

Stem Student Research Handbook

This comprehensive resource for STEM teachers and students, outlines the various stages of large-scale research projects, enabling teachers to coach their students through the research process. This handbook provides enough detail to embolden all teachersOcoeven those who have never designed an experiment on their ownOoto support student-researchers through the entire process of conducting experiments."

The purpose of this handbook is to help launch institutional transformations in mathematics departments to improve student success. We report findings from the Student Engagement in Mathematics through an Institutional Network for Active Learning (SEMINAL) study. SEMINAL's purpose is to help change agents, those looking to (or currently attempting to) enact change within mathematics departments and beyond—trying to reform the instruction of their lower division mathematics courses in order to promote high achievement for all students. SEMINAL specifically studies the change mechanisms that allow postsecondary institutions to incorporate and sustain active learning in Precalculus to Calculus 2 learning environments. Out of the approximately 2.5 million students enrolled in collegiate mathematics courses each year, over 90% are enrolled in Precalculus to Calculus 2 courses. Forty-four percent of mathematics departments think active learning mathematics strategies are important for Precalculus to Calculus 2 courses, but only 15 percent state that they are very successful at implementing them. Therefore, insights into the following research question will help with institutional transformations: What conditions, strategies, interventions and actions at the departmental and classroom levels contribute to the initiation, implementation, and institutional sustainability of active learning in the undergraduate calculus sequence (Precalculus to Calculus 2) across varied institutions?

Educators require constructive information that details their students' comprehension and can help them to advance the learners' education. Accurate evaluation of students at all educational levels and the implementation of comprehensive assessment strategies are essential for ensuring student equality and academic success. The Handbook of Research on Formative Assessment in Pre-K Through Elementary Classrooms is an essential research publication that addresses gaps in the understanding of formative assessment and offers educators meaningful and comprehensive examples of formative assessment in the Pre-K through elementary grade levels. Covering an array of topics such as literacy, professional development, and educational technologies, this book is relevant for instructors, administrators, education professionals, educational policymakers, pre-service teachers, academicians, researchers, and students. Mobile phones have become an integral part of society, as their convenience has helped democratize and revolutionize communication and the marketplace of ideas. Because of their ubiquity in higher education, undergraduate classrooms have begun to utilize smartphones and tablets as tools for learning. The Handbook of Research on Mobile Devices and Applications in Higher Education Settings explores and fosters new perspectives on the use of mobile applications in a classroom context. This timely publication will demonstrate the challenges that universities face when introducing new technologies to students and instructors, as well as the rewards of doing so in a thoughtful manner. This book is meant to present the latest research and become a source of inspiration for educators, administrators, researchers, app developers, and students of education and technology. Handbook of Research on Formative Assessment in Pre-K Through Elementary Classrooms Handbook of Research on Education and Technology in a Changing Society Handbook of Research on Innovative Pedagogies and Best Practices in Teacher Education

Handbook of Research on Innovative Digital Practices to Engage Learners

Published annually since 1985, the Handbook series provides a compendium of thorough and integrative literature reviews on a diverse array of topics of interest to the higher education scholarly and policy communities. Each chapter provides a comprehensive review of research findings on a selected topic, critiques the research literature in terms of its conceptual and methodological rigor, and sets forth an agenda for future research intended to advance knowledge on the chosen topic. The Handbook focuses on twelve general areas that encompass the salient dimensions of scholarly and policy inquiries undertaken in the international higher education community. The series is fortunate to have attracted annual contributions from distinguished scholars throughout the world. The COVID-19 pandemic drastically transformed the classroom by keeping students and teachers apart for the sake of safety. As schools emptied, remote learning rapidly expanded through online services and video chatrooms. Unfortunately, this disrupted many students and teachers who were not accustomed to remote classrooms. This challenge has forced K-12 teachers to think differently about teaching. Unexpectedly and with little time to prepare, they have been confronted with redesigning their curriculum and instruction from face-to-face to online virtual classrooms to protect students from the COVID-19 virus while ensuring that these new online initiatives remain sustainable and useful in the post-pandemic world. As teachers learn to take advantage of the affordances and strengths of the multiple technologies available for virtual classroom instruction, their instruction both in online and face-to-face will impact what and how students learn in the 21st century. The Handbook of Research on Transforming Teachers' Online Pedagogical Reasoning for Engaging K-12 Students in Virtual Learning examines the best practices and pedagogical reasoning for designing online strategies that work for K-12 virtual learning. The initial section provides foundational pedagogical ideas for constructing engaging virtual learning environments that leverage the unique strengths and opportunities while avoiding the weaknesses and threats of the online world. The following chapters present instructional strategies for multiple grade levels and content areas: best practices that work, clearly describing why they work, and the teachers' pedagogical reasoning that supports online implementations. The chapters provide ways to think about teaching in virtual environments that can be used to guide instructional strategy choices and recognizes the fundamental differences between face-to-face and virtual environments as an essential design component. Covering such topics as K-12 classrooms, pedagogical reasoning, and virtual learning, this text is perfect for professors, teachers, students, educational designers and developers, instructional technology faculty, distance learning faculty, and researchers interested in the subject.

