas of analysis and design, simulation based design is commonly used instead of the traditional "build and test", as it is much more cost effective than EFD and a substantial database is provided for diagnosing the adjacent flow field. Simulations can readily be done of physical phenomena that are difficult to measure, for example, full scale situations, environmental effects and hazards. With the introduction of CFD and FEM into an engineering curriculum, it is possible to educate the young engineer as to the pros and cons of using the three areas, AFD, EFD, CFD and FEM, and to be in a position to know which area to use according to the problem or project confronting them. Importantly, the engineer should learn not be prejudiced against using any of the three areas. So there is an increasing need to integrate computer-assisted learning and simulation, in the guise of CFD and FEM, into undergraduate engineering courses, both as a learning tool and as initial professional training. One of the efficient teaching tools is projects. They introduce the students to engineering problem solving skills and increase the students' interest in the subject of the course. Project-based learning (PBL) is an instructional model based on having students confront real-world issues and
problems that they find meaningful, determine how to address them, and then act in a collaborative fashion to create problem solutions. In order to improve the engineering education, a pedagogical method that involves PBL, using CFD and FEM, should be applied. The PBL works well for engineering education, since it prepares students for their later professional training. This book is the result of incorporation of CFD and FEM in engineering education. Its chapters are based on a number of final year engineering students projects of a former or current students, successfully completed under the supervision of the author. The author would like to thank the students for providing the projects that were presented in this book. Thanks to all students for their hard work. The book is intended to be a professional development resource book in PBL to teach undergraduate engineering students the CFD and FEM packages in a technical elective senior level course. The book is also intended to serve as a reference resource for the final year engineering students, new graduate students, and faculty.

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Chapter 2: Three-Dimensional Computational Fluid Dynamics Model for Analysis and Design of PEM Fuel Cells.
Chapter 3: CFD Analysis of the Clamping Pressure Distribution in Running PEM Fuel Cell.
Chapter 7: CFD Modeling of Dust Transport and Dispersion through an Office.

Since 2001, the international network Active Learning in Engineering education (ALE) organized a series of international workshops on innovation of engineering education. The papers in this book are selected to reflect the state of the art, based on contributions to the 2005 ALE workshop in Holland. This overview of experiences in research and practice aims to be a source of inspiration for engineering educators.

The success of Problem Based Learning and Project Organised learning (PBL) as an educational method in the field of Higher Engineering Education is clear and beyond any doubt.

The focus of this Special Issue is aimed at enhancing the discussion of Engineering Education, particularly related to technological and professional learning. In the 21st century, students face a challenging demand: they are expected to have the best scientific expertise, but also highly developed social skills and qualities like teamwork, creativity, communication, or leadership. Even though students and teachers are becoming more aware of this necessity, there is still a gap between academic life and the professional world. In this Special Edition Book, the reader can find works tackling interesting topics such as educational resources addressing students’ development of competencies, the importance of final year projects linked to professional environments, and multicultural or interdisciplinary challenges.

The success of Problem Based Learning and Project Organised learning (PBL)
as an educational method in the field of Higher Engineering Education is clear and beyond any doubt. An increasing number of Universities of Technology all over the world applies PBL in their curriculum. There are many sound arguments for changing to PBL, such as enhancing students' motivation, integration of practice oriented competences, improved retention of students, augmenting the quality of education, collaboration with industry. More and more educational research is supplying evidence to sustain these arguments. Engineers create innovations to improve the quality of our life. It just makes sense that the institutes of Higher Engineering Education want to know what educational innovations contribute to the quality of engineering education. To promote research on PBL the UNESCO chair in Problem Based Learning in Engineering Education (UCPBL) organised the first Research Symposium on Problem Based Learning in Engineering and Science Education, June 30th-July 1st, 2008 at Aalborg University. This book contains a selection of papers from this research symposium, which have been reviewed and further developed.

For most professions, a code of ethics exists to promote positive behavior among practitioners in order to enrich others within the field as well as the communities they serve. Similar to the medical, law, and business fields, the engineering discipline also instills a code of ethical conduct. Contemporary Ethical Issues in Engineering highlights a modern approach to the topic of engineering ethics and the current moral dilemmas facing practitioners in the field. Focusing on key issues, theoretical foundations, and the best methods for promoting engineering ethics from the pre-practitioner to the managerial level, this timely publication is ideally designed for use by engineering students, active professionals, and academics, as well as researchers in all disciplines of engineering.

