First Robotics 21st Century Skills Innovation Library Makers As Innovators | 2471616a8d789cac777a9bdd436374ab


Handbook of Research on Advancements in Robotics and Mechatronics. "This book explores some of the most recent developments in robotic motion, artificial intelligence, and human-machine interaction, providing insight into a wide variety of applications and functional areas"—Provided by publisher.

Reauthorization of the Carl D. Perkins Vocational and Technical Education Act. This book constitutes the refereed proceedings of the 5th International Conference on Informatics in Schools: Situation, Evolution and Perspectives, ISSEP 2011, held in Bratislava, Slovakia, in October 2011. The 20 revised full papers presented were carefully reviewed and selected from 69 submissions. A broad variety of topics related to teaching informatics in schools is addressed ranging from national experience reports to pedagogical and methodological issues. The papers are organized in topical sections on informatics education - the spectrum of options, national perspectives, outreach programmes, teacher education, informatics in primary schools, advanced concepts of informatics in schools, as well as competitions and exams.

Wearable Technologies: Concepts, Methodologies, Tools, and Applications. Teaching models that focus on blended and virtual learning have become important during the past year and have become integral for the continuance of learning. The i²Flex classroom model, a variation of blended learning, allows non-interactive teaching activities to take place without teachers’ direct involvement, freeing up time for more meaningful teacher-student and student-student interactions. There is evidence that i²Flex leads to increased student engagement and motivation as well as better exploitation of teachers’ and
classroom time leading to the development of higher order cognitive skills as well as study skills for students' future needs related to citizenship, college, and careers. The Handbook of Research on K-12 Blended and Virtual Learning Through the i²Flex Classroom Model focuses not only on how to design, deliver, and evaluate courses, but also on how to assess teacher performance in a blended i²Flex way at the K12 level. The book will discuss the implementation of the i²Flex (isquareFlex), a non-traditional learning methodology, which integrates internet-based delivery of content and instruction with faculty-guided, student-independent learning in combination with face-to-face classroom instruction aiming at developing higher order cognitive skills within a flexible learning design framework. While highlighting new methods for improving the classroom and learning experience in addition to preparing students for higher education and careers, this publication is an essential reference source for pre-service and in-service teachers, researchers, administrators, educational technology developers, and students interested in how the i²Flex model was implemented in classrooms and the effects of this learning model.

Learning for Life These volumes of "Advances in Intelligent Systems and Computing" highlight papers presented at the "Third Iberian Robotics Conference (ROBOT 2017)". Held from 22 to 24 November 2017 in Seville, Spain, the conference is a part of a series of conferences co-organized by SEIDROB (Spanish Society for Research and Development in Robotics) and SPR (Portuguese Society for Robotics). The conference is focused on Robotics scientific and technological activities in the Iberian Peninsula, although open to research and delegates from other countries. Thus, it has more than 500 authors from 21 countries. The volumes present scientific advances but also robotic industrial applications, looking to promote new collaborations between industry and academia.

Educational Robotics in the Makers Era This book includes papers presented at the International Conference "Educational Robotics in the Maker Era -- EDUCOBOTICS 2020", Online, February 2021. The contributions cover a variety of topics useful for teacher education and for designing learning by making activities for children and youth, with an emphasis on modern low-cost technologies (including block-based programming environments, Do-It-Yourself electronics, 3D printed artifacts, the use of intelligent distributed systems, the IoT technology, and gamification) in formal and informal education settings. This collection of contributions (17 chapters and 2 short papers) provides researchers and practitioners the latest advances in educational robotics in a broader sense focusing on science, technology, engineering, arts, and mathematics (STEAM) education. Teachers and educators at any school level can find insights and inspirations into how educational robotics can promote technological interest and 21st-century skills: creativity, critical thinking, team working, and problem-solving with special emphasis on new emerging making technologies.

FIRST Robotics The field of robotics in a classroom context has seen an increase in global momentum recently because of its positive contributions in the teaching of science, technology, engineering, mathematics (STEM) and beyond. It is argued that when robotics and programming are integrated in developmentally appropriate ways, cognitive skill development beyond STEM can be achieved. The development of educational robotics has presented a plethora of ways in which students can be assisted in the classroom. Designing, Constructing, and Programming Robots for Learning highlights the importance of integrating robotics in educational practice and presents various ways for how it can be achieved. It further explains how 21st century skills and life skills can be developed through the hands-on experience of educational robotics. Covering topics such as computational thinking, social skill enhancement, and teacher training, this text is an essential resource for engineers, educational software developers, teachers, professors, instructors, researchers, faculty, leaders in educational fields, students, and academicians.

