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NATIONAL FORUM
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A Guide to Deploying Comparison Activities to Support Student Learning

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Introduction

This guide provides an introduction to and direction for using comparison activities to support student learning. It reflects our understanding of learning in higher education (HE) as a process in which learners play a central and active role in self-regulating and self-directing their learning. We believe that the more students recognise and embrace their agency for learning, the more they will be able to actively avail of and engage with the range of different learning opportunities that higher education, in all its variety, offers them.

A central aspect of learning is feedback, and our interest in using comparison processes to support student learning has grown out of both our research-informed understanding and our practical experience as educators that both highlight the importance of high-quality feedback provision and its use for learning. Moreover, both the available research and our experiences as educators have shown us that feedback practices in HE need improvement. We recognise that resource constraints and other factors often limit our ability as educators to increase feedback quality, quantity and frequency to the level we would like to achieve.

In this guide we provide some basic background on feedback and comparison, describe approaches for deploying comparison to support student learning based on the deployment of comparison within a number of practice cases in different disciplines and across a range of HE settings, and share the experiences of both the educators and the students involved in these examples.



The Nature and Use of Feedback in Higher Education

Feedback is information provided to recipients that in some way reflects on a previous output of the recipient. It is central to the self-regulation of any system and is thus important for self-regulated learning (Butler & Winne, 1995). In HE, it is often more narrowly referred to as a consequence of performance and is defined as “information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one’s performance or understanding” (Hattie & Timperley, 2007: 81). Such feedback can take many forms (e.g., grades; written educator comments; verbal peer feedback), can come from many different sources (e.g., educators; peers; third parties), serve different purposes (e.g., summative; formative), can have different foci (e.g., task, process, self), and can be available and used at different times (e.g., in the classroom; after submission of a draft; at the end of a term after assessment is complete).

Yet in typical HE settings, feedback is often simply seen as “summative commenting after the fact” (Sambell, 2016: 4; see also Sambell, McDowell & Montgomery, 2013). This points to rather impoverished conceptions of learning by some educators and students (see also Dawson et al., 2019) and highlights design issues in the feedback process (Esterhazy & Damsa, 2019). Research indicates many problems with feedback and feedback practices in HE. Students often do not use feedback they are offered, do not seek out feedback even if it is available, and feel alienated and disengaged as a result of the particular ways in which feedback is offered and used (Sambell, 2016). There are a range of reasons for this (e.g., Henderson et al., 2019) which include *problematic practices* that result in feedback that:

- is **timed poorly** (e.g., offered too late, too early, or too concentrated; see Sambell, 2011);
- **does not inform future work** (Walker, 2009) or **fails to clarify where students should go next in their learning** (Hattie & Timperley, 2007);
- **does not help to close the gap between performance and desirable goals** (e.g., too ambiguous, too opaque, too complex, too abstract, too difficult to understand) (e.g., Carless, 2006; Glover & Brown, 2006);
- **is offered in the wrong format** (e.g., too much written feedback can dispirit students; see Scott, Hughes, Evans, Burke, Walter, & Watson, 2013); or that
- has **deleterious emotional impact on students** (e.g., ascribing inadequacies in their work to personal failings; see Värlander, 2008).

STUDENT VOICE

In addition to these practice related problems, there are *contextual constraints* (Henderson et al., 2019) that affect feedback such as workload implications especially in large classes, lack of time or other resources (e.g., office space for individual meetings), practices that are not scalable, or other factors that limit opportunities for timely, targeted and specific feedback. Moreover, there are *individual capacity* issues among educators (e.g., lack of expertise in designing or providing feedback; lack of sensitivity to student needs) (Henderson et al., 2019) and among learners (lack of ability to utilize feedback; lack of motivation to seek out and use feedback or apply insights generated) (Carless, 2020; Carless & Boud, 2018; Molloy et al., 2020; Sutton, 2012). Finally, there are a range of situational, cultural and historical factors that affect feedback practices, such as learner expectations and preferences, established ways of teaching that privilege educator generated feedback over other sources and thus limit feedback generation and use, or traditions that limit educators' freedom to extend the provision and use of feedback practices beyond established norms.

In light of these well documented problems with many existing feedback practices in HE, the questions that arise include:

How we can improve feedback practices to increase the amount and the learning value of feedback to support student learning?

How can we help learners maximise the value of feedback when resources and capabilities are limited?

The answer to these important questions we present here is simple: Instead of focusing only on educators and on improving their practices of providing external feedback, we suggest using comparison activities to increase the learner's ability to generate and use feedback themselves (Nicol, 2020; Nicol & Macfarlane-Dick, 2006). This approach fits particularly well with student-centred teaching philosophies that place learner agency at the heart of educational design, but can be applied in a variety of ways in almost all learning settings in HE.

“ I learned a completely different way of thinking for myself; In the process of comparison, I can find my own shortcomings and improve them; Overall, the comparison-making process has showcased for me the value of reviewing my own work and also the work of peers and receiving feedback from peers. Perhaps constructive feedback from peers is easier to digest in comparison to feedback from lecturers.

PG, Student 15

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EDUCATOR VOICE

“ In my large UG class I found that I had no time to provide within term feedback to guide and support the student learning but using comparison changed all that. Once I set up the comparison process the sharing and engaging of the student cohort increased as did their understanding of the core concepts. This happened and was observed by me during the term which was also really supportive for students as they engaged with their end of term assignments. Comparison gave them within term feedback and also a method of engaging with and discussing the module content that ensured that they were active and central to their own learning.

