

# Student co-design of confidence-building formative assessment for Level 1 Computing and IT students



**Keywords:** *Student co-design, online quizzes, Computing and Technology, programming, student forums, student partners*

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**eSTeEM project final report, June 2022**

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## Table of Contents

Executive summary .....	3
Aims and scope of the project .....	4
Activities .....	5
Activities for Goal 1: to develop an approach to student co-design of quiz questions which combines the experience of our students with that of the module team .....	5
Activities for Goal 2: to trial the approach with a small number of students.....	6
Activities for Goal 3: to develop an approach to evaluating quiz questions that are created as part of the co-design activity.....	7
Activities for Goal 4: to apply the evaluation method of Goal 3 to the questions produced as part of Goal 2.....	7
Activities for Goal 5: to develop an approach to evaluating a co-design activity .....	8
Activities for Goal 6: to apply the evaluation method of Goal 5 to the co-design activity of Goal 2.	9
Findings.....	10
Findings for Goal 2: to trial the approach with a small number of students .....	10
Findings for Goal 4: to apply the evaluation method of Goal 3 to the questions produced as part of Goal 2.....	10
Findings for Goal 6: to apply the evaluation method of Goal 5 to the co-design activity of Goal 2	12
Feedback from the workshop .....	12
Feedback from the debrief meeting.....	12
Impact.....	14
List of deliverables.....	15
Figures .....	16
Tables.....	16
References .....	17
University approval processes .....	18
Appendices.....	19
Appendix A – Metrics for the project .....	19
Appendix B – Pre-workshop email to students .....	21
Appendix C – Workshop schedule.....	23
Appendix D – Invitation email to students .....	25

## Executive summary

This project came out of some of the insights gained from a previous project we carried out for the Institute of Coding. In that project we looked at student discussions around quizzes they completed as part of their studies. One of the results was that a small number of the quiz questions could be expressed better, with students needing clarification on what was being asked of them.

Central to the current eSTEEeM project was a co-design workshop with student partners to redesign the aforementioned questions. We identified half a dozen questions where we had feedback that they could be improved. We shared these with a small group of students who had previously completed the course and asked them to identify what the strengths and weaknesses of the questions were. We then had a workshop, on the Open University's campus, in Milton Keynes with the student partners. We divided into three teams of a student and a staff member. Each team looked at the questions and made suggestions for improvements and then shared their findings with the other teams. We also had a more general discussion about studying with the Open University, learning about the wide variety of approaches adopted by our students. After the workshop we implemented the suggested changes to the quiz questions, and the most recent cohort of students worked with this new set of questions. After analysing the use of the new questions, we had a final debrief meeting with the student partners at which we examined the results and gathered further feedback from the student partners on the co-design process used in this project.

In the course of this project, we encountered a number of challenges, specifically with:

- recruiting enough students, let alone recruiting a diverse group of students,
- the lengthiness of the student selection process.

We followed a relatively standard approach with student recruitment, making first contact via email. It seems advisable for future projects to explore other innovative ways of contacting students (e.g. alternative media such as postcards via the mail or video presentations). This could make the project team feel more approachable to the student partners and reduce anxiety about engagement with the project team.

The student partners told us that they liked:

- having their voice heard,
- visiting Walton Hall,
- learning about the question design process,
- equality in discussions/partnership.

We got a better understanding of:

- the diverse ways in which students engage with the module materials,
- concrete ideas and examples from the students that help inform assessment design,
- how productive and enjoyable work in small 1 student partner + 1 academic partner teams can be,
- how important it is to explain the purpose of the co-design, and balance the need for clear information to the students with not biasing the student views towards what we would like to hear,
- how the new co-designed questions seem to be an improvement on the original questions, especially in terms of elimination of negative forum feedback on the questions. However, there was no clear trend in terms of a quantitative measure such as Discrimination efficiency.

When evaluating the co-design process, we felt that it was important to avoid undue influence on the student partners. We recommend using a neutral technology for debrief meetings (i.e. not tutorial software) and a third-party moderator for the feedback discussion (without the project team present).

## Aims and scope of the project

This project was motivated by the problems that students face when learning a complicated skill such as programming and problem solving. According to Jenkins (2002) this is a slow and gradual process with students learning at different paces. Additionally, students often start a programming course with the preconception that programming is difficult, which has a negative effect on their motivation and can be reinforced if they are subjected to summative assessment too early.

In the Stage 1 module 'Introduction to computing and information technology 2' (TM112), several strategies were used to build student confidence and encourage sustained practice and reflection (Piwek et al., 2019). Among other things, a new approach to formative assessment was explored, which makes use of strictly formative quizzes. To encourage students to engage with these quizzes, students were rewarded with a small number of marks for including evidence of engagement with the quizzes with their TMAs. Marks were for the evidence of engagement and personal narrative/reflection on their engagement with the quiz questions. Since the quiz questions were not marked, students were also encouraged to discuss their attempts and answers with other students on the module forums and, specifically, the module's Python Help forum.

