Using Concept Mapping To Foster Adaptive Expertise Enhancing Teacher Metacognitive Learning To Improve Student Academic Performance Educational Psychology

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Learning, Creating, and Using Knowledge - Joseph Donald Novak 2010
Fully revised and updated, this second edition updates Novak's theory for meaningful learning and autonomous knowledge-building along with tools to make it operational - that is, concept maps, created with the use of CMapTools and the V diagram. It is essential reading for educators at all levels and corporate managers who seek to enhance worker productivity.

Exploring Pedagogic Frailty and Resilience - Ian M. Kinchin 2018-11-01
Exploring Pedagogic Frailty and Resilience provides exemplar case studies of academics' reflective narratives, initiated by map-mediated interviews and framed by the model of pedagogic frailty. These provide an authentic commentary about the current state of university teaching as a resource for professional development.

Dominant Discourses in Higher Education - Ian M. Kinchin 2022-01-13
This book examines the dominant discourses in higher education. From the moment teachers enter higher education, they are met with dominant discourses that are often adopted uncritically, including concepts such as teaching excellence, student voice, and student engagement. Teachers are also met with simplistic binaries such as teaching vs. research, quantitative vs. qualitative research, and constructivists vs. positivists. Kinchin and Gravett suggest that this may present a distorted view, contributing to the disconnect between the aims and observable practice of higher education. Rather than celebrating difference, dominant discourses tend to seek similarities in an attempt to simplify and manage the environment. In this book, the authors share their belief that teaching and learning should be a thoughtful endeavour. Thinking with a breadth of theories, the authors explore the overlaps between different perspectives in order to offer a richer and more inclusive interrogation of the dominant discourses that pervade higher education. Offering methodological approaches to explore these perspectives, the authors bring together academics working in different parts of the university and examine the concept of a 'rich cartography', considering how this can offer meaning within higher education research and practice.

The Master Adaptive Learner - William Cutrer 2019-09-29
Tomorrow's best physicians will be those who continually learn, adjust, and innovate as new information and best practices evolve, reflecting adaptive expertise in response to practice challenges. As the first volume in the American Medical Association's MedEd Innovation Series, The Master Adaptive Learner is an instructor-focused guide covering models for how to train and teach future clinicians who need to develop these adaptive skills and utilize them throughout their careers. Explains and clarifies the concept of a Master Adaptive Learner: a metacognitive approach to learning based on self-regulation that fosters the success and use of adaptive expertise in practice. Contains both theoretical and practical material for instructors and administrators, including guidance on how to implement a Master Adaptive Learner approach in today's institutions. Gives instructors the tools needed to empower students to become efficient and successful adaptive learners. Helps medical faculty and instructors address gaps in physician training and prepare new doctors to practice effectively in 21st century healthcare systems. One of the American Medical Association Change MedEd initiatives and innovations, written and edited by members of the ACE (Accelerating Change in Medical Education) Consortium – a unique, innovative collaborative that allows for the sharing and dissemination of groundbreaking ideas and projects.

Visualising Powerful Knowledge to Develop the Expert Student - Ian M. Kinchin 2016-07-27
This book puts the structure and function of knowledge firmly in the driving seat of university curriculum development and teaching practice. Through the application of concept mapping, the structure of knowledge can be visualised to offer an explicit perspective on key issues such as curriculum design, student learning and assessment feedback. Structural visualisation allows a greater scrutiny of the qualitative characteristics of knowledge so that we can analyse students' patterns of learning and match them to expert practice. Based on nearly two decades of research and direct observations of university teaching by the author, this book aims to offer a scholarly account of teacher development. It focusses on

elements that will be of immediate utility to academics who want to develop their teaching to a level of adaptive experts, offering them greater autonomy in their role and a powerful understanding of teaching to escape the repressive routines of the traditional classroom. Rather than providing a comprehensive review of educational research, this book provides a route through selected theories that can be explored in practice by university teachers on their own or in groups. The book will help academics to identify the nature of powerful knowledge within their disciplines and consider ways that this may be used by students to become active and engaged learners through the manipulation and transformation of knowledge, and so become expert students.

