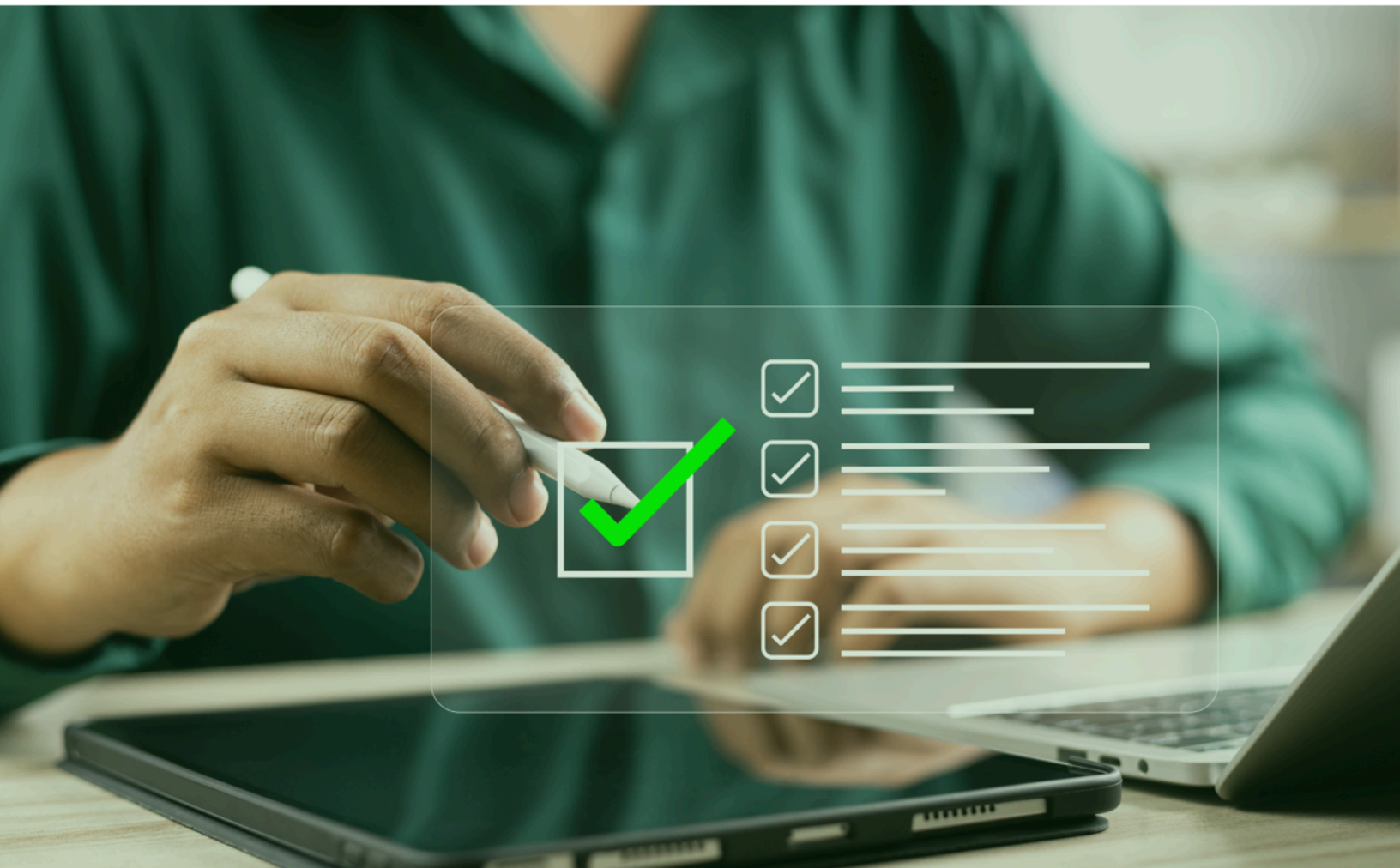


# Feedback and Assessment in Higher Education: Challenges, Innovation, and AI

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Your guide to creating inclusive, holistic, and authentic feedback and assessment practices



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# Editor's note

Feedback and assessment are at the heart of fostering student growth and development. As learning becomes more dynamic and learner-centered, educators face increasing challenges in providing assessments that not only measure achievement but also guide students toward continuous improvement. The traditional model of assessment is evolving, integrating technology, data, and inclusive practices to create more personalized and meaningful learning experiences. This shift, while full of potential, brings forth challenges that educators must navigate – ranging from workload management to ensuring equitable opportunities for all students.

This ebook is designed to offer a roadmap for educators seeking to modernize their assessment practices. It provides a blend of theoretical insights and practical strategies to help educators meet the diverse needs of their students while incorporating innovative tools and approaches.

Chapter 1 explores the difficulties institutions face as well as highlighting the opportunities that technology presents in transforming assessment into a more streamlined and impactful process.

Chapter 2 delves into the concept of 'Inner Feedback', emphasizing the importance of continuous, self-generated feedback in driving active and critical thinking.

Chapter 3 shifts focus to 'Holistic Scoring', offering a framework for assessments that emphasize growth over grades.

Chapter 4 introduces the exciting potential of AI and Assessment, examining how artificial intelligence can revolutionize feedback and evaluation practices.

Finally, Chapter 5 explores the need for assessments that reflect real-world skills and knowledge while being inclusive of diverse student populations.

We hope you will find this ebook a helpful resource to support your assessment and feedback practices.

**The FeedbackFruits team**

# Chapter 1: Assessment and feedback: Challenges and opportunities

## The challenges of assessment and feedback

Assessment and feedback are vital elements to drive student skills development, engagement, and success. [Well-facilitated assessment](#) and feedback provide faculties with ample learning analytics to make data driven decisions, at the same time allowing students to reflect on their own learning and improve their performance.



Assessment is a central feature of teaching and the curriculum. It powerfully frames how students learn and what students achieve” – [David Boud](#), Emeritus Professor, University of Technology Sydney

Due to its importance, assessment and feedback comprise a significant portion of course design and the learning process. Faculty have the great responsibility to facilitate effective assessment that evaluates students in a holistic manner, ensures frequent feedback, while nurturing lifelong skills. However, this is quite a daunting task, given the learner diversity, the workload required to design the assignments, and the need to scale up to larger student cohorts across modalities. Most importantly, it is the challenges of meeting new expectations and changes regarding academic standards now and beyond that require institutions to rethink assessment and feedback.

According to the [2022 National Student Survey \(NSS\)](#) that gathers students’ opinions on the quality of their courses in the UK, students showed much lower satisfaction towards assessment and feedback, as compared to other aspects of the learning experience. In detail, 69% of the students agreed that assessment and feedback have been fair, helpful, and timely, representing no change from last year. So what does this entail?

For the Assessment and Feedback, the NSS survey asked students to rate a number of statements from ‘Definitely agree” to “Not applicable”:

- The criteria used in marking have been clear in advance.
- Marking and assessment has been fair.
- Feedback on my work has been timely.
- I have received helpful comments on my work.

Based on the responses, we can see that many students felt the assessment was not well designed to holistically measure their progress. At the same time, they didn't receive quality feedback on a continuous basis. The fact that the result remained unchanged over the past 2 years calls for critical action from the institutions. It is time to rethink the implementation of assessment and feedback. Especially with the emerging fear over plagiarism caused by [ChatGPT and AI technology](#), this demand is even more urgent.

Quality assessment and feedback should ideally be competency-centered, rather than credential-centered. In other words, the evaluation of learning needs to allow for the development of 21st-century skills and prepare students for the real world, while still ensuring inclusivity and accessibility.

However, rethinking assessment doesn't mean neglecting the traditional methods. In fact, instructors can definitely tailor pen-and-paper tests to online examinations with a change in approach and the help of available teaching tools. In the next section, we'd like to share 5 strategies to facilitate better assessment and feedback, by harnessing pedagogical technology. Each of these will be exemplified through use cases where teachers took advantage of different teaching tools to elevate their online assessment methods.

## Facilitating holistic assessment and feedback with technology support | 5 strategies

### 1. Implement a triad approach to assessment

There has been [a major shift in the role of assessment](#) in higher education, from assessment of learning to assessment for learning. That is, assessment should provide rich information that guides and fosters the learning process, rather than labeling students as competent or incompetent.

Instead of using assessment as an institutional quality assurance process (assessment of learning), educators now believe that assessment must empower students to actively develop skills needed for learning outside of the classroom and throughout life (assessment for learning). The triad approach, which combines self, peer, and teacher assessment, was therefore developed to help achieve this goal.

Self-assessment allows students to reflect on their own performance, and it is a key tool to [empower students in the assessment process](#).

Peer assessment refers to the evaluation of students by their peers to encourage autonomy and responsibility in learning. Most importantly, peer assessment is considered an effective strategy in addressing free-riding, ensuring fair, accurate assessment of individual performance, as well as identifying potential conflicts within groups.

Teacher assessment in higher education was previously [restricted to summative practices like midterm or final exams](#). However, instructors have begun to integrate formative assessment into their curriculum to increase transparency participation, motivation, and attention, as well as cultivate a student-centered learning process where they can actively construct knowledge and skills.

Combining these 3 assessment types is proven to help students develop lifelong skills while reducing the workload for teachers.

However, three major concerns when facilitating this approach in any course modality are 1) students' lack of skills and experience to self-reflect and provide peer feedback; 2) the time-sink of facilitating the 3 assessment types; 3) a lack of motivation and engagement among students.

However, pedagogical technologies (when utilized correctly) can be a wonderful sidekick to help instructors overcome these barriers. According to Dr. [Norman Vaughan](#), "collaborative digital technologies such as blogs, wikis, and other social networking applications in higher education" are key to quality assessment. In online/blended learning, technology becomes ["an enabler for increasing meaningful personal contact"](#), thus fostering a personalized learning experience.

So how exactly can we exercise this combined approach in online/hybrid classes, with the help of pedagogical technology?

Replacing intense, stressful testing sessions with self/peer grading assignments, e-portfolios, or written reports significantly fosters higher-order thinking skills and in-class collaboration. These activities can be easily designed and implemented by employing pedagogical tools.

Instructors can rely on different teaching tools to design projects (portfolios, presentations, videos, etc.) where students can submit assignments and then review their peers' work, as well as reflect on their own performance. Finally, instructors provide comments on students' submitted work on the digital platform, identifying misconceptions and providing explanations to help students.

As an example, using [Group Member Evaluation](#), Linda Lee – Director of Instructional Design and her team at the Wharton School enabled [group configuration, group feedback and evaluation, self-assessment, and student analytics](#) for their hybrid course of nearly 1000 students. Furthermore, the teaching team considered adjusting several aspects namely configurable grading, feedback question/criteria, framing of self-reflection, and handling of late peer evaluations. Remarking on how the tool supported feedback delivery and learning analytics access, Linda said:

“ The tool really worked very seamlessly. The teaching team was able to see who had done what, and the students were immediately able to see the feedback released. It was really really successful.”



Group Member Evaluation

[Group Member Evaluation](#) helps streamline how students assess their peers' collaboration skills, based on teacher-designed criteria.

[Two instructors of Boston University](#) also successfully utilized teaching tools to facilitate peer assessment. For an MBA online course of 400 students, the teachers wanted to incorporate elements of peer feedback, group work, and automated grading. FeedbackFruits [Peer Review](#) was chosen to help instructors reduce the manual workload in grading for this large student cohort, while still allowing students to work both individually and in teams to provide meaningful feedback.



Peer Review

[Peer Review](#) supports enhancing the entire peer assessment process by enabling students to give feedback on peers' work based on instructors' predefined criteria within the LMSs.

The course curriculum was structured with asynchronous lectures in the first half of the week followed by live sessions in the second half. A Peer Review assignment was arranged after each live session. For this, students submitted and conducted a formative evaluation of each other's submitted Executive Memo based on a 3-criteria rubric designed by teachers in Peer Review. At the end of the course, they were asked to write a Formal Memo which was marked by the instructor as a summative assessment. Thanks to this design, students were motivated to engage in exchanging feedback and comments, according to Denise Kreiger, one of the instructors:



I think it is interesting that not only do we have peer review going on here, but we have two students having an exchange from the Peer Review and the Feedback given."

