Effects Of The Inquiry Based Learning Method On Students


Why is science hard to teach? What types of scientific investigation can you use in the primary classroom? Touching on current curriculum concerns and the wider challenges of developing high-quality science education, this book is an indispensable overview of important areas of teaching every aspiring primary school teacher needs to understand including: the role of science in the curriculum, communication and literacy in science teaching, science outside the classroom, transitional issues and assessment. Key features of this second edition include: • A new chapter on science in the Early Years • A new practical chapter on how to work scientifically • Master's-level 'critical reading' boxes in every chapter linking topics to relevant specialist literature • Expanded coverage of creativity, and link science to numeracy and computing This is essential reading for all students studying primary science on initial teacher education courses, including undergraduate (BEd, BA with QTS), postgraduate (PGCE, School Direct, SCITT), and also NQTs. Mick Dunne is Senior Lecturer in Science Education at
Manchester Metropolitan University Alan Peacock is Honorary Research Fellow at the University of Exeter. This study was designed as a collaborative action research study and focused on the use of an inquiry-based unit in an eighth grade honors science class at a middle school with a diverse population in the southeastern portion of the United States in the Spring of 2005. The inquiry-based unit was taught through the use of the electronics unit in Full Option Science System (FOSS). The purpose of the study was to investigate the effects of an inquiry-based curriculum on the level of participation in, attitudes of, and academic performance of students towards science. This collaborative action research study used both qualitative and quantitative methods. The qualitative forms consisted of written notes taken by the classroom teacher and I that included observations of the whole class as well as observations of students in smaller inquiry groups and conversation and interview notations of student comments while they were doing inquiry work, both individual and group, as well as my notations of interviews and conversations with the classroom teacher. Although used to a lesser degree, quantitative data was collected from pre and post attitude surveys as well as from students' scores on inquiry-based investigations, paper activities and formal assessments. All data was triangulated across a variety of data sources so that any resulting patterns or themes would be supported. My access to this middle school was based on my role as the science coach assigned to the school. As the science coach, I worked with teachers and students to integrate the FOSS middle school curriculum unit into the school's science curriculum. The FOSS kits, workbooks and related reading books were designed to increase the use of inquiry and hands-on activities within middle and elementary school science classrooms. This highly detailed study maps four decades of evolution of the concept of what constitutes effective school leadership. It analyses the theoretical background to these developments and advocates the utility of thinking of a 'lean' form of school leadership that is comparable to the concept of 'meta-control'. A wide-ranging survey of the empirical research literature on leadership effects includes the presentation of results from earlier meta-analyses as well as a new meta-analysis on some 25 studies carried out between 2005 and 2010. This survey demonstrates that older reviews and meta-analyses were predominantly based on so-called 'direct effect' studies, while more recent studies have tried to quantify the indirect effects of leadership, mediated by other school variables. While acknowledging the relatively small total effect of leadership on student outcomes, the study does identify promising intermediary factors which, stimulated by specific leadership behaviours, impact on student performance. The book ends by drawing out wider implications for educational practice and policy, presented under headings such as 'schools need leadership', 'the toolkit of the school leader as a meta-controller', 'the special case of turning around failing schools' and 'efficiency of school leadership'. In passing, the authors make several suggestions about potentially fruitful next steps in researching the effects of school leadership. This book guides the adoption, design, development and expectation of future digital teaching and learning projects/programs in K-12 schools. It provides a series of case studies and reports experiences from international digital teaching and learning projects in K-12 education. The book also furnishes advice for future school policy and investment in digital teaching and learning projects. Finally, the book provides an explanation of the future capacity and sustainability of digital teaching and learning in K-12 schools. This conference proceedings focuses on enabling science and mathematics practitioners and citizens to respond to the pressing challenges of global competitiveness and sustainable development by