Educational Robotics in the Context of the Maker Movement Makers of all ages are creating robots on their own. In this book, students learn more about this recent innovation through detailed explanations built to foster creativity and critical thinking. Fun, engaging text introduces readers to new ideas and builds on maker-related concepts they may already know. Additional tools, including a glossary and an index, help students learn new vocabulary and locate information.

Artificial Intelligence in the 21st Century "Learn the basics of Mindstorms, from building your first robot to programming its first movements."--
21st Century Skills Advances in technology continue to alter the ways in which we conduct our lives, from the private sphere to how we interact with others in public. As these innovations become more integrated into modern society, their applications become increasingly relevant in various facets of life. Wearable Technology and Mobile Innovations for Next-Generation Education is an authoritative reference source on the development and implementation of wearables within learning and training environments, emphasizing the valuable resources offered by these advances. Focusing on technical considerations, lessons learned, and real-world examples, this book is ideally designed for instructors, researchers, upper-level students, and policy makers interested in the effectiveness of wearable applications.

Teaching and Learning in the 21st Century This book includes papers presented at the International Conference “Educational Robotics 2016 (EDUROBOTICS)”, Athens, November 25, 2016. The papers build on constructivist and constructionist pedagogy and cover a variety of topics, including teacher education, design of educational robotics activities, didactical models, assessment methods, theater robotics, programming & making electronics with Snap4Arduino, the Duckietown project, robotics driven by tangible programming, Lego Mindstorms combined with App Inventor, the Orbital Education Platform, Anthropomorphic Robots and Human Makers in Education, and more. It provides researchers interested in educational robotics with the latest advances in the field with a focus on science, technology, engineering, arts and mathematics (STEAM) education. At the same time it offers teachers and educators from primary to secondary and tertiary education insights into how educational robotics can trigger the development of technological interest and 21st century skills in STEAM education (creative thinking, team working, problem solving).

Robotics: Concepts, Methodologies, Tools, and Applications These proceedings represent the work of contributors to the 2nd European Conference on the Impact of Artificial Intelligence and Robotics (ECIAIR 2020), hosted by ACI and Instituto Universitário de Lisboa (ISCTE-IUL), Portugal on 22-23 October 2020. The Conference Chair is Dr Florinda Matos, and the Programme Chairs are Dr Ana Maria de Almeida and Prof Isabel Salavisa, all from Instituto Universitário de Lisboa (ISCTE-IUL), Portugal.

Robots in K-12 Education: A New Technology for Learning This new edition provides a comprehensive, colorful, up-to-date, and accessible presentation of AI without sacrificing theoretical foundations. It includes numerous examples, applications, full color images, and human interest boxes to enhance student interest. New chapters on robotics and machine learning are now included. Advanced topics cover neural nets, genetic algorithms, natural language processing, planning, and complex board games. A companion DVD is provided with resources, applications, and figures from the book. Numerous instructors’ resources are available upon adoption. eBook Customers: Companion files are available for downloading with order number/proof of purchase by writing to the publisher at info@merlearm.com. FEATURES: • Includes new chapters on robotics and machine learning and new sections on speech understanding and metaphor in NLP • Provides a comprehensive, colorful, up to date, and accessible presentation of AI without sacrificing theoretical foundations • Uses numerous examples, applications, full color images, and human interest boxes to enhance student interest • Introduces important AI concepts e.g., robotics, use in video games, neural nets, machine learning, and more thorough practical applications • Features over 300 figures and color images with worked problems detailing AI methods and solutions to selected exercises • Includes DVD with resources, simulations, and figures from the book • Provides numerous instructors’ resources, including: solutions to exercises, Microsoft PP slides, etc.

