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Encouraging the flip with a gamified process

Jackie Hammill [a,1,*], Thinh Nguyen [b,2], Fiona Henderson [c,3]

[a] First Year College, Victoria University, Melbourne, Ballarat Rd, Footscray VIC 3011, Australia
[b] First Year College, Victoria University, Melbourne, Australia
[c] College of Arts and Education, Victoria University, Melbourne, Australia

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ABSTRACT

The current university student population mainly consists of students born between the years 1995 – 2012. This cohort has grown up in a world of technological stimulation and many expect their learning and teaching environment to reflect this (Chaudhuri, 2020). In response to this shift in student expectation there has been an increased focus on flipped learning where classrooms provide active learning activities to engage students. This article investigated student motivation and engagement in an active-learning, flipped classroom which implemented elements of gamification while supporting students' psychological needs of autonomy, relatedness and connection. A mixed-methods approach utilising student perception surveys and focus groups was used to assess student motivation and engagement. The data revealed a significant number of students were motivated and engaged in the learning process throughout the course. Students commented positively on the variety of gamification techniques used to enhance engagement. Students indicated their writing, presentation and comprehension improved throughout the course. In addition to focusing on non-technical gamification elements, the learning and teaching process included chunking pre and in-class materials which may have assisted with student engagement and comprehension. It is concluded the learning and teaching approach implemented contributes to motivating and engaging our current GenZ students in the learning and teaching process.

Introduction

Generation Z or GenZ, are those born between 1995 and 2010 and are currently the main student cohort in higher education (HE) institutions (Turner, 2015). GenZ has grown up in the world of technology and constant stimulation. They prefer to read smaller chunks of information through news feeds, tweets, videos and short texts (Twenge, 2017). This presents challenges in the HE sector where students are expected to utilise lengthy scholarly resources such as peer reviewed journal articles and academic texts, yet potentially these contribute to cognitive overload and decreased retention of content (Humphries & Clark, 2021). Cognitive load theory suggests limiting students' cognitive load to enhance engagement (Mulqueeny et al., 2015).

In academic terms, chunking refers to reorganising large amounts of information into smaller segments, regardless of its format, to help students manage cognitive load (Gobet et al., 2001). Humphries and Clark (2021) investigated student preference to chunked or didactic lecture material with 1268 second- and third-year university students in 2016 and 2017, finding a preference for chunked lectures. In Humphries and Clark's study, the chunked lectures were blocked into segments of three-to-14 min videos which students accessed online.

Chunking has been shown to improve retention of content as students are able to more easily store, retrieve and connect chunked information (Humphries & Clark, 2021). Chunking information supports Lerchenfeldt et al. (2020) recommendation that HE classrooms embed academic skills in the curriculum to develop students' research, reading

* Corresponding author.
E-mail address: Jackie.hammill@vu.edu.au (J. Hammill).

[1] Her research focuses on the development of higher education students to be future community leaders. Current research investigates active learning approaches to enhance student engagement.

[2] Thinh Nguyen has worked in the University sector for 23 year and lectures in the areas of physics, engineering, and project management Thinh's current research interests include technology-enhanced learning, problem-based learning, gamification and student mindsets. Thinh has received a number of learning and teaching awards including a national citation, a Victoria University Award for Excellence in Learning & Teaching and twice voted Lecturer of the Year at Victoria University.

[3] Fiona Henderson has worked for 25 years in the university sector, principally in the field of Academic Language and Learning pedagogy. She has received several national grants for research and innovative teaching related to Academic Literacies and Academic Integrity, a national citation in 2007, a Victoria University College Award in 2011 and Victoria University Vice-Chancellor's Awards for Excellence in Programs that Enhance Learning in 2015 and 2016. Her main research focuses on internationalisation of the curriculum with Malaysian, Vietnamese, Thai and Chinese partners.

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and writing abilities. They also suggest providing a flexible classroom environment that provides content online, real-time feedback and active learning activities that develop academic skills. This study incorporates the chunking strategy in the learning and teaching process, whilst concurrently implementing the theoretical concepts of active learning, self-determination and gamification which aim to enhance student engagement and develop academic skills.

Active learning

Active learning methods encourage student participation in classroom activities rather than traditional passive transference of knowledge (Cochran, 2015). Active learning research attests that participation in active learning activities enhances engagement (Kuh et al., 2006) and promotes higher-order thinking processes (Cochran, 2015; Kressler & Kressler, 2020). When students research, synthesise and then creatively apply their findings to their real-life experiences they are actively engaging in higher-order thought processes. The process assists to engage students while building confidence and academic skills (Kressler & Kressler, 2020) through collaborative learning activities such as creating artifacts, undertaking research, problem-solving, and presentations (Freeman et al., 2014). Active learning environments often use a flipped approach to support learning and teaching (Bishop & Verleger, 2013).

