# Chapter 11
# Students' Emotional Reactions to Social Comparison via a Learner Dashboard


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## 1 Introduction

The context for this chapter is a growing policy agenda that is focussed on addressing student well-being amid a rise in reported student mental health (Thorley, 2017; Universities UK, 2020). Concomitantly learning analytics is a burgeoning area of development with increased attention being given to the opportunities that the increased availability of data can and should have on higher education. However, it has been noted that learning analytics policies have not, as yet, addressed the well-being agenda (Ahern, 2020).

Well-being is a complex term which is easier to describe than to define (Dodge et al., 2012). Aspects which contribute to well-being include autonomy; environmental mastery; positive relationships with others; purpose in life; realisation of potential; and self-acceptance (Dodge et al., 2012). The focus for this chapter is students' emotions and motivations which are central components of managing well-being, as they are linked to a sense of purpose and to managing self-acceptance. The significance of emotions and motivation is not just in terms of well-being but also in terms of the role that they play self-regulated learning in which control of negative emotions (such as anxiety and boredom) promotes positive self-regulated learning (Shields, 2015; You & Kang, 2014).

The chapter focusses on students' responses to seeing data about their study behaviours (such as the number of books taken from the library, attendance on campus) and attainment presented via a student dashboard. Studies of students' responses to other sorts of feedback have identified a strong emotional component which includes both positive emotions including pride, confidence, motivation, and

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enjoyment alongside a range of emotions that are negatively linked to learning including anxiety, fear of failure, and thereat to self-esteem (Shields, 2015).

The power of learning analytics is that this data can be captured and manipulated at scale, which enables students to have new ways of seeing information about themselves presented in graphical form. In particular this chapter focusses on how dashboards enable students to see their performance compared to other students: that is, it allows for social comparison. The use of student dashboards is an emergent practice and a growing area of research interest, and the application of social comparisons within the field of learning analytics and its impact on student well-being is an under-researched area (Jivet et al., 2020). The chapter addresses this gap through a small-scale empirical study. The study sets out to better understand how students respond to seeing their learning data presented on a student-facing dashboard and to answer the following questions:

- How are students' emotions and hence identity affected by accessing a student dashboard?
- How are visualisations of social comparison experienced by a range of students from across a cohort?
- How is students' motivation affected by accessing a student dashboard?

## 2 Social Comparison Theory and Student Identity

In this chapter we apply social comparison theory to understand student identity. Social comparison is a sociopsychological process identified by Festinger (1954) based on observations of people's behaviour. Festinger's social comparison theory relates to the 'process of thinking about information about one or more other people in relation to the self' (Wood, 1996), and in the absence of this process of self-comparison, Festinger suggested that a person's opinions are unstable (Festinger, 1954, p.119). A key feature of self-comparison is the notion of the frame of reference, which means those who are used as the reference for the comparison process. Upward comparison occurs when the comparison with someone whose abilities or status are perceived as better, and the converse is known as downward comparison. A meta-analysis identified that when given a choice, the dominant frame of reference was upward comparison; however, this generally results in disappointment and feelings of self-deflation (Gerber et al., 2018).

Social comparison has been widely recognised within psychology studies (Gerber et al., 2018) and also applied to a range of sociological studies (Margolis & Dust, 2019; Schneider & Schupp, 2014). It has also been applied to educational contexts to understand how pupils' self-concept is influenced by their perception of the standing of the school that they attend, as well as their perception of their position within a class (Trautwein et al., 2009; Rogers et al., 1978). Trautwein et al. (2009) conclude that there is compelling evidence that "students actively seek out information about their own standing and the standing of their class and integrate that information into their academic selfconcepts." (p.864). Hence these studies suggest that social comparison data may well be useful part of supporting a student's identity development.

The chapter draws on the notion of student identity which is made up of dispositions and personal history. In doing so we take a sociocultural view of students and their

learning (Wenger, 1998) and note that identity formation is a dynamic process that is developed from and shaped by engagement with educational practices (Tett, 2014; Turner & Tobbell, 2018). We refer to identity work, a term used to describe the personal project associated with managing one's sense of self (Bhatt & de Roock, 2014), which consists of self-concept and self-esteem, and of managing one's emotional world.