In an Institute of Coding-funded project (Piwek & Savage, 2020; Savage & Piwek, 2019), the aforementioned module forum discussions around the quiz questions were examined in more detail. One observation from this examination of the forum discussion was that a small number of the questions could be expressed better, with students needing clarification on what was being asked of them. An obvious course of action would be for the module team to amend these quiz questions in order to address the issues that had been found. However, it seemed more appropriate to team up with our students, whose first-hand experience of quizzes and forum discussions could shed light on how our students understand and try to solve the quiz questions. This suggested a student co-design approach to amending the questions. Such an approach may make it possible to combine the lived experience of our students of studying the module with the module team's experience of producing module materials. More generally, this seemed a good opportunity to gain insights into the benefits and pitfalls of co-design activities with students.

Thus, we arrived at the following main aim:

***To develop and evaluate an approach to student co-design of quiz questions.***

This main aim was broken down into several specific goals:

- 1. to develop an approach to student co-design of quiz questions which combines the experience of our students with that of the module team.*
- 2. to trial the approach with a small number of students.*
- 3. to develop an approach to evaluating quiz questions that are created as part of the co-design activity.*
- 4. to apply the evaluation method of Goal 3 to the questions produced as part of Goal 2.*
- 5. to develop an approach to evaluating a co-design activity.*
- 6. to apply the evaluation method of Goal 5 to the co-design activity of Goal 2.*

## Activities

In the previous section, we introduced six specific project goals. In this section we will discuss the activities that were carried out as part of these project goals, one goal at a time. Before we do so, to help the reader gain a high-level understanding of the overall approach, we briefly discuss a chronological overview of the project, shown in .

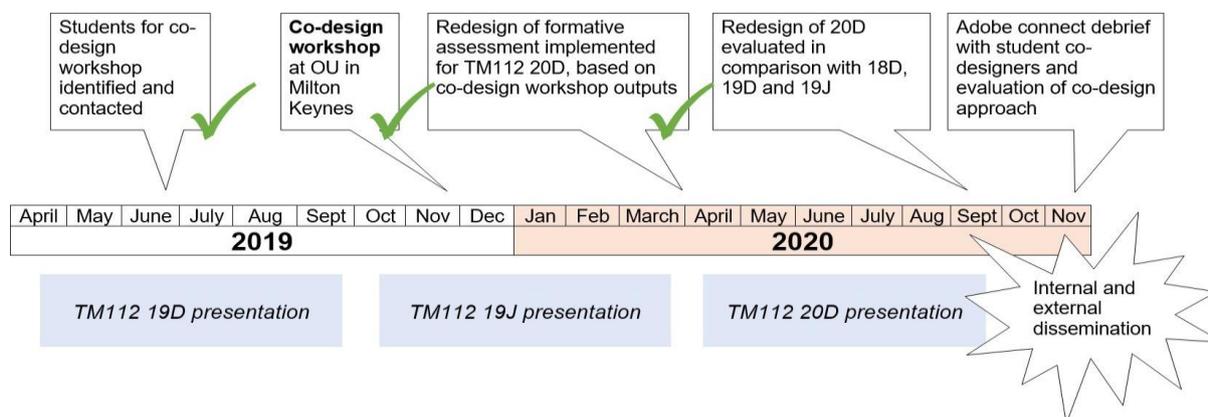


Figure 1: Chronological overview of the project

The key co-design event in this chronological representation of the project is the co-design workshop in November of 2019. This workshop involved students from the recent 19D (6 April – 12 September 2019) presentation of TM112 module. The redesigned questions were then trialled in the 20D presentation (4 April – 10 September 2020). The green ticks on the diagram show the steps that were completed at the time this diagram was prepared. At that point the plan was to have a debrief in November of 2020 with the students to evaluate the questions and the overall process. In the end, there was slight delay, with the debrief taking place on the 18<sup>th</sup> of January 2021.

Activities for Goal 1: to develop an approach to student co-design of quiz questions which combines the experience of our students with that of the module team

The approach we developed is schematically shown in Figure 2. Since we wanted to use the actual workshop time primarily for interaction and discussion, we decided to provide the students with a detailed brief in advance, which included the questions they were going to discuss. The pre-workshop email that was sent out to the students can be found in

Appendix B – Pre-workshop email to students.

The programme for the workshop itself can be found in

Appendix C – Workshop schedule. As can be seen from the programme, it included an icebreaker at the beginning, plenary discussions and small group co-design work. In the spirit of working with our student co-designers as partners, there was also free space on the programme for a student-led activity, and time for reflection at the end of the day.