transforming research and teaching of science and mathematics. The proceedings consist of 82 papers presented at the Science and Mathematics International Conference (SMIC) 2018, organised by the Faculty of Mathematics and Natural Sciences, Universitas Negeri Jakarta, Indonesia. The proceedings are organised in four parts: Science, Science Education, Mathematics, and Mathematics Education. The papers contribute to our understanding of important contemporary issues in science, especially nanotechnology, materials and environmental science; science education, in particular, environmental sustainability, STEM and STEAM education, 21st century skills, technology education, and green chemistry; and mathematics and its application in statistics, computer science, and mathematics education. This book explores in detail the role of laboratory work in physics teaching and learning. Compelling recent research work is presented on the value of experimentation in the learning process, with description of important research-based proposals on how to achieve improvements in both teaching and learning. The book comprises a rigorously chosen selection of papers from a conference organized by the International Research Group on Physics Teaching (GIREP), an organization that promotes enhancement of the quality of physics teaching and learning at all educational levels and in all contexts. The topics covered are wide ranging. Examples include the roles of open inquiry experiments and advanced lab experiments, the value of computer modeling in physics teaching, the use of web-based interactive video activities and smartphones in the lab, the effectiveness of low-cost experiments, and assessment for learning through experimentation. The presented research-based proposals will be of interest to all who seek to improve physics teaching and learning. Young adolescents with disabilities struggle in understanding science literature, in comprehending science concepts, and in applying new science knowledge when not given the appropriate tools to achieve. Although much research has been done on inquiry-based science lessons and teaching students with disabilities in language and math skills, there is little literature about teaching science to students with disabilities while using an inquiry-based approach. The purpose of this study is to determine if students with disabilities will be more engaged while participating in science inquiry lessons, ultimately improving their science achievement. Students were given three inquiry-based science lessons: active participation was then scored, inquiry indicators were used to rank knowledge gained, answers were tallied on the questionnaire, and answers on a biology assessment are examined to determine if achievement was gained. In this action research study, students with disabilities did demonstrate growth in the explanation of science concepts by improving individual processing skills. Inquiry-based lessons give students with disabilities the structure needed for them to think, discuss, reflect, and revise their thinking before mastery is assessed. This study examines whether an inquiry-based earth science course was effective at improving student spatial thinking skills in comparison with a traditional lecture world regional geography course. Spatial thinking is an important cognitive skill in the sciences and every day life. A taxonomy of spatial thinking was constructed by Gersmehl (2008) in geography
education, which includes core modes assessed in this study: comparison, region, transition, analogy, pattern, and association. Two additional modes related to space over time, change and movement, are also assessed. The central research question in this study is: What are the effects of a pre-service teacher education earth science course (Geography 1900) that is conceptually designed and inquiry-based on the spatial thinking of university students? The six sub-questions to this central question are: 1) What modes of spatial thinking do pre-service elementary teacher education students apply at the beginning of Geography 1900? 2) What spatial thinking modes are embedded in the Geography 1900 course based on the Gersmehl (2008) classification of modes of spatial thinking? 3) What changes occur in spatial thinking and spatial skills as a result of enrolling in and successfully completing a conceptually based inquiry course that has embedded clearly identifiable spatial tasks according to Gersmehl's (2008) classification? 4) What modes of spatial thinking do Geography 1900 students apply on the post-test at the completion of the course? 5) What modes of spatial thinking do students transfer from the classroom to the outdoors as they move about campus? 