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What did we learn last class? An Exploratory Study of Student-Generated Review Questions

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Abstract

'Student-generated review questions' is a classroom technique in which one or more students are assigned the task of writing a set of questions based on what was studied during a class. These questions are shown to all of the students at the beginning of the next class, and then discussed in pairs or small groups. The current study explored student perceptions of the technique. The student-generated review questions activity was run regularly throughout an entire semester with three classes of undergraduate students in a university in Bangkok. At the end of the semester, these students completed a questionnaire comprising Likert scale and qualitative questions. Students reported that preparing and answering the review questions enhanced their recall and understanding of course content, as well as their sense of engagement and motivation. I conclude that the technique is perceived by students to be beneficial, and provide

recommendations for how it can be implemented by other teachers.

Keywords: student-generated review questions (SGRQs); student question-generation (SQG); teaching techniques; teaching methodology; student engagement; learning strategies;

Introduction

Memory and Forgetting

A vast body of research is dedicated to the phenomenon of forgetting. The seminal work of Ebbinghaus in the 1880s described a 'forgetting curve', which states that the longer the time period between reviewing information, the greater the chance of forgetting it. Over a century later, modern studies have confirmed the logarithmic formula that Ebbinghaus developed to predict rate of forgetting (Murre and Dros, 2015). This formula confirms common-sense: the longer the duration before recall, and the weaker the original memory, the greater the probability of forgetting.

Remembering, however, sits at the very bottom of Bloom's taxonomy of cognitive domains, an immensely popular theory in education. It is therefore common to dismiss memorisation as unimportant, and instead to identify the core goals of education with higher levels of thinking such as analysing, evaluating and creating (see Lawler, 2017). Nevertheless, in many disciplines, particularly in language acquisition, the teacher has an important role not only in helping students to remember what they have studied, but in teaching them strategies for how to remember things.

Engaging Students

Beyond giving clear explanations and helping students remember them, teachers also have a responsibility to *engage* students, to teach in a way that kindles curiosity. A growing body of research addresses the concept of student engagement and how

to measure it, with the National Survey of Student Engagement (NSSE) standing as one of the most popular tools (Zilvinskis *et al.*, 2017). This survey uses ten indicators of engagement, including reflective and integrative learning, learning strategies, collaborative learning, and effective teaching practices (Zilvinskis *et al.*, 2017). The same body of research has found that student engagement is positively correlated with both grades achieved and overall satisfaction among students (see Webber *et al.,* 2013).

The engaged mind asks questions. *The Right Question Institute* highlights the fact that young children are full of curiosity and ask questions prolifically, but that as they progress through school, the number of questions they ask decreases (see, for example, Rothstein and Santana, 2011). Concomitant with the diminished rate of questioning is reduced engagement (Berger, 2014, as cited in Kelley-Mudie and Phillips, 2016). It is simply not routine for teachers to encourage and guide students in the process of asking questions. However Yu and Chen (2014), placing student-generated questions within the paradigm of contribution-based pedagogies, summarised several studies which found that student question generation has widespread benefits, leading to increased comprehension, intragroup communication, and active learning behaviour. Furthermore, knowing that there will be an audience for their questions other than the teacher raises the level of interest and effort when completing a task (Chin and Brown, 2002, cited in Yu and Chen, 2014). In short, student question-generation is an effective tool for engaging students.

Student-Generated Review Questions

A simple way to introduce student-generated questions into the classroom was put forward by Bress (1996, cited in Woodward, 2012) in the form of a recurring classroom activity called *Review Circles*. In this activity, one of the students, for homework, prepares a set of review questions based on what was studied in a class. These questions are shown to all of the students at the start of the next class. I have explored this activity, which in the context of research on student-generated questions I

am calling *student-generated review questions* (SGRQs), during English as a Foreign Language (EFL) classes with undergraduate students in an attempt to:

1. Provide a routine way to review course content, in order to aid memory
2. Engage students by making them active co-creators of learning resources.