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Why use comparison activities to support student learning?

STUDENT VOICE

Comparisons are ubiquitous – whenever we take in information, we make sense of it by comparing that information to what we already know. Such comparison processes are central to all learning processes, especially where learners self-regulate their progress (Butler & Winne, 1995; Hattie & Timperley, 2007).

Comparison activities are so important because they are at the centre of any integration of external and internal information, help learners regulate their progress, and are the source of internal feedback (e.g., Butler & Winne, 1995; Carless, 2020; Nicol, 2020; Nicol, Thomson & Breslin, 2014). In this context, internal (or inner) feedback refers to the understandings and insights that learners generate themselves and use to regulate their learning (Butler & Winne, 1995; Carless, 2020; Hattie & Timperley, 2007; Nicol, 2019, 2020; Nicol & Macfarlane-Dick, 2006).

Given the importance and ubiquity of comparison processes and internal feedback, the question is how they can be best used to enhance student learning? This has been the focus of the COMPARE project which has supported the design and application of deliberate use of comparison activities to support student learning. Our work with a range of educators and many students has shown that this approach can be usefully applied:

- in a variety of disciplines,
- with different types and levels of learners,
- within and beyond the classroom,
- in online, blended and in-person settings,
- for summative and formative assessment, and
- in both high-stakes and low-stakes assessment contexts.

“ Insight, awareness, learning, appreciation; I think actually that the most interesting part of that task was talking to my peers about this task. We were always asked to have a discussion about our assignments. This was good because at least I had an opportunity to meet my peers. Also, it was good to hear what they liked about my work, what they found helpful and what they did not see as good.

Doctoral, Student 7



Educator experiences supporting the use of comparison activities

Most importantly, however, is our experience that comparison activities, when appropriately deployed, can significantly increase the generation and use of internal feedback, enhance student learning, and support the development and improvement of learners’ ability to self-regulate and self-direct their learning. In our experience it is an effective way of supporting students to recognise and enact their agency for learning, and helps to address both resource constraints and overcome many of the other limitations of traditional feedback provision and practices in HE.

What is Compare and how is this different?

Click the title link to view the video or enter the URL:
<https://compare-trinity.weebly.com>



How do comparison processes support and aid learning?

STUDENT VOICE

Comparison is about discovering the similarities and differences between a number (typically two) of different items. Most individuals are not aware of the comparison processes they engage in because these processes often happen implicitly. Even when they are explicit (e.g., when students are asked to refer to assignment instructions after submitting a draft), these processes often operate without conscious awareness. Yet these comparison processes have a powerful impact on and are essential for learning. They have been shown to occur even in infants as young as three months old (Anderson et al., 2018). Simply comparing two things – even when the purpose of the comparison is not yet known, and even if the items themselves are not fully understood, helps to make the common underlying structure more visible and salient to learners (see Gentner, 2010). Such common structures or abstract relational patterns are particularly important for the transfer of learning to new and different contexts.

Fundamentally, all comparison activities help learners detect similarities and differences, generate insight, and develop new concrete and abstract knowledge (Gentner, 2010). Close or mundane comparison (Gentner, 2010), also referred to as figurative comparison (e.g., Gentner & Hoyos, 2017) or analytical comparison (e.g., Nicol, 2020), is based on relatively obvious characteristics and matches specific features of different referents, such as their concrete, clearly identifiable individual aspects or characteristics, to determine similarities and differences (see Tversky, 1977).

STUDENT VOICE

“ A knowledge of different approaches to the assignment... I have learnt that, even if the idea in question is different to yours, it is very helpful to review the ideas and thoughts of your peers in order to improve your own thinking or help to solidify your initial thoughts and approach; Ultimately the different viewpoints made me see the question in different lights and improved my report.

UG, Student 24



“ Have gained self-confidence; I found it overall to be a great experience; I gained an insight as to what is expected of me in this assignment. I was supported and motivated in writing sections of my assignment. Finally my writing was reviewed by my peers in a systematic and helpful way; I have gained a more thorough grasp of what has been asked of me. Practically using the guides that have been given to us made it more obvious what we need to do to achieve a high quality piece of work.

UG, Student 11



In contrast, analogical comparison, largely seen as crucial for the speed and adaptability of human learning (Gentner, 2010), is not just about matching readily available specific features of different referents, but about underlying, often abstract structural or relational patterns among their characteristics. Such comparison feeds the development of abstract and inferential knowledge that can more easily be deployed across settings, domains, and use contexts.

In this context it is important to point out that even though comparisons happen almost automatically, the learning outcomes can differ depending on how learners engage in this process. In other words, how learners process the material (e.g., engage with referents) matters for what they learn from given materials (see Alfieri et al., 2013; Gentner, Loewenstein & Thompson, 2003; Gentner & Hoyos, 2017). Even if the same items are presented close together in sequence but without instructions to compare or to identify commonalities, students are less likely to transfer the learning to future similar test examples (Loewenstein, Thompson & Gentner, 1999). Explicit instructions to compare make it far more likely that learners identify, retain and apply the abstract learning content derived from the referents that are considered. Similarly, asking learners to make the internal feedback they generate from comparison activities explicit adds significantly to the learning benefits they derive (Nicol, 2020). Combining this with steps that encourage learners to develop explanations further adds to their understanding and depth of learning from comparison (see Lombrozo, 2012; Siegler, 2002). It is therefore important to consider how comparison can best be deployed for maximum learning benefit in HE.