2nd European Conference on the Impact of Artificial Intelligence and Robotics As new classroom resources are developed, educators strive to incorporate digital media advancements into their curriculum to provide an enriched learning experience for students with exceptional intelligence, as well as students in need of supplementary instruction. Though the resources exist, their effective use in the classroom is currently lacking. Cases on Instructional Technology in Gifted and Talented Education provides educators with real-life examples and research-based directions for the use of digital media resources in classrooms at all academic levels. This reference work will appeal to educators and researchers interested in enriching P-12 classrooms in order to extend student learning and promote effective e-learning in the classroom.
From Motor Learning to Interaction Learning in Robots This book gathers papers presented at the International Conference “Educational Robotics in the Maker Era – EDUROBOTICS 2018”, held in Rome, Italy, on October 11, 2018. The respective chapters explore the connection between the Maker Movement on the one hand, and Educational Robotics, which mainly revolves around the constructivist and constructionist pedagogy, on the other. They cover a broad range of topics relevant for teacher education and for designing activities for children and youth, with an emphasis on using modern low-cost technologies (including block-based programming environments, Do-It-Y ourself electronics, 3D printed artifacts, intelligent distributed systems, IoT technology and gamification) in formal and informal education settings. The twenty contributions collected here will introduce researchers and practitioners to the latest advances in educational robotics, with a focus on science, technology, engineering, arts and mathematics (STEAM) education. Teachers and educators at all levels will find valuable insights and inspirations into how educational robotics can promote technological interest and 21st century skills – e.g. creativity, critical thinking, teamwork, and problem-solving – with a special emphasis on new making technologies.

Work-Integrated Learning in the 21st Century When companies develop a new technology, do they ask how it might affect the people who will actually use it? That, more or less, sums up Brian David Johnson’s duties as Intel’s futurist-in-residence. In this fascinating book, Johnson provides a collection of science fiction prototyping stories that attempt to answer the question. These stories focus on the same theme: scientists and thinkers exploring personal robotics as a new form of artificial intelligence. This isn’t fanciful speculation. Johnson’s stories are based on Intel’s futurecasting research, which uses ethnographic field studies, technology research, trend data, and science fiction to develop a pragmatic vision of consumers and computing. 21st Century Robot presents science fiction designed to bring about science fact. Get real insight into technology and the future with this book. It will open your eyes.

Robots in Education Presents an introduction to the framework of twenty-first century learning, covering the skills needed to thrive, including learning and innovations skills, digital literacy skills, and life and career skills.

21st Century Robot This book explores new questions about the state of work and work readiness for new university and college graduates in the context of work-integrated learning in the 21st century and the role of higher education in preparing students for the challenges of global economic shifts in the labour market.

Innovative Technologies and Learning


Robotics in Education In science, technology, engineering, and mathematics (STEM) education in pre-college, engineering is not the silent “e” anymore. There is an accelerated interest in teaching engineering in all grade levels. Structured engineering programs are emerging in schools as well as in out-of-school settings. Over the last ten years, the number of states in the US including engineering in their K-12 standards has tripled, and this trend will continue to grow with the adoption of the Next Generation Science Standards. The interest in pre-college engineering education stems from three different motivations. Designed to be a source of background and inspiration for researchers and practitioners alike, this volume includes contributions on policy, synthesis studies, and research studies to catalyze and inform current efforts to improve pre-college engineering education. The book explores teacher learning and practices, as well as how student learning occurs in both formal settings, such as classrooms, and informal settings, such as homes and museums. This volume also includes chapters on assessing design and creativity.

Conference proceedings. New perspectives in science education 7th edition The digital transformation is impacting various aspects of how we live and work.
Due to the pervasive effects of the digital revolution on firms and societies, both scholars and practitioners are interested in better understanding the key mechanisms behind the related challenges. This book presents a collection of research papers focusing on the relationships between technologies (e.g. artificial intelligence, social media, and the Internet of Things) and behaviours (e.g. social learning, knowledge sharing, and decision-making). Moreover, it provides insights into how the digital transformation may improve quality of personal life and work life within public and private organisations. The plurality of views offered makes this book particularly relevant for practitioners, companies, scientists, and governments. It gathers a selection of the best papers - original double-blind peer-reviewed contributions - presented at the annual conference of the Italian chapter of the AIS which was held in Naples, Italy, in September 2019.

