

Senior Secondary Course Physics

In previous research, participation in science studies in senior secondary school has been related to both background characteristics of students and to earlier achievements and interests. This paper reports on an investigation of participation in courses in senior secondary schools in Australia which embody different science orientations. Two science oriented course types were identified. The first was a 'physical science' course type which included both physics and chemistry and was followed by 15 per cent of students. The second was a 'biological and other science' course type which included two science subjects other than the combination of physics and chemistry and was followed by 9 per cent of students. As a generalisation, participation in a physical science course was most strongly shaped by earlier achievement in numeracy, an interest in investigative activities, and gender. In comparison, participation in a biological and other science course was shaped by investigative interests, social, and curriculum influences. Among males, the influence of earlier achievement on physical science participation was independent of, and much stronger than, socioeconomic status. Among females, earlier achievement influenced participation for those of higher socioeconomic background but not for those of lower socioeconomic background. This suggests that differences in social processes are operating and that conventional expectations regarding women in science still limit some females in senior secondary school.

Ein angemessenes Verständnis über Naturwissenschaften stellt eine Schlüsselkomponente naturwissenschaftlicher Grundbildung dar. Für die entsprechende unterrichtliche Gestaltung spielen die Vorstellungen der Lehrkräfte über Naturwissenschaften eine entscheidende Rolle und anwendbares Meta-Wissen gilt als zu erreichende Qualifikation im Lehramtsstudium. Im vorliegenden Forschungsprojekt wird im Rahmen von qualitativen Studien erhoben, welche Vorstellungen Lehramtsstudierende über 'Chemie als Naturwissenschaft' besitzen und wie die Studierenden unterstützt werden können, ein fundiertes Verständnis zu entwickeln und dieses praktisch zu transformieren. Auf Grundlage der Ergebnisse wird ein Modul für die Lehrerbildung entwickelt, das den Weg bereitet, authentisch (über) Chemie zu unterrichten. An adequate understanding about science represents one key component of scientific literacy. Teachers' conceptions about science play a crucial role for the design of appropriate lessons and applicable meta-knowledge is considered as a qualification to be achieved during university teacher education. In this thesis, qualitative studies are conducted to evaluate which pre-conceptions about 'chemistry as a science' teacher students possess and how students can be supported in developing an informed understanding as well as in practically transforming it. On the basis of the results a module for teacher education is developed which paves the way for authentic chemistry teaching.

Contents: Introduction, Scope and Influence, Past Experience, Objectives and Aims, Teaching under Scheme, Methods of Teaching, Role of Teacher, Measurement and Evolution, Curriculum Development, Broadbased Curriculum, Enrichment of Controls, Planning the Lesson, Teaching Devices, Audio-Visual Aids, Role of Laboratory, A Rich Laboratory, New Trends, Place among other Discipline.

This book presents a selection of the best contributions to GIREP EPEC 2015, the Conference of the International Research Group on Physics Teaching (GIREP) and the European Physical Society's Physics Education Division (EPS PED). It introduces readers interested in the field to the problem of identifying strategies and tools to improve physics teaching and learning so as to convey Key Competences and help students acquire them. The main topic of the conference was Key Competences (KC) in physics teaching and learning in the form of knowledge, skills and attitudes that are fundamental for every member of society. Given the role of physics as a field strongly connected not only to digital competence but also to several other Key Competences, this conference provided a forum for in-depth discussions of related issues.

Contains large number of Solved Examples and Practice Questions. Answers, Hints and Solutions have been provided to boost up the morale and increase the confidence level. Self Assessment Sheets have been given at the end of each chapter to help the students to assess and evaluate their understanding of the concepts.

This volume provides a broad overview of recent higher education policy in a variety of countries, both developed and developing, around the world. Using interdisciplinary methods and analysis, it focuses on how diminishing governmental resources and expanding market forces influence higher education policy in different countries in terms of access, minority status (including ethnic, national and gender groups), affirmative action, quality, and performance.

This book provides an overview of science education policies, research and practices in mainland China, with specific examples of the most recent developments in these areas. It presents an insiders' report on the status of Chinese science education written primarily by native speakers with first-hand experiences inside the country. In addition, the book features multiple sectional commentaries by experts in the field that further connect these stories to the existing science education literature outside of China. This book informs the international community about the current status of Chinese science education reforms. It helps readers understand one of the largest science education systems in the world, which includes, according to the Programme for International Student Assessment, the best-performing economy in the world in science, math and reading: Shanghai, China. Readers gain insight into how science education in the rest of China compares to that in Shanghai; the ways Chinese science educators, teachers and students achieve what has been accomplished; what Chinese students and teachers actually do inside their classrooms; what educational policies have been helpful in promoting student learning; what lessons can be shared within the international science education community; and much more. This book appeals to science education researchers, comparative education researchers, science educators, graduate students, state science education leaders and officers in the international communities. It also helps Chinese students and faculty of science education discover effective ways to share their science education stories with the rest of the world.