How can comparison processes be deployed in higher education?

Given how ubiquitous comparison is in learning, the task of deploying them is not one of introducing something entirely new to educational design. Comparisons are already present, albeit largely unrecognised and unacknowledged! Instead, the challenge for educators is *to increase the learning benefits that students can derive from comparison processes they engage in.*

To guide this approach, it is helpful to consider the three central elements involved in comparison processes. **First**, comparison activities always occur in relation to information that individuals already hold. In the context of HE, this means for example the knowledge that students have, or their current skill or performance level (as evidenced in prior work they may have completed or a performance or contribution they are making). The **second** element is the referent, or comparator, that this prior information is compared with. We will consider the range of possible comparators on page 9. The **third** is the explication of the internal feedback that is generated by the comparison. One of the key insights that emerges from the research in this area (see Nicol, 2020, for a review) is that to maximise the learning benefits from comparison, it is important for learners to make the inner feedback they generate from comparisons explicit or – in other words – to explicate and capture the insights they generate from comparisons. This is closely aligned to the value of

explanations for learning (see Lombrozo, 2012; Siegler, 2002), so prompts for explication can also highlight dimensions like explanation or justification of conclusions to further enhance the learning benefit of the comparison activity.

These three elements relate to three activities that are at the heart of fruitful comparisons that learners engage in (Nicol, 2020). They must:

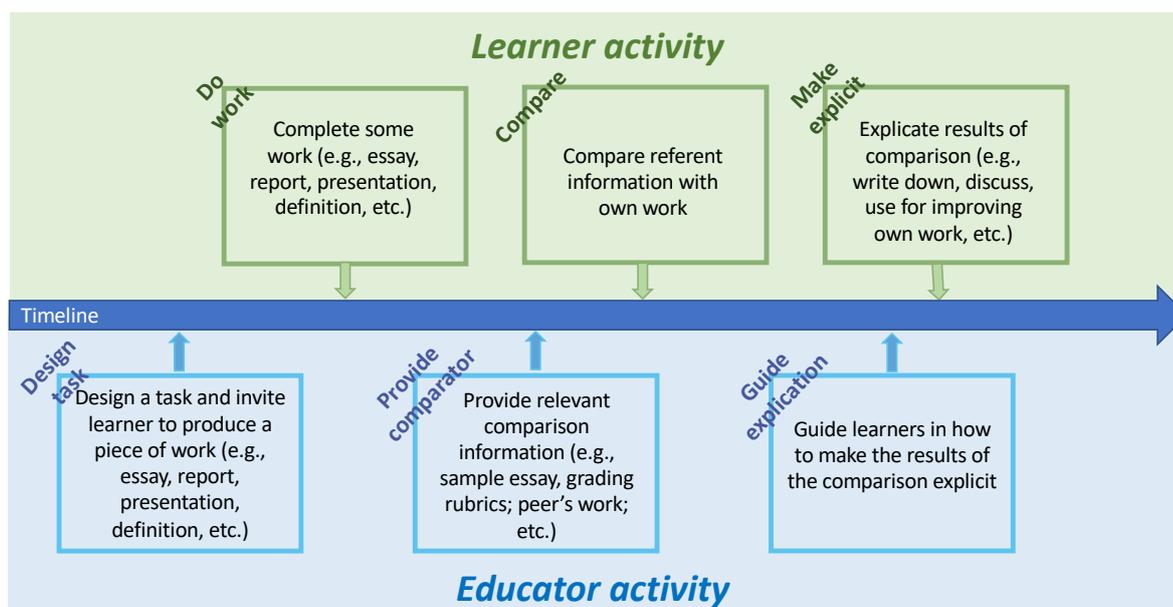
1. **do work** (i.e., express or become aware of what they know or are able to do),
2. **compare** this to a referent, and
3. **make explicit** the inner feedback (i.e., the insight) they generate through the comparison process.

Educators that want to help learners maximise the benefits they derive from such comparison processes therefore have three main opportunities to intervene. They can:

1. design the most appropriate tasks (**design task**),
2. provide relevant comparators or referents (**provide comparator**), and
3. guide learners in making their inner feedback explicit (**guide explication**).

Figure 1 provides an overview.

Figure 1: Learner and educator activities in effective deployment of comparison activities



Source:

Brady, Fellenz, MacMahon & Nicol (2020). *Increasing feedback in a manageable way: Leveraging internal feedback through deploying deliberate comparison processes.* Presented at the **Improving University Teaching (IUT) Annual Global Conference**, July 2020, Padua, Italy.

This explanation sounds initially quite abstract, so here are two examples taken from our work across a range of different modules and disciplines. The first is an example of in-class deployment of comparison in a low-stakes, non-assessed learning activity; the second reflects an integration of comparison activities as a non-assessed but required element of a graded individual assignment.



Example 1: Deploying comparison in a lecture environment.

Step 1 – do work. In a lecture, the lecturer asks students to think about their personal definition of a relevant concept, for example ‘motivation’, and to write it down.