Multiple Perspectives on Problem Solving and Learning in the Digital Age - Dirk Ifenthaler 2010-11-15
This edited volume with selected expanded papers from CELDA (Cognition and Exploratory Learning in the Digital Age) 2009 (http://www.celda-conf.org/) addresses the main issues concerned with problem solving, evolving learning processes, innovative pedagogies, and technology-based educational applications in the digital age. There have been advances in both cognitive psychology and computing that have affected the educational arena. The convergence of these two disciplines is increasing at a fast pace and affecting academia and professional practice in many ways. Paradigms such as just-in-time learning, constructivism, student-centered learning and collaborative approaches have emerged and are being supported by technological advancements such as simulations, virtual reality and multi-agents systems. These developments have created both opportunities and areas of serious concerns. This volume aims to cover both technological as well as pedagogical issues related to these developments.

Intelligent and Adaptive Educational-Learning Systems - Alejandro Peña-Ayala 2012-08-10
The Smart Innovation, Systems and Technologies book series encompasses the topics of knowledge, intelligence, innovation and sustainability. The aim of the series is to make available a platform for the publication of books on all aspects of single and multi-disciplinary

research on these themes in order to make the latest results available in a readily-accessible form. This book is devoted to the "Intelligent and Adaptive Educational-Learning Systems". It privileges works that highlight key achievements and outline trends to inspire future research. After a rigorous revision process twenty manuscripts were accepted and organized into four parts: Modeling, Content, Virtuality and Applications. This volume is of interest to researchers, practitioners, professors and postgraduate students aimed to update their knowledge and find out targets for future work in the field of artificial intelligence on education.

How Learning Works - Susan A. Ambrose 2010-04-16
Praise for How Learning Works "How Learning Works is the perfect title for this excellent book. Drawing upon new research in psychology, education, and cognitive science, the authors have demystified a complex topic into clear explanations of seven powerful learning principles. Full of great ideas and practical suggestions, all based on solid research evidence, this book is essential reading for instructors at all levels who wish to improve their students' learning." —Barbara Gross Davis, assistant vice chancellor for educational development, University of California, Berkeley, and author, Tools for Teaching "This book is a must-read for every instructor, new or experienced. Although I have been teaching for almost thirty years, as I read this book I found myself resonating with many of its ideas, and I discovered new ways of thinking about teaching." —Eugenia T. Paulus, professor of chemistry, North Hennepin Community College, and 2008 U.S. Community Colleges Professor of the Year from The Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education "Thank you Carnegie Mellon for making accessible what has previously been inaccessible to those of us who are not learning scientists. Your focus on the essence of learning combined with concrete examples of the daily challenges of teaching and clear tactical strategies for faculty to consider is a welcome work. I will recommend this book to all my colleagues." —Catherine M. Casserly, senior partner, The Carnegie Foundation for the Advancement of Teaching "As you read about each of the seven basic learning principles in this book, you will

find advice that is grounded in learning theory, based on research evidence, relevant to college teaching, and easy to understand. The authors have extensive knowledge and experience in applying the science of learning to college teaching, and they graciously share it with you in this organized and readable book." —From the Foreword by Richard E. Mayer, professor of psychology, University of California, Santa Barbara; coauthor, e-Learning and the Science of Instruction; and author, Multimedia Learning

Pedagogic Frailty and Resilience in the University - Ian M. Kinchin 2017-04-17
Pedagogic Frailty and Resilience in the University presents a theoretical model and a practical tool to support the professional development of reflective university teachers. It can be used to highlight links to key issues in higher education. Pedagogic frailty exists where the quality of interaction between elements in the evolving teaching environment succumbs to cumulative pressures that eventually inhibit the capacity to develop teaching practice. Indicators of frailty can be observed at different resolutions, from the individual, to the departmental or the institutional. Chapters are written by experts in their respective fields who critique the frailty model from the perspectives of their own research. This will help readers to make practical links between established bodies of research literature and the concept of frailty, and to form a coherent and integrated view of higher education. This can then be explored and developed by individuals, departments or institutions to inform and evaluate their own enhancement programmes. This may support the development of greater resilience to the demands of the teaching environment. In comparison with other commonly used terms, we have found that the term 'frailty' has improved resonance with the experiences of colleagues across the disciplines in higher education, and elicits a personal (sometimes emotional) response to their professional situation that encourages positive dialogue, debate and reflection that may lead to the enhancement of university teaching. This book offers a particular route through the fractured discourses of higher education pedagogy, creating a coherent and cohesive perspective of the

field that may illuminate the experiences and observations of colleagues within the profession. "If we are to realise the promise of higher education ... we will need the concepts, methods, and reflections contained in this book." – Robert R. Hoffman

