

Authentic Assessment in Science Education: A Systematic Review From the Teacher Perspective

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EXECUTIVE SUMMARY

Authentic assessment as an alternative way of evaluation is considered to be one of the most effective ways to assess a child's ability in science. It provides students with situations that engage their science process and inquiry abilities and employ their science understandings. Teachers can use authentic assessment as a way to collect information about their students and their ability to implement their knowledge in new situations about science topics. In this research that is a literature review about authentic assessment in science education, focusing on teacher perspective, concerning only journal articles published the last fifteen years (2008-2023). The methodology uses PRISMA as tool in order to clarify the articles that finally will be included. The results of this review concern research's identity, results about methodology, and contribution about authentic assessment in science education. From the review, interesting conclusions are elicited about various dimensions concerning use of authentic assessment in science education from teacher's perspective.

INTRODUCTION

Authentic assessment is a valuation approach that requires students to display attitudes, using knowledge and skills acquired from what they have learnt in real situations. The term “authentic assessment” has been extensively the last three

decades in wide variety indicating that is a topic which presents increase in publications about it over that period (Schultz et al, 2022). Gulikers, Bastiaens, & Kirscher define authentic assessment: “An assessment requiring students to demonstrate the same (kind of) competencies, or combinations of knowledge, skills and attitudes, that they need to apply in the criterion situation in professional life” (Gulikers, Bastiaens, & Kirscher, 2004, p.5).

Mueller defines authentic assessments as direct measures of students' formal knowledge and skills through education to perform authentic tasks (Mueller, 2005, p.3). Based on this description it can be understood that authentic assessment is a form of assessment concerning all domains in learning that includes both knowledge and skills, which are directly related to the real life of students who are assessed directly by the teacher. In such a context, authentic assessments should ask students to do a task that is realistic, complex and integrated closely with something the student would have to do outside of school. This allows students to use their creativity, preparation, skills and complex reasoning to demonstrate their learning in an authentic way (Mathieu, 2000).

Early use of the term authentic assessment comes from the USA at the start of the 1990s. In this context, authentic assessment is described in terms of a direct assessment of what the student is meant to have learned, which therefore does not rely on common proxies for evaluation (McArthur, 2023). Assessment is authentic when it measures products or performances that have meaning or value beyond success in school (Frey et al, 2019).

The authentic assessment should be conducted because it offers wide usefulness. The characters of the authentic assessment are namely: (1) having relevance with the real world; (2) encouraging the students to develop relevant relationship with the real-world tasks; (3) provide complex tasks continuously; (4) observing different perspective tasks; (5) displaying self-reflection; (6) displaying teamwork; (7) pursuing meaningful artwork; and (8) generating competitive problem-solving paradigm (Hanifah et al, 2019). The authentic assessment will create active, innovative, socialist and scientific students.

It is supported that authentic assessment based on project tasks is an assessment that measures the competence of knowledge, attitudes, and skills towards an investigative process to find meaningful benefits or human life that must be completed within a certain time (Widana et al, 2021). The assessment criteria use a rubric. A guideline is used to assess a certain set of activities in project tasks (Ekawarna et al., 2020). Rubrics are needed to minimize the subjectivity of the assessment, so the availability of rubrics is essential in project-based assessments.

Developing and implementing authentic assessment can provide reliable and valid information about student learning. It can be used in school classrooms for accurate assessment of students' success in achieving academic learning standards (Moon

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