Step 2 – compare. Then, the lecturer presents one or a number of alternative definitions – possibly taken from other students that agree to share their definition publicly, from a textbook, or from other sources, and invites the students to individually compare their own definition with these referents.

Step 3 – make explicit. Then, the lecturer asks each student to consider their personal definition after comparison and answer the following question, again in writing: “After reading and comparing your own with the other definition(s), what would you change about your own?”

Example 2: Deploying comparison as part of a graded individual assignment.

Step 1 – do work. As part of the assessed work in a module, students prepare and submit a draft of their written individual assignment (this can be an essay, a literature review, a reflective writing assignment, or other work).

Step 2 – compare. The educator sends each student two randomly selected drafts of the same assignment submitted by their peers. The students are instructed to read and consider each of these peer drafts and compare them to their own. Alternatively, instead of drafts submitted by other students, the referent could also be an exemplar prepared by the educator, or other relevant referent material.

Step 3 – make explicit. The students are asked to answer the following question in the form of a brief improvement plan after reading each of the other drafts (or exemplar): “After reading this draft (or exemplar) and comparing it with your own, what would you change about your own draft?”. These improvement plans may be weighted as summative assessment or submitted as an appendix to the the final draft.

STUDENT VOICE

“ It enabled me to objectively critique my work; Is of great benefits to me in all ways, I can’t comprehend the knowledge I have gained; it allowed me to see where everyone else was in terms of standards of work and it was reassuring; It provided an environment to review work with an objective to better each other’s work; Focused my attention in the right areas.

UG, Student 17



EDUCATOR VOICE

“ These compare activities contributes to creating a learning climate where students get to go deeper in their thinking through the intentional practice of comparison to achieve specific learning outcomes.



In both examples, students engage in the three steps (do work, compare, make explicit) which are central to the approach. These comparison activities can be further leveraged by integrating them into additional educational activities. For *Example 1 (lecture setting)*, after the comparison exercise is completed, students can be asked to break into buzz-groups and discuss their reactions to the comparison exercise, share their reactions and show the improvements to their own definitions. This can lead to further revisions after the students collaborate and consider, discuss and critique each other's personal definitions, and is further enhanced when students collectively develop and justify a shared definition.

STUDENT VOICE

“ I think it really taught me how to assess myself in a (better) way by stepping back. Also It really allowed me to understand how to provide good feedback which is constructive for (my) future leadership roles... The peer review process made me feel more at ease about the task in that the other's in my group had the same worries and difficulties with it. It also allowed a sharing of ideas. This process highlighted the usefulness of running ideas by others if unsure about certain aspects of a task.

PG, Student 26

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In *Example 2 (individual assignment)*, the comparison exercise includes *multiple sequential comparisons* as students consider each of the peer drafts individually and consider its implications of their own work before moving on to reading the next peer draft. Such multiple sequential comparisons increase the richness and power of the internal feedback generated (see Nichol, 2020). In this learning design, multiple comparisons can be followed by a peer-feedback exercise where the students are invited to write and submit to their peers brief feedback reports on each peer draft they have read. The students will benefit from both providing feedback on the drafts they have read, and from receiving peer feedback from other students on their own submitted draft that was used by other students first as a comparator and then for feedback provision. Overall, this order of multiple comparison, peer feedback provision, and peer feedback receipt scaffolds student learning and has proven to be a highly effective educational design.

It is useful to note that both examples actually involve additional comparisons. The lecture example involves dialogue among students, with the dialogue providing additional referents in the form of the views of the other student(s) in the buzz-group. Similarly, the feedback provided by peers also offers additional referents for learners to use in generating additional internal feedback.

There are many other opportunities to integrate comparison activities into advanced educational designs (see Jacobson et al., 2020, for an example that combines comparison with a productive failure [Kapur & Bielaczyc, 2012] learning design). The ease of integrating comparison into many educational processes and contexts allows for creative and innovative implementations in many settings. To aid this we first present a brief discussion on the range of referents that can be used for comparison activities, and then present more detailed real-life examples of how comparison activities have been deployed to support student learning in a range of disciplines and settings.



EDUCATOR VOICE

“ My aim is to get them ready for practice; all the content in the world doesn't do this. [Comparisons] is when true learning happens in group work because they are interacting and engaging, debating, and negotiating their way to agreed and shared outcomes and decisions!

”

Referents for comparison activities

There are many possible referents that can be deployed for comparison activities. The common educator-generated feedback comments on students' work is one such referent, but there are many others.

Drawing from the literature and from the range of practice cases included in this project, here is a non-exhaustive list of possible referents that can be used as comparison materials:

- Task instructions/briefing material
- Grading guidelines or rubrics
- Module readings
- Dialogue with peers
- Dialogue with educator
- Written or verbal peer feedback
- Written or verbal educator feedback
- Exemplars from the literature
- Sample answers or exemplars provided by the educator
- Observations of performances (live or on video)
- Case studies
- In-class discussion
- Expert accounts
- In-class debate contributions from peers
- Guest lecturer comments
- Online resources such as videos, blogs, wiki entries
- Student posts on discussion boards or contribution to class wikis
- Practitioner accounts (written, in class presentations, online videos, etc.)
- Etc.