Active Learning in College Science - Joel J. Mintzes 2020-02-23
This book explores evidence-based practice in college science teaching. It is grounded in disciplinary education research by practicing scientists who have chosen to take Wieman's (2014) challenge seriously, and to investigate claims about the efficacy of alternative strategies in college science teaching. In editing this book, we have chosen to showcase outstanding cases of exemplary practice supported by solid evidence, and to include practitioners who offer models of teaching and learning that meet the high standards of the scientific disciplines. Our intention is to let these distinguished scientists speak for themselves and to offer authentic guidance to those who seek models of excellence. Our primary audience consists of the thousands of dedicated faculty and graduate students who teach undergraduate science at community and technical colleges, 4-year liberal arts institutions, comprehensive regional campuses, and flagship research universities. In keeping with Wieman's challenge, our primary focus has been on identifying classroom practices that encourage and support meaningful learning and conceptual understanding in the natural sciences. The content is structured as follows: after an Introduction based on Constructivist Learning Theory (Section I), the practices we explore are Eliciting Ideas and Encouraging Reflection (Section II); Using Clickers to Engage Students (Section III); Supporting Peer Interaction through Small Group Activities (Section IV); Restructuring Curriculum and Instruction (Section V); Rethinking the Physical Environment (Section VI); Enhancing Understanding with Technology (Section VII), and Assessing Understanding (Section VIII). The book's final section (IX) is devoted to Professional Issues facing college and university faculty who choose to adopt active learning in their courses. The common feature underlying all of the strategies described in this book is their emphasis on actively engaging students who seek to make sense of natural objects and events. Many of the strategies we highlight emerge from a constructivist view of learning that has gained widespread acceptance in recent years. In this view, learners make sense of the world by forging connections between new ideas and those that are part of their existing knowledge base. For most students, that knowledge base is riddled with a host of naïve notions, misconceptions and alternative conceptions they have acquired throughout their lives. To a considerable extent, the job of the teacher is to coax out these ideas; to help students understand how their ideas differ from the scientifically accepted view; to assist as students restructure and reconcile their newly acquired knowledge; and to provide opportunities for students to evaluate what they have learned and apply it in novel circumstances. Clearly, this prescription demands far more than most college and university scientists have been prepared for.

Military Review - 2008

Advanced principles of effective e-learning - Nicole A. Buzzetto-More 2007-01-01
With the global academic community currently focused on student learning outcomes achievement, assessment, and continuous improvement, e-learning strategies provide effective measures than can assist educators and educational administrators in the satisfaction of key objectives. Whether it is creating and incorporating simulations, building courses and curriculum, engaging in virtual team building, managing online programs, concept mapping, developing an electronic portfolio program, creating active training environments, determining the instructors role, problem solving, evaluating online learning, or using e-learning to build an effective assessment program this book will prove to be an indispensable resource. Geared towards administrators, key decision makers, educators experienced with e-learning, and instructional technology students, it marries the leading literature and prevailing ideologies with best practices illustrated by notable real-world examples.

Physics Education - Hans Ernst Fischer 2022-01-12

This book offers a comprehensive overview of the theoretical background and practice of physics teaching and learning and assists in the integration of highly interesting topics into physics lessons. Researchers in the field, including experienced educators, discuss basic theories, the methods and some contents of physics teaching and learning, highlighting new and traditional perspectives on physics instruction. A major aim is to explain how physics can be taught and learned effectively and in a manner enjoyable for both the teacher and the student. Close attention is paid to aspects such as teacher competences and requirements, lesson structure, and the use of experiments in physics lessons. The roles of mathematical and physical modeling, multiple representations, instructional explanations, and digital media in physics teaching are all examined. Quantitative and qualitative research on science education in schools is discussed, as quality assessment of physics instruction. The book is of great value to researchers involved in the teaching and learning of physics, to those training physics teachers, and to pre-service and practising physics teachers.