Inclusive Robotics for a Better Society From an engineering standpoint, the increasing complexity of robotic systems and the increasing demand for more autonomously learning robots, has become essential. This book is largely based on the successful workshop “From motor to interaction learning in robots” held at the IEEE/RSJ International Conference on Intelligent Robot Systems. The major aim of the book is to give students interested the topics described above a chance to get started faster and researchers a helpful compandium.

Cases on Instructional Technology in Gifted and Talented Education

Wearable Technology and Mobile Innovations for Next-Generation Education

Education in & with Robotics to Foster 21st-Century Skills This proceedings volume comprises the latest achievements in research and development in educational robotics presented at the 9th International Conference on Robotics in Education (RIE) held in Qawra, St. Paul's Bay, Malta, during April 18-20, 2018. Researchers and educators will find valuable methodologies and tools for robotics in education that encourage learning in the fields of science, technology, engineering, arts and mathematics (STEAM) through the design, creation and programming of tangible artifacts for creating personally meaningful objects and addressing real-world societal needs. This also involves the introduction of technologies ranging from robotics platforms to programming environments and languages. Extensive evaluation results are presented that highlight the impact of robotics on the students’ interests and competence development. The presented approaches cover the whole educative range from elementary school to the university level in both formal as well as informal settings.

Mindstorms: Level 1 This book presents innovative instructional interventions designed to support inquiry project-based learning as an approach to equip students with 21st century skills. Instructional techniques include collaborative team-based teaching, social constructivist game design and game play, and productive uses of social media such as wikis and other online communication affordances. The book will be of interest to researchers seeking a summary of recent empirical studies in the inquiry project-based learning domain that employ new technologies as constructive media for student synthesis and creation. The book also bridges the gap between empirical works and a range of national- and international-level educational standards frameworks such as the P21, the OECD framework, AASL Standards for the 21st Century Learner, and the Common Core State Standards in the U.S. Of particular interest to education practitioners, the book offers detailed descriptions of inquiry project-based learning interventions that can be directly reproduced in today's schools. Further, the book provides research-driven guidelines for the evaluation of student inquiry project-based learning. Lastly, it offers education policymakers insight into establishing anchors and spaces for applying inquiry project-based learning opportunities for youth today in the context of existing and current education reform efforts. The aim of this book is to support education leaders', practitioners' and researchers' efforts in advancing inspiring and motivating student learning through transformative social constructivist inquiry-based knowledge-building with information technologies. We propose that preparing students with inquiry mindsets and dispositions can promote greater agency, critical thinking and resourcefulness, qualities needed for addressing the complex societal challenges they may face.
Assessment and Teaching of 21st Century Skills The book reports on advanced topics in interactive robotics research and practice; in particular, it addresses non-technical obstacles to the broadest uptake of these technologies. It focuses on new technologies that can physically and cognitively interact with humans, including neural interfaces, soft wearable robots, and sensor and actuator technologies; further, it discusses important regulatory challenges, including but not limited to business models, standardization, education and ethical-legal–socioeconomic issues. Gathering the outcomes of the 1st INBOTS Conference (INBOTS2018), held on October 16–20, 2018 in Pisa, Italy, the book addresses the needs of a broad audience of academics and professionals working in government and industry, as well as end users. In addition to providing readers with detailed information and a source of inspiration for new projects and collaborations, it discusses representative case studies highlighting practical challenges in the implementation of interactive robots in a number of fields, as well as solutions to improve communication between different stakeholders. By merging engineering, medical, ethical and political perspectives, the book offers a multidisciplinary, timely snapshot of interactive robotics.

Robot Scientist This proceedings volume showcases the latest achievements in research and development in Educational Robotics presented at the 7th International Conference on Robotics in Education (RiE) held in Vienna, Austria, during April 14-15, 2016. The book offers a range of methodologies for teaching robotics and presents various educational robotics curricula. It includes dedicated chapters for the design and analysis of learning environments as well as evaluation means for measuring the impact of robotics on the students’ learning success. Moreover, the book presents interesting programming approaches as well as new applications, the latest tools, systems and components for using robotics. The presented applications cover the whole educative range, from elementary school to high school, college, university and beyond, for continuing education and possibly outreach and workforce development. The book provides a framework involving two complementary kinds of contributions: on the one hand on technical aspects and on the other hand on matters of didactic.