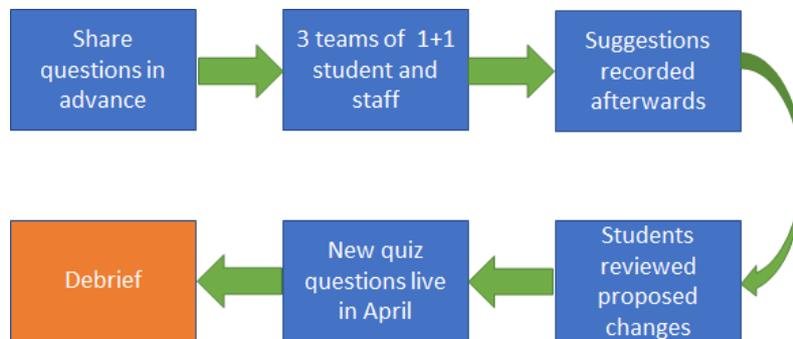


Figure 2: Diagram of co-design method

Activities for Goal 2: to trial the approach with a small number of students  
Prior to contacting students, the following three steps were completed:

1. approval gained from [Human Research Ethics](#) Committee (HREC),
2. approval gained from the Student Research Project Panel (SRPP)<sup>1</sup> and
3. registration of data collection with the Information Asset Register (IAR)<sup>2</sup>

We then selected a student sample and liaised with the OU’s BI Team (Data and Student Analytics) who provided us with contact information for a subset of the students in our sample. There are limits on the number of times students can be contacted – with students being contacted for other projects, not all the students in our sample were available to be contacted. We had to go through two further cycles to reach a sufficient number of students. The set of students who can be contacted is updated on a monthly basis and with a new month beginning some students that were previously unavailable became available.

Each student in the subset of students who were available to be contacted, was contacted by email. The text of the email is included as

<sup>1</sup> See [here](#) for OU internal information (access restricted) regarding the SRPP.

<sup>2</sup> See [here](#) for OU internal information (access restricted) regarding the IAR.

#### Appendix D – Invitation email to student.

We also liaised with the eSTeEM team to order lunch and beverages for the day, and to arrange for remuneration of travel and accommodation and process for issuing the Amazon vouchers to participants. Finally, we arranged with the eSTeEM team to provide a small keepsake (OU bag, magnet, pen and mug) on the day for each of the students as further thank you for their participation.



Figure 3: Co-design workshop room with one flipboard per group

At the workshop, which was held on the OU campus, the two-person project team was joined by one further central academic. With three student partners taking part, this allowed us to have 3 breakout groups of 1 student + 1 academic. Figure 3 shows the room set up with three flipboard, one for each of the groups.

At the co-design workshop we collected the proposals for quiz question revisions. These were then implemented for the next student cohort. Once the questions were implemented and before they were released the co-design students checked the redesigned questions, as also shown in Figure 2.

Activities for Goal 3: to develop an approach to evaluating quiz questions that are created as part of the co-design activity

We decided to evaluate the co-designed questions in three ways, aiming to gain the maximum information from both quantitative and qualitative data that was available:

1. comparing quiz question statistics of the new cohort (using the co-designed questions) with the statistics for the previous cohort.
2. reviewing the module forum discussions for any comments on the redesigned set of questions.
3. discussing the findings from 1. and 2. above at an online debrief meeting with the co-design students.

Activities for Goal 4: to apply the evaluation method of Goal 3 to the questions produced as part of Goal 2

We carried out each of the three evaluations listed in the previous section:

1. We obtained statistics for the co-designed and previous quiz questions from the OU iCMA system.
2. We reviewed the forum discussions for the presentation with the new co-designed quiz questions for any comments on these questions.
3. We had a debrief meeting. In the first half of this meeting, we presented findings from points 1 and 2 and solicited input from the students on our analysis.

Activities for Goal 5: to develop an approach to evaluating a co-design activity

We decided to collect feedback from the co-design students at two key points in the process:

1. During the workshop itself.
2. During a debrief meeting.

The debrief took place online. Originally, we planned to hold this in Adobe Connect. However, we felt that for the students Adobe Connect may be associated primarily with tutorial situations, which have a very specific power-dynamic between tutor and students, with the tutor firmly in control. With our project aiming to engage *students as partners*, we felt that a different platform would be more appropriate to avoid such associations. After checking with the student partners, Microsoft Teams was selected as it was available to everyone.