Incorporating SGRQs into these courses has produced several benefits for the teacher. First, it has lightened the teacher's burden of preparing for a class, as the first stage of any class can be prepared by students in the form of SGRQs. At the start of each class I observe students respond enthusiastically to the task of answering questions created by their peers, which has eliminated the need for me to prepare a warm-up activity for the start of class. Second, the task of reviewing course content, both during and at the end of a course, is accomplished by the SGRQs. Third, the SGRQ activity creates a common link between each of the classes in a course, helping create a sense of cohesion. Although these benefits may be readily-apparent to the teacher, there has been no research that has explicitly and systematically examined this technique since it was originally proposed by Bress in 1996. The rationale for the current study is therefore to investigate the perceptions of students themselves regarding SGRQs.

Objective

The purpose of this study was to identify student perceptions of the SGRQ activity, specifically whether it benefited students' recall, understanding, engagement and motivation.

Research Methodology

Participants

Given the exploratory nature of this study, participants were selected by opportunity sampling. I used the SGRQ activity with three sections of undergraduate students at Srinakharinwirot University in Bangkok during the first semester of the 2017

academic year, and invited all students in these sections to complete the questionnaire at the end of the semester. These students were first- and second-year undergraduate students studying as either English or English Education majors. A total of 65 out of a possible 68 students completed the questionnaire.

Design

This study used survey methodology comprising an online questionnaire containing both quantitative and qualitative questions. Students used their smart phones during class time to complete the questionnaire anonymously.

The SGRQ Activity

At the end of each class, a group of two or three students was assigned to write review questions for their homework. A rota was drawn up to ensure all students took a turn to write the questions once during the semester. (See below the section *Recommendations for Using the SGRQs Activity in a Course* for more details of the rota and specific recommendations for setting-up the activity.) These questions needed to be based on the content of the lesson just finished.

At the beginning of the next class, these questions were projected for the whole class to see. The class then discussed the questions in pairs, without reference to their textbook or notes from the previous class. When finished they were allowed to briefly check their textbook or notes, before feedback together as a class.

Instruments

The survey comprised eight questions; the first six used Likert scales and the remaining two were open-ended. The questions were translated into Thai, the first language of all respondents.

Questions one and four addressed the extent to which students perceived answering and creating the review questions benefited their understanding (see Yu and Chen, 2014). The second question determined the extent to which students felt

SGRQs were able to help them with recall. Questions three and six addressed the degree to which answering the SGRQs in class generated a sense of engagement. The aspects of engagement here relate to the 'active learning' scalelet (question three) and the 'collaborative learning' (question six) scalelet of the NSSE (see Zilvinskis *et al.,* 2017). Question five asks students if foreknowledge of their audience had a positive impact on their motivation when writing the questions (see Chin and Brown, 2002). Questions seven and eight provided a space for students to reflect on their overall experience with the SGRQ activity.

The Survey Questions

1. How much did answering the review questions in class help you to understand course content?
2. To what extent did answering the review questions in class help you to remember the content that you had already studied in a previous class?
3. To what extent did review questions encourage you to contribute to class discussion?
4. To what extent did writing the review questions as homework help you to understand course content?
5. When you wrote the questions, you knew that your questions were going to be the focus of attention during the next class. To what extent did knowing this motivate you to do your best?
6. When you were assigned to write the review questions for homework you worked in a group. How fairly was the work distributed in your group?
7. In a few words, describe your overall experience of writing and answering review questions.
8. Do you have any suggestions for how to improve the review questions process for future courses?

Results

Quantitative results revealed that a large majority of students felt that the SGRQ activity was motivating, that it

increased participation, and that it helped them to understand and remember course content. Qualitative results confirmed that the activity was a helpful way to review course content, as well as offering suggestions for how to improve the activity for future courses.