6) Are there differences in spatial thinking between the experimental sample that experiences Geography 1900 and a comparison sample of students that receives a different treatment? The analysis of this study is a mixed methods approach using quantitative and qualitative methods. Results in the fall semester 2008 suggest statistically significant improvement of the earth science students at KVCC and Geography 1020 between the pre and post-tests. In spring semester 2009 both groups, Geography 1900 and Geography 1020, suggest statistically significant improvement between pre and post-test scores. Results also suggest no statistically significant differences between the pre-tests and differences (post minus pre) of the experimental and comparison groups. This book analyzes the main Information and Communication Technologies (ICT) used in science education and the main theoretical approaches that support science education mediated by ICT in order to show how digital technologies can be employed in Inquiry-Based Science Education. It presents the results of a comprehensive review of studies focusing both on the use and effects of digital technologies in science education and on the different theoretical approaches that support the use of ICTs in science teaching. By doing so, the book provides a useful summary of the current research in the field and a strong analysis of its limitations. It concludes that there are few studies that report strategies and didactics for the practical use of ICT in science classes and that the use of ICT in science education can't be seen as an isolated action without a theoretical basis to support it. Based on these conclusions, the volume identifies the main ICTs used in inquiry activities, the main steps in inquiry activities used in science education and their approaches to the use of ICT. It shows that the use of ICT in Inquiry-Based Science Education allows students to develop more active work styles, improved attitudes towards science, better conceptual and theoretical understanding, improved reasoning, better modelling capabilities, and improved teamwork, along with improvements in other abilities. Using ICT in Inquiry-Based Science Education will be a valuable resource for science teachers and science teacher educators looking for an introductory text that presents an overview of the scientific research analyzing the implementation of digital technologies in science teaching and that provides useful insights to all educators interested in using digital technologies to introduce their students in the world of scientific inquiry and research. "A study of the effect of an inquiry-based science kit on attitude toward science was performed." -- Abstract. Learning analytics is one of the most important
research issues in the field of educational technology. By analyzing logs and records in educational databases and systems, it can provide useful information to teachers, learners, and decision makers – information which they can use to improve teaching strategies, learning performances, and educational policies. However, it is a great challenge for most researchers to efficiently analyze educational data in a meaningful way. This book presents various learning analytics approaches and applications, including the process of determining the coding scheme, analyzing the collected data, and interpreting the findings. This book was originally published as a special issue of Interactive Learning Environments. 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 US. 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. This book offers insights into the educational dimensions of climate change and promotes measures to improve education in this context. It is widely believed that education can play a key role in finding global solutions to many problems related to climate change. Indeed, education as a process not only helps young people to better understand and address the impact of global warming, but also fosters better attitudes and behaviours to aid efforts towards mitigating climate change and adapting to a changing environment. But despite the central importance of education in relation to climate change, there is a paucity of publications on this theme. Against this background, the book focuses on the educational aspects of climate change and showcases examples of research, projects and other initiatives aimed at educating various audiences. It also provides a platform for reflections on the role education can play in fostering awareness on a changing climate. Presenting a wide range of valuable lessons learned, which can be adapted and replicated elsewhere, the book appeals to educators and practitioners alike. This unique and ground-breaking book is the result of 15 years research and synthesises over 800 meta-analyses on the influences on achievement in school-aged students. It builds a story about the power of teachers, feedback, and a model of learning and understanding. The research involves many millions of students and
