

EXPLORING INTERACTIVE ONLINE SCRIPT CREATION AS A NOVEL ASSESSMENT METHOD IN HIGHER EDUCATION

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Abstract

This study presents a new assessment approach wherein students collaboratively develop interactive online scripts (text enriched by images, videos, and self-assessment quizzes) on course contents throughout the semester. The aim is for students to become subject matter experts, ensuring that the content is comprehensible for their peers. This method offers several advantages, including rapid integration of new contents into course material without a heavy workload for lecturers, who only need to produce in-class materials rather than exhaustive study guides. Moreover, students acquire valuable competencies and soft skills such as structuring of learning material as well as collaborative learning. It also aims to foster self-reflection on effective learning strategies. Results from a voluntary survey indicate that 17 out of 18 students found script creation beneficial for deepening their understanding of course contents. However, evaluation in a course of 57 participants yielded mixed results, with both exemplary and substandard submissions. The substandard results are difficult to deal with, as students then have no study material for these topics. Notable challenges include unclear assignment requirements, ineffective group dynamics, and a time-intensive nature of student tutoring by teaching assistants. Furthermore, despite defined assessment criteria, assessing script quality proved challenging due to strong homogeneity among submissions. Addressing these challenges requires enhanced training for teaching assistants providing feedback to the students, and strategies for managing gaps in script coverage. This study underscores the need for competent supervision and ongoing refinement of this assessment process to optimize learning outcomes in higher education settings.

Keywords: *Assessment, cooperative learning, online learning.*

1. Introduction

In today's rapidly changing world, university lecturers are under immense pressure to keep up with the latest developments in their fields while simultaneously delivering quality instruction to their students. This is made even more difficult by the fact that they often have very limited time besides their research to develop and update their teaching contents and materials. As a result, many lecturers find themselves resorting to traditional lecture-based methods of instruction, which may not always be the most effective way of promoting student learning and engagement (Afrasiabifar & Asadolah, 2019; Ge et al., 2020; Baumeister et al., 2023).

This paper presents an innovative approach to assessment that seeks to address this problem by leveraging the power of collaborative learning. Specifically, students are asked to work together to develop interactive online learning material on course contents throughout the semester. The goal is for students to become subject matter experts in their field, ensuring that the content is comprehensible for their peers.

This method offers several advantages over traditional lecture-based methods of instruction. For one, it allows lecturers to rapidly integrate new content into their courses without having to produce exhaustive study guides from scratch. Instead, they can focus on producing high-quality in-class materials that promote active engagement and critical thinking skills among students.

Furthermore, this approach helps students acquire valuable competencies and soft skills such as structuring of learning material and collaborative learning. It also aims to foster self-reflection on effective learning strategies, which can help students become more independent learners in the long run.

In the following chapters, a case study of this assessment method is presented in order to analyze its strengths and weaknesses in more detail.

2. Methodology

This study aimed to explore the use of collaborative learning through student-led script creation as a means of developing interactive online learning materials for university courses. The methodology involved creating and implementing an assessment approach that required students to work together to develop comprehensive, structured, and engaging online scripts on course contents throughout the semester.

The study was conducted in an elective module at a German University with 57 students (Computer Science for Engineers), both Bachelor and Master students from a mechanical engineering and engineering & management background. Creating these learning materials was voluntary but gave them bonus credits for the final exam (up to 10 out of 90 exam points). The task was mostly done in groups of 2 to 5 students, depending on the scope and depth of the topic. Students chose the topic they would like to cover at the beginning of the semester, and they had five weeks to complete the task after the respective topic had been covered in the lecture.

Students received a grading scheme before doing the task, giving them detailed information on how the online material will later be graded. The grading scheme comprised of: (a) comprehensiveness of the material, (b) structure, quality of (c) examples, (d) self-assessment questions and (e) video/animation material. The grading scheme presented different quality levels with corresponding scores for each quality criterion (e.g., "The learning module was structured in a uniform, orderly, comprehensible way and is conducive to the learning process. Subtopics are clearly separated from each other. The length and number of pages is good. Different structural elements (important/info/example/task/...) are color-coded according to the standard." = 3 points, "Learning module is sporadically unstructured, which is only very slightly a hindrance to the learning process overall." = 2 points, etc.). They also had access to a best practice example for the very first chapter of the lecture as well as a tutorial with guidelines on how to create good online learning material.