The debrief meeting consisted of two parts. In the first half, the project team briefed the students on the findings of the statistics and forum discussion comments regarding the co-designed questions. After this, the project team left the meeting, and a further academic, who had not been involved in the project up to this point, had a discussion with the students about their experience of quiz question co-design and involvement in this project. We felt that it was important that the discussion was led by someone who was not involved in the project, to ensure that the student feedback was not biased by the views of the project team members.

Prior to the debrief meeting, the project team and the academic who would conduct the second part of the debrief agreed that the questions in Table 1 would be used to guide the debrief discussion.

Table 1: Questions for the debrief meeting

<b>What were your expectations?</b>
<b>Were those expectations met?</b>
<b>If you wanted to get students involved in codesigning formative assessment, what would you keep the same/do differently?</b>
<b>Was there anything you found challenging in taking part in this project?</b>

Was there anything you found exciting/interesting/useful in taking part?

Has the experience of taking part in the project impacted your studies in any way (positive or negative)

Now that you have been involved in designing some educational material, can you see other types of material that students could add value to?

Activities for Goal 6: to apply the evaluation method of Goal 5 to the co-design activity of Goal 2

Feedback was collected during both the co-design workshop itself and at the debrief meeting later, as described in Activities for Goal 5: to develop an approach to evaluating a co-design activity.

## Findings

In this section, we discuss the findings in relation to Goals 2, 4 and 6. These three goals involved activities that implemented the methods developed as part of Goals 1, 3 and 5.

Findings for Goal 2: to trial the approach with a small number of students

Our invitation for participation in the project went out to circa 30 students. We had to readvertise twice to reach this number. Though the sample reflected the proportion of female students in the cohorts, of the 6 students agreeing to participate, only 1 was female. Of the 6 who initially agreed, 3 dropped out (2 for personal circumstances, 1 passive withdrawal).

Our experience has been that it is very difficult to attract enough students. This will have partly been due to the significant investment in time that was asked for: an entire day in Milton Keynes on the OU Campus for the workshop as well as pre-workshop work and a post-workshop online debrief. We have also reflected on the best way to initially contact a student. We used email, which may not have been most effective. Anecdotal evidence from colleagues suggest that postal mail may lead to greater uptake (e.g. by sending a postcard from the module team with the invitation). Another idea that we came up with posthoc is to do the invitation as a video presentation by the project team. This may help students put a face to the invitation and make it less daunting. From the students who did participate, we learned that visiting the Milton Keynes campus was seen as both exciting but also daunting, with some anxious about what to expect.

Some observations from the co-design workshop that stood out for the project team include:

- The benefits of talking directly with students and learning about their very different ways of using the module materials (even with such a small sample, there was a range of approaches from following the linear order of the materials as per the study calendar to consulting the materials on a need-to-know basis driven by the assessment).
- The recurring discussions about the purpose of the questions at hand as a vivid reminder to be explicit at all times to our students about why we ask them to engage with a question.

Findings for Goal 4: to apply the evaluation method of Goal 3 to the questions produced as part of Goal 2

Our evaluation method has three elements:

1. comparing quiz question statistics of the new cohort (using the co-designed questions) with the statistics for the previous cohort.
2. reviewing the module forum discussions for any comments on the redesigned set of questions.
3. discussing the findings from 1. and 2. above at an online debrief meeting with the co-design students.

Our findings for each of these are as follows:

1. We compared the quiz question statistics of 6 questions (see Table 2): 5 amended from previous quiz questions and 1 entirely new question (all through the co-design process). In particular, we looked at Discrimination efficiency - i.e., correlation between the weighted scores on the question and those on the rest of the test given the difficulty of the question

(cf. Butcher, 2010). This metric has been linked to question quality: ‘The discrimination efficiency will very rarely approach 100%, but values in excess of 50% should be achievable. Lower values indicate that the question is not nearly as effective at discriminating between students of different ability as it might be and therefore is not a particularly good question.’ (Butcher, 2010) However, note that this statistic is primarily intended for summative rather than formative tests. Nevertheless, we explored the use of this statistic, given that, also in a formative assessment context, it is helpful for students to get a good idea of their level of achievement throughout the quiz. Arguably, this is facilitated by questions with a high discrimination efficiency.

Though there were some fluctuations, there was no consistent trend suggesting that the amended questions were consistently significantly better or worse than the original ones: out of the 5 amended questions, for 2 questions, Discrimination efficiency went up slightly, whereas for 2 questions, it went down slightly (when comparing original with the amended question) and for one question it went down by a substantial amount (but this was most likely because the original question had been split into two parts, with the new part being a Multiple Choice Question (MCQ), whereas the original question required submission of program code). Finally, the entirely new question had a very good Discrimination efficiency (of 87.05, with values of 50 and above considered very good – see Butcher, 2010).

