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Review

Taking a future perspective by learning from the past – A systematic review of assessment instruments that aim to measure primary and secondary school students' ICT literacy☆

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ABSTRACT

This study systematically reviews literature on assessment instruments of primary and secondary school students' ICT literacy. It has three objectives: (1) Describe the development and characteristics of the assessments; (2) Present a synthesis of the facets of ICT literacy measured; and (3) Investigate to what extent information about reliability and validity is provided. A total of 38 tests reported in 66 studies were included. The results indicate that most of the tests target lower secondary students, comprise multiple-choice item designs, and are evaluated by quantitative methodology. The majority of the tests measure facets such as searching, retrieving, and evaluating digital information, and technical skills. In particular, the access to tests measuring digital communication, collaboration, safety, and problem solving is limited. This review demonstrates that an adequate norm for documenting and reporting test quality is lacking. Our findings point to potential future directions in developing and reporting assessments of ICT literacy.

Contents

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1. Introduction

Information and communication technology (ICT) is generally becoming more and more integrated in our society. Both ICT resources (e.g., computers, notebooks, smart-phones) and access to the Internet are largely taken for granted by young people in many countries (Davis, Deil-Amen, Rios-Aguilar, & Canche, 2012). The permeation of ICT in society has also affected education in several ways. During the last decade, many countries have introduced and implemented various policy strategies to integrate ICT into the classrooms. Actions that have been taken include increased access to ICT resources (Newrly & Veugelers, 2009), facilitating the development of teachers' technological pedagogical content knowledge (Tondeur et al., 2012), and integrating ICT literacy in national school curricula (Claro et al., 2012; Norwegian Directorate for Education and Training, 2012). As a consequence of this emphasis on ICT in education, many researchers, policy makers, national and international enterprises, and other stakeholders have contributed to the development of ICT literacy frameworks with the aim to outline and scrutinize the skills and competencies that are considered crucial for participating in work life and society (Binkley et al., 2012). In short, ICT literacy is widely acknowledged as a critically important component of what has been labeled as 21st century skills (Voogt, Knezek, Cox, Knezek, & ten Brummelhuis, 2013). As a result, knowledge about how well students master these ICT competences to become proficient users is necessary from several agent perspectives, for instance to inform educational policy, to develop teachers' instructional practices, and to initiate programs for preparing the next generation for tomorrow's working life. In order to monitor students' progress on how well they master these complex and multi-faceted competences, reliable and valid instruments are needed.

Existing research literature presents a considerable number of assessments of ICT literacy, ranging from paper-pencil tests, multiple choice (MC), and short answer tests to more interactive performance-based scenarios. In addition, questionnaires measuring students' self-reported ICT literacy (i.e., ICT self-efficacy) have been widely reported and interpreted as a proxy measure of students actual ICT literacy (e.g., Aesaert, van Nijlen, Vanderlinde, & van Braak, 2014; Hakkarainen et al., 2000).