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Preliminary Assessment of Online Student-Generated Tests for Learning

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Abstract: Whilenoting that constructing "tests" is different from constructing questions, its use for learning is yet to be explored. A study involving a total of 54 student teachers was conducted. An online student-generated tests system supporting associated tasks was adopted. Preliminary data on students' perceptions with regard to its use as an assessment and learning approach, as compared to teacher-generated tests, were collected and analyzed. Several important findings were obtained. First, more than three-quarters of the participants preferred student-generated test as the approach for assessing their learning. Second, the majority of the participants thought student-generated tests promote better learning. Third, based on chi-square goodness of fit tests (X^2), students' preference to and perceptions of student-generated tests and teacher-generated tests were statistically significant at $p < .01$. Finally, students' written responses analyzed using the constant comparative method indicated that student-generated testsis a promising assessment and learning approach. Based on the collected data, suggestions for online system developments of similar kindsand instructional implementations are provided.

Keywords:online learning system, revealed preference, student-generated questions, subjective perceptions

1. Introduction

Enabling and empowering students to find out what they view as relevant and important when engaged in learning and to construct questions around those identified areas has attracted the attention of an increasing number of researchers and practitioners.This arrangement, known variably as student-generated questions, problem posing, student question-generation, and so on (hereafter name SQG),is a notable comprehension-fostering and -monitoring cognitive strategy.

The learning benefits ofSQGon cognitive, affective and social development have been well-documented(AbramovichandCho, 2006; Barlow andCates, 2006; BrownandWalter, 2005;Chi, Brown andBruce, 2002; Rosenshine, Meisterand Chapman, 1996; WhitinandWhitin, 2004;Wong, 1985; Yu andLiu, 2005).To take advantage of the various affordances of networked technologies, currently more than a dozen online learning systems have been developed to support students constructing questions(Yu & Wu, 2012).As constructing "tests"would direct students'attention to additional criteria(e.g., the distribution of course concepts to be learned) and is different from constructing questions(ChamosoandCa'ceres,2009), its use for learning serves as the focus of this study.In this study, students'perceptions with regard to its use as an assessment and learning approach, as compared to teacher-generated tests, are examined to yield preliminary assessment data.

2. Preliminary Assessment of Online Student-Generated Tests for Learning

3.1 Participants

In light of the fact that constructing questions and tests are essential skills expected of teachers, student-generated questions and tests activities were carefully integrated into a course offered through a secondary teacher preparation program at anational university in Taiwan. A total of fifty-four student teachers enrolledin the course and participated.

3.2 Implementation procedures

In the first class, after the instructor introduced the general arrangement, requirements and course format, the purposesfor incorporating SGQ and student-generated tests in this coursewerebriefly explained.Considering that multiple-choice is the question type that dominates teacher certificate examination administered at the national level, and it is one of the most frequently encounteredquestion typesin exams at the secondary education level,it was chosen for this study. An online student-generated testsystem supporting associated tasks was adopted. For description on the system, please refer to Yu andSu (2013).

The study was dividedintotwo stages. At the first stage,as a routine practice,following instructor's delivery ofinstructionon each chapter, students were given twenty minutes to generate at least twomultiple-choice questions pertaining to the covered content. Before engaging students in SQG, a training session coveringthe basic concepts related to SGQ and operational procedures for interaction with the adopted system was arrangedto equip students with essential skills. After class, students were asked to assess at least four randomly assigned questions so that individual feedback from peers could be obtained, and SGQ could be revised with reference to peers' feedback when the question-author deemed appropriate. At the next class session, group feedback was given by a teaching assistant to highlight exemplary question-generation and -assessment practices.

At the second stage of this study, students were instructed to construct a test covering all the study content in this course, based on self-generated questions. As a learning support, students were also given a chance to provide feedback to peer-generated tests and observe peers' work during the process. A training session covering the basic concepts and operational procedures of associated tasks (e.g., test-construction, test-assessment, test-viewing)was given before engaging students in generating tests.

To collect preliminary data regarding students'perceptions toward student-generated test, participants were given a questionnaire at the last instructional session. Students' response to the following twoquestions were analyzed and reported in this study to yield preliminary assessment of its use for learning:

1. Which of the following do you prefer better as an approach for assessing your learning (student-generated tests, traditional teacher-generated tests, or no difference)? Why?
2. Which of the following do you think promote better learning (student-generated tests, traditional teacher-generated tests, or no difference)? Why?

3. Results and Conclusions

Quantitativedata from question #1 indicated that more than three-quarters of the respondents (77.78%) preferred student-generated test as the approach for assessing their learning. Only nearly10% (9.26%) preferred traditional teacher-generated test,and 12.96% expressedno preference to either approaches.A chi-square goodness of fit test (X^2) further indicated that the distribution was statistically significant at $p < .01$ (X^2=48.11).

Students' written responses to Question #1 wereanalyzed using the constant comparative method proposed by Lincoln and Guba (1985). Several salient features emerged as to why student-generated testswas their preferred assessment and learning approach, and could be grouped into two categories:affective and cognitive effects. For affective effects, student-generated tests as being '*less stressful*', and '*novel, interesting and lively*' was mentioned by 16, and seven respondents, respectively. As for cognitive effects, its focus on '*application rather than rote memorization,*'and '*provision for exercising higher-order thinking skills,*' such as cognitive strategy (e.g.,building linkage to personal life, other subjects, or future work; locating main ideas of the study content), metacognitive strategy (e.g.,

self-monitoring of comprehension; self-revision; integration of learned material), generative process, self-regulation, reflective thinking, and so on,was stressed by 24 and 12 respondents, respectively.Finally, five respondents highlighted the '*meaningfulness*' of student-generated tests as it provided an opportunity for students to practice generating questions, which is an essential skill expected of teachers.

Quantitative data from question #2showedthat more than 60% of the respondents (61.11%) regarded student-generated testspromotebetter learning, while nearly 30% (29.63%) expressedno differences and nearly 10% (9.26%) considered traditional teacher-generated tests.A chi-square goodness of fit test (X^2) further indicated that the distribution was statistically significant at $p< .01$ (X^2=22.11).Students' written responses to question #2were also analyzed using the constant comparative method. Results reflected basically what were revealedin the previous paragraph. Generally speaking, students felt that the aforementioned processes and effectsaltogether helped engender a '*sense of achievement*,'and '*higher interest associated with learning*,' which in turn lead to '*better retention*,''*cognitive development*'and learning.

In sum, preliminary assessment data from students' responses supported student-generated tests as a promising assessment and learning tool. Developers of online student-generated questions learning systems are strongly suggested to consider the enhancement of their current systems to allow students to generate tests using student-generated questions as a basis. With such an enhancement in place, instructors can integrate student-generated tests following SGQ learning activities to further promote learning and cognitive growth.

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