The flipped classroom

Flipping the classroom is one way to create an active learning environment. In a flipped classroom, students are expected to view online resources such as readings, videos and lecture material prior to attending class thus in class they can participate in active learning activities (Bishop & Verleger, 2013). In class apply theory to their experiences and communicate their understanding of the content through tasks such as creating artifacts and giving presentations (Reyna, 2015). The flipped classroom concept is not new (Musallam, 2011) but technology has made the process easier and more flexible for students as they can access course content through their learning management system (LMS).

For GenZ students providing a flipped environment means they have more autonomy over how, when and where they access course materials. In addition, chunking information helps reduce cognitive load. Unfortunately, the flipped approach is not always successful, mainly because students do not always regulate their learning and fail to complete pre-class tasks, meaning, they are not able to effectively engage in active learning activities within the classroom (Hao, 2016; Rivera, 2015; Tomas et al., 2019). Rivera (2015) countered this challenge by linking a pre-class task to an assessment and found this contributed to students engaging in the material. Although some research indicates pre-class tasks should not be assessed as they can decrease internal motivation (Ryan & Deci, 2000), Talbert (2021) suggests if assessing a pre-class task, make the assessment low-stakes to support competence, engagement and ongoing motivation.

Self-determination

Flipped classroom environments promote students' development of self-determination needs (Sergis et al., 2018). Self-determination theory (SDT) posits that innately, individuals are motivated to grow and develop when their three psychological needs of autonomy, competence and relatedness are actualised (Ryan & Deci, 2000). A flipped classroom approach can enhance the elements of SDT (Sergis et al., 2018) through the integration of intrinsic motivation strategies in the curriculum. For example, autonomy can be supported through group activities (Sergis et al., 2018) and providing students with the ability to express their creativity and make choices around what and how things happen in the class (Niemiec & Ryan, 2009). Niemiec and Ryan (2009) also state that students' sense of competence is supported when they feel they have the skills required to complete the course through supportive feedback and tasks that are challenging but achievable. Chunking assists in breaking down tasks and information into manageable workloads that assist with student progression, thus adding to their sense of achievement.

Connectedness, the third aspect of SDT, is achieved when students feel that others in the class like, value and respect them (Rigby & Ryan, 2018). Feeling connected with others enhances the likelihood that students will accept and value the teaching and learning practices within the class. When the SDT elements of autonomy, competence and connectedness, are integrated into classroom processes students tend to be more internally motivated to engage in classroom activities (Niemiec & Ryan, 2009).

Gamification

Active learning strategies, SDT and gamification concepts aim to promote student motivation and engagement (Kapp, 2013; Sailer & Sailer, 2020). Deterding et al. (2011) define gamification as the implementation of game elements in a non-game environment. Gamification incorporates active learning activities that enhance student learning (Deterding et al., 2011). The most common elements used to motivate students in higher education are points, badges and/or leaderboards (PBLs) through technology. Ekici (2021) undertook a review of empirical research on the use of gamification in a flipped class between 2010 and 2019; their search uncovered 22 articles, 18 in HE. Over half of the 18 studies in HE used Kahoot, Socrative or Quizziz as the game element. Similarly, Majuri, Koivisto, & Hamari, 2018 carried out a literature review that identified 128 empirical studies using gamification in education, which showed the main gamification elements were PBLs. Werbach and Hunter (2012) argue this is because they are easy to implement in the absence of a dedicated gamification platform.

Although the majority of gamification applications in higher education utilise technology and/or PBL to motivate students, gamification can be incorporated into the teaching and learning process, without using software (Deterding et al., 2011). Langendahl et al. (2016) explored three case studies and mapped the teaching practices to gamification principles. They demonstrated how gamified principles can be incorporated into the curriculum, without the use of software or PBLs. Their analysis focused on learning and teaching processes and used end-of-course student-teacher feedback to assess engagement. Huotari and Hamai (2017) also recommend that gamification be thought of as a process by incorporating motivating - gamified elements into the curriculum. Langendahl et al. identify four gamified elements used to engage and motivate HE students; feedback, progression, narrative and challenge. This study focuses on three of these four, namely feedback, narrative and challenge, to enhance engagement in an active learning environment.

Feedback

In a game situation, in order to motivate players to continue to engage, designers consider several feedback elements; the type, timing, how feedback is presented and characteristics of the players (Johnson et al., 2017). These considerations are necessary in the HE classroom as well. Henderson et al. (2019) describe feedback being effective in HE when students access, analyse and implement it to improve academically. How, when and what form of feedback is included in a classroom situation varies and what works in one context may not work in another (Henderson et al., 2019). Regardless of whether students are working independently or in groups to complete a task, feedback can, in addition to developing students' confidence (Slezak et al., 2019), be used to encourage, challenge, advise and guide students in their academic progression (Langendahl et al., 2016). Additionally, Henderson et al. (2019) highlight how feedback is most effective when it is understandable, timely and targeted.