## 3 Visualisations of Social Comparison

With the advancement of digital technology, it is now possible to provide students with social comparison data, and this can be achieved in a systematic way through the adoption of student-facing dashboards. There are a range of ways that social comparison can be achieved including rank order, cohort comparison, and comparison to a particular group. These are considered in turn and are shown in Fig. 11.1a

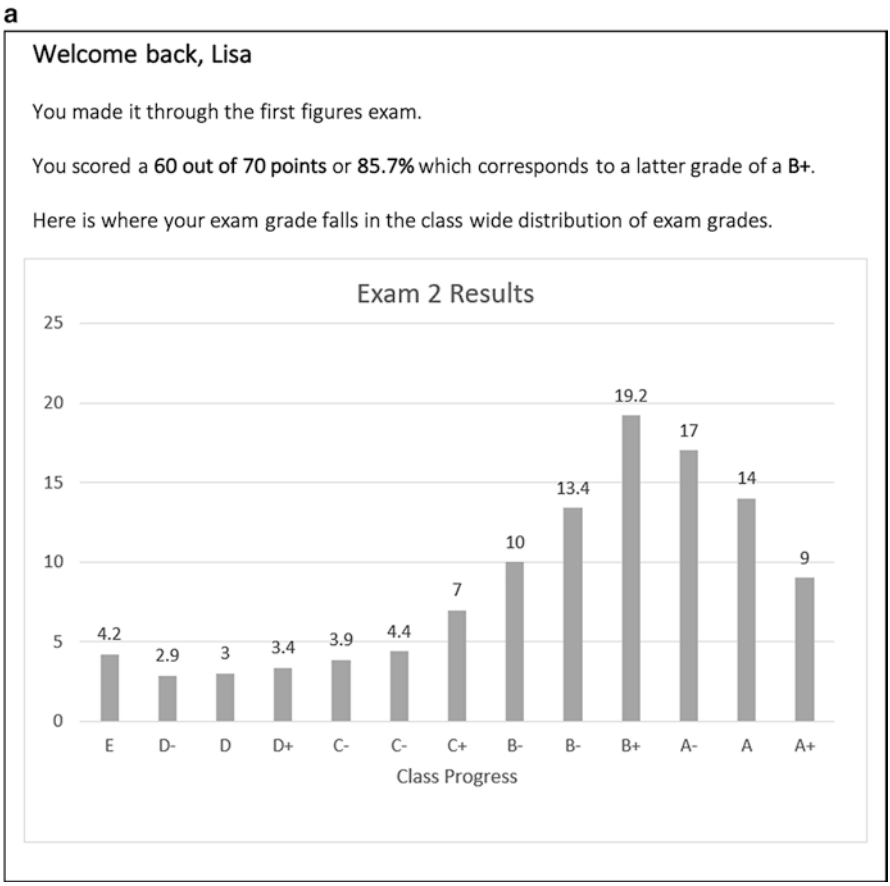
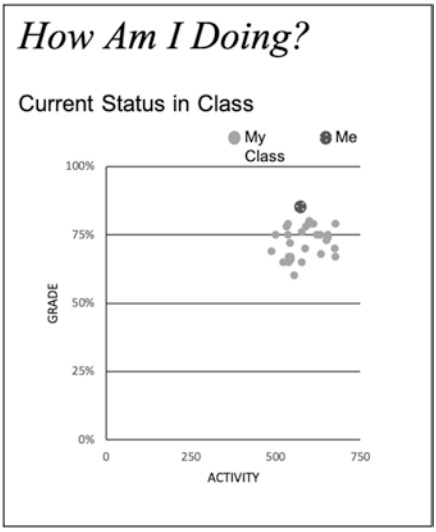