## 2. Facilitate continuous, meaningful feedback in asynchronous environments with online discussions

Asynchronous and synchronous discussion is another effective method that instructors can use to establish effective dialogues and communications in online/hybrid settings. The opportunity to provide clear, concise responses to both teachers and peers allows students to cultivate critical thinking and evaluation skills, while further reducing instructors' workload.

Pedagogical technology, again, allows teachers to create "[seamless discussions in online classes](#)". For example, instructors can design discussion group project activities in which students work collaboratively to create a project (a presentation, a video, or a paper), upload their work, and then provide feedback on other groups' work based on a given rubric.

In an engineering course at the bachelor's level, instructors at Deakin University successfully implemented [online discussion as the alternative assessment](#). Using FeedbackFruits [Discussion on Work](#), the Deakin team created an online poster conference for students to showcase, view, and comment on each other's posters. These posters are the results of the thesis project conducted throughout the school year. In total, around 75 students uploaded their work and about three-quarters of them actively contributed to discussions in the tool, writing about 2-4 comments each. The Discussion tool was found to be effective for stimulating a discussion among students, "*They were willing to go out of their way and discuss with no pedagogic push*", stated Catherine Fraser, former Teaching Scholar at Deakin.



### Discussion Assignment

[Discussion on Work](#) helps create engaging, meaningful conversations where students can reflect on their deliverables

Online discussion with support from technology was also adopted for an open enrollment [course issued by MIT](#). Students were required to produce a report based on the face-to-face lectures and then give feedback on their peers' work. This feedback was used as input for an online discussion in which instructors and learners together elaborate on outstanding comment points. Not only did this activity foster critical thinking and self-regulated learning, but it also motivated students to focus on improvements instead of the end results.

### 3. Refresh summative assessment practices

In a face-to-face setting, knowledge-based tests like quizzes, tests, or exams are favorite methods to measure students' progress and performance. In online/blended classrooms, however, there are major constraints to how these assessments can be conducted. As students' use of outside resources can't be monitored, knowledge-based tests need to be redesigned to focus on developing higher-order thinking skills and delivering constructive feedback, rather than rote memorization. And there are multiple tools available to help you upgrade the traditional pen-and-paper exams.

Assessments in the form of quizzes or short exams are considered convenient ways to evaluate students' comprehension of the study materials. Creating and formulating in-class quizzes is easy; however, it is much more challenging in an online context. There is a need for technology that allows for flexibility in creating quizzes and helps instructors engage their students in this activity. FeedbackFruits collaborated with MITx to develop and introduce the [Quiz tool](#) to help instructors optimize their online testing experience.



### Self Assessment

[Self Assessment](#) is a tool to help facilitate self-reflection to encourage critical thinking and self-improvement

Quiz enables instructors to ask both multiple-choice and open questions to students and keep track of their level of understanding. It also presents a Scratch-off question mode feature: (also known as the Immediate Feedback Assessment Technique (IF-AT)) which provides students with multiple attempts to answer the question and only reveals whether the answer is correct after submission.

#### 4. Design transparent, growth-oriented assessment rubrics and feedback criteria

To implement effective, holistic assessment and feedback, the use of rubrics is absolutely critical. Transparent rubrics help promote fairness and consistency across faculties and save instructors time on grading and teaching. Most importantly, they inform students of what is expected of them upon completing the course and also guide them in providing feedback. This significantly motivates learners to engage in the learning process, eventually increasing retention and success.

It is therefore important to design transparent, detailed rubrics and criteria that evaluate students in a holistic manner, at the same time nurturing a growth mindset.

##### Check out more resources on creating feedback rubrics

- [Feedback for learning: A comprehensive guide](#): This ebooks gives details explanation of feedback rubrics and how to design different types of rubrics
- [Authentic assessment rubrics](#): A collection of rubrics created and shared by different institutions worldwide

Technology can be extremely helpful when it comes to creating rubrics, by allowing instructors to generate grading criteria faster, share these with students, and even turn them into shareable templates for the entire institution. FeedbackFruits is among the technologies that can accommodate just this.

All FeedbackFruits assessment tools come with the [Feedback Criteria setup](#), which enables teachers to design feedback rubrics with detailed criteria, explanations of criteria, rating scales, and descriptions of rating scales to guide students throughout the feedback process. This ensures that students are always aware of the grading criteria and have access to the rubric directly within the assignment. These rubrics can also be

[exported and shared](#) between faculty, and there are even template rubrics to make use of.

The screenshot displays a 'Build set of criteria' window. At the top, there is a close button (X) and a title 'Build set of criteria'. Below the title, a subtitle reads 'Build your set of criteria by adding as many criteria sections as you like'. The main area contains three distinct criteria sections, each with an 'EDIT SECTION' button and a three-dot menu icon to its right. The first section is 'Comment criterion section' with 'Overall Feedback' listed below it. The second section is 'Rubric section - 4 levels' with 'Organization', 'Level of Content', and 'Development' listed below it. The third section is 'Scale rating section' with 'Quality of writing' listed below it. At the bottom of the interface, there is a dashed box labeled 'New section' and a purple 'DONE' button.

Figure 1. Setting feedback criteria in FeedbackFruits Peer Review

Instructors also have the option to [customize the grading criteria and weighting](#), with instructors specifying the points received for completing each activity step, such as leaving a minimum number of review comments or engaging in a certain number of discussions. With this grade weighting per step transparent for students, increased motivation and higher participation are often seen as a result.

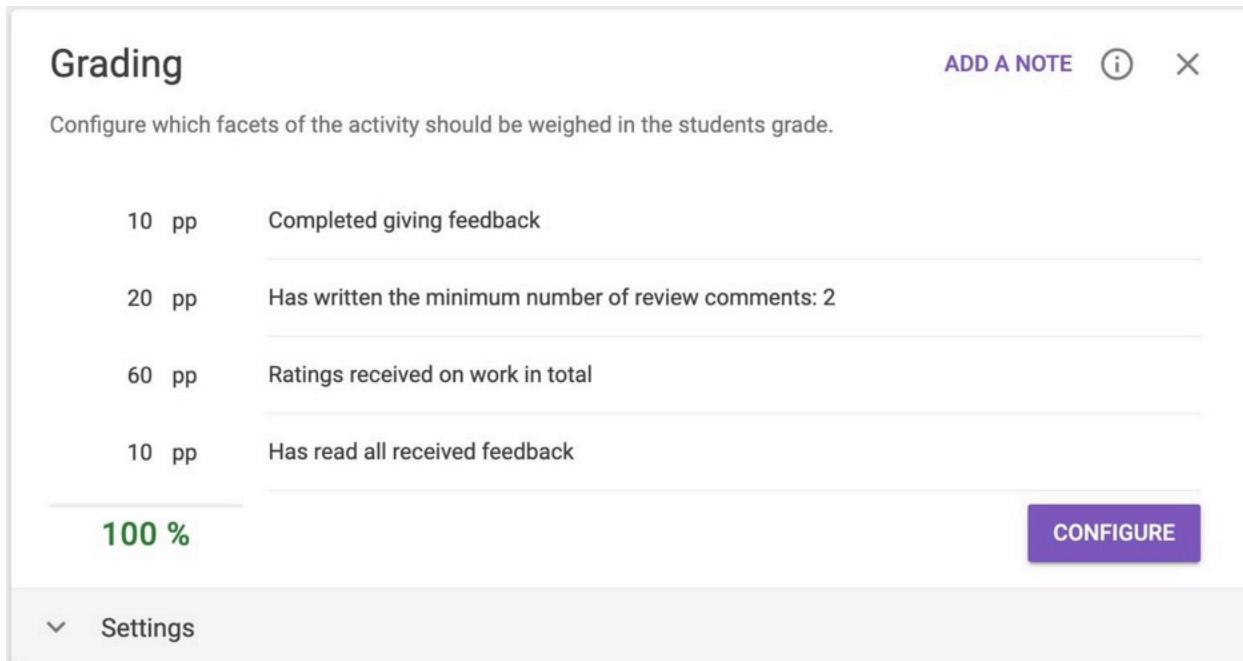


Figure 2. Assign grade weighting to each step of the assignment to turn it into a summative assessment

## 5. Provide personalized feedback at scale

Consistent, timely, and personalized feedback not only supports the teaching experience but also provides students with multiple opportunities to reflect on and adjust their work according to the required standard. However, this can be time-consuming and laborious for instructors, especially in large student cohorts.

Several tools and platforms allow teachers to facilitate an effective, sustainable [feedback culture](#), in which feedback happens frequently, in varied forms, and cater to each student's needs and preferences.

Reviewing written work, whether between peers or from teacher to learner, can be an arduous process, exponentially more so with larger student cohorts. It turns out that a lot of time spent reviewing is mainly focused on correcting spelling, grammar, style, and semantics, rather than content and argumentation. It is therefore time-consuming and less efficient for teachers as they should focus on addressing higher-order thinking skills namely critical thinking and reasoning. FeedbackFruits [Writing Coach](#), a feature of Acai aims to address this problem for instructors and learners in higher education. It enables students to receive instant, formative feedback on their academic writing skills based on criteria set by teachers. Students can iterate on their assignments before they

hand in a final version, incorporating the actionable, inline AI-generated feedback suggestions as much as they like.

## Generating personalized feedback with AI technology



**DEAKIN  
UNIVERSITY**

For his 2nd-year bachelor's course of 250 students, Dr. Adam Cardilini at Deakin University issued a final assignment in the form of a portfolio submission to communicate students' understanding of a controversial issue.

FeedbackFruits Automated Feedback was chosen to provide detailed, real-time, and personalized feedback on students' work. In detail, students uploaded their portfolios, and then chose whether to use Automated Feedback to receive instantaneous feedback on their writing, according to criteria that the instructor determined. The tool parsed each uploaded document and highlighted areas of potential conflict with the established

“Ultimately I'd like to provide detailed feedback for every single assignment but that's unrealistic. Automated Feedback did something I couldn't provide for students.”

**ADAM CARDILINI**

Lecturer, Deakin University

Read more about the [use case](#).

## How students feel about technology-enhanced assessment and feedback

Our biggest ambition is for students to enjoy a better learning experience. That's why we distributed a student survey to measure how our solutions impact students' learning process.

Based on the input, students expressed high satisfaction when participating in FeedbackFruits assessment and feedback activities, with **77% praising the tools' user-friendliness and capacity to streamline the entire feedback process.**

“ I liked how easy it was to give feedback and how systematic the feedback process was. This made it easy to consider the different pieces of the rubric and make sure that I gave helpful feedback to each member of the group on each requested item.”

STUDENT RESPONDENT,  
Arizona State University

70% of the respondents said they developed better collaboration skills and engagement through meaningful interactions. Also, participating in FeedbackFruits activities stimulated critical thinking and a growth mindset as students practiced giving constructive feedback, and processing peer comments, with 70% of the respondents noting an improvement in feedback skills. According to a student at Miami Dade College:

“ By giving honest feedback, I realize what I should do better and what I do well, and I'm sure my teammates took their feedback into account as well.”

Another student also agreed with receiving useful feedback:

“ Yes, the feedback tool made us reflect on each other's performance and contribution to the group project. Also, knowing how impactful it'd be on our grade we made sure we all completed it.”

For full details of our survey and results, take a look at our [2024 Impact Report](#)

## Conclusion

Assessment should be the driving factor behind effective, lifelong learning, rather than a constant source of fear for students. We must all do better than relying on surveillance and control to ensure academic integrity. What we should and must do is strive to facilitate effective assessments that evaluate students in a holistic manner that promotes skills development and a growth mindset.