Transforming the Workforce for Children Birth Through Age 8 - National Research Council 2015-07-23
Children are already learning at birth, and they develop and learn at a rapid pace in their early years. This provides a critical foundation for lifelong progress, and the adults who provide for the care and the education of young children bear a great responsibility for their health, development, and learning. Despite the fact that they share the same objective - to nurture young children and secure their future success - the various practitioners who contribute to the care and the education of children from birth through age 8 are not acknowledged as a workforce unified by the common knowledge and competencies needed to do their jobs well. Transforming the Workforce for Children Birth Through Age 8 explores the science of child development, particularly looking at implications for the professionals who work with children. This report examines the current capacities and practices of the workforce, the settings in which they work, the policies and infrastructure that set qualifications and provide professional learning, and the government agencies and other funders who support and oversee these systems. This book then makes recommendations to improve the quality of professional practice and the practice environment for care and education professionals. These detailed recommendations create a blueprint for action that builds on a unifying foundation of child development and early learning, shared knowledge and competencies for care and education professionals, and principles for effective professional learning. Young children thrive and learn best when they have secure, positive relationships with adults who are knowledgeable about how to support their development and learning and are responsive to their individual progress. Transforming the Workforce for Children Birth Through Age 8 offers guidance on system changes to improve the quality of professional practice, specific actions to improve professional learning systems and workforce development, and research to continue to build the knowledge base in ways that will directly advance and inform future actions. The recommendations of this book provide an opportunity to improve the quality of the care and the education that children receive, and ultimately improve outcomes for children.

Mapping Equity and Quality in Mathematics Education - Bill Atweh 2011-01-06
Concerns about quality mathematics education are often posed in terms of the types of mathematics that are worthwhile and valuable for both the student and society in general, and about how to best support students so that they can develop this mathematics. Concerns about equity are about who is excluded from the opportunity to develop quality mathematics within our current practices and systems, and about how to remove social barriers that systematically disadvantage those students. This collection of chapters summarises our learning about the achievement of both equity and quality agendas in mathematics education and to move forward the debate on their importance for the field.

Teaching Change - José Antonio Bowen 2021-09-28
"This book for educators shows that focusing on relationships, resilience, and reflection can better prepare graduates for the future"--

HCI International 2020 – Late Breaking Papers: Cognition, Learning and Games - Constantine Stephanidis 2020-10-03
This book constitutes late breaking papers from the 22nd International Conference on Human-Computer Interaction, HCII 2020, which was held in July 2020. The conference was planned to take place in Copenhagen, Denmark, but had to change to a virtual conference mode due to the COVID-19 pandemic. From a total of 6326 submissions, a total of 1439 papers and 238 posters have been accepted for publication in the HCII 2020 proceedings before the conference took place. In addition, a total of 333 papers and 144 posters are included in the volumes of the proceedings published after the conference as "Late Breaking Work" (papers and posters). These contributions address the latest research and development efforts in the field and highlight the human aspects of design and use of computing systems.
Developments in Engineering Education Standards: Advanced Curriculum Innovations - Rasul, Mohammad 2012-04-30
SUMMARY.
Empowering India Through Digital Literacy (Vol. 2) - Dr. S. Kalaivani & Dr. K. Saileela

Innovating with Concept Mapping - Alberto Cañas 2016-08-20
This book constitutes the refereed proceedings of the 7th International Conference on Concept Mapping, CMC 2016, held in Tallinn, Estonia, in September 2016. The 25 revised full papers presented were carefully reviewed and selected from 135 submissions. The papers address issues such as facilitation of learning; eliciting, capturing, archiving, and using "expert" knowledge; planning instruction; assessment of "deep" understandings; research planning; collaborative knowledge modeling; creation of "knowledge portfolios"; curriculum design; eLearning, and administrative and strategic planning and monitoring.
World Congress of Medical Physics and Biomedical Engineering 2006 - Sun I. Kim 2007-05-07
These proceedings of the World Congress 2006, the fourteenth conference in this series, offer a strong scientific program covering a wide range of issues and challenges which are currently present in Medical physics and Biomedical Engineering. About 2,500 peer reviewed contributions are presented in a six volume book, comprising 25 tracks, joint conferences and symposia, and including invited contributions from well known researchers in this field.
How People Learn - National Research Council 2000-08-11
First released in the Spring of 1999, How People Learn has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula, classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. How People Learn examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.
International Perspectives on Knowledge Integration - Thomas Lehmann