**Fig. 11.1** a–e Different forms of social comparison. (**a**) Bar chart showing individual performance in rank order. (**b**) Table showing comparing individual performance to cohort average, (**c**) Scatter diagram showing cohort comparison. (**d**) Leader board showing ranking and badges gained. (**e**) Radar diagram showing key performance indicators compared to the cohort average

b

| Metric | Your Data (Week X) | Class Average (Week X) | Observations |
|---|---|---|---|
| Range of Participation | ***5 days*** | 6 days | |
| # of sessions | ***7*** | 14 | |
| Average session length | ***34 min*** | 50 min | |
| % of sessions with posts | ***70%*** | 51% | |
| # of posts made | ***9*** | 11 | |
| Average post length | ***151 words*** | 130 words | |
| % of posts read | ***83%*** | 90% | |
| # of reviews of own posts | ***24*** | 15 | |
| # of reviews of others' posts | ***9*** | 115 | |

c

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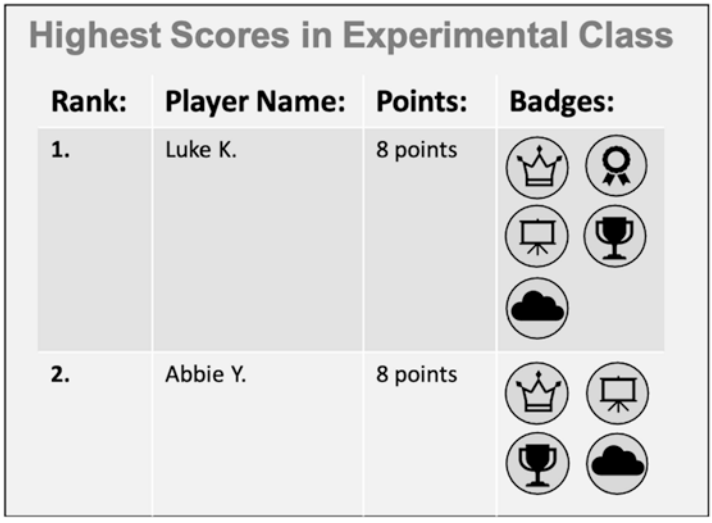


**Fig. 11.1** (continued)

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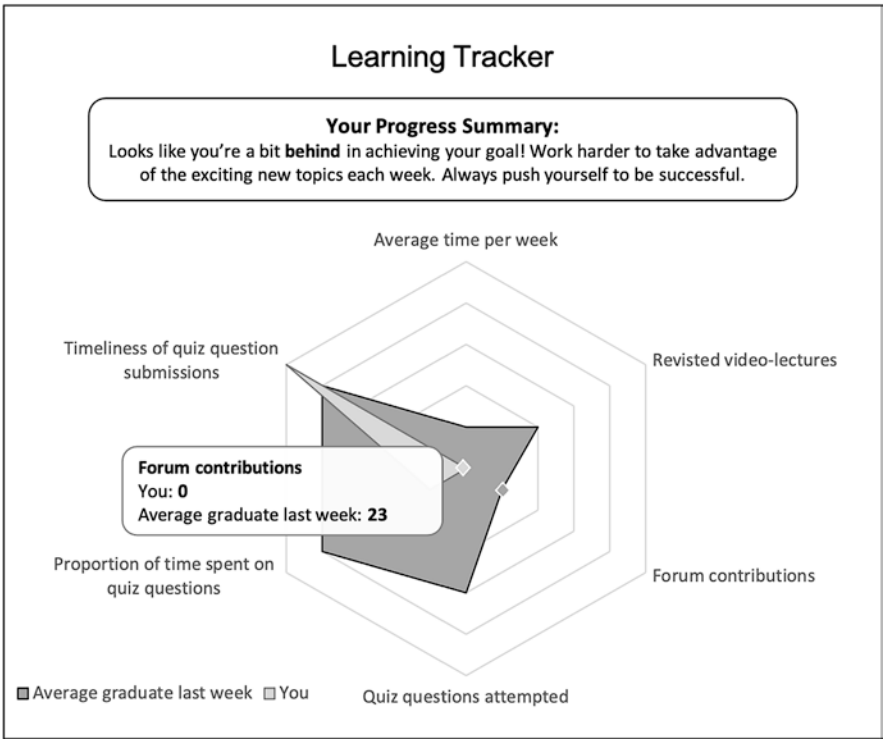