## Chapter 2: Using active feedback to develop critical thinking in students

Effective feedback is key to student growth and development. Traditionally, feedback has been seen as a one-way communication from teacher to student, focused on correcting mistakes and guiding future improvements. But, as highlighted by Professor David Nicol of Adam Business School, University of Glasgow in his keynote – [“Using Active Feedback to Develop Students’ Critical Thinking”](#), this approach can be vastly expanded by recognizing the role of inner feedback—a process where students generate their insights from comparisons made with reference materials, peers, and self-evaluation.

### About the instructors:



**Professor David Nicol** is a Research Professor leading the Teaching Excellence Initiative in the Adam Smith Business School, University of Glasgow where he collaborates with academic staff on educational improvement projects. He has published widely on assessment and feedback, e-learning, and change management in higher education.

His current research, which won Silver Award for Innovation in the Science of Learning, focuses on the processes by which learners generate inner feedback, and on how to harness this natural capacity in educational settings.



**Suzanne McCallum** is a qualified chartered accountant who worked in practice before joining the Adam Smith Business School, University of Glasgow in 2005. She is a senior lecturer and an Associate Head of Accounting and Finance in the area of Learning and Teaching. She has researched and published in the area of accounting education and assessment and feedback for many years.

Her current research projects center around inner feedback and ways to harness and amplify the power of this in her teaching practice.

This chapter is inspired by Professor Nicol and Suzanne's [keynote at the inspirED 2023 conference](#), as well as their paper – [“Making internal feedback explicit: exploiting the multiple comparisons that occur during peer review”](#)

## Rethinking feedback: Moving beyond teachers' comments

Feedback is not just the teacher's comments on a piece of student work; it's a generative process in which students create their understanding, emphasized Dr. Nicol in the keynote. The traditional method in which students do some work, and teachers provide comments leaves out the potential richness of inner feedback students can produce themselves. Students are actively creating feedback all the time, even in the absence of the teacher's comments, via a process of comparing their work against some form of reference information and drawing conclusions based on those comparisons.

“ Students are generating feedback all the time, even when there are no comments or dialogue from anyone else. The feedback process is a natural, ongoing process that permeates all learning, and it's a means by which students regulate their learning.”

DAVID NICOL,  
Research Professor, Adam Smith Business School

For instance, students may compare their work to textbook examples, other students' essays, or examples found online to assess their understanding. This kind of feedback, or inner feedback as defined by Professor Nicol isn't merely reactive; it's part of a continuous learning cycle that empowers students to reflect, compare, and generate new knowledge that leads to deeper learning and critical thinking.

“ Teacher comments represent only a very small proportion of the information that students use to generate feedback.” – Professor David Nicol

This process of comparison is crucial because it allows students to reflect on their current knowledge and measure it against a reference point, be it a peer's work, a high-quality example, or expert input from external resources. This comparison allows them to generate new insights that lead to deeper learning and critical thinking.

## What is inner feedback?

According to Prof. Nicol:

“ So my definition is that inner feedback is a new knowledge that students generate when they compare their current knowledge against some reference information guided by their goals. And I say guided by their goals because the students are the protagonists of feedback. If they don't do anything with it, you know, or they're not interested in it, then it's not going to have any effect.”

Inner feedback refers to the self-generated knowledge that students create when they compare their current work against a benchmark. Guided by their goals, students can make meaningful improvements. However, it's not simply about giving students resources and leaving them to it. Teachers must guide them with structured tasks that involve comparisons and encourage explicit reflections on those comparisons.

For example, students writing an essay might be asked to compare their work with three other essays—two from peers and one high-quality example from a previous cohort. Through these comparisons, students generate feedback on their performance, which can be more detailed and personalized than what a teacher might have time to provide. They become aware of gaps in their knowledge, discover alternative ways of approaching problems, and begin to think critically about their work.

## The power of comparisons in critical thinking

The ability to generate comparison underlies many important cognitive processes namely memory, problem-solving, reasoning, learning, and even feedback, though this often goes unnoticed. Professor Nicol remarked: *“Do you not need to compare new information and find the connections, then build new knowledge out of that? So it is embedded in the whole learning process, so in a way, it is kind of invisible.”*

Therefore, comparison plays a crucial role in developing feedback skills, and incorporating comparison into the feedback process helps students in a variety of ways:

**1. Detailed self-evaluation:** When students actively compare their work against multiple references, they often produce more detailed evaluations than a teacher might. This process pushes them to analyze not only surface-level errors but also deeper structural and critical thinking issues.

**2. Different formats for deeper insight:** Comparisons aren't limited to written text. A student might compare an explanation of a biological process against a diagram or a flowchart, offering fresh perspectives that foster more complex understanding. Students aren't limited to comparing written work with written feedback. For example, a student might compare their essay on a biological process to a diagram or flowchart of that process. The visual representation can highlight relationships or sequences that aren't as clear in text form, pushing the student to engage in more sophisticated reasoning.

**3. Development of autonomy:** By actively generating feedback on their work, students are encouraged to develop the ability to regulate their learning, fostering independence and self-reliance.

**4. Developing critical thinking:** When students compare their work to multiple sources, such as peer work, examples, and teacher feedback, they're encouraged to think critically about their choices, assumptions, and reasoning. The act of comparison requires them to evaluate not only their own performance but also the strengths and weaknesses of other perspectives, fostering deeper learning and understanding.

**5. Targeting higher-order thinking:** Comparisons push students beyond surface-level learning. They begin to engage in higher-order thinking skills like analysis, synthesis, and evaluation. Instead of merely correcting errors, students reflect on why certain approaches work better than others and how their understanding fits into broader disciplinary knowledge.

**6. Scalability of feedback:** This method also helps address the tension between wanting students to become independent learners while needing to manage teacher workload. The more feedback students can generate themselves, the less dependent they become on teacher interventions, allowing for feedback to scale without overburdening educators.

## Turning active learning into active feedback

So how can institutions integrate comparisons into the feedback process, in other words, turning active learning into active feedback?

The shift from active learning to active feedback doesn't require drastic changes in the classroom. The process is relatively simple: students complete a task, compare their work against various resources, and make their reflections explicit. This can take many forms—written, oral, or even graphical outputs. The key is to guide students to make thoughtful comparisons and encourage them to express what they've learned from those comparisons. As stated by David:

“ So my definition is that inner feedback is a new knowledge that students generate when they compare their current knowledge against some reference information guided by their goals. And I say guided by their goals because the students are the protagonists of feedback. If they don't do anything with it, you know, or they're not interested in it, then it's not going to have any effect.”

Explicitness is also a key factor because it helps turn a natural process—students learning from their work—into a powerful pedagogical tool. Students do not only learn to reflect on their learning but also transfer these insights to new contexts, sharpening their critical thinking.

“ This is the most important principle of this. It requires not very much, just getting the students to make an explicit output. And that turns active learning into active feedback.”

DAVID NICOL,  
Research professor, Adam Smith Business School

## Practical classroom application: A Financial Accounting course use case

Suzanne McCallum, Senior Lecturer in Accountancy at Adam Smith School, University of Glasgow shared her successful story of applying the principles of active feedback in her first-year financial accounting course.

In this course, instead of implementing a typical feedback process, where Suzanne would provide comments on the essays, she guided students through a self-feedback process.

This self-feedback activity involved students writing a short 500-word essay, and then comparing it to three essays (two randomly selected from their peers and one high-quality exemplar from a previous year). This process involves 4 review rounds, each round providing a more refined self-evaluation. A detailed breakdown of the review rounds can be found below:

1. **Self-review 1:** After writing the essay, students compare it with peer essay 1 by answering a series of questions:
2. **Self-review 2:** So after they've done self-review 1, they move on and look at peer essay number two - the high-quality one and compare it with their essays, answering the same questions.
3. **Self-review 3:** Students go through the process again, comparing their essays to peer essay 3. However, the questions for this round are different, as they asked students to reflect on what they learned, rank the essays including theirs from best to least good, and to name two things they would improve.
4. **Self-review 4:** For the final review round, students reflect on their work based on comments from two peers by answering questions about what they have learned from their peer reviews, and what additional changes they would make to their essays.

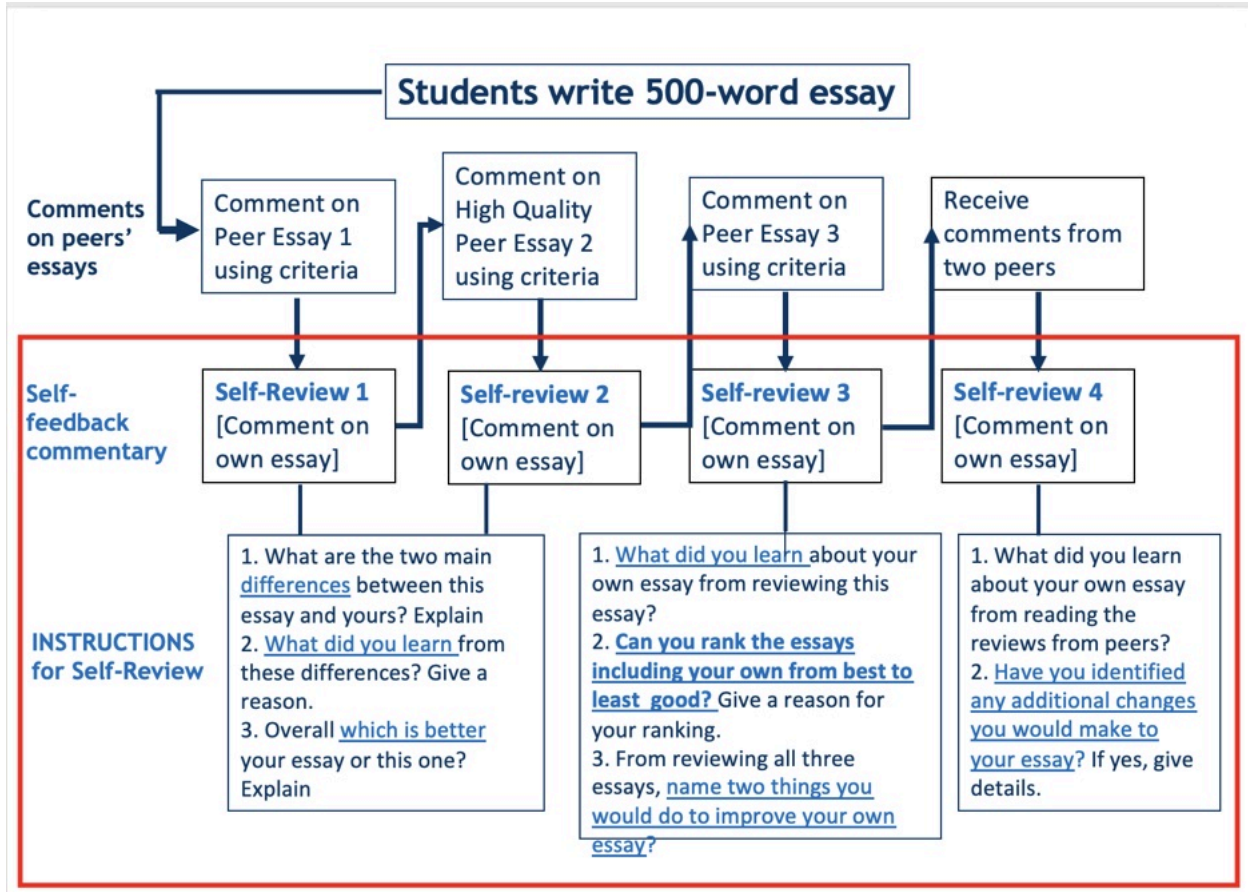


Figure 1. The design of the self-generated review activity (Nicol & McCallum, 2023)

The results were remarkable according to Suzanne considering the students' nature and preference.

“ They're very focused on the numbers. They don't like to write anything in the first place. So would they take this seriously and would they write much in their self-reviews? Well, I was amazed by the volume of information the students generated.”