As multiple sequential comparison enhances learning, it is useful to consider how learning designs can deploy multiple referents, combining appropriate mixtures of close and analogical comparisons, with referents of different types and different quality levels (see Nicol, 2020, for some suggestions). In this context the instructions provided to learners also need attention. Explicit invitations to compare are important, as are instructions to explicate the insights that are generated from the comparison (i.e., the inner feedback). This can be further enhanced by explicit invitations for students to explain their insights and with instructions to students to reflect on their learning process.



EDUCATOR VOICE

“ Using a range of referents allowed the students to viewed the module learning from different perspectives and then having to compare their views and opinions with others and with the lecturer meant that they to really and explicitly understand these. There was a depth of explication beyond what was expected.

”

An overview of the range of settings and practices that have informed this project

To explore comparison activities we identified academics who were already using these practices, documented our own and their relevant practices, interviewed all educators and some of the students involved to learn about their experiences. We also invited additional colleagues interested in applying comparison activities in their learning, and documented their experiences. Table 1 provides an overview of the range of settings in which comparison activities were deployed. The project benefitted from input from educational design work and implementation in 22 modules by 18 educators and involving over 2,100 students. Experiences from these applications have informed the development of the instruction and guidance provided within this document.

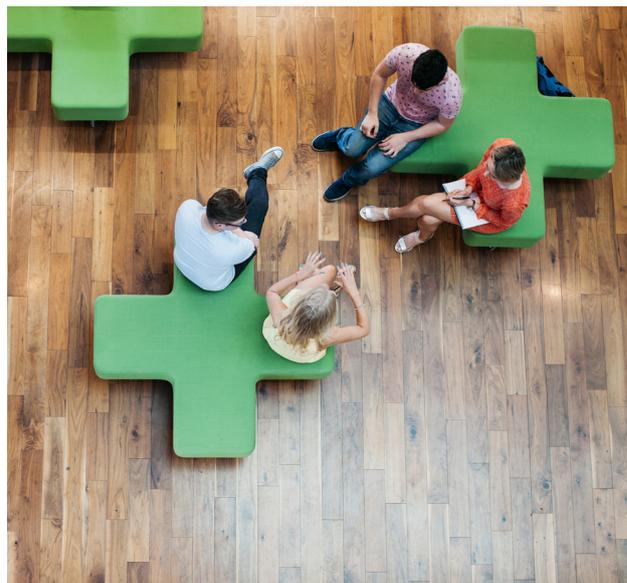


Figure 2

Student level	No. of modules	No. of students	No. of instructors	Disciplines	Implementation methodology: Comparison task examples
Undergraduate	11	1697	8	Business, Computer Science, Nursing & Midwifery, Pharmacy	Within class: buzz and breakout groups, whole-class Q&A, mini case studies; individual-group-class decision making; group/class level criteria and quality identification; computer lab group work Assignments: individual and group, computer coding, ethical dilemmas, applying theory, synthesising literature, problem solving case studies.
Postgraduate	7	362	6	Business, Pharmacy	Within class: ethical problem solving, establishing and recognising quality Assignment: individual/group application of theory; developing plans
Doctoral	1	19	1	Business	Within class and assignment: Individual/group review article analysis
Practitioners	3	68	3	Health services, Education	Within class: assessment design, improving online learner engagement Assignment: leadership development plans
Total:	22	2146	18		



Detailed examples of applying comparison processes

The following section details the deployment of comparison activities to support student learning drawn from six practice sites. These illustrative examples provide insights into how comparison-based educational practices can be designed, deployed and managed, and highlight the experiences of the educators during these processes.

The two practice cases are informed by applications of the same design in two large UG (in-person and online only - Case A) and four UG/PG (both UG and PG modules were delivered in person pre-Covid and online thereafter - Case B) modules, respectively. Both cases feature ambitious educational designs that integrate and deploy comparison activities throughout the module. Case A includes a four-wave trial and submission sequence of coding assignments where the comparison tasks helps prepare students for the submission of progressively more challenging graded programming assignment. Case B features a group project where group-project related comparison activities at the individual level feed into joint work towards the assessed group project. The group project in turn helps students prepare for a subsequent individual graded assignment. The practice sites selected for these case studies are:

Practice Case Study A: A 1st year UG computer science module with 170+ students where comparison activities were used repeatedly during four assessment tasks. Each comparison activity was deployed as part of a preparation coding task which helped students develop programming skills that were relevant for the subsequent completion and submission of graded programming work.

Practice Case Study B: Two PG modules with 68 and 72 students and two 3rd year UG business studies module with 180+ students where comparison activities were integrated as a central part of the assessment structure for these modules. The comparison activity provided significant self-generated feedback and guided student learning and the preparation of the final assessed submissions.

Practice Case Study A: Computer Science – UG (1st year with 170+ students)

Overview

A computer science ‘Introduction to Computing’ module for approx. 170+ first year students (first iterations face to face and online delivery for the second iteration) used a multi-part programming assignments with some aspects graded and others non-graded. Each assignment consisted of two exercises over two consecutive weeks, an introductory practice opportunity (“Part A” in week 1, not graded) and a follow-on summative assessment exercise (“Part B” in week 2, graded). This sequence was repeated four times over a total of eight weeks. For each of the two-week segments, students received instructions for Part A. After completing and submitting their Part A assignment, students were provided with a referent and instructed to compare the referent with their own submission in order to identify key features of an effective program (e.g., functionality, efficiency, structure, readability, use of language features). The referent used was, for alternate assignments, either (a) an educator-provided rubric or (b) the submission of one of their peers to the same task. They were instructed to record what changes they would make to their own work to improve it after reviewing it against the referent material. In the case of peer work, they were also asked to provide peer feedback by specifying what changes they recommend to their peer to improve their work. After completing the comparison and submitting their record of the improvement options they identified in their own work (internal feedback), they received the instructions for the graded submission (Part B) where they could apply the learning from Part A and from the comparison activity.