Quantitative Results

Table one shows frequencies of responses for questions 1-5, in which students indicated the extent of their agreement with items on a Likert scale. Questions 1-3 asked to what extent *answering* the SGRQs benefitted their understanding (question 1), memory (question 2), and contribution to class discussion (question 3). Questions 4 and 5 asked to what extent *writing* the questions improved understanding (question 4) and motivation (question 5).

Table 1: Frequency of responses for questions 1-5 shown as percentages

Question	n	Extremely	Very	Somewhat	Not very	Not at all
Q1	65	32%	63%	5%	0%	0%
Q2	65	48%	38%	14%	0%	0%
Q3	65	38%	46%	14%	2%	0%
Q4	65	45%	51%	5%	0%	0%
Q5	65	32%	49%	17%	2%	0%

A diverging stacked bar charts pattern[1] in figure 1 shows that a large majority of students agreed with questions 1-5, with over 80% of students answering either 'extremely' or 'very' for every question.

[1] The 'diverging stacked bar charts' pattern, according to the recommendations of Robbins and Heiberger (2011), shows the percentage of respondents who agree with a statement on the right-hand side of the chart, as positive percentages, and respondents who disagree on the left-hand side, as negative percentages. For respondents who gave a neutral answer, percentages are divided evenly around the zero axis.

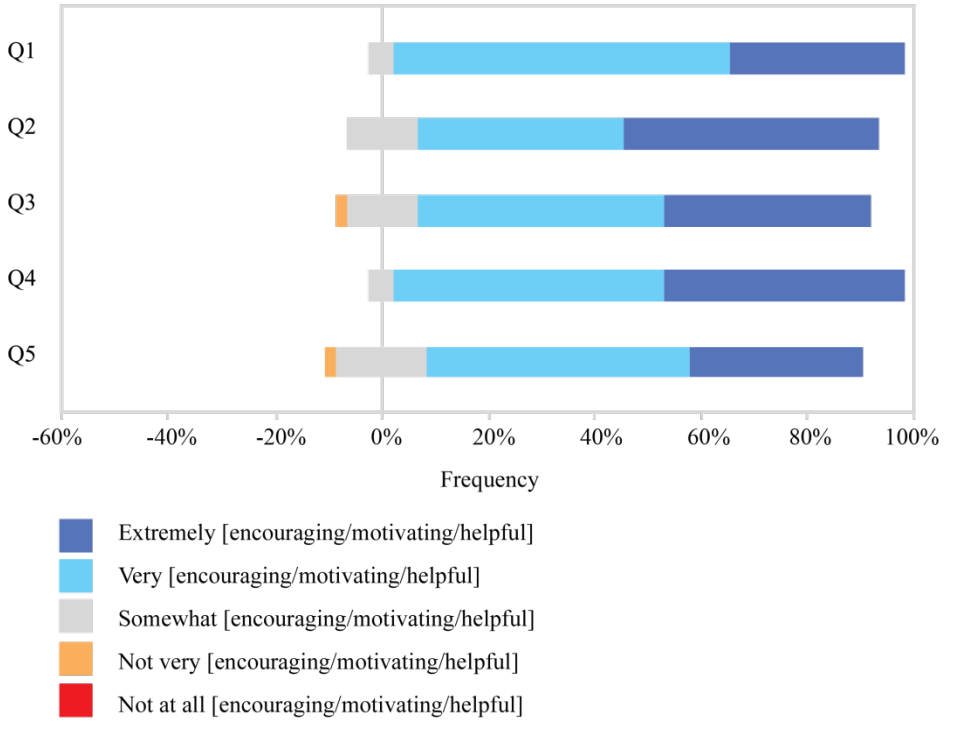

Figure 1: Frequency of responses for questions 1-5.

Table 2 below shows the frequencies of responses to question 6, which addressed how fairly the homework was distributed. A large majority of students (86%) responded that the work was distributed evenly between all group members.