SUZANNE MCCALLUM  
Senior Lecturer, Adam Smith Business School

By the final round of comparisons, over 90% of the students were able to generate feedback that matched or exceeded the comments Suzanne would have provided as a

teacher. Even those who did not fully match teacher expectations identified the most significant issues, showing that this method is highly effective at helping students become their critics.

“ I marked the essays in the way I normally would and produced feedback comments just for the research study, not to give to the students. We could then compare the feedback comments I would have provided with what the students produced in their self-feedback reviews. What they achieved was really amazing because the students were able to match and exceed the comments I would have provided.”

SUZANNE MCCALLUM

Senior Lecturer, Adam Smith Business School

Most importantly, the students also began to reflect on deeper aspects of writing that go beyond surface-level corrections. They discussed how their essays would be received by a reader, thought about alternative approaches to the same problem, and considered how their argumentation and evidence presentation could be improved. These reflections signal a move toward higher-order critical thinking, which is the ultimate goal of education. *“Making comparisons forces you to engage and understand the material more than just getting told what to fix or amend.”*, commented a student on the impact of the self-review activities.

“ Rather than just being able to match what I would have said, the students exceeded that in many different ways. First of all, about the criteria, they gave a lot more detail because they weren't as time-bounded as I would be when looking at their work. They identified additional issues and gave detailed action points on how they could improve their work. They also went well beyond just the criteria and moved to other aspects which would be impossible to achieve if just using comments from me.”

SUZANNE MCCALLUM

Senior Lecturer, Adam Smith Business School

What's more, students were able to improve their work after the self-generated feedback process. After the review rounds, 70% of the students managed to improve their grades with *"absolutely no comments"* from the teachers.

The benefits of this feedback comparison activity aren't limited to only writing assignments, but can also be adapted to different subject domains (e.g. medicine, biology, etc.) and activity types. Below you can find several learning activities where self-generated feedback can be implemented, shared by Suzanne:

1. Theory-application comparisons
2. Analysis through different lenses (using different comparators)
3. Creative thinking – comparators quite different from what students have produced
4. Problem-solving - comparisons against expert think-aloud videos, different problem-solving methods
5. Knowledge elaboration/perspectives – different genre (e.g., poem against essay) or modality comparisons (e.g., diagram versus text)
6. Metacognition – comparing earlier work with later work, earlier goals with later goals
7. Many possibilities in areas of skills or emotional development using narratives as comparison resource

## Overcoming feedback concerns

Some educators raise concerns that self-generated peer feedback might lead students astray, with peers leading each other down the wrong path. Suzanne addressed this concern by explaining that peer comments are not essential to the process. If teachers are concerned about the accuracy of peer feedback, they can provide structured, reliable comparison resources, such as high-quality examples or professional sources, for students to use as benchmarks.

“ If you're worried actually about what the peers say, take out the peer comments completely, because that's not an integral part of the process. It

is the students who are actually making judgments and evaluating where they are themselves.”

SUZANNE MCCALLUM

Senior Lecturer, Adam Smith Business School

Another concern is the time and effort required to implement this approach, especially when students are already balancing heavy workloads. However, Suzanne emphasized that active feedback doesn't necessarily add extra tasks. Instead, it leverages existing assignments and learning activities, transforming them into richer feedback opportunities. By embedding the comparison and reflection process into tasks that students are already doing, teachers can enhance learning without overburdening students.

## Addressing AI concerns

Suzanne also emphasized the importance of integrating AI into the feedback comparison process, as well as addressing several key issues presented by AI technology.

One of the primary concerns with AI is the potential for bias, inaccuracy, and lack of source verification. To address this, it is important for students to critically engage with AI outputs by comparing them against other reliable sources of information. This includes challenging AI models through different forms of comparison, such as contrasting text-based responses with visual diagrams or cross-referencing data with real-world observations. These comparative exercises help students identify inconsistencies and reinforce the importance of human judgment in evaluating AI-generated content.

Another issue is the question of academic integrity—whether the student or the machine is truly doing the work. To address this, teachers can focus on making inner feedback processes more explicit, thereby emphasizing the thinking and learning that occurs throughout the task, rather than just the final product. By encouraging students to generate self-feedback for summative assessments, they can engage in a deeper reflection on their learning journey, helping them take ownership of their work and reinforcing the value of independent thought.

The use of AI in education also raises concerns about the potential loss of the human dimension in learning. To mitigate this, it's essential to integrate AI tools like ChatGPT into dialogic comparisons, fostering collaboration, sharing, and critique among students. By amplifying these AI-generated outputs with human dialogue, educators can provide a richer context for comparison tasks, encompassing ethical, social, personal, and environmental dimensions. This approach ensures that AI remains a tool to support learning rather than replace the critical human elements of interaction, judgment, and ethical reasoning.

## A scalable model for deeper learning

The concept of inner feedback and active feedback offers a scalable model for developing critical thinking and independent learning in students. By shifting the focus from teacher-driven comments to student-generated feedback, educators can empower students to take control of their learning. This method allows students to engage more deeply with the material, encourages reflective thinking, and fosters the critical skills they will need in the real world.

Moreover, this approach helps address two critical challenges in education: how to promote student autonomy while still providing guidance, and how to scale feedback effectively without increasing teacher workload. By embedding comparison and reflection into regular classroom activities, educators can create a feedback-rich environment that leads to lasting improvements in student performance and critical thinking skills.

As we continue to rethink the role of feedback in education, the principles of inner feedback offer a promising way forward. They align with the growing emphasis on student-centered learning, critical thinking, and the development of self-regulated learners, making them essential tools for the modern educator.

## Technology-enhanced feedback comparison activity

Technology can greatly help enhance the design and implementation of the feedback comparison activity. Below are multiple ways in which teachers can utilize pedagogical solutions, specifically FeedbackFruits solutions to automate manual tasks and maximize the impact of the self-generated review process.

Using [Peer Review](#) for self-review rounds. Within this tool, students are randomly assigned to review their peers's work. Teachers have the option to add detailed review rubrics and open questions that require students to compare their work with that of their peers. The rubrics can be created from scratch or adapted from the existing templates, which have been developed and shared by other teachers.

To support the final review round, where students reflect on their work based on two peers' comments, teachers can use the self-assessment feature. This feature allows adding a final step to the activity that requires students to compare their work against peers' reviews, and then answer several questions.

As for the peer review stage, the Feedback Coach feature can be enabled to guide students in delivering quality feedback. This feature is part of [Acai](#) – FeedbackFruits pedagogy-driven AI solution.

To visualize this activity setup, we have created a learning journey that showcases each self-review round with the integration of pedagogical technology. Find this in the Appendix section.

#### GOOD TO CHECK

- [Unlocking the power of inner feedback: Comparisons change everything](#)
- ["Turning Active Learning into Active Feedback"](#), Introductory Guide from Active Feedback Toolkit, Adam Smith Business School. Edge Hill University. Educational resource.

# Chapter 3: Designing holistic assessment and feedback for a growth mindset

Higher education should no longer be about accreditation or certification. It should generate a learner-centered environment where students can engage in meaningful interactions, develop lifelong skills, and most importantly acquire the ability to learn beyond classrooms. In essence, building a growth mindset for students is among the critical objectives of teaching and learning now and for the future.

How can faculties curate a growth-oriented learning environment? According to Dr. Kim Chappell, Assistant Professor at Fort Hays State University, targeted feedback and holistic assessment are two effective strategies to achieve this goal. In this article, we will elaborate on practical strategies and opportunities to implement growth-oriented assessment and feedback.

## About the instructor:



**Dr. Kim Chappell** is an Assistant Professor at Fort Hays State University in the Advanced Education Programs Department of the College of Education. Dr. Chappell has been teaching for more than 32 years including 18 years in higher education. Her experience and research interests include effective teaching, assessment, curriculum, and leadership in higher education.

The input for this chapter is inspired by Dr. Kim Chappell's presentation at inspirED 2022 – [“The Role of Feedback and Holistic Scoring in Building a Growth Mindset”](#).

## The importance of nurturing a growth mindset

The ultimate goal of education is not about accreditation, but to equip students with essential skills and knowledge that help them thrive beyond their study. Dr Chappell remarked: *“I think most of us would say we want them to carry this knowledge and skills with them further into additional study, as well as into their careers and in their lives.”*

Dr. Chappell's philosophy of teaching has always been about helping students to become lifelong learners. That means creating an environment that develops a lifelong learning attitude, or so-called growth mindset.

“ We often say we want students to become lifelong learners. Well, what does that mean? That means that they need to have a growth mindset, and to understand that learning isn't a fixed point in time.”

DR. KIM CHAPPELL  
Assistant Professor, Fort Hays State University

In order to develop a growth mindset and increase self-efficacy, instructors need to keep in mind 3 main principles, and most importantly, implement targeted feedback and holistic assessment.

## Principles for developing a growth mindset culture

### 1. Be intentional

When designing any courses, instructors need to specify the end goals – that is, which skill sets students should accomplish in the end aside from the subject matter. Furthermore, the desired skills should be closely aligned with the learning activities. Whether it is critical reading and thinking, information literacy, or evidence-based decision-making, faculties need to provide a transparent description and link to the corresponding course activities. This will help students understand the purposes and benefits of the tasks, thus motivating them to engage in the learning process. According to Dr. Chappell, being selective of the desired skill sets allows instructors to focus their feedback on supporting students' growth and fostering the development of these skills.

“ We can't feed back everything, we cannot teach everything. So it's really important that we focus on specifically what we want to accomplish within a course, that's outside the content in order to build a growth mindset. Because that's what will help to support not only a growth culture but also support the skills you're trying to build.”

Here are some resources to help you with designing clear course objectives:

1. [Revised Bloom's Taxonomy](#)
2. [Examples of learning objectives](#)

## 2. Assessing for growth

To build a growth-oriented course, “the real kick and key is whether or not you assess for growth”, as remarked by Dr. Chappell. If faculties only administer a midterm and final exam within the entire course, students are under the impression that they only need to know everything at certain fixed points in time, rather than continually progressing. This leads to disengagement throughout the course and emergency cramming for exams at the end. Relying solely on summative assessment is then definitely not an ideal approach to cultivating a growth mindset. Instead, instructors should combine both periodic and final evaluations to measure students’ progress throughout the learning process. There are several strategies to achieve this triangulation of assessment, namely:

- Allowing for resubmissions
- Integrating peer and group assessment opportunities
- Dividing one big assignment into bite-size tasks
- Issue growth-infused feedback

Dr. Chappell especially values the impact of peer review activity in developing a growth mindset, and how it is easier to facilitate this approach with pedagogical technology:

Dr. Chappell’s philosophy of teaching has always been about helping students to become lifelong learners. That means creating an environment that develops a lifelong learning attitude, or so-called growth mindset.

“ So you gotta love FeedbackFruits for that. I've issued peer assessment activity using their Peer Review tool, and I have found it to be super successful in helping students to give each other feedback.”

### 3. Think long-term

The course design needs to show students how they can progress over time. This means considering what we want our students to achieve throughout the entire course from start to finish and gradually building towards those goals.

Faculties can communicate to students that they are expected to grow, by presenting assignments that are progressively more challenging, regardless of levels or importance within the course. As Dr. Chappell stated, *“Whether the assignments are high-stakes or low-stakes, we should give them more weight in the course to emphasize their significance in promoting long-term growth.”*

## Feedback strategies for nurturing a growth mindset

### 1. Provide growth-infused feedback

Focusing on positivity is the key factor when delivering growth-infused feedback, according to Dr. Chappell.



I use positive terms and leave things open for students to interpret so they take responsibility for their own growth.”

It's also important to provide growth-oriented feedback on both correct and incorrect work. If a student receives an A, they need to know which parts of their project were done correctly so they can replicate it in the future. On the other hand, if a student defines a topic but fails to provide examples, instructors should acknowledge what they did correctly but also suggest ways to improve.