Narrative

Narration is used in most games to enhance motivation and engage players through fantasy and suspense (Mott et al., 1999). In a classroom environment, narrative can be used to assist students to identify connections between concepts (Langendahl et al., 2016) which, similar to real games, can provide a playful experience (Deterding et al., 2011). Narrative provides students with the opportunity to be part of the classroom dialogue and contribute to the development of knowledge and understanding (Langendahl et al., 2016). Actively participating in the dialogue assists to engage and motivate students, especially when they link the content to their lived experiences (Kapp, 2012). Narrative is not commonly used in HE gamified classrooms but has been shown to enhance motivation and engagement (Clark & Rossiter, 2008).

Challenge

Games typically motivate players by creating challenging tasks for them to complete while progressively increasing the difficulty of the task (Langendahl et al., 2016). Fredricks et al. (2004) argue that engagement is higher in classrooms that provide a supportive, challenging environment that allows students a sense of autonomy. Providing tasks that are challenging can intrinsically motivate students, especially when students understand the relevance of the tasks to their personal lives (Deci & Ryan, 2016). However, students may be demotivated and refuse to engage in tasks if they feel the tasks threaten their psychological needs of autonomy, competence and relatedness (Assor, 2016). Autonomous-supportive learning environments that provide students an opportunity to collaborate on challenging tasks enhance task engagement and support students' psychological needs of autonomy, competence and relatedness (Assor, 2016; Deci & Ryan, 2016).

Although the number of studies combining gamification principles in a flipped classroom is increasing, there is limited research into applying a gamification process to a flipped environment to enhance student engagement. This study fills this gap by investigating a teaching and learning process that encourages students, in a first-year business course, to complete 'flipped' activities prior to arriving in class in order to support an active learning environment. It maps three gamification elements, in a non-technical application, that Langendahl et al. (2016) identified as being prominent in higher education to motivate and engage. Results are analysed with qualitative and quantitative data from student surveys and focus group comments to assess students' motivation and engagement in the learning and teaching process. In addition, the study embeds the strategy of chunking to decrease cognitive load and assist students to develop academic skills such as researching, writing and presenting.

Materials

Participants

The study took place in an Australian university that transformed its course delivery format in 2018. Rather than the traditional 12-week delivery format where students complete four courses simultaneously, first-year courses were 'blocked'. Each course was delivered sequentially, for four weeks. Students attended classes three days a week for three hours each day. Student numbers were capped at 38 students per class to support an active learning environment.

Part of the rationale for this transformational change was to support student motivation and engagement through an active learning and teaching process. As part of the active learning process, classes were flipped and content was available to students on the LMS. Students had set pre-class and post-class tasks to complete prior to and following each class. The dataset consisted of 36 students studying a compulsory first-year marketing course, ten females and 26 males ranging in age from 18 to 33, with all but five under the age of 25. The primary researcher was the class instructor. The study was approved by the University's Human Ethics Committee and written consent received from participants.

Surveys

In the final week of the course students were surveyed and asked to comment on their self-perceptions of the feedback provided, the presentation process and their level of motivation and engagement during the unit. Participants were asked to respond either yes or no in response to the questions pertaining to the gamified - active learning process. A 10-point Likert scale, from 1 = not at all, to 10 = very much, was used to assess students' motivation and engagement in the course. The scale showed good internal reliability consistency with Cronbach's alpha = 0.92 for the current sample (Pavot et al., 1991). Data were collected via paper-based surveys which were completed in-class. All responses were anonymous.

Focus groups

A focus group was conducted on the last day of the course in a comfortable meeting room close to the participants' class. Five students participated in the focus group which was conducted by the study's secondary researchers to decrease bias. Participants were provided with juice and a snack. The focus group was digitally recorded and transcribed within 48-hours by the primary researcher.

Procedures

The study utilised a mixed methods approach to assess student motivation and engagement throughout the course. Scaffolding literature describes "academic practice in terms of learning cycles" which support students in their academic tasks. An adapted version of Rose (2018, p.3) active learning cycle, used in this study is outlined in Fig. 1. The cycle begins with a pre-class task, then outlines the 5 stages in the presentation process. Both the pre-class task and presentation process fed into summative assessments.

Pre-class

The active learning cycle (see Fig. 1) started before class when students were instructed to access, via the LMS, a chunked video clip or reading that related to content for the following class. After completing the task students wrote a 200-word summary of the material. Students were allocated a pre-class activity group. Everyone in the same group accessed the same video/reading and each group's content focused on a different aspect of the content needed in-class. The pre-class group was different to the in-class presentation group, so the individual students in-class groups had access to different pre-class content. Each group was provided with a prompt indicating what they needed to focus on for their summary writing. Prior to coming to class, students were required to watch/read their task and upload the writing summary to the LMS. Students had the autonomy to choose what aspects of their video/reading they felt would best fulfil the requirements of the task. Feedback was provided within eight-hours of students posting their written summary. In addition, students who were identified as not making changes according to the written feedback were asked, in class, if they were reading their feedback and if they had any questions about the feedback. The summary writing contributed to 30% of students' final grade, with each summary worth three marks. There were general rules and instructions that students needed to follow in order to get full marks for their summary writing. These were:

- Prior to classes 2–11 you will access a short pre-class video/ reading task from your assigned group folder on the LMS.
- First, read the summary instructions so you are aware of what you need to focus on when completing your task. Decide what elements

