iSTAR - international STudies of Astronomy Education Research Database

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Historically, an important part of the scientific research cycle is to situate any research project within the landscape of the existing scientific literature. In the field of discipline-based astronomy education research, grappling with the existing literature base has proven difficult because of the difficulty in obtaining research reports from around the world, particularly early ones. In order to better survey and efficiently utilize the wide and fractured range and domain of astronomy education research methods and results, the international **ST**udy of Astronomy Education Research database, iSTAR project was initiated.

The project aims to host a living, online repository of dissertations, theses, journal articles, and grey literature resources to serve the world's discipline-based astronomy education research community. Perhaps more than any other science discipline-based education research field, the scholarly literature base describing and documenting astronomy education research is highly fragmented and widely dispersed across numerous journals. The resulting wide diversity of journals that publish astronomy education research presents an arduous challenge for scholars trying to best understand what work has been done and what work still needs to be done. Moreover, a vast amount of education research on the teaching and

learning of astronomy exists in dissertations that were never published and even more exists in the realm of un-disseminated grey literature hosted in conference proceedings and society newsletters going back decades.

The screenshot shows the iSTAR Advanced Search interface. At the top, the iSTAR logo is displayed with the text "International Studies of Astronomy Education Research Database". Below the logo is a navigation bar with links: Home, About, Advanced Search, and Browse. A search bar with a "Search" button is also present. The main section is titled "Advanced Search" and includes a warning: "Don't panic! Just leave the fields you don't want to search blank. [Click here for a simple search.](#)". Below this are two buttons: "Search" and "Reset the form". The search fields include: Documents (all of), Title (all of), Authors (all of), Abstract (all of), Date, Uncontrolled Keywords (all of), and Subjects (Astronomy Education Research, Newsletter Reports Resources, RTSRE Related Research). At the bottom, there is a section for "Item Type" with checkboxes for Article, Book, Book Section, Conference or Workshop Item, Monograph, and Thesis.

Figure 1. Screenshot of Advanced Search Function in the iSTAR database.

With a few notable exceptions far less extensive than the current project, there has been no comprehensive repository for cataloging astronomy education research methods and results to date. In

response, the online iSTAR database serves as an online host to bring together in one place digital copies of hard to locate journal articles, isolated dissertations and theses, and professional meeting contributions to extend the world's scholars abilities to more easily find and utilize a far broader collection of astronomy education research literature than has been previously available.

Works are categorized by research method, nature of study-participants, educational learning venue studied, country and language of the study, and other fruitfully useful categories. The first domain of research artifacts ingested into the iSTAR database were doctoral dissertations (Slater et al., 2016). To the authors' great surprise, nearly 300 astronomy education research dissertations were found from the last 100-years. Few, if any, of the literature reviews from recent astronomy education dissertations surveyed even come close to summarizing this many dissertations, most of which have not been published in traditional journals, as re-publishing one's dissertation research as a journal article was not a widespread custom in the education research community until recently.

We observe that modern-era astronomy education research writings reaches as far back as 1923 and that the majority of dissertations come from the same eight institutions. Moreover, most of the astronomy education research work has been done covering learners' grasp of broad knowledge of astronomy rather than delving into specific learning targets, which has been more in vogue during the last two decades. The surprisingly wide breadth of largely unknown research revealed in the iSTAR database motivates us to begin to synthesize the research and look for broader themes using widely practiced meta analysis techniques.

As a first steps study, consider that today, nearly 3,000 permanent planetarium facilities are available to show the stars and heavenly motions to children and adults alike across the world, with perhaps another thousand portable planetariums

adding to the available teaching venues. Simultaneous with their construction, discipline-based astronomy education have been trying to better understand, and ultimately improve, how people learn astronomy in the planetarium.

A systematic analysis of planetarium education research articles, dissertations, and theses found in the recently constructed, community-wide the international **STudy of Astronomy Education Research** database (Slater and Tatge, 2017), iSTAR reveals that many of the systematic studies conducted in the 1960s and 1970s using domes served by servo-mechanical star projects have been reproduced again in recent decades in theaters using digital video projection showing nearly the same results: student-passive, information-download lectures are largely ineffective at enhancing student learning and student attitudes toward science whether they occur in a traditional classroom or multi-media planetarium theater.

References

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