STEM Student Research HandbookNSTA Press

This state-of-the art research Handbook provides a comprehensive, coherent, current synthesis of the empirical and theoretical research concerning teaching and learning in science and lays down a foundation upon which future research can be built. The contributors, all leading experts in their research areas, represent the international and gender diversity that exists in the science education research community. As a whole, the Handbook of Research on Science Education demonstrates that science education is alive and well and illustrates its vitality. It is an essential resource for the entire science education community, including veteran and emerging researchers, university faculty, graduate students, practitioners in the schools, and science education professionals outside of universities. The National Association for Research in Science Teaching (NARST) endorses the Handbook of Research on Science Education as an important and valuable synthesis of the current knowledge in the field of science education by leading individuals in the field. For more information on NARST, please visit: <http://www.narst.org/>.

STEM Student Research Handbook

Handbook of Research on Fostering Student Engagement With Instructional Technology in Higher Education

Handbook of Research on Classroom Diversity and Inclusive Education Practice

Handbook of Research on Future Opportunities for Technology Management Education

Trends and Perspectives

For more than two decades, the concept of student engagement has grown from simple attention in class to a construct comprised of cognitive, emotional, and behavioral components that embody and further develop motivation for learning. Similarly, the goals of student engagement have evolved from dropout prevention to improved outcomes for lifelong learning. This robust expansion has led to numerous lines of research across disciplines and are brought together clearly and comprehensively in the Handbook of Research on Student Engagement. The Handbook guides readers through the field's rich history, sorts out its component constructs, and identifies knowledge gaps to be filled by future research. Grounding data in real-world learning situations, contributors analyze indicators and facilitators of student engagement, link engagement to motivation, and gauge the impact of family, peers, and teachers on engagement in elementary and secondary grades. Findings on the effectiveness of classroom interventions are discussed in detail. And because assessing engagement is still a relatively new endeavor, chapters on measurement methods and issues round out this important resource. Topical areas addressed in the Handbook include: Engagement across developmental stages. Self-efficacy in the engaged learner. Parental and social influences on engagement and achievement motivation. The engaging nature of teaching for competency development. The relationship between engagement and high-risk behavior in adolescents. Comparing methods for measuring student engagement. An essential guide to the expanding knowledge base, the Handbook of Research on Student Engagement serves as a valuable resource for researchers, scientist-practitioners, and graduate students in such varied fields as clinical child and school psychology, educational psychology, public health, teaching and teacher education, social work, and educational policy.

Teacher education is an evolving field with multiple pathways towards teacher certification. Due to an increasing emphasis on the benefits of field-based learning, teachers can now take alternative certification pathways to become teachers. The Handbook of Research on Field-Based Teacher Education is a pivotal reference source that combines field-based components with traditional programs, creating clinical experiences and "on-the-job" learning opportunities to further enrich teacher education. While highlighting topics such as certification design, preparation programs, and residency models, this publication explores theories of teaching and learning through collaborative efforts in pre-Kindergarten through grade 12 settings. This book is ideally designed for teacher education practitioners and researchers invested in the policies and practices of educational design.

As classrooms are becoming more diverse, teachers are now faced with the responsibility of creating an inclusive classroom community. As such, researching classroom pedagogies and practices is an imperative step in curriculum planning. The Handbook of Research on Classroom Diversity and Inclusive Education Practice is an authoritative reference source for the latest scholarly research on ways to effectively teach all students and further refine and strengthen school-wide inclusive pedagogy, methods, and policies. Featuring extensive coverage on a number of topics such as special education, online learning, and English language learners, this publication is ideally designed for professionals, educators, and policy makers seeking current research on methods that ensure all students have equal access to curricular content and the chance for growth and success.