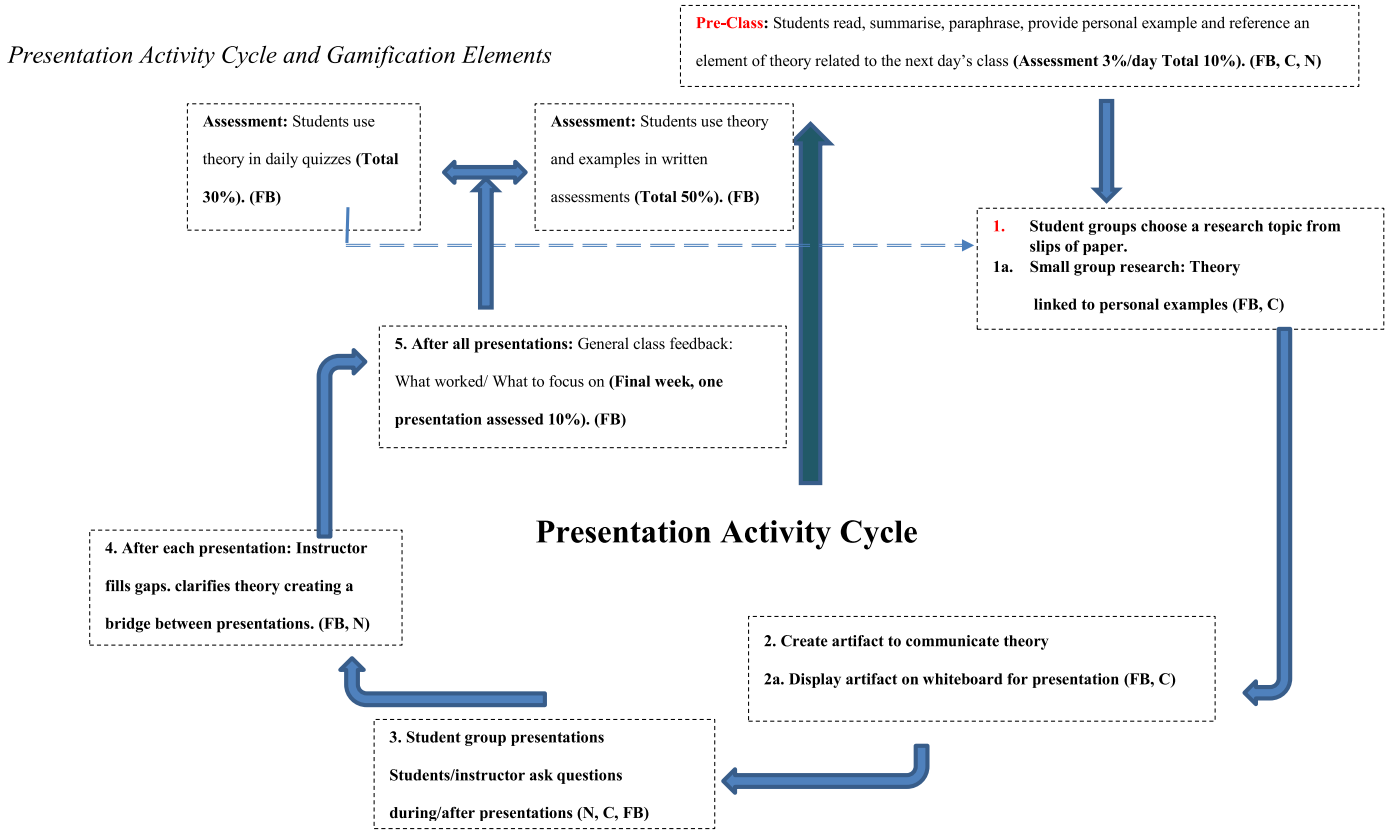

Fig. 1. Presentation activity cycle and gamification elements.

of the video/reading you will include in your written summary. After completing your video/reading you need to post a written summary on the discussion forum.
  - Using your own words, your summary should be approximately 200 words
  - Reference in-text and at the end of your summary
  - Use personal examples to support the theory
- The written summaries contribute 30% (3 points for each summary) to your final results.
- You need to upload your written summary to the LMS prior to attending class in order to get marks for your writing.
- After you post your summary on the LMS you will be able to read what other students have posted.
- Please read other student's posts as they will help you in your learning and understanding of the topic. You can use concepts and ideas from the summary writings in-class and in your final written assessment.
- The summary writing discussion forum will close when class begins for that topic.

The summary writing activity required students to engage in several higher-order academic skills such as analysing, paraphrasing, referencing, synthesising and writing. Any of these may present a challenge for students. However, chunking the material aimed to decrease students' cognitive load while the repetition of the task allowed students to develop their academic skills and the feedback which was timely and personalised allowed them to focus and improve their skills. The main gamification elements drawn on in this task were feedback and challenge.