**Fig. 11.1** (continued)

to e. *Rank order* is where students are given details of where they stand in order within the cohort, e.g. 10th out of 180 which can be give numerically or visually (see Fig. 11.1a used by Teasley, 2017 and Smith, 2019). More frequently dashboards provided students with information about how they compare to the whole cohort, *cohort comparison* (Jivet et al., 2017). Figure 11.1b and c shows cohort comparisons (used by Wise et al., 2013 and Teasley, 2017). Alternatively, students can be compared to a particular group of students, for instance, those in at the top of the class. For instance, Davis et al. (2017) designed a student dashboard that compared learners to those who had been successful on the course in the previous year. Similarly, dashboards can use a 'leader board' by showing those students who are achieving highest in the group and hence allow students to compare their achievement to their high-performing peers (used by Krause et al., 2015; see Fig. 11.1e).

There is contradictory evidence of the impact of social comparison on students. Frequently there is concern for, and attention paid to, those who are the bottom of the cohort as to the impact of social comparison. Wise et al. (2013) identified that low performers were discouraged by social comparison; however, in direct contrast,

other studies found that social comparison was motivating, especially for low-performing students (Teasley, 2017). Whereas Tan et al. (2016) reported mixed motivational outcomes in students who were performing below the class average, for some the dashboard stimulated competition through 'healthy peer pressure', but for others these data were 'demoralising'. A study by Davis et al. (2017) offered some insight into the reasons for these differences when they concluded that it was those with higher levels of prior education accrued the benefits of the social comparison dashboard compared to their peers with less prior education. This is supported by Smith (2019) whose study focussed on high-attaining students (postgraduate doctors undertaking specialist training) and identified that social comparison was experienced as motivational by this particular cohort. An alternative hypothesis that was suggested by Gašević et al. (2015) is that the negative impact of comparison is experienced by students with low levels of self-efficacy rather than simply those who are the low attainers. Hence there is conflicting empirical evidence on the impact of social comparison on students' motivation to study, and this is the gap the study aims to address.

## 4 Methodology

The study was a small-scale qualitative study based on semi-structured interviews with 24 undergraduate students that aimed to understand how students interpreted and responded to feedback via a learner dashboard. We wanted to uncover the range of responses to various dashboard elements and the student dispositions that led to these responses to address the gap identified in the literature.

The dashboard was designed to display seven descriptive elements: Fig. 11.2 shows four of these elements, and Fig. 11.3 illustrates the other three elements. Note that the 'on-track' display (bottom left of Fig. 11.2) averages the marks that the student has received and this appears to be a form of prediction. However, it is not prediction in the sense of using machine learning and hence is classified as part of a descriptive dashboard. The elements of social comparison used in our dashboard were shown in the top right display on Fig. 11.2 which shows rank order, i.e. 9 out of 17, and on the bottom right display which shows the same information in a line graph format. Figure 11.3 element top right compares the student's engagement with the VLE against the cohort average.

The sample was final year undergraduate students within the Department of Education at a single case study UK higher education institution. The sample for the first round of interviews was self-selecting and consisted of 10 students from the cohort of 178. For the second round, the sample consisted of a nearly complete cohort (14 out of 16). The dashboard presented each student with their performance in a recent assignment. The students' attainment in this assignment ranged from 1st to 168th out of 178 in the first group and in the second from 1st to 16th in a cohort of 16 students. The dashboard displayed the degree classification that the student was on track to achieve, ranged from 51% (low 2:2) to 74% (1st) for the first round,