This book discusses and assesses the latest trends in the interactive mobile field, and presents the outcomes of the 12th International Conference on Interactive Mobile Communication Technologies and Learning (IMCL2018), which was held in Hamilton, Canada on October 11 and 12, 2018. Today, interactive mobile technologies are at the core of many – if not all – fields of society. Not only does the younger generation of students expect a mobile working and learning environment, but also the new ideas, technologies and solutions coming out practically every day are further strengthening this trend. Since its inception in 2006, the conference has been devoted to highlighting new approaches in interactive mobile technologies with a focus on learning. The IMCL conferences have since established themselves as a valuable forum for exchanging and discussing new research results and relevant trends, as well as practical experience and best-practice examples. This book contains papers in the fields of: Interactive Collaborative Mobile Learning Environments Mobile Health Care Training Game-based Learning Design of Internet of Things (IoT) Devices and Applications Assessment and Quality in Mobile Learning. Its potential readership includes policymakers, educators and researchers in pedagogy and learning theory, schoolteachers, the learning industry, further education lecturers, etc.
Future generations are being faced with the potential challenge of having to solve professional problems in a hybrid world in which there is no clear boundary between autonomous, non-human nature, and human-generated processes. This requires young students to effectively prepare themselves for managing issues of complexity, uncertainty, and ambiguity in their professional practice. Global Perspectives on Fostering Problem-Based Learning in Chinese Universities is a comprehensive reference source that provides insight into the growing need for problem-based learning within higher education environments. Featuring a wide range of topics such as curriculum design, STEM education, and cross-cultural communication, this reference source is ideal for educators, instructional designers, academicians, administrators, and researchers.

"This book provides insights into initiatives that enhance student learning and contribute to improving the quality of undergraduate STEM education"--Provided by publisher.

Computer science graduates often find software engineering knowledge and skills are more in demand after they join the industry. However, given the lecture-based curriculum present in academia, it is not an easy undertaking to deliver industry-standard knowledge and skills in a software engineering classroom as such lectures hardly engage or convince students. Overcoming Challenges in Software Engineering Education: Delivering Non-Technical Knowledge and Skills combines recent advances and best practices to improve the curriculum of software engineering education. This book is an essential reference source for researchers and educators seeking to bridge the gap between industry expectations and what academia can provide in software engineering education.

Pre-university engineering education has become the topic of increasing interest in technology education circles. It can provide content for the E in STEM (Science, Technology, Engineering and Mathematics) education, which is in the interest of technology educators at different educational levels as it builds the bridge between them and the science and mathematics educators. In this book goals for pre-university engineering education are explored as well as existing practices from a variety of countries. The coming years will show if pre-university engineering education will catch on. The trend towards STEM integrated education that today can be seen in many countries will certainly create a further need and stimulus for that to happen. Hopefully this book can contribute to such a development of both formal and informal K-12 engineering education. Not only for preparing the next generation of engineers, but also for the technological literacy of future citizens.

This book gathers papers presented at the 22nd International Conference on Interactive Collaborative Learning (ICL2019), which was held in Bangkok, Thailand, from 25 to 27 September 2019. Covering various fields of e-learning and distance learning, course and curriculum development, knowledge management and learning, real-world learning experiences, evaluation and outcomes assessment, computer-aided language learning, vocational education development and technical teacher training, the contributions focus on innovative ways in which higher education can respond to the real-world challenges related to the current transformation in the development of education. Since it was established, in 1998, the ICL conference has been devoted to new approaches in learning with a focus on collaborative learning. Today, it is a forum for sharing trends and research findings as well as presenting practical experiences in learning and
engineering pedagogy. The book appeals to policymakers, academics, educators, researchers in pedagogy and learning theory, school teachers, and other professionals in the learning industry, and further and continuing education.

Developing students’ creative problem-solving skills is paramount to today’s teachers, due to the exponentially growing demand for cognitive plasticity and critical thinking in the workforce. In today’s knowledge economy, workers must be able to participate in creative dialogue and complex problem-solving. This has prompted institutions of higher education to implement new pedagogical methods such as problem-based and case-based education. The Handbook of Research on Creative Problem-Solving Skill Development in Higher Education is an essential, comprehensive collection of the newest research in higher education, creativity, problem solving, and pedagogical design. It provides the framework for further research opportunities in these dynamic, necessary fields. Featuring work regarding problem-oriented curriculum and its applications and challenges, this book is essential for policy makers, teachers, researchers, administrators, students of education.