In-class

The in-class aspect of the activity cycle involved student groups researching content and providing a mini-presentation, approximately 7 min each, to other groups. The overarching class activities were developed to encourage several sub-skills essential for academic success; (1) reading and researching a section of chunked material from the textbook, (2) whiteboard presentations which encouraged creativity through the creation of artefacts, (3) demonstration of understanding course content through the application of personal examples to theory; and (4) active listening skills during student presentations.

The learning and teaching process provided an environment for groups to autonomously work together, with assistance from the instructor when required. As with the pre-class task, material was chunked so cognitive load was decreased as students did not need to read the complete chapter. Student groups were encouraged to link personal examples to theory and present their findings to classmates. The process supported students' ability to read, analyse and comprehend theoretical concepts. The instructor endeavoured to create an autonomous-supportive classroom environment to facilitate student motivation and engagement. The following is a summary of the five steps in the presentation cycle (see Fig. 1). Each of the five steps in the presentation cycle supported the development of the SDT elements of autonomy, competency and connectedness.

Step 1. The focus for step one was to get students reading theory from their textbook and applying the theory to their personal context. Each in-class group, which remained constant throughout the course, chose a slip of paper relating to a section of the day's theory. The slips were numbered, with one being the initial topic to be discussed and

Table 1
Mapping of presentation Cycle, gamification and SDT elements.

Activity Cycle	Gamification Element(s)	SDT Psychological Element(s)
Pre-class summary writing	Feedback: focused written feedback within eight-hours and the opportunity to discuss feedback in-class. Challenge: the challenge could be related to reading, analysis, synthesis, evaluation, application, referencing.	Autonomy: working individually students chose what aspects of theory they would use to support the focus for the task. Competency: the task assisted students to understand the content better through the process
Stage 1 Research	Challenge: challenge examples include; reading theory, analysing theory, selecting relevant aspects, putting ideas in their own words. Narrative: students were encouraged to use the theory and examples to tell a story in their own words that their peers would understand. Feedback: real-time feedback during the process as required.	Autonomy: students choose the slip of paper and in table groups decided what aspects of theory to use and what personal examples would best support the theory. Competency: through the process students read and applied theory to their personal lives in order to communicate the relevant ideas to other students. If they experienced difficulty, the instructor was able to assist and provided relevant feedback. Connectedness: students worked in group, supporting each other and providing different skill-sets to achieve the task.
Stage 2 Student groups create an artefact to communicate theory	Challenge: possible challenges include, being creative, evaluating theory and applying it to a visual artefact. Feedback: feedback provided during the process when required.	Autonomy: students chose how to present information and communicate it to their peers. Competency: through the process students read and applied theory to their personal lives in order to communicate the relevant ideas to other students. If they experienced difficulty, the instructor was able to assist and provided relevant feedback. Connectedness: students worked in group, supporting each other and providing different skill-sets to achieve the task.
Step 3 & 4 Presentations & questions	Narrative: students were encouraged to tell a story with the theory, examples and artefact. Challenge: presentation challenges can include; verbal and non-verbal elements of presentations, communicating effectively to peers. Feedback: students are provided with feedback from peers and the instructor.	Autonomy: students decided who would do which aspects of the presentation. Competency: students develop the ability to communicate information in their own words. Through teaching others their learning is enhanced. Connectedness: students worked in group, supporting each other and providing different skill-sets to achieve the task.
Step 5 General class feedback	Feedback: encouraged reflection to consider changes for the following class presentation.	Competency: feedback assisted with students learning and understanding of the skill-sent required in presentations. Connectedness & Autonomy: groups discussed the feedback given throughout class and together decided what they felt was relevant to use for the next class.

numbers increasing in the order the content needed to be presented. Each group nominated one person to choose a slip from an envelope. If a group wanted to swap their topic with another group, they could do so but this was negotiated directly between groups. Each topic on a slip of paper was linked to an aspect of theory from the textbook for that day's class. Students read the section of their textbook that related to their topic. They identified what content was most relevant for their topic then linked theoretical concepts to either personal examples (preferable) or an example from the textbook.

Step 2. The aim for step two was to encourage the development of SDT elements autonomy, competency and connectedness and enhance creativity and enhance presentation skills through a mini-presentation (approximately 7 min). Groups, working autonomously, created visual artifacts which they displayed on the whiteboard; they were encouraged to be creative in their artifacts. As students were researching and creating their artifacts the instructor went to each table to assist students, if required, and provide feedback when needed. Students delivered presentations in chronological order, based on the number on their slip of paper.

Step 3. The objective of step three was to encourage class discussion through active listening, to strengthen comprehension of the content. Both the instructor and students asked questions or made comments during the presentations. This encouraged a sense of connectedness between student groups and the content and created lively discussions.

Step 4. After each presentation the instructor clarified theory or provided examples that needed further explanation or development.

Step 5. Step five provided an opportunity for reflection on the mini-presentations. After all presentations were completed, students were provided with general feedback on what worked well and areas to think about for the next class. Students were encouraged to consider their presentations that day and how they might change them for the next class.