The International Handbook of the Learning Sciences is a comprehensive collection of international perspectives on this interdisciplinary field. In more than 50 chapters, leading experts synthesize past, current, and emerging theoretical and empirical directions for learning sciences research. The three sections of the handbook capture, respectively: foundational contributions from multiple disciplines and the ways in which the learning sciences has fashioned these into its own brand of use-oriented theory, design, and evidence; learning sciences approaches to designing, researching, and evaluating learning broadly construed; and the methodological diversity of learning sciences research, assessment, and analytic approaches. This pioneering collection is the definitive volume of international learning sciences scholarship and an essential text for scholars in this area.

Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age

Handbook of Research on Stem Education

Volume 34

The Handbook of Media Education Research

STEM Education from Asia

This book discusses critical areas of progress in stem cell research, including the most recent research and applications of pluripotent embryonic cells, induced pluripotent cells, oligopotent tissue stem cells and cancer stem cells. The text covers basic knowledge, cell ethics, development of techniques for applying stem cell therapy, the technology of obtaining appropriate cells for transplantation as well as the role of stem cells in cancer and how therapy may be directed to cancer stem cells. This new volume is essential reading for researchers currently in the field or allied research areas, and those for those graduate students who envision a career in stem cells.

Comprehensive overview of the theoretical, conceptual, and applied/practical presentations of action research as it is found and conducted solely in educational settings. The Wiley Handbook of Action Research in Education is the first book to offer theoretical and applied/practical presentations of action research as it is found and conducted solely in educational settings. Covering primarily PK-12 educational settings, the book utilizes a cross-section of international authors and presentations to provide global perspectives on action research in education. Part I of The Wiley Handbook of Action Research in Education focuses on various foundational aspects and issues related to action research. Part II is centered on chapters that present theories and principles that help to guide the use of action research in education. Part III focuses on specific applications of educational action research in practice. Part IV provides an outlet for seven educational practitioners to share their experiences in conducting action research. Each of these authors also discusses the importance a

has had on him or her, both professionally and personally. Discuss action research in PK-12, as well as in higher education settings The first book to focus on the importance and application of action research exclusively in educational settings Offers world-class perspectives on action research in education Written by a team of international scholars The Wiley Handbook of Action Research in Education is an excellent book for advanced undergraduate students, graduate students, and scholars studying and/or researching educational action research

Successful STEM Mentoring Initiatives for Underrepresented College Students is a step-by-step, research-based guide for higher education faculty and administrators who are charged with designing mentoring programs to recruit and retain students from underrepresented groups. Written by an acknowledged expert in the field of STEM mentoring, the book constitutes a virtual consultant that enables readers to diagnose the issues they face, identify priorities, and implement appropriate practices to achieve their goals. The book describes barriers that underrepresented students—to include women, students of color, transfer students, and first-generation college students—encounter when considering enrollment, or participating, in science courses; considers the issues they face at the various stages of their college experience; from entering college to declaring a major and moving on to a profession; and sets out the range of mentoring options available to program designers. By posing key questions and using three running case illustrations of common dilemmas, the book walks readers through the process of matching the best design options with the particular needs and resources of their own department or campus. Intentionally brief and to the point, the book is nonetheless a comprehensive guide to the full range mentoring models and best practices, that are appropriate to the particular and departmental climate and teaching methods, and offers insider insights to help designers avoid pitfalls as they create effective, sustainable mentoring initiatives. This guide will assist administrators working on new initiatives to broaden access and improve the success of their programs, as well as apply for research grants, by clarifying objectives and identifying the effective evidence-based practices to achieve them. It also provides common conversation-starters for departments to identify obstacles to enrollment and retention. "This book provides teachers, faculty and educational leaders with an opportunity to share their recent research with focus on best teaching practices through the use of online platforms"--

Handbook of Research on Innovations in Non-Traditional Educational Practices

International Handbook of Research on Multicultural Science Education

Higher Education: Handbook of Theory and Research

Cambridge Handbook of Engineering Education Research

Handbook of Research on Mobile Devices and Applications in Higher Education Settings

Educational strategies have evolved over the years, due to research breakthroughs and the application of technology. By using the latest learning innovations, curriculum and instructional design can be enhanced and strengthened. The Handbook of Research on Driving STEM Learning With Educational Technologies is an authoritative reference source for the latest scholarly research on the implementation and use of different techniques of instruction in modern classroom settings. Featuring exhaustive coverage on a variety of topics including data literacy, student motivation, and computer-aided assessment, this resource is an essential reference publication ideally designed for academicians, researchers, and professionals seeking current research on emerging uses of technology for STEM education.