Table 2: Frequency of responses for question 6 shown as percentages

n	You did all the work on your own	You did more work than others in your group	The work was distributed evenly between all group members	You did some work, but others did more	You didn't do anything
65	2%	8%	86%	5%	0%

Qualitative Results

Question Seven

In question seven, students described their overall experience writing and answering review questions. Several themes emerged. Strongest, with approximately 75% of respondents making this point, was that review questions were a helpful way to review past content, which otherwise can easily be forgotten among the other subjects that they study during the week.

Another theme that emerged strongly was that the process of *writing* the questions was a useful exercise for the students who had been assigned to the task. Reasons given for this were that having to write the questions forced the students to carefully review the class content, identify the main points of the lesson, and that doing this helped them to understand the content more thoroughly. Five respondents mentioned that this improved their question-writing skills, while two discussed the challenge of making questions that were both interesting and of a difficulty suitable for their classmates.

Students raised several benefits of the process of *answering* the questions in class, praising the way the questions led them to interact with their friends, and helping each other on points they found difficult. Of relevance to EFL teachers is that this discussion provided an opportunity to practice speaking and listening in English in a way that had a genuine communicative goal. One student commented on the fact that answering review questions was the first thing we did in each class, describing this as a good way to “wake up” and get into the lesson, and further that this start to each lesson provided a sense of continuity between lessons in the course.

In terms of less positive feedback, one respondent wrote that the questions were too difficult to answer, a theme that will be explored in the discussion.

Question Eight

Question eight asked for suggestions on how to improve the SGRQ project for future courses. Several students asked for the questions to be given more frequently, starting from the very first class of semester, and others to have a larger number of questions each time. Two students mentioned that sometimes the questions were too easy, and that the teacher could provide more help in getting a variety of questions ranging from easy to difficult. Other suggestions included using pictures in the questions instead of just text, and making the process of answering the questions a small competition, perhaps getting pairs to score each other's answers. Several other students called for a broader range of questions, as sometimes the style of questions became repetitive.

Discussion

The results show that students perceived answering review questions in class as helpful for their understanding (question one) and remembering (question two) of class content. When it was a group's turn to write the questions, their motivation was improved due to their knowledge that there would be an audience (question five). The boost to their understanding was also higher when writing questions due to the fact that they had to consider the class content carefully in order to write questions that addressed the key points of the lesson, and which would be interesting and of an appropriate difficulty for their class mates (question seven). Student engagement was achieved both when writing the questions, which almost all respondents did as part of a group (question six), and when answering the questions, during which time students felt they had a chance to participate in class discussion (question three) and also to explain difficult areas to their classmates (question seven).

In terms of the purpose of the research, it can be concluded that students perceived SGRQs to benefit their recall and understanding of class content, and to boost their sense of engagement and motivation.

Challenges

Some of the SGRQs were very difficult to answer. This was because the meaning wasn't clear, which is partly due to the fact that these students use English as a foreign language, leading to frequent grammatical inaccuracies. However, there were two positive consequences of this. During the feedback stage, in which the teacher and the class negotiated the best answer to each question, the matter of grammatical errors and unclear meaning could be discussed, and the questions themselves re-written in a more clear and accurate way. This helped students to become aware of the errors in their writing as well as gradually improve their ability to write clear, well-constructed questions.

Another solution to this issue arose organically, as students in one of the sections spontaneously began submitting proposed 'best answers' along with their questions. After one group did this, it became a pattern that subsequent groups followed. This had a positive effect on the quality of their questions, possibly because when trying to write down clear, succinct answers, the students themselves would spot weaknesses in the questions and edit them accordingly before submitting.

Future Directions

Developing the SGRQs Activity

Question eight revealed that several students wanted a greater variety of questions. As the semester progressed, most of the questions followed the patterns given in the 'Student Guidelines' (see below the sub-section *Student Guidelines*) that were given to students at the start of the semester. While these guidelines gave them a structure for generating questions, in future courses I will encourage students to balance questions that follow a pattern with more novel approaches, and make it explicit that creativity is a part of the marking criteria. I will also spend time in the first class teaching the *Question Formulation Technique* (see Rothstein and Santana, 2011) in order to help produce a greater variety of questions which at the same time stimulate deeper levels of thinking around the core topics of the class.