The presentation cycle incorporated gamification elements of feedback, challenge and narrative that supported SDT of students feeling autonomous, a sense of achievement, competence and connectedness. Table 1 maps the presentation cycle, gamification and SDT elements.

Results

This study used student in-class surveys and focus group comments to measure the effectiveness of the gamification elements on their course motivation and engagement. The pre-class activity was measured through student perceptions of the feedback provided. The results are discussed through analysis of the data in the pre-class summary writing task, the presentation activity cycle and class survey on student motivation and engagement. P values significance are reported at $P < 0.05$.

Pre-class summary writing

In the final week of the course, student perceptions were surveyed anonymously in terms of the pre-class summary writing activity. They were asked to indicate yes or no in response to the questions 'was receiving fast feedback on your writing motivating/useful' and 'did the feedback assist you to improve your writing'?

When students were asked what they found engaging about the course, responses reflected on the delivery mode and process. In regard to the summary writing delivery one student reflected "I found the way

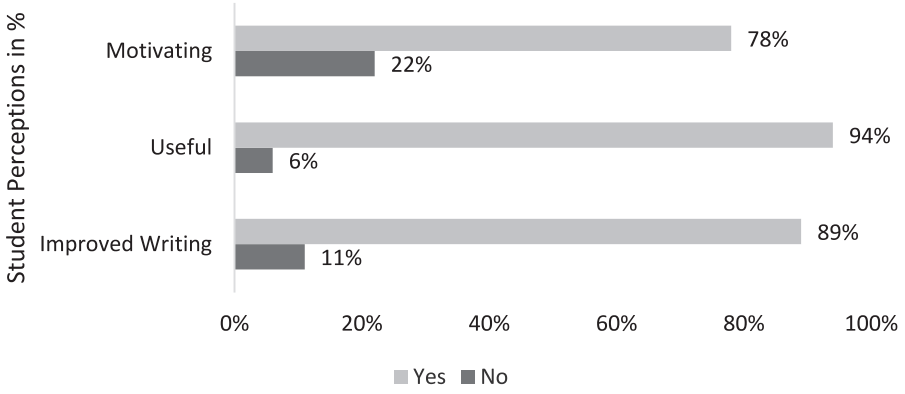

Fig. 2. Student perceptions of summary writing feedback ($n = 36$).

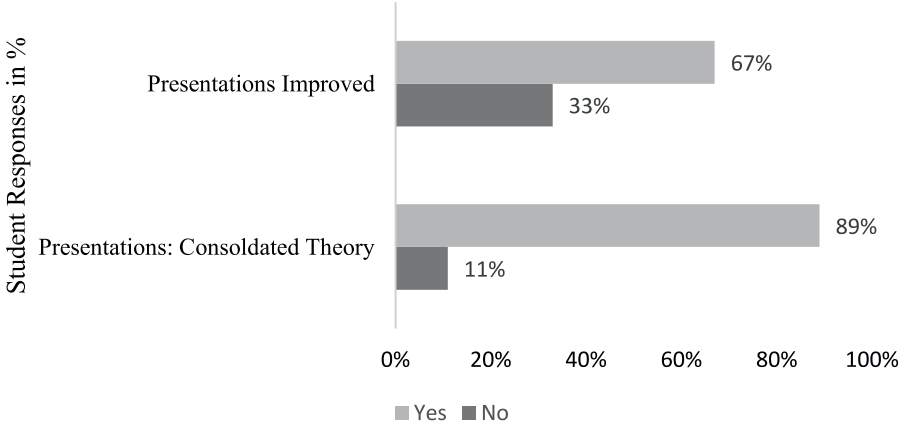

Fig. 3. Student perceptions of presentation process ($n = 36$).

it was taught engaging; this course was different to others throughout the year. You had to do readings the night before and she [the instructor] would go around to the groups and ask questions like 'what is one thing that you learned from the readings'; it was engaging in that sense." Fig. 2 shows students' perceptions when asked if the feedback was useful, motivating and if it helped their writing improve.

To assess any significance in student perceptions of the summary writing feedback, the mean scores of feedback elements were analysed using chi-square. All aspects of feedback were significant ($p < 0.05$) indicating most students found the feedback motivating, useful, and helped improve their writing. Cohen (1988) indicated the effect size for the feedback being motivating was medium ($w = 0.3$) and large in regard to feedback being useful and improved writing ($w = 0.8$).

Student responses on the feedback provided indicated a clear link was made between addressing the feedback and improvement in writing. Students commented "if you read the feedback, and put it in place it improved your mark" and "with my feedback, I was getting the formatting wrong and so I addressed this and then in the last five summaries I was getting top marks." Another student reflected "I was very impressed with the feedback; it was very helpful with improving my structure which previously I lacked". These responses suggest the students' academic writing competence increased as a result of the feedback.

In-class presentation process

Students were asked to comment on their perceptions of the in-class presentations. Students responded yes or no to the questions "did the process assist to improve your presentations" and "did the presentation process enable you to consolidate the theory by applying it to your personal life?" Fig. 3 outlines student responses in percentages.