Building on the foundation set in Volume I: a landmark synthesis of research in the field! Volume II is a comprehensive, state-of-the-art new volume highlighting new and emerging research perspectives. The contributors, all experts in their research areas, represent the international and gender diversity in the science education research community. The volume is organized around six themes: theory and methods of science education research; science learning; culture, gender, and society and science learning; science teaching; curriculum and assessment in science; science teacher education. Each chapter presents an integrative review of the research on the topic it addressespulling together the existing research, working to understand the historical trends and patterns in that body of scholarship, describing how the issue is conceptualized within the literature, how methods and theories have shaped the outcomes of the research, and where the strengths, weaknesses, and gaps are in the literature. Providing guidance to science education faculty and graduate students and leading to new insights and directions for future research, the Handbook of Research on Science Education, Volume II is an essential resource for the entire science education community.

Digital integration is the driving force of teaching and learning at all levels of education. As more non-traditional students seek credentialing, certification, and degrees, institutions continue to push the boundaries of innovative practices to meet the needs of diverse students. Programs and faculty have moved from merely using technology and learning management systems to unique and innovative ways to engage learners. The Handbook of Research on Innovative Digital Practices to Engage Learners is an essential scholarly publication that offers theoretical frameworks, delivery models, current guidelines, and digital design techniques for integrating technological advancements in education contexts to enforce student engagement and positive student outcomes. Featuring a wide range of topics such as gamification, wearable technologies, and distance education, this book is ideal for teachers, curriculum developers, instructional designers, principals, deans, administrators, researchers, academicians, education professionals, and students.

Educators and those who prepare teachers are facing increased scrutiny on their practice that include pressures to demonstrate their effectiveness, meet the needs of changing demographics and students, and adapt to ever-changing learning environments. Thus, there is a need for innovative pedagogies and adoption of best practices to effectively serve the needs of digital learners. The Handbook of Research on Innovative Pedagogies and Best Practices in Teacher Education is an essential research book that takes an in-depth look at the methods by which educators are prepared to address shifting demographics and technologies in the classroom and provides strategies for focusing their curricula on diverse learning types. It takes a look at the use of innovative pedagogies and effective learning spaces in teacher education programs and the decisions behind them to enhance more inquiry learning, STEM initiatives, and prove more kinds of exploratory learning for students. Covering topics such as higher education, virtual reality, and inclusive education, this book is ideally designed for teachers, administrators, academicians, instructors, and researchers.

Handbook of Research on Science Education

Handbook of Research on Using Educational Robotics to Facilitate Student Learning

Successful STEM Mentoring Initiatives for Underrepresented Students

Handbook of Research on the Global Empowerment of Educators and Student Learning Through Action Research

Stem Cells Handbook

The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. The Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age highlights current research on the latest trends in education with an emphasis on the technologies being used to meet learning objectives. Focusing on teaching strategies, learner engagement, student interaction, and digital tools for learning, this handbook of research is an essential resource for current and future educators, instructional designers, IT specialists, school administrators, and researchers in the field of education.

With the ever-changing climate of education around the globe, it is essential that educators stay abreast of the most updated teaching methods and applications. To do this, fostering teacher education programs that include innovative practices and initiatives within the field is imperative. The Handbook of Research on Teacher Education and Professional Development investigates current initiatives and approaches in educational programs. Focusing on research studies and theoretical concepts on innovative projects related to teacher education and professional development programs, this book is a pivotal reference source for academics, professionals, students, practitioners, and researchers.

Education in the 21st century is shifting focus from accessing and sharing information to designing active and collaborative learning environments which foster student engagement and critical thinking skills. Active learning features a hands-on, activity-based teaching approach during which students synthesize information and take joy in new discovery. The Handbook of Research on Learner-Centered Pedagogy in Teacher Education and Professional Development presents a comprehensive look into the methodologies and strategies necessary to establish classroom climates in which students feel free to question their preconceptions and express opinions. Featuring chapters from international researchers, this book is ideal for administrators, teachers, policy makers, and students of education.