2. Out of the 6 questions, only one of the new/amended questions still attracted negative feedback on the forum about the formulation.
3. We discussed the findings reported under 1. and 2. above at the debrief meeting. It was helpful to have the student partner input, specifically a suggestion with regards to the question that still attracted negative module forum feedback. The question in case is rather lengthy, because it introduces a new tool (CodeRunner) that the students will be using in this and subsequent questions. The suggestion was to provide the explanation of the tool separately, in a video presentation. This will make the question text itself much shorter and clearly signpost the tool explanation.

Table 2: Discrimination efficiency of questions (amended/new questions introduced for 20D) and forum comments

Question\Presentation	18D	19D	20D	Trend	Module forum comments
Q11 - amended	75.42	85.23	<b>86.85</b>	↑	Still negative comments
Q19 – original split in two: MCQ and coding	78.24	86.50	<b>50.99</b>	↓	-
Q21 - amended	76.34	80.26	<b>79.65</b>	↓	-
Q24 – entirely new	-	-	<b>87.05</b>	-	-
Q31 - amended	45.90	49.89	<b>56.74</b>	↑	-
Q14 - amended	50.21	56.09	<b>48.66</b>	↓	-

Findings for Goal 6: to apply the evaluation method of Goal 5 to the co-design activity of Goal 2

Feedback from the workshop

We collected some feedback during the workshop and received further feedback over email very shortly after the workshop. Overall, the student partners were positive about the workshop, with feedback such as:

- 'Good workshop today, hopefully it was as useful and interesting to yourselves as it was interesting to me',
- 'thoroughly enjoyed taking part'.

There was a sense that the programme was perhaps too overloaded and more time could have been dedicated to the actual co-design activity:

- 'I thought the initial agenda was well thought out, I did however think that more time should have been spent on designing questions.

For the pre-workshop activity, we provided the students with quiz questions and explained that *as one of our activities we'll be asking you to evaluate some quiz questions. I've attached two questions to this email and would ask you to spend a few minutes identifying what you feel are the strengths and weaknesses of these questions. We specifically formulated this in very non-committal terms ('strengths and weaknesses')* to avoid biasing the student partners with our views. However, one of the student partners expressed a preference for more precise instructions:

- 'For example we could have been given an objective for what a question would need to achieve, ie which subject areas or programming concept they would cover and then create a question from that.'
- 'Or we could have looked at the style of questions and maybe thought how we could have created a new format.'

There are at least two ways one could address this. Firstly, it is of course possible to provide a more detailed instruction. This may however bias the student input and potentially deprive us of original insights or perspectives. Alternatively, we could try to explain better that we were interested in the students' own perspectives and that, at the workshop, they would be an opportunity to discuss the scope and purpose of the quiz questions further with their staff partners.

We also found that the students felt that the questions that we selected (based on the original module forum feedback) were generally already of a very high quality:

- 'As it happened we had a limited opportunity to evaluate original questions, which if I'm completely honest, with the exception of the one [anonymised] pointed out where very well thought out initially and so could not have been amended to make them any better, but only different in subject matter.'

We may need to have a higher threshold for which questions to include in this type of co-design exercise. It may also be an opportunity to collaboratively identify question topics or types where further questions are needed.

Feedback from the debrief meeting

The feedback from the debrief meeting (and via email for the students who were unable to attend in person) is summarised in Table 3.

Table 3: Student partner feedback from the debrief (meeting and email)

What were your expectations?	none/opportunity to help improve quiz questions
Were those expectations met?	Yes. Happy with equality in discussions/partnership.
If you wanted to get students involved in codesigning formative assessment, what would you keep the same/do differently?	Try to involve a more representative sample, including those who struggled.
Was there anything you found challenging in taking part in this project?	Face to face in MK was great/good fun. "online would not have been the same". Pre-workshop work was challenging, being uncertain about expectations.
Was there anything you found exciting/interesting/useful in taking part?	Interesting to see question design process and effort going into it.
Has the experience of taking part in the project impacted your studies in any way (positive or negative)	Learned about designing questions, but no academic value so far, but there may be for Year 3. Enjoyed helping OU and felt proud to be involved.
Now that you have been involved in designing some educational material, can you see other types of material that students could add value to?	<b>There is value in multiple perspectives. "There will always be things which lecturers just don't see from their one perspective"</b>

## Impact

This has been one of the first eSTEEeM projects to explore student partners for co-design of assessment. Since the project's inception in 2019, project progress has been reported at 2019 eSTEEeM student conference, as well as the 2020 and 2021 eSTEEeM conferences.

The work has also been shared at University-wide events promoting best practice across the University such as the 'engaging students in curriculum design - sharing best practice' event (2020) and the first 'Assessment Programme/Scholarship Steering Group Event' (2021). At the latter event, the project team was specifically encouraged to document the process for involving student partners as a way to inform future projects and initiatives. The current Final Project report is aimed at doing precisely this.