To assess any significance in student perceptions of the presentation process, the mean scores of student responses were analysed using chi-square. There were significantly more students who indicated their presentations improved and the presentation process assisted them to consolidate theory into their assessments χ^2 (1, $N = 36$) = 21.78, $p = 0.001$. Cohen's w indicated the effect size for the feedback assisting to improve presentations was medium ($w = 0.3$) and large for students' ability to consolidate theory from the process ($w = 0.8$).

Part of the learning and teaching process involved daily mini-presentations. Students were asked to reflect on delivering mini-presentations in every class. Responses focused on how they assisted students to stay focused "I think by getting us to do those little presentations in class you have to be more present in class because if you are not present you get caught out in the presentation" and "it makes you more engaged in the classes and what you are learning, it gives you that increased awareness to try and focus". Another student's response reflected the importance of personalising the theory "what motivated me was making the work relevant". Others reflected on the importance of learning through doing "you learn it because you have to present it" and "I was engaged with having to present every day we got focused on what we had to learn. I understand something more through discussion rather than reading so the presentations were useful".

Other comments by students pertained to the learning activities, cognitive load, engagement and class interaction which linked to SDT elements autonomy and connectedness. One student said "I liked the activities they were fun; they were engaging and got our brains paying attention and switching on" and "you can present in your own way, a few groups have done role plays and stuff so that made it fun" and another "the course was quite creative and I was able to engage and enjoy what I was learning rather than sitting through theory driven lectures, it helped that each group was given small parts of the theory to focus on, I didn't feel overwhelmed with information". In terms of class interaction "I really liked working with others in class and the inclusiveness in groups and class" another commenting "I enjoyed the positive attitudes from class members and the instructor". These comments indicate

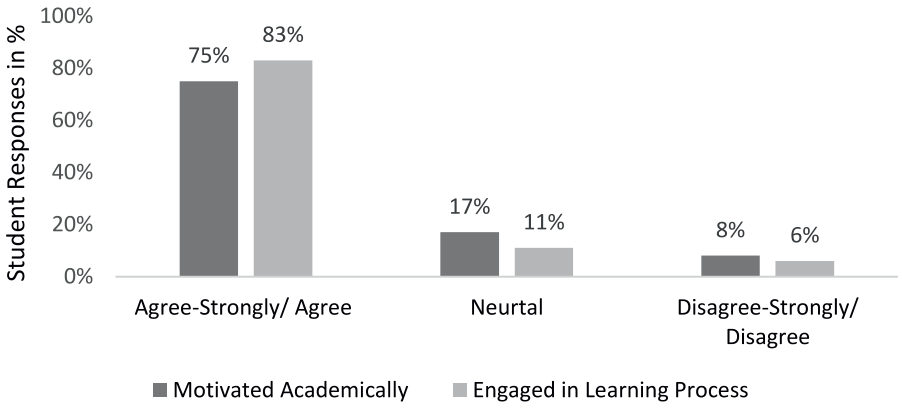

Fig. 4. Student perceptions of course: Motiavtion & engagement (n = 36).

that students' academic skills were improving through the presentation process which they found fun, creative and challenging.

Student perception of course

At the end of the course, students were asked to indicate 'to what extent the unit made them feel motivated academically' and 'engaged in the learning process' (see Fig. 4).

Student motivation and engagement perceptions of the unit were assessed using chi-square. Data indicate there were significantly more students who were motivated academically χ^2 (2, N = 36) = 28.500, p = 0.001, and engaged in the learning process χ^2 (2, N = 36) = 40.667, p = 0.001. Cohen's w indicated the effect sizes were large for motivated academically (w = 0.8) and engagement in the learning process (w = 1.2). This data supports the qualitative data provided above which saw students using adjectives that relate to gamification such as fun, creative, challenging and different, to describe the course. Students also refer to having autonomy when completing tasks, being challenged and feeling a sense of connectedness in the process.

Discussion

Utilising a flipped class approach, this study wove elements of gamification into the curriculum to engage and motivate first-year undergraduates. Data from student perception surveys reveal a significant number of students were motivated academically and engaged in the learning process throughout the course. Results suggest the learning and teaching process, which encouraged SDT elements, integrated active-learning methods, and gamification elements, contributed to students' motivation and engagement. Active learning strategies are foundations of gamification and aim to support student motivation and engagement (Kapp, 2013). Students commented that the teaching method was engaging as it was different to others throughout the year. Moffett (2015) recommends variety in the learning and teaching process to enhance engagement, this variety may be particularly significant for GenZ students who are used to a high level of stimulation (Chaudhuri, 2020). The remainder of the discussion maps gamification elements onto aspects of the active learning cycle's learning and teaching activities which supported literature surrounding chunking strategies and SDT. It supports research that indicates the learning and teaching process can be gamified without the use of software (Deterding et al., 2011; Langendahl et al., 2016).

Active-learning cycle

Both the pre-class task and the presentation cycle utilised the feedback and challenge elements of gamification. The presentation cycle also supported the narrative aspect of gamification. These three gamification principles are discussed individually.