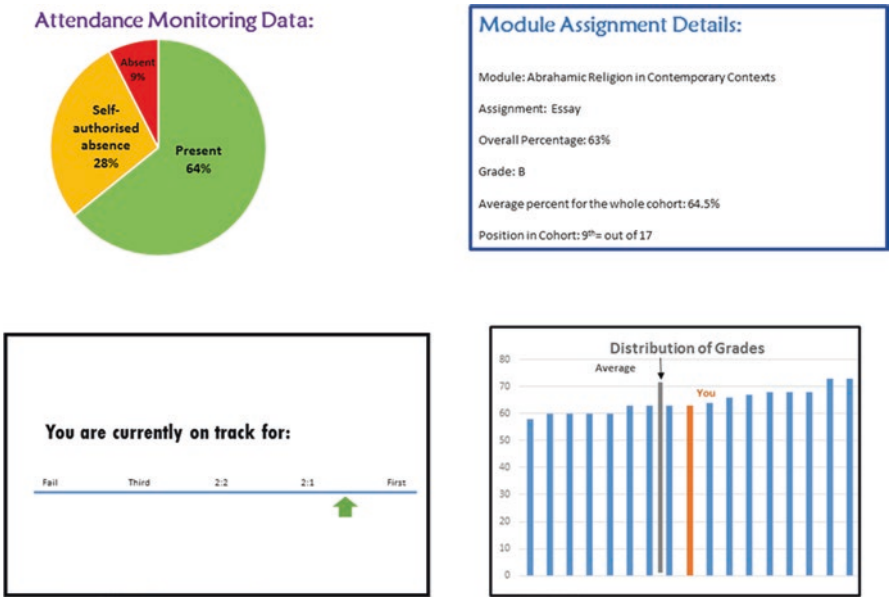
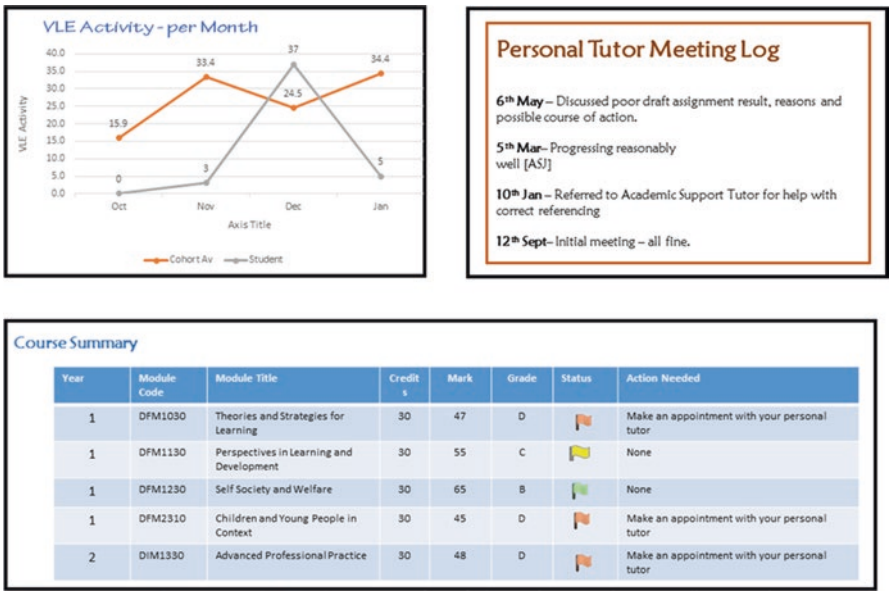



**Fig. 11.2** Four elements of the learner dashboard used in our study




| Year | Module Code | Module Title | Credits | Mark | Grade | Status | Action Needed |
|---|---|---|---|---|---|---|---|
| 1 | DFM1030 | Theories and Strategies for Learning | 30 | 47 | D | | Make an appointment with your personal tutor |
| 1 | DFM1130 | Perspectives in Learning and Development | 30 | 55 | C | | None |
| 1 | DFM1230 | Self Society and Welfare | 30 | 65 | B | | None |
| 1 | DFM2310 | Children and Young People in Context | 30 | 45 | D | | Make an appointment with your personal tutor |
| 2 | DIM1330 | Advanced Professional Practice | 30 | 48 | D | | Make an appointment with your personal tutor |

**Fig. 11.3** Three further elements of the student dashboard used in our study

and the range of participants in the second round was from 60% (border of 2:1 and 2:2) to 76% (1st). Slightly more students were doing worse in the assignment presented on the dashboard than their overall on-track score. Thus, the sample had the potential to uncover a range of emotional responses to the assignment data, not just being pleased that this assignment was bringing their average mark up or disappointment that it was lowering their mark.