The Wiley Handbook of Social Studies Research is a wide-ranging resource on the current state of social studies education. This timely work not only reflects on the many recent developments in the field, but also explores emerging trends. This is the first major reference work on social studies education and research in a decade An in-depth look at the current state of social studies education and emerging trends Three sections cover: foundations of social studies

research, theoretical and methodological frameworks guiding social studies research, and current trends and research related to teaching and learning social studies A state-of-the-art guide for both graduate students and established researchers Guided by an advisory board of well-respected scholars in social studies education research

Handbook of Research on Transforming Teachers' Online Pedagogical Reasoning for Engaging K-12 Students in Virtual Learning

Handbook of Research on Field-Based Teacher Education

Handbook of Research on Learner-Centered Pedagogy in Teacher Education and Professional Development

Occupational Outlook Handbook

Transformational Change Efforts: Student Engagement in Mathematics through an Institutional Network for Active Learning

"This handbook will focus on assessing effectiveness of active learning and constructivist teaching to promote student engagement by providing research based practices to help educators make the connection between active student learning and student engagement to maximize the teaching and learning process"--

Higher education has changed significantly over the past 50 years, and the individuals who provide leadership for these institutions has similarly changed. The pathway to the college presidency, once the domain of academic administration, has diversified as an increasing number of development officers, student affairs and enrollment management professionals, and even politicians have become common in the role. It is important to understand who the presidents are in the current environment and the challenges they face. Challenges such as dealing with the COVID-19 pandemic, enrollment shortfalls, Title IX, and athletic scandals have risen to the forefront and have contributed to the issues and role of college and university leadership. The Handbook of Research on the Changing Role of College and University Leadership provides important research on the topic of college and university leadership, especially focusing on the changing role of the college president. The chapters discuss college leadership as it is now and how it will evolve into the future. Topics included are the role of the president at various types of universities, their involvement within university functions and activities, and the duties they must carry out and challenges they face. This book is ideal for professionals and researchers working in higher education, including faculty members who specialize in education, public administration, the social sciences, and management, along with teachers, administrators, teacher educators, practitioners, researchers, academicians, and students who are interested in college and university leadership and how this role is transforming.

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.

It is the responsibility of educators to utilize contemporary avenues in order to reach their students in ways familiar to them. When teaching digital natives, new techniques are necessary for making new information relevant to their experience. One way to do this is through the use of mobile devices in curricula. This integration can make education accessible anywhere and to anyone, personalized to each student's schedule and needs. The Handbook of Research on Mobile Learning in Contemporary Classrooms expounds the current research on m-learning and strategies to leverage mobile devices in educational contexts. It also addresses the importance of communication, community, and mobility in modern classrooms, while offering a comprehensive overview of the theory and pedagogy associated with this new technology. Nonprofit organizers, K-12 educators, administrators, policy makers, students of education, and developers will find this book to be an important research companion.

Handbook of Research on the Changing Role of College and University Leadership

Handbook of Research on Student Engagement

The Wiley Handbook of Action Research in Education

Handbook of Research on Teacher Education and Professional Development

Handbook of Research on Faculty Development for Digital Teaching and Learning

The allure and marketplace power of digital technologies continues to hold sway over the field of education with billions spent annually on technology in the United States alone. Literacy instruction at all levels is influenced by these evolving and ever-changing tools. While this opens the door to innovations in literacy curricula, it also adds a pedagogical responsibility to operate within a well-developed conceptual framework to ensure instruction is complemented or augmented by technology and does not become secondary to it. The Handbook of Research on Integrating Digital Technology With Literacy Pedagogies is a comprehensive research publication that considers the integration of digital technologies in all levels of literacy instruction and prepares the reader for inevitable technological advancements and changes. Covering a wide range of topics such as augmented reality, literacy, and online games, this book is essential for educators, administrators, IT specialists, curriculum developers, instructional designers, teaching professionals, academicians, researchers, education stakeholders, and students.

Student engagement relies on the students and their willingness to participate in the learning process and can be enhanced through the application of various technologies within learning environments. However, strategies for implementing these technologies need research and development to be implemented effectively. The Handbook of Research on Fostering Student Engagement With Instructional Technology in Higher Education is a comprehensive academic publication that focuses on the engagement of learners with academics in higher education and especially how this engagement can be fostered with the integration of new technologies. Featuring an array of topics such as gamification, digital literacy, and social networking, this book is ideal for instructors, educators, administrators, curriculum developers, instructional designers, IT consultants, educational software developers, researchers, academicians, and students.