Project Management for Education “This book explores the theory and practice of educational robotics in the K-12 formal and informal educational settings, providing empirical research supporting the use of robotics for STEM learning”--Provided by publisher.

Digital Transformation and Human Behavior In the Industrial Revolution Era 4.0, led by technological developments, education plays an essential role in preparing students with the skills required to survive. Pedagogical innovations in the pre-service teacher programme are necessary to encourage pre-service teachers with adequate abilities and skills in preparing classroom activities that enhance the essential skills. This book results from a one-year study examining a new approach to equip prospective mathematics teachers with 21st-century skills. The prospective teachers were involved in RoboSTE[M], a STEM-based approach that employs robotics in the classroom. The book contains articles that discussed Robotic and STEM education, followed by ready-to-used RoboSTE[M] students worksheets that prospective mathematics teachers produced.

Robotics in Education Today’s global knowledge economy requires individuals and companies alike to quickly adapt to new tools and strategies. To remain competitive, both must continually seek out the latest advancements and developments, and upgrade their skillsets accordingly. In the United States, however, support for ongoing education lags far behind other developed nations, creating a crippling skills gap between the workforce and industries in the US and its global competitors. In a country that has been multiple steps ahead of everyone else since its birth, how did this happen? Why are other countries, previously inferior when it came to technological advancements, suddenly faring markedly better? What keeps our nation’s vast network of corporate training, workforce development, and K-12 and college education so fragmented and inefficient? In the tells-it-like-it-is Learning for Life, readers will learn about:• Why America’s existing educational models are failing employees and employers• The shift in content knowledge toward new ways of thinking and working• Policies and programs that are working in the US and abroad• Recommendations for overhauling our education and training infrastructure and building partnerships between providers and employersThe stakes are too important for America to continue falling behind in its education. But the good news is, the pathways to get us back to the top are there ahead of us. Learning for Life points the way forward.
Informatics in Schools: Contributing to 21st Century Education Over the last few years, increasing attention has been focused on the development of children’s acquisition of 21st-century skills and digital competences. Consequently, many education scholars have argued that teaching technology to young children is vital in keeping up with 21st-century employment patterns. Technologies, such as those that involve robotics or coding apps, come at a time when the demand for computing jobs around the globe is at an all-time high while its supply is at an all-time low. There is no doubt that coding with robotics is a wonderful tool for learners of all ages as it provides a catalyst to introduce them to computational thinking, algorithmic thinking, and project management. Additionally, recent studies argue that the use of a developmentally appropriate robotics curriculum can help to change negative stereotypes and ideas children may initially have about technology and engineering. The Handbook of Research on Using Educational Robotics to Facilitate Student Learning is an edited book that advocates for a new approach to computational thinking and computing education with the use of educational robotics and coding apps. The book argues that while learning about computing, young people should also have opportunities to create with computing, which have a direct impact on their lives and their communities. It develops two key dimensions for understanding and developing educational experiences that support students in engaging in computational action: (1) computational identity, which shows the importance of young people’s development of scientific identity for future STEM growth; and (2) digital empowerment to instill the belief that they can put their computational identity into action in authentic and meaningful ways. Covering subthemes including student competency and assessment, programming education, and teacher and mentor development, this book is ideal for teachers, instructional designers, educational technology developers, school administrators, academics, researchers, and students.

Handbook of Research on K-12 Blended and Virtual Learning Through the i²Flex Classroom Model Advances in technology continue to alter the ways in which we conduct our lives, from the private sphere to how we interact with others in public. As these innovations become more integrated into modern society, their applications become increasingly relevant in various facets of life. Wearable Technologies: Concepts, Methodologies, Tools, and Applications is a comprehensive reference source for the latest scholarly material on the development and implementation of wearables within various environments, emphasizing the valuable resources offered by these advances. Highlighting a range of pertinent topics, such as assistive technologies, data storage, and health and fitness applications, this multi-volume book is ideally designed for researchers, academics, professionals, students, and practitioners interested in the emerging applications of wearable technologies.