SUMMARY.

This book comprises the proceedings of the International Conference on Transformations in Engineering Education conducted jointly by BVB College of Engineering & Technology, Hubli, India and Indo US Collaboration for Engineering Education (IUCEE). This event is done in collaboration with International Federation of Engineering Education Societies (IFESS), American Society for Engineering Education (ASEE) and Global Engineering Deans’ Council (GEDC). The conference is about showcasing the transformational practices in Engineering Education space.

This second edition of Project-Based Learning (PBL) presents an original approach to Science, Technology, Engineering and Mathematics (STEM) centric PBL. We define PBL as an “ill-defined task with a well-defined outcome,” which is consistent with our engineering design philosophy and the accountability highlighted in a standards-based environment. This model emphasizes a backward design that is initiated by well-defined outcomes, tied to local, state, or national standard that provide teachers with a framework guiding students’ design, solving, or completion of ill-defined tasks. This book was designed for middle and secondary teachers who want to improve engagement and provide contextualized learning for their students. However, the nature and scope of the content covered in the 14 chapters are appropriate for preservice teachers as well as for advanced graduate method courses. New to this edition is revised and expanded coverage of STEM PBL, including implementing STEM PBL with English Language Learners and the use of technology in PBL. The book also includes many new teacher-friendly forms, such as advanced organizers, team contracts for STEM PBL, and rubrics for assessing PBL in a larger format.

The integration of technology in education has provided tremendous opportunity for learners of all ages. In today’s technology-focused society, the traditional classroom setting is being transformed through online learning platforms, collaborative and experimental methods, and digital educational resources that go hand-in-hand with non-digital learning devices. The Handbook of Research on Applied E-Learning in Engineering and Architecture Education reviews the latest research available on the implementation of digital tools and platforms within the framework of technical education, specifically in the subjects of architecture and engineering. Taking a global approach to the topic of online learning environments for technical education at all grade levels, this comprehensive reference work is ideally designed for use by
educators, instructional designers, and researchers from around the world. This handbook contains pertinent research on a variety of educational topics including online learning platforms, mobile and blended learning, collaborative learning environments, gaming in education, informal learning, and educational assessment.

PBL in Engineering Education: International Perspectives on Curriculum Change presents diverse views on the implementation of PBL from across the globe. The purpose is to exemplify curriculum changes in engineering education. Drivers for change, implementation descriptions, challenges and future perspectives are addressed. Cases of PBL models are presented from Singapore, Malaysia, Tunisia, Portugal, Spain and the USA. These cases are stories of thriving success that can be an inspiration for those who aim to implement PBL and change their engineering education practices. In the examples presented, the change processes imply a transformation of vision and values of what learning should be, triggering a transition from traditional learning to PBL. In this sense, PBL is also a learning philosophy and different drivers, facing diverse challenges and involving different actors, trigger its implementation. This book gathers experiences, practices and models, through which is given a grasp of the complexity, multidimensional, systemic and dynamic nature of change processes. Anette Kolmos, director of Aalborg PBL Centre, leads off the book by presenting different strategies to curriculum change, addressing three main strategies of curriculum change, allowing the identification of three types of institutions depending on the type of strategy used. Following chapters describe each of the PBL cases based upon how they implement the seven components of PBL: (i) objectives and knowledge; (ii) types of problems, projects and lectures; (iii) progression, size and duration; (iv) students’ learning; (v) academic staff and facilitation; (vi) space and organization; and (vii) assessment and evolution. The book concludes with a chapter summarizing all chapters and providing an holistic perspective of change processes.

Problem-based learning (PBL) is becoming widely used in higher education. Popular in the medical sciences, PBL is now finding applications beyond - in engineering, sciences and architecture - and is widely applicable in many fields. It is a powerful teaching technique that appeals to students and educators alike. This book will be of great value to those who want to improve their use of PBL and for those who want to learn more and implement it. It provides compelling accounts of experiences with PBL from eight countries including the UK, US, Canada, Australia and New Zealand, and gives readers the opportunity to understand PBL and to develop strategies for their own curriculum, in any subject and at many levels. Copyright © 2018, ICLEL Conferences All rights reserved by ICLEL Conferences

"This book is aimed at educators who may be considering introducing problem-based learning and need to know what it involves, its benefits and the practical details of how to implement it"—Provided by publisher.

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