Beyond the OU itself, the work has been disseminated more widely via a video on the project which is part of the OpenLearn Badged Open Course on 'Scholarship of Teaching and Learning in STEM'.

Finally, the project's AL investigator, Simon Savage, has used the research for this project and a sister project funded through the Institute of Coding (Piwek & Savage 2020; Savage & Piwek 2019) as the foundations for his EdD research project with the Open University, with the current project's principal investigator as supervisor.

If anything, this project has reinforced the project team's realisation how stimulating and useful it is to work with student partners – as the student partners themselves have pointed out: **there is value in multiple perspectives, or in their words "There will always be things which lecturers just don't see from their one perspective."**

## List of deliverables

- Invited presentation at 'The 1st eSTEEeM Online Student Conference: Engaging Students as Partners in Scholarship' on 'Co-designing confidence-building quizzes with Computing & IT students', November 20, 2019, Milton Keynes. [Poster 2019]
- Students as partner in a Level 1 Computing and IT module: Co-design of formative quiz questions. [9th eSTEEeM Annual Conference](#) - Informing Student Success – From Scholarship to Practice, held on 29-30 April 2020. [Poster 2020]
- Panel member at 'engaging students in curriculum design - sharing best practice', Panel-led discussion about increasing and improving opportunities for student involvement in developing and refreshing modules and qualifications, The Open University, 10 November, 2020.
- Poster 4: Student co-design of formative assessment for Level 1 Computing & IT students - Paul Piwek, Simon Savage, Matthew Nelson and Cameron Watkinson, The [10th eSTEEeM Annual Conference 2021](#): STEM Scholarship for a Changing World – Disruption, Innovation and Impact. [\[Presentation recording on YouTube\]](#) [Poster 2021]
- Lightning talk on 'Student co-design of confidence-building formative assessment for Level 1 Computing & IT students (eSTEEeM)' at Assessment Programme/Scholarship Steering Group Event, Open University, 10 November, 2021. [\[Recording, presentation starts about 07:40\]](#)
- Video as part of Scholarship of Teaching and Learning in STEM OpenLearn Badged Open Course. Session 4: Students as partners and ethical considerations in SoTL research Activity 3 Students as co-designers of formative assessment. [\[Video\]](#)

## Figures

Figure 1: Chronological overview of the project.....	5
Figure 2: Diagram of co-design method .....	6
Figure 3: Co-design workshop room with one flipboard per group.....	7

## Tables

Table 1: Questions for the debrief meeting.....	8
Table 2: Discrimination efficiency of questions (amended/new questions introduced for 20D) and forum comments.....	11
Table 3: Student partner feedback from the debrief (meeting and email) .....	13

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## University approval processes

- *SRPP/SSPP – Approval from the Student Research Project Panel/Staff Survey Project Panel was obtained according to the Open University’s code of practice and procedures before embarking on this project. Application number 2019-066 - Piwek P. (Approval received 06/06/2019)*
- *Ethical review – An ethical review was obtained according to the Open University’s code of practice and procedures before embarking on this project. Reference number HREC/3272/Piwek (HREC approval date: 24/05/2019)*
- *Data Protection Impact Assessment/Compliance Check – A Data Protection Impact Assessment/Compliance Check was obtained according to the Open University’s code of practice and procedures before embarking on this project. Data Protection registration number 2804007*

## Appendices

### Appendix A – Metrics for the project

<b>Project staff</b>	
Number of academic, academic-related staff who contributed to the project	3
Number of days spent working on the project for all staff involved, including the project lead(s)	12 days (Piwek 10 days, Wermelinger 1 day, Nelson 1 day)
Number of ALs and number of days contribution to the project	1 AL (Savage 10 days)
Number of students involved as co-researchers/co-collaborators on the project and any student incentives provided	<p>3 students</p> <p>Incentives:</p> <ul style="list-style-type: none"> <li>• £50 Amazon voucher and</li> <li>• travel reimbursed and lunch for Milton Keynes workshop for all three students.</li> <li>• accommodation for one student.</li> </ul>
<b>Student survey data (if applicable)</b>	
Number of students surveyed	N/A
Number of student respondents	N/A
<b>Student interview data (if applicable)</b>	
Number of students interviewed	N/A
<b>Student focus group data (if applicable)</b>	
Number of students involved either as interviewers or interviewees	<p>This project involved two events with students:</p> <ul style="list-style-type: none"> <li>• Co-design workshop in Milton Keynes with three students.</li> </ul>

	<ul style="list-style-type: none"> <li>Debrief and feedback focus group via Teams with one student (and written feedback from one other student).</li> </ul>
<b>AL survey data (if applicable)</b>	
Number of ALs surveyed	N/A
Number of AL respondents	N/A
<b>AL interview data (if applicable)</b>	
Number of ALs interviewed	N/A
<b>AL focus group data</b>	
Number of ALs involved either as interviewers or interviewees	N/A

## Appendix B – Pre-workshop email to students

Subject Line: Open University TM112 project on co-designing quizzes

Dear [insert name here]

We hope you are well. This email is to confirm the details of the co-design workshop being held on 24<sup>th</sup> November and to ask you to undertake a small amount of preparatory work.