Feedback

Data indicate students found the feedback provided in the pre-class task and during the presentation cycle to be significant in terms of motivation and usefulness. The pre-class activity required students to work individually to analyse a video or reading and writing a short summary. When undertaking autonomous tasks, it is important to provide feedback in order for students to feel confident in the correctness of their answer (Slezak et al., 2019). As with previous research (Cho & Cho, 2014), we suggest that decreasing cognitive load by chunking the pre-class activity along with the rapid and personalised feedback on the LMS contributed to their motivation and engagement during the course. Students indicated that their writing improved as a result of the focused feedback.

Often in HE feedback is general and delayed, decreasing its usefulness and possibly demotivating students (Anderson, 2020). Provision of immediate feedback was not possible with the pre-class activity due to the nature of writing task. However, significant results were seen in students' motivation and perceptions of increased writing competence, which supports previous research that when students are rewarded with feedback and grades soon after task completion, it contributes to students' intrinsic motivation (Woolley & Fishbach, 2017). This study supports previous theory that ongoing, constructive, timely, clear and specific feedback leads to student motivation and engagement in the learning process (Henderson et al., 2019; Kressler, 2020). Although the HE environment does not always provide for immediate or even timely feedback, instructors need to re-think the learning and teaching process to ensure that feedback is timely, focused and understandable.

Narrative

This study utilised narrative throughout the delivery process of each class. Students were encouraged to use the content they were researching, personal examples and artifacts to 'tell a story' that would clearly communicate their message. Between group presentations, the instructor linked aspects of content to provide connections between presentations.

The use of narrative as a process is difficult to analyse. Students were not explicitly told this was a gamified process being used in the class and they accepted the narrative element as 'this is how we do things in this class'. In saying this, students found the presentation process fun, motivating and engaging. Results show that a significant number of students felt their comprehension of theory and presentation skills improved as a result of the process. This course did not use elements of technology to gamify the course, and when technology is not used, narration is commonly achieved through case studies (Langendahl et al., 2016). The results indicate that the use of narrative in the teaching and learning process to make the content personally relevant, which is uncommon in the gamification literature, has the potential to motivate and engage supporting postulations from previous research (Deterding et al., 2011;

Langendahl et al., 2016). Although not analysed, it is suggested that breaking down tasks into manageable chunks and allowing students to work autonomously in small groups assisted with positive student feeling of connectedness and task achievement.

Challenge

The pre and in-class tasks required student to utilise academic and work-related skills such as researching, evaluating and synthesising. As GenZ students may have different perspectives of academic expectations which may differ from university norms the academic skills required in task completion may be challenging (Lerchenfeldt et al., 2020; Rose, 2018). Therefore, the process of chunking the material into manageable sections should decrease students' cognitive load and assist with task completion and engagement. Students who feel they have the ability to successfully complete tasks are more engaged in the learning process (Kahu & Nelson, 2018).

A significant number of students identified that the process adopted in the course allowed them to better integrate theory and practice and as a result their writing and presentations improved. Growing up in a technologically-stimulating environment may present different challenges to GenZ students at university, than challenges experienced by other generations. In order to aid learning through successful task completion, it is recommended that tasks are not made easier but chunked to decrease cognitive load to support the development of academic skills.

Conclusions

This study investigated the use of the non-technical gamification elements of feedback, narrative and challenge, in an active learning-flipped classroom environment to engage students. The combination these elements, in combination with chunking strategies in the learning and teaching process, resulted in students feeling significantly motivated academically and engaged during the course while simultaneously developing writing and presentation skills. This study builds on research that gamification can be used as an approach to learning and teaching without the use of software.

The study's findings have limitations in terms of generalisation in regard to the small sample size and the duration of the course. Further studies on larger student populations and traditional 12-week semesters would strengthen and confirm the findings. However, we believe the results have implications for curriculum design. The study encourages instructors, HE facilities and curriculum developers to reflect on how engaging the classroom environments are. Many instructors would argue their learning and teaching practices currently utilise the gamification elements discussed in this study, so, to an extent the study demystifies the concept of gamification in higher education. However, we challenge instructors to honestly reflect if their teaching practice actively supports students' need for autonomy, competence and connectedness in order to engage their learners. HE faculties need to consider their student cohort. GenZ students have matured in a world of stimulation and are accustomed to access information in short chunks rather than lengthy scholarly articles. This study highlighted that through adapting the learning and teaching process these students can improve their academic skills and have fun in the classroom.

The authors recommend that curriculum is evaluated across the degree, rather than in terms of discrete courses vying to provide variety. Findings support this as students commented that one reason the course was engaging was that it differed from other courses. Curriculum developers need to consider how each course is delivered, thinking about, in addition to relevant content, aspects of the learning and teaching process that can be implemented, such as chunking material, to support academic skill development. Developing curriculum across a discipline with a focus on both content and process takes a significant time investment on behalf of the HE sector. However, as our external technological environment changes so must our learning and teaching practices to support the learning outcomes of future generations.

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