Strategies to enhance student engagement with formative assessment in undergraduate computer science programs amidst competing summative assessments: A scoping review

Samson Damilola Fabiyi, School of Computing. email: s.d.fabiyi@leeds.ac.uk

Introduction

Background

- Formative assessments can improve students' academic performance and mind-set about the class (Ozan & Kıncal, 2018).
- However, students pay less attention to formative assessments, when compared with summative assessments (Pan, 2020).
- Colleagues (teaching undergraduate computer science) who employ formative assessment also raised similar concerns about students' attitude towards formative assessment.

Why is this a problem?

- Benefits that formative assessments offer cannot be harnessed unless students engage with them, (Abney et al., 2017).

Research question

What are the:

- Deterrents to students' engagement with formative assessment and
- Strategies to enhance students' engagement with formative assessment in undergraduate computer science programs in the presence of other competing summative assessments?

Methodology

Design and search strategy:

- A scoping review of related studies
- Collection and selection of studies based on prisma extension for scoping reviews (Tricco et al., 2018).
- Databases: Scopus, ScienceDirect, ERIC, EBSCOHOST, ProQuest, and SpringerLink.

Exclusion criteria:

- Studies that exceed the last 15 years
- Studies that focused on primary education (accommodating studies which focused on undergraduate, and other post-primary education studies due to limited work in the area of studies).

Data analysis:

- Data extraction and analysis performed in Taguette, an open source software
- Analysis of extracted data is performed using thematic analysis approach
- Inductive approach adopted for data coding and themes identification

Results

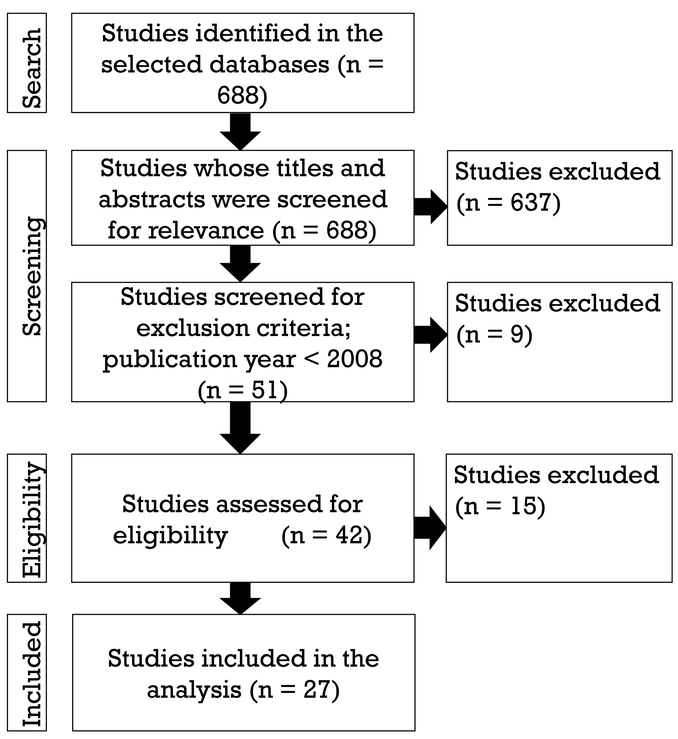

Fig. 1 Flow chart of search results based on prisma extension

Deterrents

Theme 1: Grade-consciousness and misaligned formative assessments

- Being grade-conscious
- Overlapping deadlines
- Misalignment between formative and summative assessments
- Misalignment between formative tasks and learning goals and materials

Deterrents

Theme 2: Lack of assessment literacy

- Unclear marking criteria
- Suboptimal assessment literacy

Theme 3: Timing

- Time-consuming assessments/activities
- Time constraint and other obligations

Deterrents

Theme 4: Substandard Feedback

- Sparse feedback
- Delayed feedback

Theme 5: Others

- Lack of flexibility
- Perceived difficulty of questions
- Lack of opportunity to discuss with peers
- Fear of judgement

Strategies

Theme 1: Treating students as active agents

- Students' involvement in assessment design/setting processes e.g. rubrics development
- Peer and self-assessment, creating opportunities for reflection
- Setting engaging/interactive questions

Theme 2: Diversity and Freedom

- Diversity and inclusion
- Flexible assessments
- Anonymity
- Avoid excessive reuse of approaches: diverse assessment methods or activities

Strategies

Theme 3: Working with peers

- Discussion group
- Group work

Theme 4: Connection between formative assessments and learning goals, activities, and summative assessments

- Constructive alignment: Alignment between assessments, intended outcomes and learning activities
- Linking formative tasks to summative assessment: preparing students for the latter

Theme 5: Dealing with time and perceived difficulty

- Adjustment of assessment calendar
- Allocate part of study time for assessment completion
- Avoid using questions requiring too much time
- Use of questions with moderate difficulty
- Offer opportunities for help

Strategies

Theme 6: Quality feedback

- Timely feedback
- Detailed feedback
- Dialogic feedback

Theme 7: Authentic assessment

- Valuable/beneficial: relevance
- Authenticity: real-world based assessments

Theme 8: Assessment Literacy

- Transparency of assessment: clarify goals, expectations and guidelines
- Clarity of value, benefits and purpose
- Enlightenment on alignment of formative assessments to: learning outcomes, learning materials and summative assessments

Limitations and validity

- Exclusion of grey literatures (except full conference papers) and studies that exceed the last 15 years
- 4 (14.8%) of the included studies are online learning based
- None of the included studies is computer science based
- 4 (14.8%) of the included studies focused on non-undergraduate programs

Implication for my practice

- Next: Implement and evaluate the findings of this study in my practice
- Expected: Increased students' motivation and participation in formative assessments
- Implication: Enhanced students' educational experience and my own professional practice development

References

- Abney, A. J., Amin, S., & Kibble, J. D. (2017). Understanding factors affecting participation in online formative quizzes: an interview study. *Adv Physiol Educ*, *41*, 457–463.
- Ozan, C., & Kıncal, R. Y. (2018). The Effects of Formative Assessment on Academic Achievement, Attitudes toward the Lesson, and Self-Regulation Skills. *EDUCATIONAL SCIENCES: THEORY & PRACTICE*, *18*(1), 85–118.
- Pan, Y.-C. (2020). Taiwan University Students' Perceptions of Summative and Formative Classroom Assessment in English Courses . *TESOL International Journal*, *15*(2), 46–64.
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., & Levac, D. et. al. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, *169*(7), 467–473.