Managing comparison activities

The educator used Blackboard and Google docs to effectively manage the process. After completing the comparison activity and after uploading their internal feedback, student received the task instructions for Part B through Blackboard’s adaptive release feature. Google docs were used to share peer feedback.

Practice Case Study A

STUDENT VOICE

Educator experiences

The educator reported that the set-up of the comparison activities required **the investment of significant amount of effort and time**.

After evaluating the student submissions, the educator commented on the **educational benefits of the comparison activities**. In his analysis they supported student learning of important learning outcomes in several ways by helping them to:

- learn fundamental concepts and to correct basic misconceptions.
- recognise the importance of thoroughly testing programs and identifying “edge cases”
- appreciating code quality, readability, maintainability and documentation as important skills for software developers
- understanding the factors that influence performance of programs, often requiring a deeper understanding of subject matter and higher-order learning

In addition, the educator found **evidence of critical thinking** in the student responses to the comparison tasks. He added that the comparisons activities were **a useful approach for students** in that they were effective in *“getting them to engage in different ways, having them reach out and be open to having their work critiqued, and getting and giving feedback”*.

Guidance and practical suggestions

Based on the experience of implementing a complex set of comparison tasks as part of a four-wave, online delivered assessment process, the educator identified the following guidance and practical suggestions for future design and implementation efforts:

- Spend more time on describing and explaining the comparison process to students before they start. Thoroughly briefing students on the comparison activities in class (see Powerpoint slides with instructions (hyperlink)) and explaining their logic and benefits will help students understand this worthwhile learning activity and will increase their engagement with the process. The more clarity and understanding they have, the more they can benefit from this learning design. Make the students partners in learning!
- Provide clear information on all relevant deadlines in an easy-to-use format (in-class and on Blackboard/VLE), and remind students repeatedly of upcoming tasks and deadlines.
- If peer work is used as a referent and peer feedback is used, make sure that there are firm deadlines so that

“ I learned to reflect on my work, which I think is definitely beneficial as it can be too easy to move on and not look back on what could be done better; Learned how to work with others; I have gained better insights into how difficult it is to review others work leading me to detailing my own work a lot better and making it much more legible; Better analysis and critical thinking skills; Ability to reflect and learn about the problems we are tasked with solving even after I have my solution completed.

UG, Student 28

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all students submit on time. Ungraded but mandatory submission (with penalties for late submission) are a useful option to assure on-time submission without increasing grading workload.

- Use the adaptive release function on Blackboard/your VLE which is useful as it allows the process to be largely automated. In addition, students who finish tasks early receive the instructions for Part B earlier so they can get started.
- Simplify the process – in this design, after each Part A submission, simply distribute a random sample of peer submissions and a rubric so that students have different referents for the comparison.
- For the first application of this process do not over-complicate the design so that opportunities for process improvements based on student and lecturer experiences can be availed of.
- Students benefit from multiple referents of different types and, if peer work is included as a referent, of varying quality.
- If the students are sharing their work for peer feedback use an excel sheet to direct which students share or which groups share so they can manage the process themselves. If this is handled in the context of groupwork it can be helpful to institute a group communicator who manages and supervises this. Sharing instructions can also be set up on Blackboard/your VLE but that requires some skill (see Blackboard Sharing and similar functions).
- Conduct a post-comparison debriefing in class and use specific questions on student experiences with the comparison activities to elicit useful feedback for evaluation and improvement.

Practice Case Study B: Business Studies – PG (two modules 68 and 75 Masters in Marketing students) and UG (two modules 175 and 181 – 3rd year students)

Overview

Comparison was trialled across two business studies modules one at Post Graduate (68 students) and one at UG (with 185 third year students) and trialled twice once face to face and once with online delivery only. All modules used the comparison activities as a core part of the assessed work for both group and individual. The innovative design of this comparison used the joint group work as an opportunity for individual students to build skills and knowledge that they could subsequently apply in both their group and their individual assignments. The comparison activities were employed at both individual and group levels.

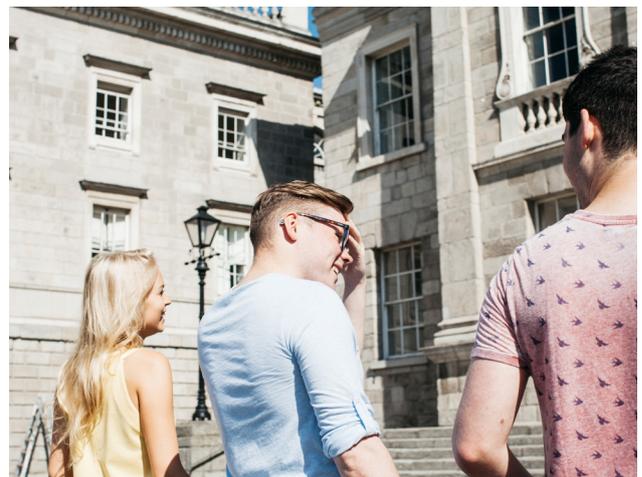
Student groups were asked to prepare a draft of their group project for week 5 of the term. These drafts were shared with two other groups. Each member of the group was asked to individually compare the two received drafts with their own group's submitted draft and, after reading and comparing, to identify and write down improvement ideas (200 words minimum) for their own group's draft. These written individual improvement ideas were uploaded to Blackboard by a specified deadline as a mandatory component but not graded. After this deadline, the groups were instructed to meet online and share their individual improvement plans with their group members and discuss and agree on a shared way to further develop and complete their group projects. This group improvement document had to be uploaded to Blackboard again as mandatory but not graded. The groups were also asked to provide – as a group – written feedback for each of the two other groups that had sent their drafts to the group. This feedback had to contain an appreciation of each draft's strengths, and a brief set of improvement suggestions.