When a student begins with the course of Class XI he/she is bound to encounter difficulty at initial level of study due to huge gap in the syllabus of secondary and higher secondary stage. This book will serve as a Bridge course for all students moving from class X to class XI, who will take the course of Physics. This book can act as a Prerequisite for learning Physics in class XI and XII. Since this book has been aimed at the students to cover the essential mathematics Calculus & Vectors in quick time, the number of problems and questions has been restricted. Stress has been given to develop the fine link or connection between mathematics and physics and application of mathematical ideas in understanding Physics. This book will also be useful for those students who are preparing for NEET or similar Biological examinations but do not have mathematics at 10+2, but have Physics in their course of study.

Developing Science, Mathematics and ICT (SMICT) in Secondary Education is based on country studies from ten Sub-Saharan African countries: Botswana, Burkina Faso, Ghana, Namibia, Nigeria, Senegal, South Africa, Uganda, Tanzania

and Zimbabwe, and a literature review. It reveals a number of huge challenges in SMICT education in sub-Saharan Africa: poorly-resourced schools; large classes; a curriculum hardly relevant to the daily lives of students; a lack of qualified teachers; and inadequate teacher education programs. Through examining country case studies, this paper discusses the lessons for improvement of SMICT in secondary education in Africa.

Contents: Science Education for Contemporary Society: Problems, Issues and Dilemmas, Current Trends and Main Concerns as Regards Science Curriculum Development and Implementation in Selected States in Asia, Current Trends and Main Concerns as Regards Science Curriculum Development and Implementation in Selected States in Europe, New Approaches in Science and Technology Education, The Challenges to be Faced in Order to Progress Towards a Greater Coherence and Relevance of Science and Technology Education.

- Strictly as per the new term wise syllabus for Board Examinations to be held in the academic session 2021-22 for classes 11 & 12
- Multiple Choice Questions based on new typologies introduced by the board- I. Stand- Alone MCQs, II. MCQs based on Assertion-Reason III. Case-based MCQs.
- Revision Notes for in-depth study
- Mind Maps & Mnemonics for quick learning
- Include Questions from CBSE official Question Bank released in April 2021
- Answer key with Explanations
- Concept videos for blended learning (science & maths only)

Contents: Introduction, The Fundamentals, The Environment, Pollution in Nature, Various Kinds of Pollution, Impact on People, Impact on Life, Salient Features, Significance of Soil, Trees and Plants, The Animals, Treasure of Nature, Programmes for Instruction, Teaching Objectives, Teaching Objectives, Teaching Methods, The Treatment, Audio-Visual Aids, Concerns in India, Concern at World Level, Educational Technology.

This text on physics has been written for students in the senior secondary classes within the Ghanaian education system. It is specially designed to provide guidance for school and private students leading to the West African Examinations Council (WAEC) Senior Secondary schools as well as the GCE examinations. The book is essentially designed to meet the requirements of the senior secondary school syllabus in physics. Part One is for the use of students during the first senior secondary school physics course; Part Two and Three cover year two and year three respectively.

"This timely and innovative book encourages us to 'flip the classroom' and empower our students to become content creators. Through creating digital media, they will not only improve their communication skills, but also gain a deeper understanding of core scientific concepts. This book will inspire science academics and science teacher educators to design learning experiences that allow students to take control of their own learning, to generate media that will stimulate them to engage with, learn about, and become effective communicators of science." Professors Susan Jones and Brian F. Yates, Australian Learning and Teaching Council Discipline Scholars for Science "Represents a giant leap forward in our understanding of how digital media can enrich not only the learning of science but also the professional learning of science teachers." Professor Tom Russell, Queen's University, Ontario, Canada "This excellent edited collection brings together authors at the forefront of promoting media creation in science by children and young people. New media of all kinds are the most culturally significant forms in the lives of learners and the work in this book shows how they can move between home and school and provide new contexts for learning as well as an understanding of key concepts." Dr John Potter, London Knowledge Lab, Dept. of Culture, Communication and Media, University College London, UK Student-generated Digital Media in Science Education supports secondary school teachers, lecturers in universities and teacher educators in improving engagement and understanding in science by helping students unleash their enthusiasm for creating media within the science classroom. Written by pioneers who have been developing their ideas in students' media making over the last 10 years, it provides a theoretical background, case studies, and a wide range of assignments and assessment tasks designed to address the vital issue of disengagement amongst science learners. It showcases opportunities for learners to use the tools that they already own to design, make and explain science content with five digital media forms that build upon each other—podcasts, digital stories, slowmation, video and blended media. Each chapter provides advice for implementation and evidence of engagement as learners use digital tools to learn science content, develop communication skills, and create science explanations. A student team's music video animation of the Krebs cycle, a podcast on chemical reactions presented as commentary on a boxing match, a wiki page on an entry in the periodic table of elements, and an animation on vitamin D deficiency among hijab-wearing Muslim women are just some of the imaginative assignments demonstrated. Student-generated Digital Media in Science Education illuminates innovative ways to engage science learners with science content using contemporary digital technologies. It is a must-read text for all educators keen to effectively convey the excitement and wonder of science in the 21st century.

