

ACS SYMPOSIUM SERIES 994

Process-Oriented Guided Inquiry Learning



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Process Oriented Guided Inquiry Learning Pogil Acs Symposium Series 994

Shawn R. Simonson



Process Oriented Guided Inquiry Learning Pogil Acs Symposium Series 994:

Process Oriented Guided Inquiry Learning (POGIL) Richard Samuel Moog, 2008 POGIL is a student centered group learning pedagogy based on current learning theory This volume describes POGIL s theoretical basis its implementations in diverse environments and evaluation of student outcomes *Cooperative Learning in Higher Education* Barbara Millis, 2023-07-03 Research has identified cooperative learning as one of the ten High Impact Practices that improve student learning If you ve been interested in cooperative learning but wondered how it would work in your discipline this book provides the necessary theory and a wide range of concrete examples Experienced users of cooperative learning demonstrate how they use it in settings as varied as a developmental mathematics course at a community college and graduate courses in history and the sciences and how it works in small and large classes as well as in hybrid and online environments The authors describe the application of cooperative learning in biology economics educational psychology financial accounting general chemistry and literature at remedial introductory and graduate levels The chapters showcase cooperative learning in action at the same time introducing the reader to major principles such as individual accountability positive interdependence heterogeneous teams group processing and social or leadership skills The authors build upon and cross reference each others chapters describing particular methods and activities in detail They explain how and why they may differ about specific practices while exemplifying reflective approaches to teaching that never fail to address important assessment issues

The Cambridge Handbook of Computing Education Research Sally A. Fincher, Anthony V. Robins, 2019-02-13 This is an authoritative introduction to Computing Education research written by over 50 leading researchers from academia and the industry POGIL Shawn R. Simonson, 2023-07-03 Process Oriented Guided Inquiry Learning POGIL is a pedagogy that is based on research on how people learn and has been shown to lead to better student outcomes in many contexts and in a variety of academic disciplines Beyond facilitating students mastery of a discipline it promotes vital educational outcomes such as communication skills and critical thinking Its active international community of practitioners provides accessible educational development and support for anyone developing related courses Having started as a process developed by a group of chemistry professors focused on helping their students better grasp the concepts of general chemistry The POGIL Project has grown into a dynamic organization of committed instructors who help each other transform classrooms and improve student success develop curricular materials to assist this process conduct research expanding what is known about learning and teaching and provide professional development and collegiality from elementary teachers to college professors As a pedagogy it has been shown to be effective in a variety of content areas and at different educational levels This is an introduction to the process and the community Every POGIL classroom is different and is a reflection of the uniqueness of the particular context the institution department physical space student body and instructor but follows a common structure in which students work cooperatively in self managed small groups of three or four The group work is focused on activities that

are carefully designed and scaffolded to enable students to develop important concepts or to deepen and refine their understanding of those ideas or concepts for themselves based entirely on data provided in class not on prior reading of the textbook or other introduction to the topic The learning environment is structured to support the development of process skills such as teamwork effective communication information processing problem solving and critical thinking The instructor's role is to facilitate the development of student concepts and process skills not to simply deliver content to the students The first part of this book introduces the theoretical and philosophical foundations of POGIL pedagogy and summarizes the literature demonstrating its efficacy The second part of the book focusses on implementing POGIL covering the formation and effective management of student teams offering guidance on the selection and writing of POGIL activities as well as on facilitation teaching large classes and assessment The book concludes with examples of implementation in STEM and non STEM disciplines as well as guidance on how to get started Appendices provide additional resources and information about The POGIL Project

Broadening Participation in STEM Zayika Wilson-Kennedy, Goldie S. Byrd, Eugene Kennedy, Henry T. Frierson, 2019-02-28 This book reports on high impact educational practices and programs that have been demonstrated to be effective at broadening the participation of underrepresented groups in the STEM disciplines

Exploring More Signature Pedagogies Nancy L. Chick, Aeron Haynie, Regan A. R. Gurung, 2023-07-03 What is distinctive about the ways specific disciplines are traditionally taught and what kinds of learning do they promote Do they inspire the habits of the discipline itself or do they inadvertently contradict or ignore those disciplines By analyzing assumptions about often unexamined teaching practices their history and relevance in contemporary learning contexts this book offers teachers a fresh way to both think about their impact on students and explore more effective ways to engage students in authentic habits and practices This companion volume to Exploring Signature Pedagogies covers disciplines not addressed in the earlier volume and further expands the scope of inquiry by interrogating the teaching methods in interdisciplinary fields and a number of professions critically returning to Lee S Shulman's origins of the concept of signature pedagogies This volume also differs from the first by including authors from across the United States as well as Ireland and Australia The first section examines the signature pedagogies in the humanities and fine arts fields of philosophy foreign language instruction communication art and design and arts entrepreneurship The second section describes signature pedagogies in the social and natural sciences political science economics and chemistry Section three highlights the interdisciplinary fields of Ignatian pedagogy women's studies and disability studies and the book concludes with four chapters on professional pedagogies nursing occupational therapy social work and teacher education that illustrate how these pedagogies change as the social context changes as their knowledge base expands or as online delivery of instruction increases