2020-05-18
International Perspectives on Knowledge Integration explores theoretical conceptions and methods and reports on original research and good practices for fostering knowledge integration in pre-service teacher and higher education.

Web-based Support Systems - JingTao Yao 2010-03-02
Web-based Support Systems (WSS) are an emerging multidisciplinary research area in which one studies the support of human activities with the Web as the common platform,mediumandinterface.TheInternetaffectseveryaspectofourmodernlife. Moving support systems to online is an increasing trend in many research domains. One of the goals of WSS research is to extend the human physical limitation of information processing in the information age. Research on WSS is motivated by the challenges and opportunities arising from the Internet. The availability, accessibility and ?exibility of information as well as the tools to access this information lead to a vast amount of opportunities. H- ever, there are also many challenges we face. For instance, we have to deal with more complex tasks, as there are increasing demands for quality and productivity. WSS research is a natural evolution of the studies on various computerized support systems such as Decision Support Systems (DSS), Computer Aided Design (CAD), and Computer Aided Software Engineering (CASE). The recent advancement of computer and Web technologies make the implementation of more feasible WSS. Nowadays, it is rare to see a system without some type of Web interaction. The research of WSS is classi?ed into four groups. • WSS for speci?c domains.

Concept Mapping and Education - Amm Sharif Ullah 2020-10-13
The assimilation theory of verbal learning leads to meaningful learning wherein the learning outcomes take the form of concept maps-networks of some selected linguistic expressions and concepts. Concept-map-based education helps avoid rote learning, prepare content for effective on-ground and e-learning, and measure learning outcomes at the course, program, and institutional levels. As a result, it has been used at school, college, university, and professional levels. This book consists of five

selected articles, providing insights into concept-map-based education, and will benefit students, teachers, and education managers.

Design and Measurement Strategies for Meaningful Learning - Gómez Ramos, José Luis 2022-04-01
Teaching content and measuring content are frequently considered separate entities when designing teaching instruction. This can create a disconnect between how students are taught and how well they succeed when it comes time for assessment. To heal this rift, the theory of meaningful learning is a potential solution for designing effective teaching-learning and assessment materials. Design and Measurement Strategies for Meaningful Learning considers the best practices, challenges, and opportunities of instructional design as well as the theory and impact of meaningful learning. It provides educators with an essential text instructing them on how to successfully design and measure the content they teach. Covering a wide range of topics such as blended learning, online interaction, and learning assessment, this reference work is ideal for teachers, instructional designers, curriculum developers, policymakers, administrators, academicians, researchers, practitioners, and students.

Knowledge Creation in Education - Seng Chee Tan 2014-06-12
This book arises from research conducted through Singapore's National Institute of Education on such topics as integrating knowledge building pedagogies into Singaporean classrooms, with both students and teachers across school levels, from primary schools to high schools. Additionally, international scholars contribute research on theories of knowledge creation, methodological foundations of research on knowledge creation, knowledge creation pedagogies in classrooms and knowledge creation work involving educators. The book is organized in two sections. Section A focuses on theoretical, technological and methodological issues, where sources of justification for claims are predominantly theories and extant literature, although empirical evidence is used extensively in one chapter. Section B reports knowledge creation practices in schools, with teachers, students or both; the key sources of justification for claims are predominantly empirical evidence

and narratives of experience The editor asserts that schools should focus on developing students' capacity and disposition in knowledge creation work; at the same time, leaders and teachers alike should continue to develop their professional knowledge as a community. In the knowledge building vernacular, the chapters are knowledge artifacts – artifacts that not only document the findings of the editors and authors, but that also mediate future advancement in this area of research work. The ultimate aim of the book is to inspire new ideas, and to illuminate the path for researchers of similar interest in knowledge creation in education.