Published annually since 1985, the Handbook series provides a compendium of thorough and integrative literature reviews on a diverse array of topics of interest to the higher education scholarly and policy communities. Each chapter provides a comprehensive review of research findings on a selected topic, critiques the research literature in terms of its conceptual and methodological rigor and sets forth an agenda for future research intended to advance knowledge on the chosen topic. The Handbook focuses on a comprehensive set of central areas of study in higher education that encompasses the salient dimensions of scholarly and policy inquiries undertaken in the international higher education community. Each annual volume contains chapters on such diverse topics as research on college students and faculty, organization and administration, curriculum and instruction, policy, diversity issues, economics and finance, history and philosophy, community colleges, advances in research methodology and more. The series is fortunate to have attracted annual contributions from distinguished scholars throughout the world.

The Handbook of Research on STEM Education represents a groundbreaking and comprehensive synthesis of research and presentation of policy within the realm of science, technology, engineering, and mathematics (STEM) education. What distinguishes this Handbook from others is the nature of integration of the disciplines that is the founding premise for the work – all chapters in this book speak directly to the integration of STEM, rather than discussion of research within the individual content areas. The Handbook of Research on STEM Education explores the most pressing areas of STEM within an international context. Divided into six sections, the authors cover topics including: the nature of STEM, STEM learning, STEM pedagogy, curriculum and assessment, critical issues in STEM, STEM teacher education, and STEM policy and reform. The Handbook utilizes the lens of equity and access by focusing on STEM literacy, early childhood STEM, learners with disabilities, informal STEM, socio-scientific issues, race-related factors, gender equity, cultural-relevancy, and parental involvement. Additionally, discussion of STEM education policy in a variety of countries is included, as well as a focus on engaging business/industry and teachers in advocacy for STEM education. The Handbook's 37 chapters provide a deep and meaningful landscape of the implementation of STEM over the past two decades. As such, the findings which are presented within provide the reader with clear directions for future research into effective practice and supports for integrated STEM, which are grounded in the literature to date.

Handbook of Research on Mobile Learning in Contemporary Classrooms

Handbook of Research on Active Learning and Student Engagement in Higher Education

A Research-Based Guide for Faculty and Administrators

The Wiley Handbook of Social Studies Research

International Handbook of the Learning Sciences

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, academicians, researchers, and students.

While many school districts and institutions of higher education still cling to the traditional agrarian school year with a factory model delivery of education and Carnegie units based on seat time when most people are no longer farmers, factory workers, or reliant on learning in a classroom, there are bursts of promising practices that buck the norm by questioning the educational value of these traditions. Though researchers have investigated the potential of students learning in their own homes via personalized instruction delivered by computers rather than attending traditional institutions, the status quo in education has remained stubbornly resistant to change. Mixed-reality simulations, year-round schooling, grouping students by competencies instead of age, and game-based teaching are just a few of the educational innovations that seek to maximize learning by recognizing that innovation is essential for successfully teaching students in the modern era. The Handbook of Research on Innovations in Non-Traditional Educational Practices is a comprehensive reference source that examines various educational innovations, how they have developed workarounds to navigate traditional systems, and their potential to radically transform teaching and learning. With each chapter highlighting a different educational innovation such as experiential learning, game-based learning, online learning, and inquiry-based learning and their applications in all levels of education, this book explores the issues and challenges these educational innovations face as well as their impact. It is intended for academicians, professionals, administrators, and researchers in education and specifically benefits academic deans, vice presidents of academic affairs, graduate students, faculty technology leaders, directors of teaching and learning centers, curriculum and instructional designers, policymakers, principals and superintendents, and teachers interested in educational change.

Faculty development is currently practiced in a variety of approaches by individuals, committees, and centers of excellence. More research is needed to draw better benefit from these approaches in the impending digital world by taking advantage of digitally enabled teaching and learning. The Handbook of Research on Faculty Development for Digital Teaching and Learning offers holistic and multidisciplinary approaches to enhancing faculty effectiveness in teaching, boosting motivation, extending knowledge, expanding teaching behaviors, and disseminating skills in digital higher education settings. Featuring a broad range of topics such as faculty learning communities (FLCs), virtual learning environments, and professional development, this book is ideal for educators, educational technologists, curriculum developers, higher education staff, school administrators, principals, academicians, practitioners, and graduate students.