As you can see from the attached proposed agenda, we'd like to start the session at 10am. We have a room booked in the Jennie Lee building (circled in yellow on the enclosed map), so we suggest that we meet by the main door of the building at 9:45am. We're sure everything will be okay, but just in case there is an emergency then [name]'s mobile number is [mobile number].

After going through a few logistics we'd like to have a gentle icebreaker where we introduce the person next to us. As part of this it would be nice if you could bring a small artefact with you which is symbolic of why you are studying an OU degree and that you wouldn't mind showing to someone else.

You may have noticed the use of the word "proposed" above. This is a codesign workshop and as such we would welcome your input into the structure of the day. Towards the end of the icebreaker we'll be discussing any activities or ideas that you would like to explore during the day so that we can accommodate them if possible. It would be useful if you could give this some thought in advance.

As one of our activities we'll be asking you to evaluate some quiz questions. I've attached two questions to this email and would ask you to spend a few minutes identifying what you feel are the strengths and weakness of these questions. Please don't feel that you need to answer the questions although you are welcome to do so if you would like to! (We'll provide you with the feedback/solutions closer to the workshop date, but for now would like you to consider the question itself.)

Finally, we are providing lunch and refreshments (of course) so please do let us know if you have any special dietary requirements.

Once again, thank you for volunteering to be part of this project. We're very much looking forward to seeing you on the 24<sup>th</sup>.

Best regards

Paul Piwek (TM112 module chair) and Simon Savage

[Signature here]

Please note that this project is subject to the Open University's ethical approval process and has been given the following reference numbers:

Student Research Project Panel: 2019/066  
Human Research Ethics Committee: HREC/3272/Piwek  
Information Asset Register: 2804007

## Appendix C – Workshop schedule

### 9:30 - Room open with coffee/teas and pastries

#### 10:00 – 10:45 - Introduction (45 minutes)

- Hellos - Simon
- Logistics for the day - Paul
- Making sure everyone has what they need etc. (claim forms, consent form, etc., end of the day travel)
- Icebreaker: Everyone say a few words about why they're studying with the OU and their experience so far. Bring an artefact, if possible, to talk about your reason for OU Study. (Format: Explain to the person next to you, who then introduce you to the group). - All
- Discussion of what the students would like to cover during the day and amending timetable to accommodate it. - All

#### 10:45 – 11:15 - Question evaluation Activity (30 minutes) – Simon lead

- Come together as a group to discuss evaluation of the questions which were distributed as part of the preparation work - All

#### 11: 15 – 11:30 BREAK

#### 11:30 – 12:00 – Quiz study experience Discussion Activity (30 minutes) – Paul lead

- Reflection on experience of quizzes. For example...
  - How did the quizzes fit in with study patterns?
  - How did they fit in with the module?
  - Does it vary per part of the module?
  - Does it vary per topic?
    - How did the programming questions work?
  - What was the experience of using the forums to discuss the quizzes?

#### 12:00 – 13:00 - Question authoring Activity (1 hour)

- Pairs discussion
  - Amend a quiz question and explain why it is now better
  - Write a new question and explain why it is a good question
- Round robin
  - Swap with other pairs and ask them for feedback and to improve the questions

#### 13:00 – 14:00 Lunch (1 hour)

#### 14:00 – 15:00 Student-led Activity (1 hour)

- Activity content to be determined by the student co-designers.

#### 15:00 – 15:15 BREAK

#### 15:15 – 15:40 - Activity (25 mins)

- Wrap up of student-led activity

#### 15:40 – 15:50 - Reflection (10 minutes)

- What went well so far (not only today, but the whole process so far)?
- What went could be improved so far?
- What should we have done differently?

**15:50 – 16:00 - Plenary (10 minutes)**

- Recap on day and look ahead
- Handle any logistics – e.g. claiming for expenses

## Appendix D – Invitation email to students

Dear [Student name here],

I am Paul Piwek, the module chair for TM112 (Introduction to computing and information technology 2) which you are or have recently been studying. I am contacting you on behalf of my colleague Simon Savage and myself in connection with a research project that is funded through eSTEEem, the OU's centre for STEM pedagogy. We would like to ask you whether you may be interested in joining the project team.