STEM Education: An Emerging Field of Inquiry, 2018-11-01 The second decade of the 21st century has seen governments and industry globally intensify their focus on the role of science technology engineering and mathematics STEM as a vehicle for

future economic prosperity Economic opportunities for new industries that are emerging from technological advances such as those emerging from the field of artificial intelligence also require greater capabilities in science mathematics engineering and technologies In response to such opportunities and challenges government policies that position STEM as a critical driver of economic prosperity have burgeoned in recent years Common to all these policies are consistent messages that STEM related industries are the key to future international competitiveness productivity and economic prosperity This book presents a contemporary focus on significant issues in STEM teaching learning and research that are valuable in preparing students for a digital 21st century The book chapters cover a wide spectrum of issues and topics using a wealth of research methodologies and methods ranging from STEM definitions to virtual reality in the classroom multiplicative thinking STEM in pre school primary secondary and tertiary education opportunities and obstacles in STEM inquiry based learning in statistics values in STEM education and building academic leadership in STEM The book is an important representation of some of the work currently being done by research active academics It will appeal to academics researchers teacher educators educational administrators teachers and anyone interested in contemporary STEM Education related research in a rapidly changing globally interconnected world Contributors are Natalie Banks Anastasios Tasos Barkatsas Amanda Berry Lisa Borgerding Nicky Carr Io Keong Cheong Grant Cooper Jan van Driel Jennifer Earle Susan Fraser Noleine Fitzallen Tricia Forrester Helen Georgiou Andrew Gilbert Ineke Henze Linda Hobbs Sarah Howard Sylvia Sao Leng leong Chunlian Jiang Kathy Jordan Belinda Kennedy Zsolt Lavicza Tricia McLaughlin Wendy Nielsen Shalveena Prasad Theodosia Prodromou Wee Tiong Seah Dianne Siemon Li Ping Thong Tessa E Vossen and Marc J de Vries Learning, Design, and Technology J. Michael Spector, Barbara B. Lockee, Marcus D. Childress, 2023-10-14 The multiple related fields encompassed by this Major Reference Work represent a convergence of issues and topics germane to the rapidly changing segments of knowledge and practice in educational communications and technology at all levels and around the globe There is no other comparable work that is designed not only to gather vital current and evolving information and understandings in these knowledge segments but also to be updated on a continuing basis in order to keep pace with the rapid changes taking place in the relevant fields The Handbook is composed of substantive 5 000 to 15 000 words peer reviewed entries that examine and explicate seminal facets of learning theory research and practice It provides a broad range of relevant topics including significant developments as well as innovative uses of technology that promote learning performance and instruction This work is aimed at researchers designers developers instructors and other professional practitioners *Computer Supported Education* Beno Csapó, James Uhomoibhi, 2022-08-20 This book constitutes selected revised and extended papers from the 13th International Conference on Computer Supported Education CSEDU 2021 held as a virtual event in April 2021 The 27 revised full papers were carefully reviewed and selected from 143 submissions They were organized in topical sections as follows artificial intelligence in education information technologies supporting learning learning teaching methodologies and

assessment social context and learning environments ubiquitous learning current topics **Overcoming Students' Misconceptions in Science** Mageswary Karpudewan,Ahmad Nurulazam Md Zain,A.L. Chandrasegaran,2017-02-28 This book discusses the importance of identifying and addressing misconceptions for the successful teaching and learning of science across all levels of science education from elementary school to high school It suggests teaching approaches based on research data to address students common misconceptions Detailed descriptions of how these instructional approaches can be incorporated into teaching and learning science are also included The science education literature extensively documents the findings of studies about students misconceptions or alternative conceptions about various science concepts Furthermore some of the studies involve systematic approaches to not only creating but also implementing instructional programs to reduce the incidence of these misconceptions among high school science students These studies however are largely unavailable to classroom practitioners partly because they are usually found in various science education journals that teachers have no time to refer to or are not readily available to them In response this book offers an essential and easily accessible guide

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