Following student suggestions in question eight, in future courses we could include multimedia such as images as part of the questions, and make the feedback stage a competition. A semester leader board could further motivate students to do their best, and perhaps lead to more students reviewing the previous lesson before a class starts.

Limitations and Suggestions for Further Research

The questionnaire was very limited, with each construct (such as 'understanding') being addressed by a maximum of two Likert scale questions. To build stronger construct validity and more robust data, a greater range of questions could be asked. Future studies could also have a larger number of respondents, and even an experimental design, going beyond student perceptions and actually measuring whether understanding and remembering are increased by the SGRQ activity.

Conclusion

This paper began with the problem of forgetting and the importance of engaging students at all times. I proposed that the SGRQ classroom activity, in which students write questions based on class content and then discuss the answers to the questions in the following class, may be able to address both of these issues.

The results of this study indicate that students perceive the SGRQ activity to help not only their memory of course content, but also their understanding of it. Furthermore, they reported increased motivation and engagement, which was achieved by working as a group when doing the question-writing assignment for homework, by foreknowledge of an audience that would be discussing their questions, and by answering the questions collaboratively in class.

From this preliminary study, it seems that the SGRQ activity is a strong candidate for the task of enhancing student memory and engagement on a course. Suggestions for how teachers can implement the activity are presented in the following section.

Recommendations for Using the SGRQs Activity in a Course

The following recommendations are based on my experience with SGRQs, presented alongside the developments proposed in the *Future Directions* section.

Designing the Rota

The SGRQ activity can be explained to students in the first or second class of a semester. Based on the content of that class, the teacher creates the first set of review questions for students to answer in the next class. These questions will also serve as an example for when students will be writing questions themselves. After the first SGRQ activity has been completed, explain the rota. Calculate how many classes remain in the semester, how many students there are in the class, and therefore how many students need to be in each group. For example, if a class has 24 students, and there are 13 classes remaining, students would be working in pairs to write the questions. (In the final class of the semester, students would be answering questions, but not creating any new ones for homework.)

Student Guidelines

I gave guidelines to the students after the first SGRQ activity to help them create their own questions, since for some of the students this would be the first time they attempted an activity like this. Following is a set of guidelines that would be most relevant to EFL classrooms:

1. Review your notes and all resources from the current class, and write 5-8 questions based on this.
2. Some of your questions could follow these patterns:
    - Vocabulary (recognise): What does … mean?
    - Vocabulary (recall): What word means …?
    - Pronunciation: How do you pronounce…?
    - What's the difference between … and …?
    - Grammar or vocabulary corrections
3. Your questions will be graded on the following criteria:
    - Addressing the key concepts from the class
    - Encouraging us to think in depth

- Asking unique, creative questions. (So don't just follow the patterns for all your questions!)

4. Provide model answers for each of your questions.

Using the Questions in Class

The deadline for sending the questions to me was 24 hours before the start of the next class. I briefly checked that the questions were understandable and relevant. At the start of the next class, after explaining the lesson plan, I displayed the review questions in large text using a projector. The class then discussed the questions in pairs, without reference to their textbooks or notes from the previous class. I reminded students that this is not a writing activity, and that they are to discuss the questions with their partners or in a group of three.

When they had finished, students were then allowed to briefly check their notes, textbooks or handouts from the previous week. Finally we did feedback together as a class, where we negotiated the best answer to each question and discussed any issues with the questions themselves.

The author

Christopher Johnson has been teaching English in Thailand since 2008. His interests are provoking curiosity in students through the power of story, making language-learning engaging, and building learner autonomy. He can be reached at kit@withkit.com.

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