Dr. Emilia Illana Mahiques, lecturer at Cornell University [shared a similar opinion on the use of positive feedback](#). *“People tend to say that positive feedback doesn't work, that's not true.”*

Positive feedback can have positive effects if it is accompanied by detailed reasoning and elaboration. “When you point out to the students “why do I like this?” and especially if you justify “I like this because ...”, students can incorporate this feedback again into their learning”, Dr. Mahiques explained.

Simply saying “It is good” or “Great job” doesn’t do much, but when saying “It’s good because...”, and explaining to their peers why, the comment becomes much more helpful. These reasoned, positive comments will leave a lasting impression on the students, thus motivating them to repeat this in their future work. Furthermore, asking students to focus on what they like about their peers’ work allows them to learn from each other.

So what positive language should instructors use when giving feedback? Dr. Chappell provided a list of commonly used phrases:

To suggest improvement actions:

- Try this...
- You might start....
- Let’s do this...
- Let me encourage you to consider....

To let students know what they did right and wrong:

- You wrote detailed reasons for....
- You defined the topic; however, you needed to provide examples of .....
- You gave examples that accurately explained...
- Best to avoid pronouns without referents

## 2. Encourage peer review on formative and low-stakes assessment

Besides instructor input, [peer feedback](#) is a critical element in nurturing a growth mindset, and it needs to be delivered continuously. Formative and low-stakes assessments are therefore effective ways to ensure students are frequently presented with opportunities to engage in feedback exchange. There are multiple ways to incorporate formative elements into the curriculum, especially with the aid of available digital tools. Dr. Chappell often utilizes online discussion, in which students are required to produce and upload videos related to the week’s topic onto the discussion platform, then watch, discuss, and provide feedback to each other. This approach is a fun and engaging alternative to the traditional discussion boards. According to Dr. Chappell, her students enjoyed the activities and even put more effort into these than normal assignments.

“ And as some of my students have told me, they actually prepare more to do a peer review session, something that's peer-reviewed, like a discussion board or a peer-to-peer video, as opposed to how much effort they put into an assignment for me, which I have found to be extremely interesting.”

DR. KIM CHAPPELL

Assistant Professor, Fort Hays State University

For more suggestions on how to integrate formative peer assessment into your course, check out the following articles:

- [How to integrate formative assessment with pedagogical technology](#)
- [Online Summative and Formative Assessment \[Myths and Strategies\]](#)

### 3. Feedback from the front

Giving feedback right from the start is as important as doing so during and after the course. That is, instructors should draw students' attention to the focus points of a particular assignment, a week, or a module. This approach provides a certain level of transparency, allowing students to understand what they should do to achieve the required learning goals. A straightforward and concise syllabus, weekly reminders, or activity instructions act as a detailed roadmap for students, guiding and motivating them to engage in the learning process. For instructors, crafting quality guidelines from the beginning would help save so much time having to repeat and explain to students what needs to be done.

Marnie Roestel, Associate Director of Learning Systems Support at Central Michigan University [provided great tips on crafting a concise, easy-to-read course syllabus](#) that encourages growth-oriented learning.

# Holistic scoring to encourage self-improvement

Another critical component when designing a growth-oriented learning experience is holistic scoring. As Dr. Chappell stated:

“ In order to build a growth mindset, you need to have a grading policy that shows growth. That is, the course grade must represent the highest performance level that the student obtained, rather than the grades that are taken at fixed points in the turn.”

In essence, the grading policy should encourage student improvement throughout the courses. Most importantly, the final mark should showcase what students have achieved by the end of the learning process, instead of being an average of fixed grading points such as midterms or quizzes. It is therefore important to adopt a holistic approach to grading that generates ample information that reflects an objective picture of students' performance level. Below are some strategies to implement holistic scoring, shared by Dr. Chappell:

## 1. Use words instead of numbers

Instead of assigning a numerical grade, instructors should describe students' accomplishment of each criterion with a word. Dr. Chappell uses “developing, proficient, and exemplary” to represent students' performance. Assessment scores are calculated as an average of the rated criteria in the rubric. In other words, focus on describing the competencies that you expect students to achieve, rather than using a number to label the performance levels.

## 2. Score over time

Grading needs to show students that they are growing and improving over time. This can be done by creating multiple scoring components that contribute to a final project or incorporating formative assessment opportunities. For example, a big writing assignment can be broken down into smaller tasks, namely: materials comprehension, first draft creation and submission, peer feedback, second draft iteration based on the comments, final submission, self-reflection, and teacher feedback. Each of these steps will be graded to make sure students receive constant feedback and have opportunities to improve and reach their highest performance.

More examples of implementing the “Scoring over time”:

- [Normalizing effective peer feedback in hybrid courses at TU Dublin](#)
- [Revolutionizing online engagement and interaction at South Plains College](#)

### 3. Allow for resubmissions

Students will learn at a deeper level when they are working with materials over and over and over again. Most importantly, allowing your students to improve their work indicates that you expect and welcome them to grow. This can be achieved by creating opportunities for resubmissions, such as letting students work on several versions and iterate on them before producing the final product. By incorporating this approach into the syllabus, faculties “*will start building a culture of growth within the courses*” – said Dr. Chappell. In other words, this simple act showcases instructor understanding and openness to growth among students.

According to Dr. Chappell, students appreciated the ability to resubmit their work:

“ What students have told me is it was comforting, and it was encouraging to their own self-efficacy, to know they didn't have to be perfect out of the gate, and that there would be opportunities to improve, revise, and to change.”

### 4. Use growth-oriented rubric

Finally, the assessment rubric needs to inform students of the highest point that they should reach, at the same time detailing the competencies to be demonstrated to achieve the indicated criteria.

“ It's not the amount as it is the quality. And that's the difference between a true growth-oriented type of rubric.”

Dr. Chappell provided her growth-oriented rubric for research synthesis, which outlines 7 components of the writing and their corresponding requirements. The completion level of these components is indicated on 4 descriptive scales, “Needs intervention”,

“Emerging”, “Proficient”, and “Exemplary”. This rubric design demonstrates the highest level students are expected to obtain, and what they should do to reach this level. Most importantly, students are aware that the assignment focuses on growth, rather than accreditation.

	<b>Exemplary</b>	<b>Proficient</b>	<b>Emerging</b>	<b>Needs Intervention</b>
<b>Introduction</b> [Title heading] <b>Conclusion</b>	<ul style="list-style-type: none"> <li>○ introduced the topic and provided background and pertinent details to contextualize the paper</li> <li>○ summarized the key points, provided closure to the writing, and indicated the value of the topic</li> </ul>	<ul style="list-style-type: none"> <li>○ introduced the topic to provide a context for the paper</li> <li>○ summarized the key points, and provided closure to the writing</li> </ul>	<ul style="list-style-type: none"> <li>○ stated the topic and indicated the subtopics for the paper</li> <li>○ restated the topic and provided a limited summary of the key points</li> </ul>	<ul style="list-style-type: none"> <li>○ stated the topic broadly and articulated disjointed or disconnected subtopics</li> <li>○ restated the topic and subtopics</li> </ul>

Figure 1. Example of a holistic rubric

## The positive impact of effective feedback and holistic scoring

After implementing feedback and holistic scoring to develop growth-oriented learning, Dr. Chappell noticed changes in her students’ learning.

“ My students are now more focused on improving themselves and growing rather than achieving high grades. The approach also increases their self-efficacy and responsibility throughout the learning process.”

Feedback and holistic scoring are powerful tools that can be used to promote a growth mindset in students. Effective feedback provides students with the information they need to improve, while holistic scoring helps students focus on the process rather than the outcome. By creating a learning environment that promotes a growth mindset, students are more likely to embrace challenges, learn from their mistakes, and achieve their full potential.

You can find and download Dr. Chappell's rubrics for holistic scoring in the links below:

- [Evaluate APA citation style](#)
- [Evaluate research paper language](#)
- [Evaluate research synthesis](#)
- [Evaluate research paper content](#)

## Chapter 4: Leveraging AI for feedback and assessment

Without a doubt, the flourishing of AI generative tools like ChatGPT has sent institutions into a whirlwind, with concerns over academic integrity, plagiarism, depletion of students' real-life skills, and more. However, according to Dr. John Fitzgibbon – Associate Director for Digital Learning Innovation at Boston College, these issues are the least institutions should be worried about:

“ If we're worried about tools and technology taking over and defeating us, that's the wrong way to think about it. We need to think about humans and technology working together. So we've got to figure out how to work with AI technology.”

As AI will be here to stay and continue to play a crucial role in every aspect of our lives, a thorough understanding of and proper skills to utilize this technology are of great importance. Instead of considering AI as a threat, faculties need to explore the potential of AI and help students navigate through this technology.

This, however, is easier said and done. How exactly can institutions work with AI and integrate it into the learning process? Faculties are in dire need of the best strategies and examples of AI implementation.

In this chapter, we compile several examples of embracing AI to enhance feedback and assessment activities and help students develop desired skills like feedback, critical thinking, collaboration, and more. These are shared by Dr. John Fitzgibbon and Nathan Riedel – Instructional technologist at Fort Hays State University in [a webinar on embracing AI](#).

### Activities to develop critical evaluation and feedback skills

For instructional technologist Nathan Riedel, nurturing a growth mindset and lifelong skills, especially in the age of AI has become the core mission of higher education.

“ What is important is to encourage a growth mindset. This is about learning. Mistakes are okay.” – Nathan Riedel

That’s why Nathan came up with several learning activities to help students develop not only a critical reflection of AI-generated content but also feedback and collaboration skills. He also utilized FeedbackFruits solutions for AI, feedback, and assessment to support the implementation of these activities in

### Activity 1: Critical analysis of ChatGPT-generated content using technology

For this activity, Nathan used ChatGPT to generate answers to several questions using ChatGPT. He then put these answers into a document and uploaded this to [FeedbackFruits Assignment Review](#). Within this tool, students are required to analyze the document, annotate important sections and provide comments, feedback, and questions, even give suggestions on how to curate the prompts for AI.

The screenshot displays the FeedbackFruits interface. On the left, a document titled "Executive Summary" is visible, containing text about recidivism and a list of three conclusions. A green highlight is present on the first sentence of the summary. On the right, a "Feedback" panel is open, showing a list of reviewers (Hilal Nur Türer (Teacher)), an "Overall Feedback" section with one comment from Hilal Nur Türer (Teacher) dated 13 days ago, and an "Introduction" section with a progress bar showing ratings from 0 to 3 points.

Figure 1. Students analyze the AI-generated content, highlight important sections to add ratings and comments

According to Nathan, this activity encourages students to actively and critically regard the AI content and detect the existing flaws.

“ By asking students to thoroughly analyze ChatGPT content, they can find the deficiencies. In other words, you’re encouraging your students to go out and look for these holes. They can find the knowledge that is lacking in the language model.”

## Activity 2: Peer review AI-generated content

The same critical analysis activity can be upgraded into a peer and group assessment component, in which students upload their ChatGPT-generated answers and give feedback on each other’s submissions.

This activity update would normally take up plenty of time for assigning peer reviewers or group members, developing feedback rubric criteria, and such. However, Nathan opted for [FeedbackFruits Peer Review](#) to streamline the entire review process.

Within the tool, students easily uploaded their AI content, and get assigned to another peer’s work to review based on a set of criteria. They can also annotate the submission and add questions or discussion points for further exchange.