Handbook of Research on Using Educational Robotics to Facilitate Student Learning This unique book is for two audiences! Read one way it is for educators; flip it over and read the other way it is for project managers! Project based learning (PBL), a set of engaging and powerful learning methods organized around motivating projects, is one of the most popular ways to bring the skills used by project management into students' educational experience, giving them amazing opportunities to develop the essential 21st century competencies they need. In Project Management for Education: The Bridge to 21st Century Learning, authors Bernie Trilling and Walter Ginevri provide a "two-in-one" guide for educators and project management professionals, demonstrating how the two fields can work together. By teaming up to enrich the experience of students, both educators and project management professionals can continue to develop their own skills and better meet the challenges they face in our ever-changing world.

Engineering in Pre-College Settings This book provides a detailed description of research and application outcomes from the Assessment and Teaching of 21st Century Skills project, which explored a framework for understanding the nature of these skills. The major element of this new volume is the presentation of research information from the global assessment of two 21st century skills that are amenable to teaching and learning: collaborative problem solving, and learning in digital networks. The outcomes presented include evidence to support the validity of assessment of 21st century skills and descriptions of consequent pedagogical approaches which can be used both to teach the skills and to use them to enhance key learning goals in secondary education systems. The sections of the volume are connected through a focus on the degree to which innovative assessment tasks measure the constructs of interest. This focus is informed by conceptual and methodological issues associated with affordances of 21st century computer-based assessment. How understanding of the nature of the skills, as derived from these assessments, can guide approaches to the integration of 21st century skills in the classroom, is informed by initiatives adopted by participating countries. The guiding questions in this volume are: "Do the assessment tasks measure the constructs?"
and "What are the implications for assessment and teaching in the classroom?" It is the third volume of papers from this project published by Springer.

Teaching 21st Century Skills This book constitutes the refereed proceedings of the First International Conference on Innovative Technologies and Learning, ICITL 2018, held in Portoroz, Slovenia, in August 2018. The 66 revised full papers presented together with 4 short papers were carefully reviewed and selected from 160 submissions. The papers are organized in the following topical sections: Augmented and Virtual Reality in Education; Collaborative Learning; Design and Framework of Learning Systems; Instructional Strategies; Learning Analytics and Education Data Mining; Mind, Brain and Education; Pedagogies to Innovative Technologies; Personalized and Adaptive Learning; Social Media and Online Learning; Technologies Enhanced Language Learning; Application and Design of Innovative Learning Software; Educational Data Analytics Techniques and Adaptive Learning Applications; and Innovative Thinking Education and Future Trend Development.

Robotics in STEM Education Readers will learn what it takes to succeed as a robot scientist. The book also explains the necessary educational steps, useful character traits, potential hazards, and daily job tasks related to this career. Sidebars include thought-provoking trivia. Questions in the backmatter ask for text-dependent analysis. Photos, a glossary, and additional resources are included.

21st Century Skills Development Through Inquiry-Based Learning The field of mechatronics integrates modern engineering science and technologies with new ways of thinking, enhancing the design of products and manufacturing processes. This synergy enables the creation and evolution of new intelligent human-oriented machines. The Handbook of Research on Advancements in Robotics and Mechatronics presents new findings, practices, technological innovations, and theoretical perspectives on the latest advancements in the field of mechanical engineering. This book is of great use to engineers and scientists, students, researchers, and practitioners looking to develop autonomous and smart products and systems for meeting today's challenges.

ROBOSTEM This book describes recent approaches in advancing STEM education with the use of robotics, innovative methods in integrating robotics in school subjects, engaging and stimulating students with robotics in classroom-based and out-of-school activities, and new ways of using robotics as an educational tool to provide diverse learning experiences. It addresses issues and challenges in generating enthusiasm among students and revamping curricula to provide application focused and hands-on approaches in learning. The book also provides effective strategies and emerging trends in using robotics, designing learning activities and how robotics impacts the students' interests and achievements in STEM-related subjects. The frontiers of education are progressing very rapidly. This volume brought together a collection of projects and ideas which help us keep track of where the frontiers are moving. This book ticks lots of contemporary boxes: STEM, robotics, coding, and computational thinking among them. Most educators interested in the STEM phenomena will find many ideas in this book which challenge, provide evidence and suggest solutions related to both pedagogy and content. Regular reference to 21st Century skills, achieved through active collaborative learning in authentic contexts, ensures the enduring usefulness of this volume. John Williams Professor of Education and Director of the STEM Education Research Group Curtin University, Perth, Australia