"Full course for year 12 physics (NCEA level 2)"--Back cover. Suggested level: senior secondary.

There is much discussion about what needs to change in education institutions in the 21st century, but less attention given to how core disciplinary studies should be considered within that context. This book is based on a major 4-year research study of history and physics in the changing environment of schools and universities in Australia. Are these forms of knowledge still valuable for students? Are they complementary to, or at odds with the concerns about '21st century skills', interdisciplinary and collaborative research teams, employability and 'learner-centred' education? How do those who work in these fields see changes in their disciplines and in their work environment? And what are the similarities and differences between the experiences of teachers and academics in physics and those in history? The book draws on interviews with 115 school teachers and university academics to provide new perspectives on two important issues. Firstly, how, for the purposes of today's schools and universities, can we adequately understand knowledge and knowledge building over time? Secondly, what has been productive and what has been counter-productive in recent efforts to steer and manage the changes in Australia?

PREFACE The Third International Mathematics and Science Study (TIMSS), sponsored by the International Association

for the Evaluation of Educational Achievement (IEA) and the governments of the participating countries, is a comparative study of education in mathematics and the sciences conducted in approximately 50 educational systems on six continents. The goal of TIMSS is to measure student achievement in mathematics and science in participating countries and to assess some of the curricular and classroom factors that are related to student learning in these subjects. The study is intended to provide educators and policy makers with an unparalleled and multidimensional perspective on mathematics and science curricula; their implementation; the nature of student performance in mathematics and science; and the social, economic, and educational context in which these occur. TIMSS focuses on student learning and achievement in mathematics and science at three different age levels, or populations.

- Population 1 is defined as all students enrolled in the two adjacent grades that contain the largest proportion of 9-year-old students;
- Population 2 is defined as all students enrolled in the two adjacent grades that contain the largest proportion of 13-year-old students; and
- Population 3 is defined as all students in their final year of secondary education, including students in vocational education programs. In addition, Population 3 has two “specialist” subpopulations: students taking advanced courses in mathematics (mathematics specialists), and students taking advanced courses in physics (physics specialists).

One of the most important and consistent voices in the reform of science education over the last thirty years has been that of Peter Fensham. His vision of a democratic and socially responsible science education for all has inspired change in schools and colleges throughout the world. Often moving against the tide, Fensham travelled the world to promote his radical ideology. He was appointed Australia's first Professor of Science Education, and was later made a Member of the Order of Australia in recognition of his work in this new and emerging field of study. In this unique book, leading science educators from around the world examine and discuss Fensham's key ideas. Each describes how his arguments, proposals and recommendations have affected their own practice, and extend and modify his message in light of current issues and trends in science education. The result is a vision for the future of science teaching internationally.

Academics, researchers and practitioners in science education around the world will find this book a fascinating insight into the life and work of one of the foremost pioneers in science education. The book will also make inspiring reading for postgraduate students of science education.

In *Education in China, ca. 1840–present* the authors offer a description of the Chinese education system. In doing so, they touch upon various debates such as on educational modernization and the role of female education. Relevant statistical data is provided as well.

The present volume consists of original scholarly articles that develop further issues pertaining to gender equity in mathematics education. The premise - that there is no physical or intellectual barrier to the participation of women in mathematics, science, and technology - provides the starting point for analyses and discussion. The authors explore the attitudinal and societal/structural reasons for the gender imbalance in these fields and look at foci for change, including curriculum and assessment practices, classroom and school cultures, and teacher education programs. A major part of the book comprises a series of detailed descriptive studies of education systems across the world from the perspective of mathematics and gender equity issues.

This volume is the first international collection of the best physics problems (both theoretical and experimental) given at the national physics competitions for high school students in different countries. The book introduces the short history of the International Physics Olympiad, the Statutes, the Syllabus, the statistical data including complete list of winners and a collection of national reports. Each of the national report will contain — as a main part — the best theoretical and experimental problems (with complete solutions) given at the national competition or at the training of the team before the international competition. Taking into account that at present the International Physics Olympiad involves about 35 countries, we are sure that the book will be interesting for everybody involved with physics education not only with the physics olympiads.

Suggested level: senior secondary.

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