Technology has become an integral part of our everyday lives. This trend in ubiquitous technology has also found its way into the learning process at every level of education. The Handbook of Research on Education and Technology in a Changing Society offers an in-depth description of concepts related to different areas, issues, and trends within education and technological integration in modern society. This handbook includes definitions and terms, as well as explanations of concepts and processes regarding the integration of technology into education. Addressing all pertinent issues and concerns in education and technology in our changing society with a wide breadth of discussion, this handbook is an essential collection for educators, academicians, students, researchers, and librarians.

Handbook of Research on Driving STEM Learning With Educational Technologies

Handbook of Research on Integrating Digital Technology With Literacy Pedagogies

Technology management education and business education are visibly intertwined in the current educational system. Certain efforts that have taken place in the recent past are the interinstitutional discourse around the world. Technology management is a dynamic and evolving profession, driven by changes in technology, globalization, sustainability, and the increasing importance of the service economy. The Handbook of Research on Future Opportunities for Technology Management Education is a comprehensive reference book that enables readers to comprehend the trends in technological changes and the need to orient business education and technology management in workplaces. The book serves to support with the formation and implementation of appropriate policies for technology management. Covering topics such as big data analytics, cloud computing adoption, and massive open online courses (MOOCs), this text is an essential resource for managers, technologists, teachers, executives, instructional designers, libraries, university researchers, students, faculty, and industry taught leaders.

Over the past forty years, media education research has emerged as a historical, epistemological and practical field of study. Shifts in the field—along with radical transformations in media technologies, aesthetic forms, ownership models, and audience participation practices—have driven the application of new concepts and theories across a range of both school and non-school settings. The Handbook on Media Education Research is a unique exploration of the complex set of practices, theories, and tools of media research. Featuring contributions from a diverse range of internationally-recognized experts and practitioners, this timely volume discusses recent developments in the field in the context of related scholarship, public policy, formal and non-formal teaching and learning, and DIY and community practice. Offering a truly global perspective, the Handbook focuses on empirical work from Media and Information Literacy (MIL) practitioners from around the world. The book's five parts explore global youth cultures and the media, trans-media learning, media literacy and scientific controversies, varying national approaches to media research, media education policies, and much more. A ground breaking resource on the concepts and theories of media research, this important book: Provides a diversity of views and experiences relevant to media literacy education research Features contributions from experts from a wide-range of countries including South Africa, Finland, India, Italy, Brazil, and many more Examines the history and future of media education in various international contexts Discusses the development and current state of media literacy education institutions and policies Addresses important contemporary issues such as social media use; datafication; digital privacy, rights, and divides; and global cultural practices. The Handbook of Media Education Research is an invaluable guide for researchers in the field, undergraduate and graduate students in media studies, policy makers, and MIL practitioners.

This handbook gathers in one volume the major research and scholarship related to multicultural science education that has developed since the field was named and established by Atwater in 1993. Culture is defined in this handbook as an integrated pattern of shared values, beliefs, languages, worldviews, behaviors, artifacts, knowledge, and social and political relationships of a group of people in a particular place or time that the people use to understand or make meaning of their world, each other, and other groups of people and to transmit these to succeeding generations. The research studies include both different kinds of qualitative and quantitative studies. The chapters in this volume reflect differing ideas about culture and its impact on science learning and teaching in different K-14 contexts and policy issues.

Research findings about groups that are underrepresented in STEM in the United States, and in other countries related to language issues and indigenous knowledge are included in this volume.

Asia is the largest continent in the world. Five out of the top ten high performing economies in the Programme for International Student Assessment (PISA) 2018 are located in Asia. Why do Asian students perform so well in STEM-related subjects? This book answers this by examining the STEM education policies and initiatives in Asian economies, as well as the training programmes undertaken by STEM teachers in Asia. The book is broken into four sections, each accompanied by a passage of commentary that summarizes the key takeaways of the chapters. Section one focuses on STEM policy environments and how various countries have developed policies that promote STEM as an integral part of national economic development. Section two focuses on STEM teacher education in the Philippines and Thailand, while section three focuses on STEM curriculum design, context, and challenges in four Asian economies. The fourth and final section focuses on presenting snapshots of STEM education research efforts in Malaysia, South Korea, and Singapore. Written by Asian academics, this book will provide valuable insights to policy makers, educators, and researchers interested in the topic of STEM education, especially in the Asian context. Chapters 7 and 11 of this book are freely available as a downloadable Open Access PDF under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license available at <http://www.taylorfrancis.com>