Handbook of Research on Ecosystem-Based Theoretical Models of Learning and Communication - Railean, Elena A. 2019-03-22
ICT and globalization have completely redefined learning and communication. People virtually connect to, collaborate with, and learn from other individuals. Because educational technology has matured considerably since its inception, there are still many issues in the design of learner-centered environments. The Handbook of Research on Ecosystem-Based Theoretical Models of Learning and Communication is an essential reference source that discusses learning and communication ecosystems and the strategic role of trust at different levels of the information and knowledge society. Featuring research on topics such as global society, life-long learning, and nanotechnology, this book is ideally designed for educators, instructional designers, principals, administrators, professionals, researchers, and students.

Using Concept Mapping to Foster Adaptive Expertise - Diane Salmon 2015-01-30
Concept mapping is a powerful means to promote metacognitive learning in students and teachers alike. When teachers integrate concept mapping into their instructional planning, they clarify the big ideas, expose new conceptual relationships, and refine learning goals for their students. Salmon and Kelly provide a research-based framework and corresponding strategies to help teachers develop, critique, and revise their concept maps. In using this approach, teachers refine knowledge for teaching in order to expand their adaptive expertise and ultimately improve the academic performances of their students. Teacher

candidates at both the undergraduate and graduate level can use this book to support their professional learning and planning for teaching. Teacher educators will find this text appropriate for courses that address learning, cognition, and instructional planning. In-service professionals can use the approach described here to support their own professional development through their practice. Administrators and coaches will find the volume a useful tool in fostering a professional learning community in their schools.

An Introduction to Artificial Intelligence in Education - Shengquan Yu 2021-11-29
This book systematically reviews a broad range of cases in education that utilize cutting-edge AI technologies. Furthermore, it introduces readers to the latest findings on the scope of AI in education, so as to inspire researchers from non-technological fields (e.g. education, psychology and neuroscience) to solve education problems using the latest AI techniques. It also showcases a number of established AI systems and products that have been employed for education. Lastly, the book discusses how AI can offer an enabling technology for critical aspects of education, typically including the learner, content, strategy, tools and environment, and what breakthroughs and advances the future holds. The book provides an essential resource for researchers, students and industrial practitioners interested and engaged in the fields of AI and education. It also offers a convenient handbook for non-professional readers who need a primer on AI in education, and who want to gain a deeper understanding of emerging trends in this domain.

How People Learn II - National Academies of Sciences, Engineering, and Medicine 2018-09-27
There are many reasons to be curious about the way people learn, and the past several decades have seen an explosion of research that has important implications for individual learning, schooling, workforce training, and policy. In 2000, How People Learn: Brain, Mind, Experience, and School: Expanded Edition was published and its influence has been wide and deep. The report summarized insights on the nature of learning in school-aged children; described principles for

the design of effective learning environments; and provided examples of how that could be implemented in the classroom. Since then, researchers have continued to investigate the nature of learning and have generated new findings related to the neurological processes involved in learning, individual and cultural variability related to learning, and educational technologies. In addition to expanding scientific understanding of the mechanisms of learning and how the brain adapts throughout the lifespan, there have been important discoveries about influences on learning, particularly sociocultural factors and the structure of learning environments. How People Learn II: Learners, Contexts, and Cultures provides a much-needed update incorporating insights gained from this research over the past decade. The book expands on the foundation laid out in the 2000 report and takes an in-depth look at the constellation of influences that affect individual learning. How People Learn II will become an indispensable resource to understand learning throughout the lifespan for educators of students and adults.