represents the largest ever evidence based research into what actually works in schools to improve learning. Areas covered include the influence of the student, home, school, curricula, teacher, and teaching strategies. A model of teaching and learning is developed based on the notion of visible teaching and visible learning. A major message is that what works best for students is similar to what works best for teachers - an attention to setting challenging learning intentions, being clear about what success means, and an attention to learning strategies for developing conceptual understanding about what teachers and students know and understand. Although the current evidence based fad has turned into a debate about test scores, this book is about using evidence to build and defend a model of teaching and learning. A major contribution is a fascinating benchmark/dashboard for comparing many innovations in teaching and schools. 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 addresses - pulling 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. Das Handbuch stellt Grundlagen, Anwendungen und Perspektiven digitalisierten Lernens und Lehrens mit mobilen Endgeräten vor. Es behandelt theoretische Bezüge von Mobile Learning ebenso wie praktische Einsätze mobiler Endgeräte. Technologische Grundlagen, didaktische Designs mit Lernimplikationen und Einsatzmöglichkeiten von Mobile Learning in den verschiedenen Bildungskontexten – Schule, Hochschule, Aus- und Weiterbildung – werden erläutert genauso wie grundlegende Bestimmungen des Datenschutzes und des Copyrights. Das Handbuch spannt damit einen Bogen von der historischen Entwicklung bis hin zu zukünftigen Aussichten von Mobile Learning. Die Beiträge von 91 Autorinnen und Autoren fassen die zentralen wissenschaftlichen und für die Praxis relevanten Erkenntnisse über Mobile Learning zusammen, machen Potenziale und Veränderungen durch die zunehmende digitale Mobilität deutlich und geben Impulse für zukünftige Gestaltungsaufgaben hinsichtlich der Digitalisierung im Bildungsbereich. From Dewey to the Standards, inquiry has been an increasingly prominent theme in multiple science education reform movements, yet the transition from theory and advocacy to practice and policy has been disappointing. While there is a growing body of research which suggests that student understanding is enhanced by inquiry-based teaching, only recently have studies begun to use experimental designs. This study attempts to answer the following questions: (1) To what extent can differences in student learning between the inquiry-based and commonplace groups be attributed to randomized group assignment?; (2) What differences in achievement by treatment group exist specific to the learning goals of knowledge, reasoning, and argumentation?; and (3) Does student race/ethnicity, gender, or socio-economic status account for
variation in posttest scores above and beyond variation accounted for by pretest scores and group assignment? The study participants came from 24 schools from seven districts from across a range of urban, suburban, and rural areas; five of the students attended private schools and two were homeschooled. The authors use the Horizon Research Inc. survey and interview data (Weiss et al., 2003 and Hudson, McMahan & Overstreet, 2002) to define "commonplace teaching", and use The Biological Sciences Curriculum Study (BSCS) 5E instructional model, or the "5Es" (Bybee, 1997) to organize the inquiry-based unit. This study found that students in an inquiry-based classroom reached significantly higher levels of achievement than students experiencing commonplace teaching. The superior effectiveness of the inquiry-based instruction was consistent across a range of learning goals (knowledge, scientific reasoning, and argumentation) and types of measures (dichotomous items, open-response items, and clinical interviews). This study therefore contributes to the growing body of evidence demonstrating the effectiveness of inquiry-based teaching; supports the claims about inquiry in national science education reform documents (e.g. A A A S, 1993, 2000; NRC, 1996, 2000); and refutes the claims made by Kirshner, Sweller & Clark (2006) in response to the findings by Klahr and colleagues (Chen & Klahr, 1999; Klahr & Nigam, 2004). (Contains 2 tables and 2 figures.)

The book describes how to design a computer-based simulation lesson employing currently available Personal Computer and internet software and investigate its effects in learning situations. The heart of the lesson was the utilitarian Gas Law Simulation program that was incorporated into a hypertext interface display with active links to related notes and worksheets. The simulated lesson allowed students to see the relationships between the variables in graphical forms when a selected independent variable was manipulated and all the corresponding values were keyed into the Excel table. The field testing was conducted using a 3 x 2 factorial design, employing three modes of cooperative learning, namely, heterogeneous-ability cooperative learning group, friendship-based cooperative learning group, and traditional group work group. The sample consisted of 301 16-year-old science students. The findings showed that the inquiry-based computer simulation program was effective in enhancing scientific reasoning and conceptual understanding of students of all reasoning abilities but for maximum