
USING SOLO TAXONOMY TO DEVELOP A STRUCTURED DESIGN FOR MATHEMATICS EXAM QUESTIONS.

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ABSTRACT

Evaluation is a complex task that requires clear and transparent criteria, ensuring all involved understand it as credible, with educational and social responsibility. However, as evaluation is not an exact science, it is naturally subjective. Do teachers prepare questions covering all levels of complexity? Do they reflect on the knowledge and complexity required for each question? What methods and tools do they use? In higher education, studies on evaluation are few, and in mathematics subjects, they are almost nonexistent. Greater reflection on this topic in higher education institutions is needed to deepen knowledge. The SOLO taxonomy, developed by John Biggs and Kevin Collis [1], in 1982, includes five levels of learning complexity: pre-structural, uni-structural, multi-structural, relational, and abstract. The authors have used this taxonomy to assess exam quality and identify cognitive complexity levels needed for assessments [2, 3]. The SOLO taxonomy should be used by teachers to formulate questions, classifying them according to cognitive complexity and assigning appropriate weights in student evaluations [4]. This approach helps identify areas for student improvement, aiming for greater academic and professional success. In this paper, the design approach adopted for the structured development of questions in a mathematics exam is described, following an ascending process of cognitive complexity. The exam questions are structured to flow in a sequence starting with some items of lower complexity and gradually becoming more challenging. By following this pattern, students engage with questions that vary in levels of progressive cognitive complexity, which also helps them build confidence as they progress towards more complex and challenging tasks.

Keywords SOLO taxonomy · cognitive complexity · assessment · levels of cognitive knowledge · mathematics · higher education

References

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