Modeling collaborations in self-adaptive systems of systems - Wätzoldt, Sebastian 2015-04-30
An increasing demand on functionality and flexibility leads to an integration of beforehand isolated system solutions building a so-called System of Systems (SoS). Furthermore, the overall SoS should be adaptive to react on changing requirements and environmental conditions. Due SoS are composed of different independent systems that may join or leave the overall SoS at arbitrary point in times, the SoS structure varies during the systems lifetime and the overall SoS behavior emerges from the capabilities of the contained subsystems. In such complex system ensembles new demands of understanding the interaction among subsystems, the coupling of shared system knowledge and the influence of local adaptation strategies to the overall resulting system behavior arise. In this report, we formulate research questions with the focus of modeling interactions between system parts inside a SoS. Furthermore, we define our notion of important system types and terms by retrieving the current state of the art from literature. Having a common understanding of SoS, we discuss a set of typical SoS characteristics and derive general requirements for a collaboration modeling language. Additionally, we retrieve a broad spectrum of real scenarios and frameworks from literature and discuss how these scenarios cope with different characteristics of SoS. Finally, we discuss the state of the art for existing modeling languages that cope with collaborations for different system types such as SoS.

An Evidence-based Guide to College and University Teaching - Aaron S. Richmond 2021-11-24
An Evidence-based Guide to College and University Teaching outlines a definition of "model teaching" based on research evidence and accepted best practices in high education. Teachers at all levels of skill and experience can benefit from clear, objective guidelines for defining and measuring quality teaching. To fulfil this need, this book outlines six fundamental areas of teaching competency—model teaching characteristics—and provides detailed definitions of each characteristic. The authors define these essential characteristics as training, course content, the assessment process, instructional methods, syllabus construction, and the use of student evaluations. This guide outlines through research and supplemental evidence how each characteristic can be used toward tenure, promotion, teaching portfolios, and general professional development. Additional features include a self-assessment tool that corresponds to the model teaching characteristics, case studies illustrating common teaching problems, and lists of "must reads" about college teaching. An Evidence-based Guide to College and University Teaching describes how college faculty from all disciplines and at all levels of their career – from graduate students to late-career faculty – can use the model teaching characteristics to evaluate, guide, and improve their teaching. The book is additionally useful for teachers, trainers, and administrators responsible for promoting excellence in college teaching.

Encyclopedia of the Sciences of Learning - Norbert M. Seel 2011-10-05
Over the past century, educational psychologists and researchers have posited many theories to explain how individuals learn, i.e. how they

acquire, organize and deploy knowledge and skills. The 20th century can be considered the century of psychology on learning and related fields of interest (such as motivation, cognition, metacognition etc.) and it is fascinating to see the various mainstreams of learning, remembered and forgotten over the 20th century and note that basic assumptions of early theories survived several paradigm shifts of psychology and epistemology. Beyond folk psychology and its naïve theories of learning, psychological learning theories can be grouped into some basic categories, such as behaviorist learning theories, connectionist learning theories, cognitive learning theories, constructivist learning theories, and social learning theories. Learning theories are not limited to psychology and related fields of interest but rather we can find the topic of learning in various disciplines, such as philosophy and epistemology, education, information science, biology, and – as a result of the emergence of computer technologies – especially also in the field of computer sciences and artificial intelligence. As a consequence, machine learning struck a chord in the 1980s and became an important field of the learning sciences in general. As the learning sciences became more specialized and complex, the various fields of interest were widely spread and separated from each other; as a consequence, even presently, there is no comprehensive overview of the sciences of learning or the central theoretical concepts and vocabulary on which researchers rely. The Encyclopedia of the Sciences of Learning provides an up-to-date, broad and authoritative coverage of the specific terms mostly used in the sciences of learning and its related fields, including relevant areas of instruction, pedagogy, cognitive sciences, and especially machine learning and knowledge engineering. This modern compendium will be an indispensable source of information for scientists, educators, engineers, and technical staff active in all fields of learning. More specifically, the Encyclopedia provides fast access to the most relevant theoretical terms provides up-to-date, broad and authoritative coverage of the most important theories within the various fields of the learning sciences and adjacent sciences and communication technologies; supplies clear and precise explanations of the theoretical terms, cross-references to related entries and up-to-date references to important research and publications. The Encyclopedia also contains biographical entries of individuals who have substantially contributed to the sciences of learning; the entries are written by a distinguished panel of researchers in the various fields of the learning sciences.