effectiveness cooperative learning groups should be composed of students of heterogeneous abilities. Didaktik ist eine Kunst, die man erlernen kann. Eine zentrale Frage lautet: Welche Vorteile haben die verschiedenen didaktischen Techniken für Lernende und Lehrende zum Beispiel im Vergleich zum Frontalunterricht? Die Publikation stellt Unterrichtsmethoden und -techniken vor. Anhand der nachgewiesenen Effektstärken können die Leser eigene Vergleiche anstellen. Der Forschungsstand ist in diesem Werk umfassend und in leicht verständlicher Sprache dargelegt. Der Aufbau des Buches folgt lernpsychologischen Gesetzen. So werden zu Beginn einer Unterrichtseinheit Lernziele, Unterrichtsablauf und Prüfungsaufgaben formuliert. Zielpublikum sind Studierende und Lehrende, bereits im Schuldienst tätige Personen und alle, die an einem stressfreien Unterricht interessiert sind. Die Grundschule prägt als erste Schule das Bild von schulischer Bildung und legt gemeinsam mit elementaren Bildungseinrichtungen den Grundstein für lebensbegleitendes Lernen. Sie soll als gemeinsame Schule für alle Kinder die personale, soziale und fachliche Basis für den weiteren Bildungsgang legen und einen Beitrag zum Verständnis von Diversitätsbereichen leisten und zur Solidarität zwischen Gesellschaftsgruppierungen beitragen. Zu den Auffgaben der Grundschule zählt neben der Sicherung von Grundkompetenzen in allen fachlichen Bereichen auch
This study was designed to examine if teaching type, traditional versus inquiry-based, affected students' science performance or attitudes toward science. -- Abstract. Although various arguments for integrated learning of mathematics and science exist, empirical evidence that integrated learning is as beneficial as anticipated is limited. Therefore, this quasi-experimental study investigates the effect of integrated learning of mathematics and science on eight student variables by comparing it to a control group. Results show that integrated learning is no miracle cure but has positive and negative effects on specific student outcomes. Whereas integrated learning effects students' view of the relation between mathematics and science positively, it effects students' scientific self-concept negatively. Thus, integrated learning should not substitute but rather complement disciplinary learning. Obwohl zahlreiche Argumente für das integrierte Lernen von Mathematik und Naturwissenschaften existieren, ist die vorteilhafte Wirkung integrierten Lernens begrenzt empirisch belegt. Im Rahmen dieser quasi-experimentellen Studie wird der Effekt integrierten Lernens auf acht Schülervariablen durch Vergleiche mit einer Kontrollgruppe untersucht. Die Ergebnisse zeigen, dass integriertes Lernen kein Allheilmittel ist sondern positive und negative Effekte auf bestimmte Schülervariablen hat. Während integriertes Lernen die Sicht der Schülerinnen und Schüler auf die Beziehung zwischen Mathematik und Naturwissenschaften positiv beeinflusst, hat es einen negativen Effekt auf das naturwissenschaftliche Selbstkonzept. Daher sollte integriertes Lernen nicht stellvertretend sondern ergänzend zu disziplinärem Lernen implementiert werden. This volume brings together educational effectiveness research and international large-scale assessments, demonstrating how the two fields can be applied to inspire and improve each other, and providing readers direct links to instruments that cover a broad range of topics and have been shown to work in more than 70 countries. The book’s initial chapters introduce and summarize recent discussions and developments in the conceptualization, implementation, and evaluation of international large-scale context assessments and provide an outlook on possible future developments. Subsequently, three thematic sections – “Student Background”, “Outcomes of Education Beyond Achievement”, and “Learning in Schools” – each present a series of chapters that provide the conceptual background for a wide range of important topics in education research, policy, and practice. Each chapter defines a conceptual framework that relates recent findings in the educational effectiveness research literature to current issues in education policy and practice. These frameworks were used to develop interesting and relevant indicators that may be used for meaningful reporting from international assessments, other cross-cultural research, or national studies. Using the example of one particular survey (the Programme for International Student Assessment (PISA 2015)), this volume links all theoretical considerations to fully developed questionnaire material that was field trialed and evaluated in questionnaires for students and their parents as well as teachers and principals in their schools. The primary purposes of this book are to inform readers about how education effectiveness research and international large-scale assessments are already interacting to inform research and policymaking; to identify areas where a closer collaboration of both fields or input from other areas could further improve this work; to provide sound theoretical frameworks for future work.