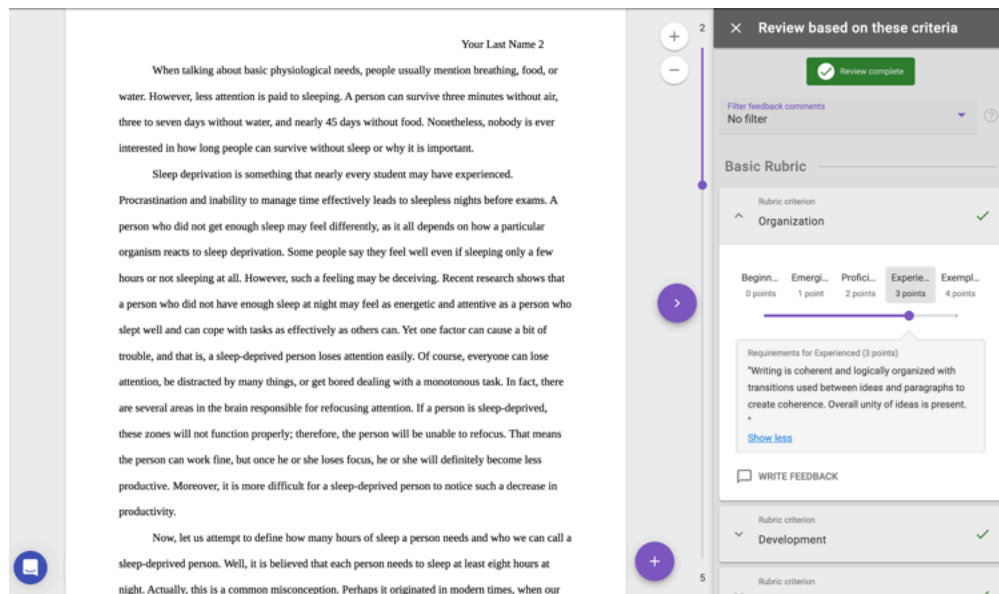


Figure 2. Students review peers’ ChatGPT-generated documents by giving ratings on different criteria and adding comments

Not only does this activity encourage critical reflection on AI content, but it also creates plenty of feedback opportunities and interaction moments where students can develop social and collaborative learning.

### Activity 3: Self-reflection of AI-generated content

Besides peer and group feedback, self-reflection constitutes a critical part of feedback skills. That's why Nathan suggested adding another layer to the critical analysis activity, which is the self-evaluation of AI-generated content. For this, he relied on [FeedbackFruits Self Assessment](#). With this tool, students upload their ChatGPT-generated transcripts and critically analyze them based on a set of criteria. At the same time, instructors can access students' progress, give comments on the analysis, and provide timely support. This activity, according to Nathan, stimulates self-regulatory skills and teacher-student interactions, while “encouraging students to think carefully about their interactions with AI”.

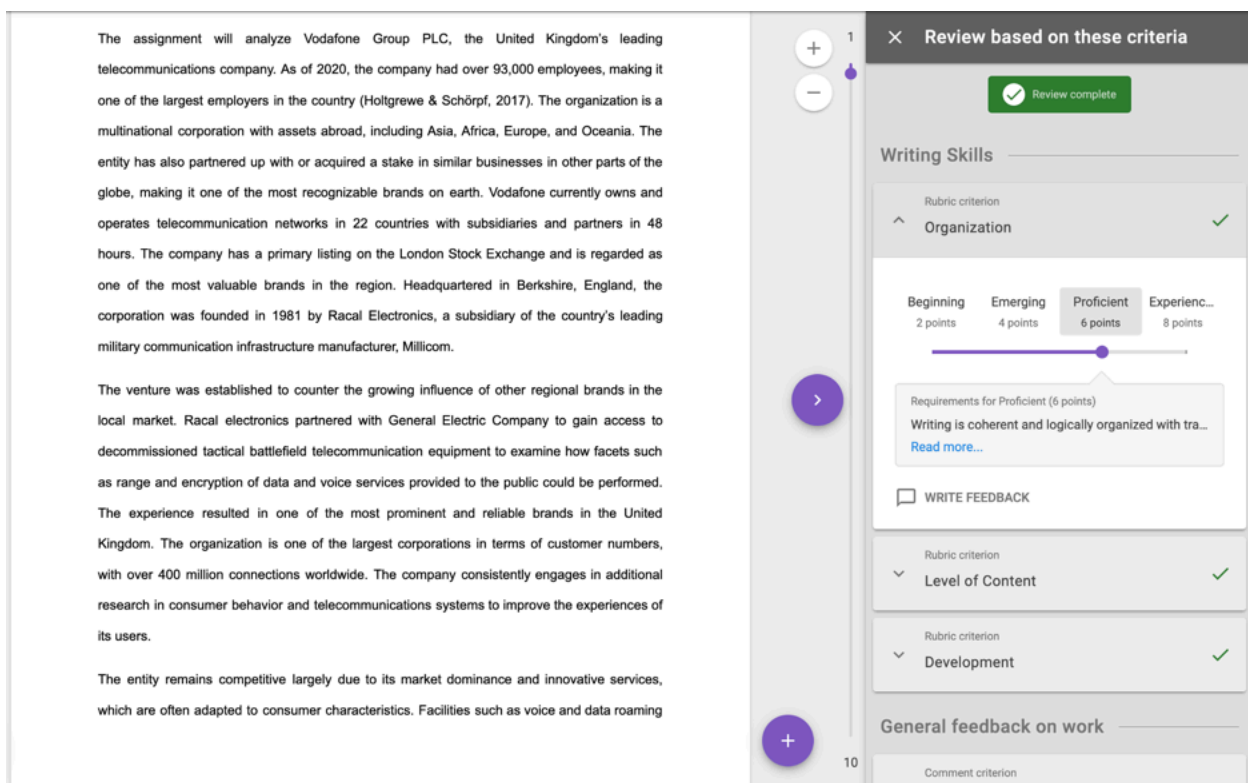
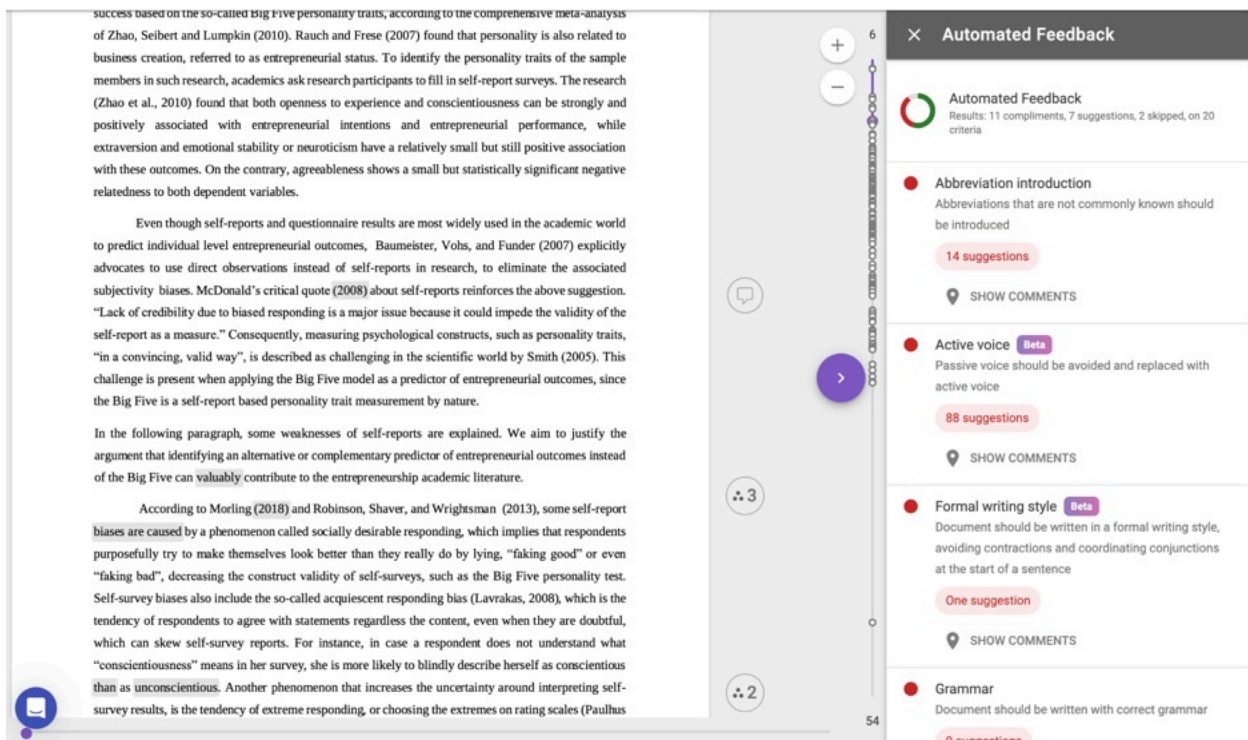


Figure 3. Students evaluate their AI-generated draft based on a set of criteria

## Activity 4: Utilize AI-powered feedback

[Effective, quality feedback](#) needs to be continuous, growth-oriented, and personalized. However, achieving this can be quite challenging, especially within a large student cohort. This is where AI can be leveraged to support instructors in the feedback delivery process, and [FeedbackFruits AI solution – Acai](#) is developed to fulfill this role. Powered by AI, this LMS plug-in scans through students' writing and provides instant, formative feedback on structural writing elements like citation, academic style, grammar, and structure, which then leaves teachers with more time to address higher-order cognitive skills like comprehension and critical argumentation. Based on this feedback, students can iterate and produce a better final work.

For Nathan, he used Automated Feedback to let students receive automated feedback on their ChatGPT transcripts regarding a set of pre-selected writing criteria (grammar, personal pronouns, reference, literature review, content, structure, etc.). Students are also encouraged to decide on which feedback to follow, by indicating whether the comment is helpful or not.



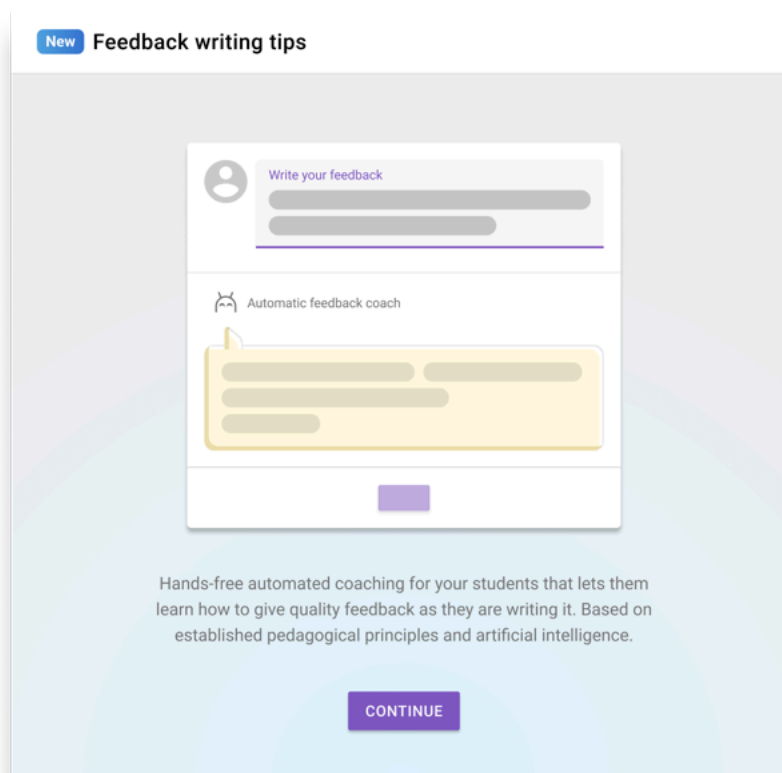
The screenshot displays the Automated Feedback interface. On the left, a sample text discusses personality traits and self-reports. On the right, a sidebar titled "Automated Feedback" provides a summary of results: 11 compliments, 7 suggestions, and 2 skipped criteria. The sidebar lists four categories of feedback:

- Abbreviation introduction:** 14 suggestions. Feedback: "Abbreviations that are not commonly known should be introduced."
- Active voice:** 88 suggestions. Feedback: "Passive voice should be avoided and replaced with active voice."
- Formal writing style:** 1 suggestion. Feedback: "Document should be written in a formal writing style, avoiding contractions and coordinating conjunctions at the start of a sentence."
- Grammar:** 9 suggestions. Feedback: "Document should be written with correct grammar."