The referents used in this comparisons design were the draft submissions of two other groups, the task instructions and grading guidelines (rubrics) provided to the students about the group project by the educator, and the in-group dialogue generated in integrating individual improvement ideas and during the joint feedback provision to other groups.

The group project had to be submitted by week 8 of the 12-week term, incorporating all module content up to week six of term. After submission of the group project students started on a similar individual assignment incorporating all module content, so the learning from the group project informed their subsequent individual work.

Managing comparison activities

The educator used Blackboard and email to manage the process. The educator posted an excel spreadsheet that indicated to each group the recipients for their draft. All groups had a group communicator nominated who was in charge of making sure that all emails went out on time and to the right recipients. All emails were copied to the educator to assure an audit trail of timely submissions. Student were also instructed to upload all group and individual submissions to Blackboard which provided the educator with easy access to all student work.



EDUCATOR VOICE

“ The more instruction and explanation - briefing and debriefing - the students received the more they understood their role and their responsibility and took ownership for their and their group's learning. Student thanked me for putting the energy into this and for managing this process. They noted that they wished all lecturers did this!

”

Practice Case Study B

Educator experiences

The educator reported that the set-up of the comparison activities required **the investment of a significant amount of effort and time**, about two days to design and set up the comparison activities and a further two days' work to manage the comparison process within term.

The innovative approach of using comparison activities at the group level can generate anxiety among students. Some **students took issue with their work being shared**, and in response the educator allowed individual groups to opt-out of the comparisons process. Only one group of the sixteen groups chose this, and the feedback from most group members after they had talked to other groups and individuals was that they regretted this decision, and they would have preferred to participate as they felt they had missed out on a valuable learning experience. Indicating from the beginning that the comparison was a required part of the module assessment could have led to a different outcome but also knowing that your work will be shared can also change how students perceive their work and the sharing aspect.

As a practical benefit the educator reported that the frequent questions and requests for clarification about the group and individual assignment, she had received in previous years were almost completely absent. The comparison activity and the arising in-group discussions apparently helped students clarify the nature of the assignment and the requirements so that, in a marked contrast to previous years, virtually **no additional educator clarification to these assignments was requested**.

After evaluating the student submissions, the educator commented on the **educational benefits of the comparison activities**. In her analysis they supported student learning of important learning outcomes in several ways by helping them to:

- Improve and understand the framing and structure of the group and the individual assignment
- Recognise the need to deploy module content in the assignments and explore different methods of doing that
- The standard of the group assignments and of the individual assignment submissions was higher than in past years
- Engage with the theories and concepts earlier and multiple times during the term – in some cases three times as the same content was needed for each version of the assignment but at a higher level of comprehension

- The linkages between and the dependency on previous module content was developed clearly and at more depth with each iteration of the assignment
- Combining checklists and grading rubrics with peer work exemplars provided an increased comparison variety and allowed the students to evaluate their work from a variety of angles and perspectives
- Designing and implementing comparison chains of iterative tasks of increasing complexity ensured that the students engaged throughout the module

Numerous students commented on the **benefit of the individual comparison activity for the subsequent quality of the group work**. One student commented that he *had never taken part in a group project where every single group member had been as prepared, focused and willing to share improvement ideas with the group as in this module*.

Guidance and practical suggestions

Based on the experience of implementing an individual level comparison task that informed a group project and also incorporated integration of individual improvement plans for a joint group project, and group to group peer feedback, all in an online delivered module, the educator identified the following guidance and practical suggestions for future design and implementation efforts:

- Spend more time on initial descriptions of the process, and fully explain and justify the use of the comparison activities within class. The clearer the initial instructions are and the more students understand their own role in this, the more they can take ownership of the learning process arising from comparisons.
- Repeat these instructions closer to the first deliverables to ensure that students are both engaged and understand the requirements and the benefits of this self-regulated learning approach.
- Automate the process as much as possible– using email generates an enormous amount of additional email traffic for educators so always have a student group communicator and only allow group emails from this student group communicator but with all group members cc'd.
- Use the Blackboard (or other VLE) functionality as this helps to manage the process more efficiently but requires additional start-up investment in time and skill-building.