in both fields; and finally to relate these theoretical debates to currently available and evaluated material for future context assessments. Welche Qualität hat der Fachunterricht in unseren Schulen? Ist er wirksam? Erreicht er seine Ziele? Die Buchreihe «Wirksamer Fachunterricht» schöpft aus der Expertise der Fachdidaktiken und der Fachpraxis der Schulfächer, um die Frage zu beantworten, was einen wirksamen Fachunterricht auszeichnet. Mit Hilfe von strukturierten Interviews werden Expertinnen und Experten der unterschiedlichen Schulfächer nach ihrer fachlichen Expertise befragt, die angelehnt ist an die wichtigsten Forschungsergebnisse und Praxiserfahrungen aus dem jeweiligen (Schul-)Fach. Die Zusammensetzung aller Beiträge der Expertinnen und Experten des jeweiligen Faches wird zu einer verdichteten Beantwortung der Frage führen, was einen wirksamen Fachunterricht ausmacht. This book introduces the advanced technologies used for authentic learning, an educational term that refers to a variety of techniques focusing on how students apply the skills and knowledge acquired in school in real-world situations. In the meanwhile, it presents the latest trends and future developments in learning design, learning environment and assessment for authentic learning using advances in technology, this book discusses how technology supports authentic learning and what makes it effective. This action research evaluates the effects of the implementation of an inquiry-based, data-to-concept curriculum on students and teachers. The data-to-concept model is a pedagogical approach where students gather data first and formulate their own explanations or mental models for the observations prior to any introduction to the concept or vocabulary associated with the concept. While a previous study supports achievement gains in science after implementing a data-to-concept curriculum, there is uncertainty about the distribution of achievement gains in science across various subpopulations such as gender, Title I status and income status. Comparisons were made using students' scores from M ontCas (Montana's state achievement test), Lawson's Classroom Test of Scientific Reasoning, a modified Science Attitudes, Skill and Knowledge survey along with interviews of both teachers and students. Analysis indicates that in general, students make gains in their reasoning skills after two years of data-to-concept science classes. There does not appear to be a difference in science achievement based on gender or income status, but there seems to be an achievement gap based on Title I status. In relationship to attitude, students generally have a positive attitude towards science after one semester of data-to-concept instruction. Both teachers and students prefer the data-to-concept method to more traditional, expository methods of teaching and learning. In general, this study supports the use/implementation of a data-to-concept curriculum. While in general this is true, there are some improvements to the data-to-concept model, which will be necessary to make achievement equitable for all students regardless of status. The science department at Big Sky High School will have to address the achievement gap based on Title I status. In my classroom, I will need to work to help students understand the limitations and power of science as a way of understanding the natural world. The data-to-concept model of instruction is supported by data and preferred by both students and teachers. This hands-on resource offers a wealth of strategies aligned with national science education standards, including sample lessons for integrating reading instruction into inquiry-based science classrooms. This book proposes and validates an information flow approach to analyzing knowledge co-construction and predicting group performance in the context of collaborative learning. In addition, it highlights the importance of socially shared regulation in collaborative learning, and illustrates in
detail how it can be analyzed and promoted. The book investigates several innovative examples, including: Methodological approaches to studying and analyzing knowledge building and regulation in collaborative learning; Social software tools for capturing the dynamics of knowledge building and regulation in collaborative learning; Collective regulatory mechanisms to scaffold socially shared regulation in real-life collaborative learning; and Scripts and interventions to facilitate effective and productive collaborative learning on the basis of several case studies. The original methodological contributions to the analysis of knowledge building and scaffolding socially shared regulation make this an essential read for anyone interested in collaborative learning. This book will also be of interest to a wide audience of researchers, teachers, and students in the field of collaborative learning, as well as the rapidly growing community of people investigating how collaborative learning can be effectively used in education.

This book examines the implementation of inquiry-based approaches in science teaching and learning. It explores the ways that those approaches could be promoted across various contexts in Europe through initial teacher preparation, induction programmes and professional development activities. It illustrates connections between scientific knowledge deriving from the science education research community, teaching practices deriving from the science teachers’ community, and educational innovation. Inquiry-Based Science Teaching and Learning (IBST/L) has been promoted as a policy response to pressing educational challenges, including disengagement from science learning and the need for citizens to be in a position to evaluate evidence on pressing socio-scientific issues. Effective IBST/L requires well-prepared and skilful teachers, who can act as facilitators of student learning and who are able to adapt inquiry-based activity sequences to their everyday teaching practice. Teachers also need to engage creatively with the process of nurturing student abilities and to acquire new assessment competences. The task of preparing teachers for IBST/L is a challenging one. This book is a resource for the implementation of inquiry-oriented approaches in science education and illustrates ways of promoting IBST/L through initial teacher preparation, induction and professional development programmes.

"This book examines the implementation and success of mobile digital learning tools, with the inclusion of data on specific learning environments enhanced by ubiquitous educational technologies"--Provided by publisher.