TM112 took a new approach to some of your assessment, particularly in relation to quizzes. You may remember that these were formative in nature, with the TMAs giving marks for having "had a go". This meant that you could discuss them in forums and support each other.

Looking back at the TM112 forums we noticed how active you were. We wondered whether you may be interested in being involved in our eSTEEem project. We anticipate holding a co-design workshop with 5 former TM112 students in Milton Keynes (where the OU is based) in November this year where we would like to work with you on evaluating the design of the quizzes and potentially amend existing questions and/or develop proposals for new questions. This will be followed up with an Adobe Connect meeting in which we would like to discuss your experience of collaborating with us on the quiz question design (to take place in November 2020). We will also use the meeting to share information on how we followed up on the co-design workshop.

Whilst we are not able to pay you for your participation we will, of course, recompense your expenses (including overnight stay, if you do not live near MK), provide lunch and present you with a £50 Amazon voucher. If you need us to make any adjustments in order to be involved, then please let us know (we will keep anything shared confidential).

You can find more information about the project on the eSTEEem website here: <http://www.open.ac.uk/about/teaching-and-learning/esteem/projects/themes/innovative-assessment/student-co-design-confidence-building-formative-assessment>. Included with this email (see below) you will find a consent form which we will ask you to sign if you are happy to be a research partner. I'd like to draw your attention to the section about how the data we collect will be used. Specifically, any data collected will be treated as confidential and anonymised before use.

We do hope that you are interested in joining us in this research. If so, please do let us know by August 12 (if possible – if you read this message later, do still let us know). We are, of course, happy to answer any questions before you decide. Places on the project will be allocated on first come, first serve basis. We look forward to hearing from you.

Best regards,

Paul Piwek (module chair for TM112) and Simon Savage

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## Student co-design of confidence-building formative assessment for Level 1 Computing and IT students

### Information and Consent Form

In TM112 (Introduction to computing and information technology 2), several strategies were used to build student confidence and encourage sustained practice and reflection. Among other things, a new approach to formative assessment was explored, which makes use of strictly formative quizzes. To encourage students to engage with these quizzes, students were rewarded with a small number of marks for including evidence of engagement with the quizzes with their TMAs. Marks were for the evidence of engagement and personal narrative/reflection on their engagement with the quiz questions. Since the quiz questions were not marked, students were also encouraged to discuss their attempts and answers with other students. A more detailed overview of the research is provided on the final page of this document.

You have been invited to take part in a face-to-face codesign workshop in Milton Keynes with other students followed, sometime later, by an online Adobe Connect evaluation and debriefing session to discuss your experience of the workshop with us and other attendants. The aim of these events is to work with you on developing a better understanding of the student perspective on design of the quizzes. In the period between the face-to-face workshop and the evaluation and debriefing session, we may contact you for discussion or feedback (via email).

We would ideally like to **record** the online Adobe Connect evaluation and debriefing session to ensure we capture all of the information to help us understand your perspective.

Because we are collecting data for research purposes, we need to inform you about how the data will be used and ask you for your consent.

- The recordings which we collect will be transcribed and stored on password-protected Open University systems. The transcript and recording will only be accessible by authorised personnel.
- All data collected during the workshop and the debriefing session will be treated as confidential and transcripts will be anonymised. This includes views and opinions expressed during either session.
- Any analysis or publication from the data will not present any information which could be used to identify the individual it came from unless prior written consent has been obtained
- The data will be retained by the Open University for the duration specified below and will only be used for the purpose of research, and statistical and audit purposes.
- By signing this form, you are consenting to the University storing your data for the purposes stated above. The data will be processed and stored in accordance with the provisions of the Data Protection Act 2018. Recordings and transcripts will be kept for 5 years, after which time it will be destroyed. No identifiable personal data will be published.

Participation in this project is voluntary and you are free to withdraw at any time without giving a reason. If you withdraw then your personal data will be deleted.

The Principal Investigator for this research is Paul Piwek and his contact details are the next page together with those for Sharon Dawes. Sharon is a member of Open University staff and an impartial

contact for you to communicate with if you have any concerns about the way the research project is being conducted.

Tick below if you happy to be recorded as part of this research project.

Yes:  No:

As part of this project, you would be collaborating with us and a small number (about 5) of other students. Tick 'Yes' below if you are happy for your email contact details to be shared with these students.

Yes:  No:

By signing this form, you are confirming that you have read and understand the information in this form.

<p>Name: _____</p> <p>Signature: _____</p> <p>Date: _____</p>
---

## Contact Details

[Details of contacts here]

## Ethical Approval Reference Numbers

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