- With clear deadlines that are communicated in class and online, students are well able to manage their progress. All students submitted all requirements on time with one class reminder email each time.
- The use of ungraded but mandatory submission (with penalties for late submission) are a useful option to assure on-time submission without increasing grading workload.
- Where anxieties around this process exist, provide additional explanation and offer skill-building sessions for students who feel they lack the skill to provide or receive and integrate peer feedback.
- Given the online delivery of the module due to Covid-19 restrictions, the added group meetings helped the project groups to structure and pursue their work. It added valuable structure to the group task and aided team development.
- This process allowed the quiet students in group work to share their ideas and for all group members to see and hear the ideas of the other group members. This was perceived by students as a great addition.
- The scaffolding of the group to the individual assignment meant that students were very familiar with the format for the individual assignment and could use their time and energy on really grappling with the issues and showcasing their engagement and understanding, synthesis and evaluation of the module content without any concerns in relation to the assignment criteria.
- Initial set up of the group member details is critical. Send them an excel template which include their ID, name and emails and also their nominated team communicator. The group team communicators were posted to Blackboard and this allowed the educator to easily update that with the sharing instructions. Group A share with Group B and C. Group B share with group C and D etc – see group sharing material within the online resources guide.
- This process worked equally well online as face to face though a greater understanding of the issues and options for students to discuss concerns face to face was valuable. The use of a student response system for online students provided the educator with ongoing insight into any issues and allowed for these to be managed within the term.
- Finally be prepared for the change in your own workload and also to flag this change to students, especially if they are not used to within term engagement. The rewards for this process are multiple, particularly in student learning but there is an effort needed.

“ As with all new processes there were some minor issues but once you see the benefits you will stick with this. There is a different dynamic within the class and a different understanding of their learning and how to develop same. Remember student’s do this all the time we are just managing it to ensure it occurs at the right time and that all students get to experience it’.

”

Conclusion

Our experience with this project, and the feedback we have received from the participating educators and students about their experiences with comparison activities, fully support our initial expectations that the use of comparison activities to support student learning offers significant benefits. At the lower threshold of difficulty or ambition, such activities can be easily and beneficially implemented in many settings, both formal and informal. Given the impressive research evidence for the importance of comparison for learning, all that is required is to ensure that students receive explicit instructions to compare relevant referents, and the resulting learning is further enhanced by guidance in explicating the insights that learners generate from comparisons.

At a more advanced level, we have been able to work with colleagues who implemented comparison activities centrally in highly innovative and ambitious learning designs. The individual steps identified above, the supporting materials we developed in collaboration with many participating educators and with the benefit of student feedback, and the experiences shared by our colleagues and students have been enormously helpful in making these implementations successful.

We designed this guide to provide information and additional material to support the application of comparison activities to support student learning. We hope that it is of help to all those interested in supporting learners in a wide variety of settings and in developing students that confidently and successfully self-regulate and self-direct their learning.

Resource Guide

What does the teaching intervention of comparison look like in practice? An academics perspective



*Click the title link to view the video or enter the URL:
www.teachingandlearning.ie/project/empowering-student-learning-using-comparison-and-feedback-as-drivers-of-self-directed-learning/*

What do students need to know to be able to engage with comparison work within your module? The student perspective



*Click the title link to view the video or enter the URL:
<https://compare-trinity.weebly.com>*

A case study of comparison Trinity Business School



*Click the title link to view the video or enter the URL:
<https://compare-trinity.weebly.com>*

A case study of comparison School of Computer Science and Statistics



*Click the title link to view the video or enter the URL:
<https://compare-trinity.weebly.com>*

A powerpoint presentation to explain Compare to students – the more explanation and insight provided to the students the better.



*Click the title link to view the video or enter the URL:
<https://compare-trinity.weebly.com>*

Online Resources



**Detailed Instructions
Templates to support implementation.**

Sample instruction emails

Briefing guide

Debriefing guide

Sample group sharing and individual sharing excel file

Powerpoint slides to support student understanding of the comparison concept and their role.

*Click the title link to view the resource or enter the URL:
<https://compare-trinity.weebly.com>*

Biographies



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Mairead Brady is Associate Professor of Marketing at the Trinity Business School, Trinity College Dublin and is the Director of their Joint Honours degrees in Computer Science and Law. She completed her PhD at the University of Strathclyde into the challenges of technological adoption within managerial practices. Her research and teaching focuses on the intraorganizational challenges for marketing managers and the adoption of digital technologies. She is a co-author on the leading Marketing Management (2019) text, with Philip Kotler, Kevin Keller, Malcolm Goodman and Torben Hansen. She developed a Marketing Planning simulation with Pearson Education. She is co-editor on ‘The Future of Management Education, Routledge 2021 and co-editor on a special issue on the impact of the pandemic on interactive marketing practice (2021). She is chair elect for 2024 for the Management Education and Development Division of the American Academy of Management and is their current PDW chair. She has more than 100 refereed journal articles, book chapters and conference papers. These include the Journal of Business and Industrial Marketing, Psychology and Marketing, International Journal of Technology Marketing, British Journal of Educational Technology, Services Industries Journal, Journal of Marketing Management, and Management Decision.



Michelle MacMahon is a Research Fellow with Trinity College Dublin where she works on the COMPARE project. Separately, she is an Adjunct Assistant Professor with Trinity Business School where she lectures on undergraduate and graduate programmes. Michelle also provides professional coaching on balancing social and analytical intelligence to employees in many of the world’s largest organizations. Michelle completed her doctoral degree at Trinity Business School and received her master’s degree from Dublin City University. Her research interests include the organizational climate for learning, individual and group level behaviours such as feedback literacy and dialogue, and team processes.

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