Figure 4. Automated Feedback scans the AI-generated documents and provides feedback on structural writing elements

# Using AI to guide students in giving feedback

An important part of the feedback process is letting students know how to deliver good feedback. In fact, students' feedback often falls into either too short, too positive, or negative spectrum. This is due to a lack of guidance and also an unwillingness to complete the activity. It is also challenging for instructors to follow, and provide instruction for each student in their feedback delivery process. That's why we introduced the Feedback Coach feature as part of Acai to assist educators in guiding students to deliver better feedback.



*Figure 5. The Feedback Coach giving suggestions and guidance on students' feedback delivery*

The Feedback Coach provides tips, suggestions, and feedback on students' feedback to help them improve their comments.

The feature uses advanced Large Language Models provided by Azure OpenAI Service to process students' input and provide feedback. We choose to use Azure's OpenAI Service to deliver this feature because of its enterprise-level security, compliance, and regional availability.

For more ideas and strategies on utilizing AI tools, you can check the following resources:

- [FbF AI resources hub](#): A collection of resources on AI including articles, use cases, tools, and more that will help you and your faculty embrace AI technology (such as ChatGPT) in every teaching and learning aspect: from course design, assessment, technology adoption, to policy making.
- [Authentic assessment learning journey](#): A 7-step framework on how to design and facilitate authentic assessment activities that encourage a growth mindset and nurture lifelong skills.
- [ChatGPT: How to adapt your courses for AI?](#): Suggestions on how institutions can adapt your courses to embrace the rise of ChatGPT and AI technology

# Chapter 5: Implementing authentic and inclusive digital assessment in higher education

With the rise of digital tools and the increasing diversity of student populations, universities are exploring new ways to ensure assessments are not only effective but also inclusive and authentic. This chapter will elaborate on this topic, by drawing on the insights and experiences of two educators at the University of Leeds in revolutionizing assessment practices, offering valuable insights into the challenges and opportunities of digital-first, inclusive assessments.

## About the educators:



**Pam Birtill** is an associate professor of Psychology and academic lead of Leeds Expectations for Assessment and Feedback (LEAF). She holds a fellowship from the Leeds Institute of Teaching Excellence which supports her pedagogical research. She is leading work on the implementation of the assessment strategy at the University of Leeds, as part of the 10-year 'Curriculum Redefined' project.



**Samantha Pugh** is a Professor in STEM education at the University of Leeds and a National Teaching Fellow in 2017. She is the institutional academic lead for digital assessment and is currently the director of student education in the School of Physics and Astronomy.

Content for this chapter is inspired by Pam and Samantha's session at the inspirED 2023 conference, titled ["Implementing Authentic and Inclusive Digital Assessment"](#)

# Why digital assessment? The Leeds approach

The University of Leeds, a research-intensive institution with approximately 40,000 students, has embarked on a bold mission to make assessments “digital by default.” The goal is not simply to move assessments online but to use digital tools to enhance accessibility, reduce stress, and improve both student and staff experience. According to Pam:

“ As a research-intensive university, we have very, very good students who come to us, but an increasingly diverse set of students, and we need to be able to cater to all of the students who come to us and support them. So, our assessments have to be inclusive. We want them to be fair.”

The decision to make digital assessment the norm at Leeds was driven by several factors:

1. **Creating an inclusive learning environment:** With an increasingly diverse student population, it’s crucial to design assessments that cater to all students, regardless of background or abilities. Digital tools help make content more accessible and provide flexible ways for students to engage with their assessments.
2. **Promoting efficiency and fairness:** By using digital platforms, both students and staff can track progress more easily. It reduces administrative overhead and provides more transparency in the assessment process. For instance, digital marking allows for real-time tracking of grading progress, giving academic leads a clearer picture of student performance across modules.
3. **Maintaining authenticity:** Authentic assessment—where students apply knowledge in real-world or creative contexts—has become a central pillar of the Leeds strategy. However, as Samantha, the Digital Assessment Lead, pointed out, authenticity can mean different things depending on the discipline. While some view it as preparation for the workplace, others see it as a means of fostering social justice or applying knowledge creatively.

“ We want to use digital technologies to help us to enhance assessment, because we are in a world where we have got more and more students, and we're all having to do more and more things, and digital can make that better for everybody. We want to use digital technology to help us support and deliver our strategy.”

**PAM BIRTILL**

Associate Professor, University of Leeds

## Principles of a good assessment system

Before integrating digital technology into the assessment process, it is important to define what constitutes “a good assessment system”. The team at Leeds introduced 6 key principles, namely:

1. Assess students on program-level skills as well as subject-level knowledge
2. Differentiates student ability satisfactorily in outcomes
3. Rewards synoptic understanding of the subject, stops topics from being discarded
4. Reduces single point-of-failure assessments for students
5. Reduces high-stress situations during assessment for students
6. Keeps staff workload under control, and in particular reduces ‘out of semester’ workload.

## Breaking down barriers: Authentic and inclusive design

One of the primary challenges in implementing a digital-first assessment strategy is ensuring that it meets the needs of diverse student groups while maintaining disciplinary integrity. At the University of Leeds, this meant taking a flexible approach to defining what “authentic” assessment looks like in different subjects. Authenticity isn’t limited to simulating workplace tasks; it can also be about encouraging students to use their knowledge in novel, creative ways. The end goal, according to Pam, is that:



We want to be able to say what the graduates of our university should be able to do. But we also want our assessment to successfully discriminate between students. We want employers and other higher education institutes, where students may go on to do further qualifications, to be able to know who the good students are.”

So how did the teaching team at Leeds implement a digital-first assessment strategy?

First of all, the team assigned an academic assessment lead within each school with sufficient leadership skills, knowledge, credibility, and reputation to monitor the assessment “within the disciplinary context”, as well as to help “drive the centralized change” that they want to achieve across the entire institution.

Pedagogical conversations are also organized to build a strong community of practices where faculty members can share and exchange insights on digital-enhanced feedback and assessment.

The team also introduces radical changes to assessment, by adopting new approaches namely: Synoptic (programmatic) assessment; Pass-fail assessment; Competence-based approaches; Sprints, Prototypes, Pilots; Co-creating with students

Central to the implementation is the initiative taken to embed digital technologies in certain steps throughout the feedback and assessment processes, which can be grading, giving feedback, reflection, and more. As Samantha remarked, going digital doesn’t mean turning fully remote. Instead, it involves careful consideration of which assessment aspects can be digital.

## Digital by default

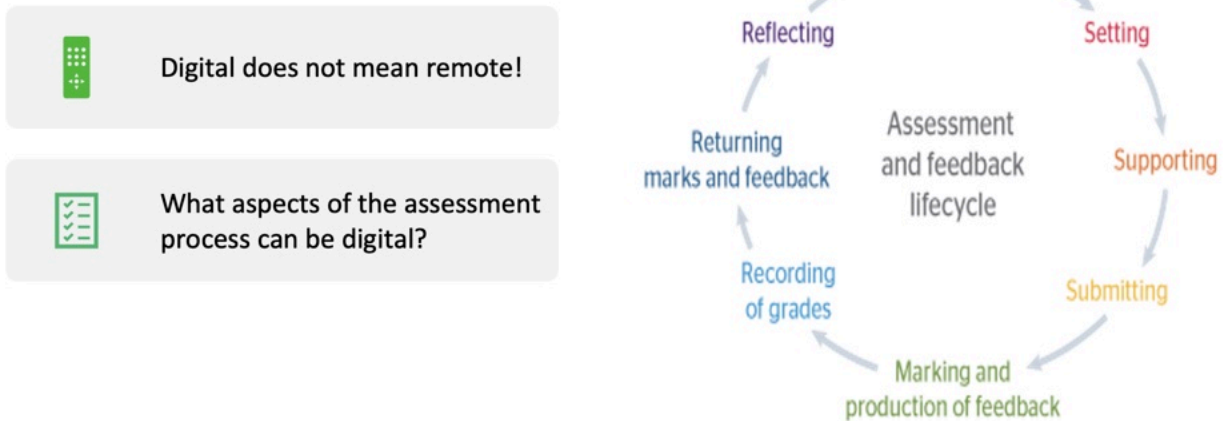


Figure 1. Integrating digital technology into the assessment process (Birtill & Pugh, 2023)

Sharing about digital assessment implementation, Professor Samantha Pugh commented:

“ We've been doing some piloting with scanning exam papers and marking them online, and then the return of the marks will be digital, the reflection process might be digital, and then in things like coursework where the student feedback, that could be digital, and that could be video, could be audio, could be written. It is really about encouraging people to think of the whole cycle and where it can be digital.”

## Moving beyond grades: Reducing stress and single-point failures

A key aim of the digital assessment strategy at Leeds is to reduce the stress that high-stakes assessments often cause for both students and staff. As remarked by Pam, approximately 30% of students at Leeds experience mental health challenges, many of which are exacerbated by assessments. The university is taking steps to move away from traditional grading systems in favor of more developmental, competency-based assessments.

For instance, in the physics department, the curriculum is being redesigned with a focus on two key components: “threshold testing” and “synoptic assessment”.

**Threshold testing**, or VITAL (Verifiable Indicator of Threshold Abilities and Learning) focuses on testing students’ competence in specific learning outcomes through low-stakes, pass-fail assessments. Students are allowed multiple attempts to pass these tests, reducing the pressure of a single high-stakes exam. Once students have demonstrated competence across all learning outcomes, they move on to the synoptic assessment, which tests their ability to integrate and apply knowledge across the curriculum.

This two-stage approach ensures that students can progress at their own pace while still being challenged to demonstrate deeper understanding and critical thinking in the synoptic assessments. It also helps eliminate single-point failures—those moments when a student’s entire progress hinges on one exam or project—which can disproportionately affect students dealing with personal or academic difficulties.

**A synoptic assessment** is an evaluation method that spans across a broader syllabus or program, rather than being directly tied to individual teaching units. This approach allows students to demonstrate a comprehensive understanding of the full curriculum. Unlike traditional assessments, synoptic assessments are fully graded and include a mix of terminal assessments—typically 2-3 papers featuring longer, integrative questions—and substantive coursework such as lab reports and presentations.

Students who have successfully passed the VITALs, having demonstrated a threshold attainment of all learning outcomes, are guaranteed a minimum score of 40%. This assures that they have met the basic standards of competence. However, synoptic assessments play a crucial role in determining degree classifications beyond a basic pass, allowing students to showcase their higher-level knowledge and skills across the entire program.

## Digital assessment in practice: Authentic assessment in a Psychology course

Using this approach, Samantha transformed her Biological Psychology module to focus on authenticity and inclusivity.

“ Biological psychology is normally really quite scientific, really quite dry, and often considered in isolation from the real world. We wanted to kind of take this and turn it upside down.”

**Here is how the module was transformed:**

The [flipped classroom approach](#) was used to initiate active engagement and preparation among students, helping them to achieve a certain understanding of the topic before working on the assignments.

Rather than relying on traditional exams, students were tasked with group projects with authentic elements, such as discussing a topic using any means they like (podcast, presentation, poster, etc.), or developing a hypothetical guide for NASA on assessing alien intelligence. This approach allowed students to apply their knowledge creatively and collaboratively, fostering both deeper engagement with the material and a stronger sense of belonging within the group.

[Group work](#) played a key role in making these assessments more inclusive. Students were assigned to groups to avoid the cliques or social isolation that can sometimes arise, especially among international students or minorities. Additionally, group check-ins were built into the process to foster open communication and create a safe learning environment for the students. A learning contract was also applied at the beginning of the module to allow students to negotiate and find common ground among themselves.

According to Samantha, the fact that students could choose the topic of focus and the mode of assessment that they preferred was also key to ensuring the inclusivity element.

“ Why was this inclusive? So, it was inclusive because students had a choice. They had choices about their topics. They had choices about what it was they were going to be submitting, and how they would submit it.”

This new assessment design brought several benefits to the teachers, from maintaining academic integrity amid the rise of AI, closing the awarding gap between non-white and

white students, reducing the grading workload, and promoting social cohesion among the cohort.