Adaptive Instructional Systems - Robert A. Sottilare 2019-07-10 This book constitutes the refereed proceedings of the First International Conference on Adaptive Instructional Systems, AIS 2019, held in July 2019 as part of HCI International 2019 in Orlando, FL, USA. HCII 2019 received a total of 5029 submissions, of which 1275 papers and 209 posters were accepted for publication after a careful reviewing process. The 50 papers presented in this volume are organized in topical sections named: Adaptive Instruction Design and Authoring, Interoperability and Standardization in Adaptive Instructional Systems, Instructional Theories in Adaptive Instruction, Learner Assessment and Modelling, AI in Adaptive Instructional Systems, Conversational Tutors.

Handbook of Research on Organizational Culture Strategies for Effective Knowledge Management and Performance - Tessier, Dana 2021-06-25 Organizations are facing major disruptions in technology, consumer preferences, and in the makeup of their workforce, and as a result, they will need to adapt to these rapidly changing times to stay effective. Organizations that are able to tap into the collective knowledge of their employees and leverage their insights will have an advantage over those that lack this connectivity. Implementing a knowledge management (KM) strategy can help organizations improve operational effectiveness, innovation, and adapt to changes, but the majority of KM implementations fail due to misalignment with the organization's existing culture. Organizational culture can enable effective KM, or it can be a barrier to its implementation. The Handbook of Research on Organizational Culture Strategies for Effective Knowledge Management and Performance defines the relationship between organizational culture and knowledge management and how they impact one another. This handbook also identifies critical business practices to assist organizations in transitioning to work from home while maintaining a

strong corporate culture that includes beneficial knowledge-sharing behaviors. Covering topics including knowledge management, organizational culture, and change management, this text is essential for managers, executives, practitioners, leaders in business, non-profits, academicians, researchers, and students looking for research on how organizations can thrive and adapt due to emerging global disruptions as well as local or internal disruptions.

Ensuring Quality in Professional Education Volume II - Karen Trimmer 2019-01-11
This book examines quality teaching in professional education in the fields of engineering and international knowledge structures. The second of a two-volume series, the editors and contributors structure the book around case studies which highlight the elements constituting good practice within professional education. While there is no one specific route to prepare well-qualified professionals, this volume explores the decisions the academics responsible for delivering this education make to ensure quality curricula. Ultimately, the key to effective preparations rests with the value employers place on the focus, emphasis and balance between the academic and practical in relation to their own expectations for skills that graduates must have. The second volume in this collection will appeal to students and scholars of professional pedagogy, and engineering pedagogy more specifically.

Creativity - Sílvio Manuel Brito 2022-09-14
What is creativity? There are many definitions, many of which involve trying different experiences, searching for new solutions, exercising our brains, and meeting and talking with new people. To be creative we need to believe in our skills and step outside our comfort zones in the search for new challenges. This book is a discussion of creativity in four parts: creativity behaviour, creativity learning, creativity in science and arts, and creativity tendencies. Chapters address such topics as creativity in children, creativity in education, creativity at the emotional level, and more.

Pedagogy for Conceptual Thinking and Meaning Equivalence: Emerging Research and Opportunities - Etkind, Masha 2019-11-08
Research in neuroscience and brain imaging show that exposure of learners to multi-semiotic problems enhance cognitive control of inter-hemispheric attentional processing in the lateral brain and increase higher-order thinking. Multi-semiotic representations of conceptual meaning are found in most knowledge domains where issues of quantity, structure, space, and change play important roles, including applied sciences and social science. Teaching courses in History and Theory of Architecture to young architecture students with pedagogy for conceptual thinking allows them to connect analysis of historic artifact, identify pattern of design ideas extracted from the precedent, and transfer concepts of good design into their creative design process. Pedagogy for Conceptual Thinking and Meaning Equivalence: Emerging Research and Opportunities is a critical scholarly resource that demonstrates an instructional and assessment methodology that enhances higher-order thinking, deepens comprehension of conceptual content, and improves learning outcomes. Based on the rich literature on word meaning and concept formation in linguistics and semiotics, and in developmental and cognitive psychology, it shows how independent studies in these disciplines converge on the necessary clues for constructing a procedure for the demonstration of mastery of knowledge with equivalence-of-meaning across multiple representations. Featuring a wide range of topics such as curriculum design, learning outcomes, and STEM education, this book is essential for curriculum developers, instructional designers, teachers, administrators, education professionals, academicians, policymakers, and researchers.

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