During their 5-week time frame to work on the material for their assigned chapter of the lecture, the students were also assisted by a student tutor with whom they had two 30-minute meeting sessions: a kick-off meeting to make sure that they had the proper idea of what is to be done, and an intermediary meeting where they received feedback on their current progress. The student tutor was also the person responsible for grading the final work (in consultation with the lecturer).

The online learning materials created by the students consisted of text enriched by images, videos, and self-assessment quizzes (single/multiple choice, fill in the gaps, assign terms to definitions, mathematical and programming tasks). Students were required to structure the learning content, write short definitions, provide example scenarios, create or find relevant images/illustrations, create short tutorial videos and come up with formative self-assessment question for the learner. The total workload per student was estimated to be between 15 and 25 hours.

Near the end of the semester, an anonymous survey took place where students were asked to rate their experience with this new approach.

3. Results

This newly implemented assessment format has been evaluated in two different regards: An anonymous survey was conducted near the end of the lecturing period asking for the students' perception of this task, and the quality of the resulting online material has been analyzed in-depth. The results of this evaluation are presented in the next two subchapters.

3.1. Student feedback

The students were given four statements as part of the survey, which they were asked to rate on a Likert scale of 1 to 5 (1 = Fully agree, 5 = Fully disagree). The following statements were given:

- a) *"Creating learning modules has helped me to reflect on the learning content myself in more depth."*
- b) *"I only created/will only create the learning module because I get bonus points for it."*
- c) *"The group work involved in creating the learning module worked well."*
- d) *"The requirements for creating my learning module were clearly formulated."*

These questions were answered by 16 to 21 participants (the questions could optionally be left unanswered). It is important to note that not all groups had completed or even started work on their assigned topic when the evaluation was conducted. The feedback was gathered during the official teaching quality evaluation run centrally by the University. We chose to include the survey in there since response rates are usually rather high in this evaluation. The results of this survey can be found in Table 1.

Table 1. Results of the student feedback survey.

Statement	1	2	3	4	5	Average
(a) Self-reflection	7	10	1	0	0	1.67
(b) Extrinsic Motivation	8	6	3	2	2	2.24
(c) Group work	9	4	2	0	1	1.75
(d) Requirements	8	6	3	1	0	1.83

Based on the data, it can be said that the student feedback was rather positive. All responding students stated that this task helped them with self-reflection or that they were at least neutral about it. However, there is still room for improvement in terms of cooperation within the groups and the precise quality requirements. This was also confirmed by some students in personal feedback: group work was sometimes unsuccessful, as some of the team members did not know each other before the task and most of the work took place remotely via video conferencing. In addition, the students come from a purely technical background, which initially presents them with a major challenge when creating didactic teaching material. The feedback also mentioned that there were some technical difficulties in creating material with the university's learning platform.

3.2. Submission quality

There were 26 topics in total, which were assigned to 26 groups (some of which were individual assignments). The students had to book a topic at the beginning of the semester. Of these topics, a total of only 17 topics were worked on, i.e., unfortunately no result was achieved by 9 groups. As the course is an elective subject, it is not unusual for students to decide against the module during the course of the semester and therefore no longer take on the work.

Of the 17 topics worked on, 11 topics were flawless or almost flawless and could be published as official learning material without any relevant changes. The other 6 learning materials were of average or poor quality and could not be published. Common problems were a highly unstructured script organization, incorrect or didactically unsuitable self-check questions, and gross errors in content.

4. Conclusion

This study has presented an innovative approach to assessment where students create interactive online learning material on course contents. The results from a voluntary survey indicate that the majority of students found script creation beneficial for deepening their understanding of course contents. However, the student submissions yielded mixed results. The challenges identified in this study include unclear assignment requirements, ineffective group dynamics, and a lack of preknowledge of students on the creation of didactic material. Additionally, despite defined assessment criteria, assessing script quality proved challenging and time-consuming due to strong homogeneity among submissions.

Addressing these challenges requires enhanced training for teaching assistants providing feedback to the students, as well as strategies for managing gaps in script coverage when submissions need to be rejected or are missing due to students dropping the module. Furthermore, ongoing refinement and optimization of this assessment process will be necessary to maximize learning outcomes in higher education settings.

In conclusion, the use of collaborative learning through student-led script creation holds great promise as a means of enhancing student engagement and facilitating deep understanding of course contents. However, it is important to carefully consider and address the challenges identified in this study in order to ensure the success and sustainability of this approach in practice.

References

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