The changes were positively welcomed by the students, as they found the interactive workshops, authentic assignments, and group work beneficial to their skills development and knowledge acquisition.

“ I am in full support of reducing the emphasis on knowledge as something you need to pass exams, and instead prompting students to flexibly apply our knowledge in different more 'life-like' contexts.” – Student response

## Co-creation and collaboration: Involving students in the process

A standout feature of the Leeds approach to digital assessment is its emphasis on co-creation. The university actively involves students in the design and testing of new assessment models through pilots, prototypes, and feedback sessions. Samantha explained how Leeds uses human-centered design approaches, including design sprints, where students provide input on how assessment communication and processes could be improved.

This collaborative process helps ensure that assessments are not just something done for students but something done with them. It also breaks down traditional silos between academics, professional services, and students, creating a more integrated and supportive learning environment.

## Embracing digital tools for the future

While digital assessments offer many benefits, implementing them comes with challenges. Staff training, changing old habits, and ensuring that digital tools meet the needs of various departments are ongoing issues that require careful management. However, the advantages of digital assessments—greater accessibility, more efficient workflow, and enhanced student engagement—make the investment worthwhile.

Leeds has already begun piloting new technologies, such as scanning exam papers for digital marking, incorporating video and audio feedback, and creating digital assessment maps to help students track their progress. By embedding digital processes across the entire assessment lifecycle, the university is not only improving the quality of its assessments but also preparing students for the increasingly digital world they will enter after graduation.

## Towards a more inclusive and effective future

The digital assessment strategy at the University of Leeds exemplifies how universities can adapt to meet the changing needs of students and society. By focusing on inclusivity, authenticity, and the thoughtful integration of digital tools, Leeds is creating a more equitable and effective assessment environment. The journey is not without its challenges, but by involving students in the process and fostering collaboration across departments, the university is setting a model for others to follow.

For educators looking to implement similar strategies, the key takeaway from the webinar is that successful digital assessment requires flexibility, creativity, and a commitment to continuous improvement. Whether it's developing group assessments that foster creativity and collaboration or reducing stress through competency-based models, the future of assessment is one where students are empowered to demonstrate their knowledge in ways that are both meaningful and manageable.

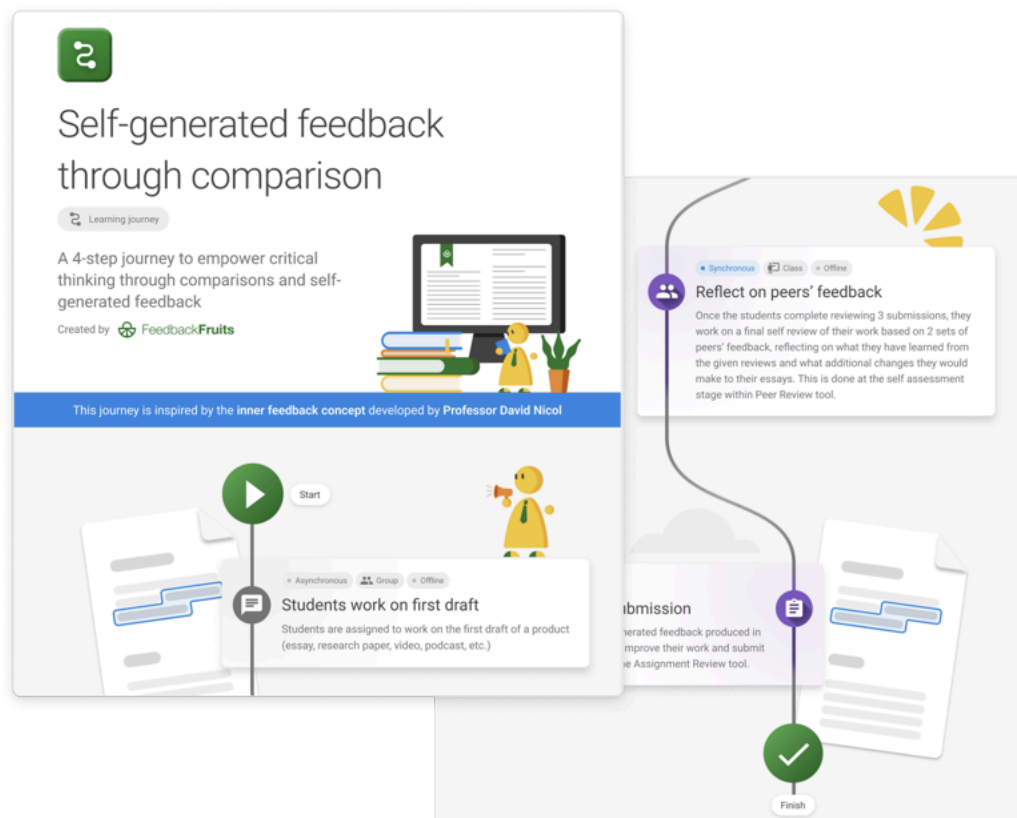
# Appendix

## A. Self-generated feedback learning journey

Inspired by Dr. David Nicol's concept of "Inner feedback", this learning journey details how to design an entire learning process that encourages active learning and critical thinking by feedback comparison. Furthermore, the journey provides suggestions on technological tools to be utilized to help save time designing the activity.

You can access and download the journey via the link below.

[DOWNLOAD THE JOURNEY](#)



## B. Templates for feedback and assessment: Learning Design Community

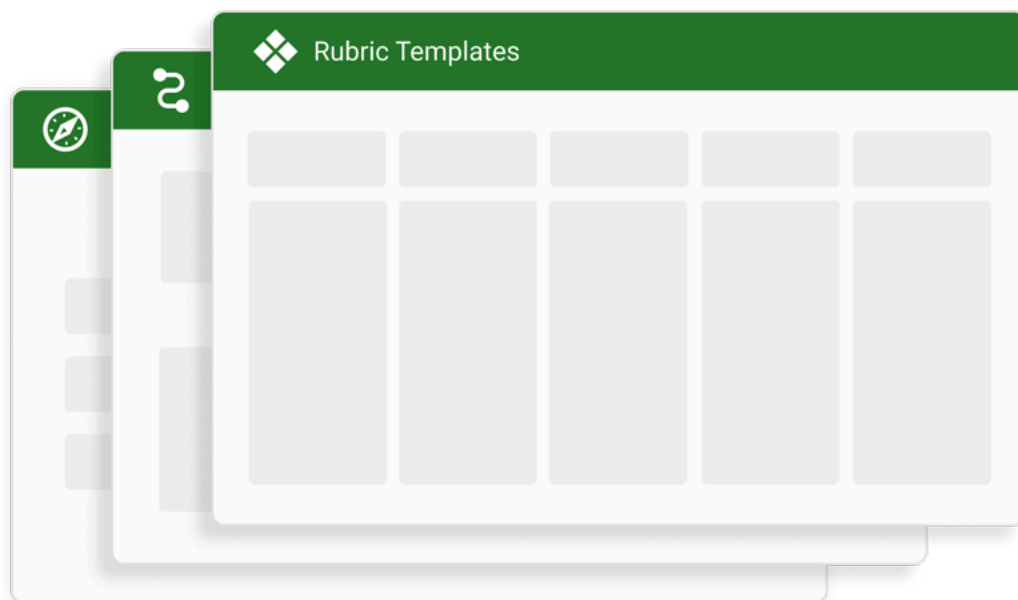
The [Learning Design Community](#) by FeedbackFruits is an innovative platform that allows educators to share, discover, customize, and scale over 50 teaching templates (learning activities, rubrics, learning journeys).

You can easily access and download the templates in either PDF or Google Doc format, also find the template that suits your needs using the filter options.

So what templates can you find?

- The Learning Journeys consist of multi-step templates that show how to create a meaningful learning experience by integrating different pedagogical approaches and technologies.
- The Assessment Rubrics offer detailed sets of criteria to support self/peer/group evaluation of different skills in different activities.
- The Learning Activities present a range of activity designs that align with a variety of learning outcomes and pedagogical.

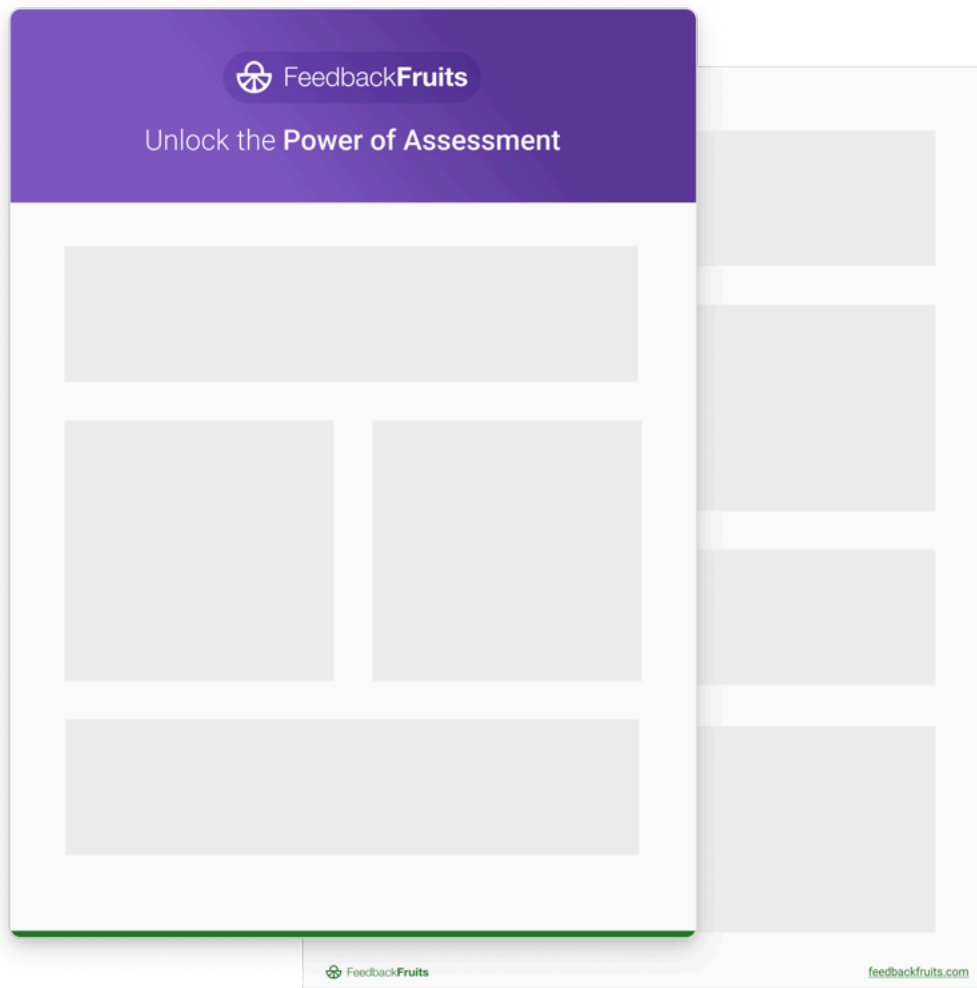
### [ACCESS THE TEMPLATES](#)



## C. Solutions for feedback and assessment

Effective assessment and feedback are crucial for fostering student skills development and ensuring success, yet facilitating this process presents several challenges. These include the diversity in learners' needs and preferences, the significant workload involved in designing tailored assignments, and the necessity to scale these assessments for larger student cohorts across various teaching modalities. The [FeedbackFruits Feedback and Assessment solution](#) is developed to address these issues, making the organization of assessments more streamlined and efficient, regardless of scale or learning environment.

[DOWNLOAD THE BROCHURE](#)



# Let's drive educational transformation together

In the journey to transform pedagogy, FeedbackFruits wishes to be the institution's sidekick, and equip our heroes with the best pedagogical solutions to address your educational challenges and cultivate a quality learning community



Looking for suggestions about inclusive education?

Our specialists can help you find the right strategy and tools to support your use case

[GET IN TOUCH WITH US](#)