This was the first time that the students had seen their data presented in this way, and the semi-structured interview, immediately after being presented with their dashboard, enabled them to gain clarification and reassurance about their interpretation of their data. This approach has influenced the findings, leading to a more nuanced understanding of the challenges for students in using dashboards, and influenced our choice of analytical framework in that we conceptualise dashboard feedback as a dialogic process (Carless & Boud, 2018). The interviews lasted between 10 and 30 min (typically 15 min) and asked students about their response to seeing the dashboard elements. Students talked about their feelings, their responses to the dashboard, and how they would act as a result of seeing the data presented in this way. The semi-structured interview allowed for follow-up questions and students to share feelings that arose as they made sense of the data and its presentation. Data was coded thematically (Braun & Clarke, 2006) based on the analysis using an interpretive framing. The trustworthiness of the data and the analysis is based on students having trust in the interviewers, who were not part of their teaching team, bringing a neutral and critical eye to the analysis process (Lincoln & Guba, 1981).

The study was sensitive in nature, given its focus on students' academic performance. BERA (2018) ethical principles informed the study. Participation was voluntary, and students' identity has been anonymised through the use of pseudonyms. We were aware of the responsibility that we had for supporting students and did this by preparing carefully to ensure that all the data presented were valid and by helping students to interpret their data in a way that would encourage positive outcomes, for instance, explaining how the on-track score was calculated and how it will change according to future module results. We also encouraged students to reflect on their progress and plan how to approach their final year of study. Ethical permission was given by the Ethics Committee of the School of Education at the case study university.

The study has some methodological limitations in that it involved a small sample of final year students from one academic discipline in one UK university. However, a particular strength of the study is that nearly a whole cohort was interviewed (14 out of 16 students) in the second round, thus avoiding the bias that arises from self-selecting samples. The interviews provided a rich source of insight into students' responses that enables the details of individual's dispositions, experiences of study, and other factors to be considered.

# 5 Findings

## *5.1 Social Comparison and Student Identity*

It was evident that dashboards elicited emotional and identity work. For some students seeing their dashboard data appears to have a positive impact on their self-confidence (Esme) or reinforce aspects of their learner identity (Claire) or provided reassurance (Asmah). Please note the students' names have been changed:

> That's quite a surprise because I didn't really think I was very good at it. (Esme, 9th equal out of 16)

> Knowing your position in a class is always a nice thing because you know where you are, what you need to, do you need to move up or you just need to, are you keep, are you on the right track? Are you following other classmates? (Claire, 25th out of 178)

> I honestly didn't think I'd done very well on the essay. So seeing that it [her mark just below the average] does make me feel a bit better to be honest. (Asmah, 9th equal out of 16)

In these quotations students are using the positional data for self-evaluation, and it appears to develop their identity or to reinforce their existing self-concept. Asmah recognised she had not done as well in that assignment, so was pleasantly surprised to be in the middle of her cohort. It had beneficial and reinforcing impact on her self-esteem. In the following quotes, other students appeared to have a negative impact on their self-identity of the social comparisons: Marcia talks about seeing herself as a student with the ability to achieve a '2:1 or first' and feeling concerned at the way the dashboard appears to show her as doing less well. Similarly, Ingrid feels a sense of dejection at seeing her profile:

> Oh am I really going to graduate with a 2:2? […] Because I've always seen it as hoping to aim for a 2:1 or a first. (Marcia, 53rd out of 178)

> The saddest one is the core summary overall because looking back on grades that you've previously had – you can't really change them anymore so you can't really do anything. (Ingrid, 168th out of 178)

Hence social comparison data can provide students with feedback that helps them to locate themselves within their cohort. Whilst this appears to have been reassuring and reduce anxiety (for Esme and Asmah and Claire), in line with Festinger's theory (Festinger, 1954), it is also emotionally charged. For some it may have diminished their self-esteem, with feelings of sadness, or feeling resigned to their position in the cohort. Similarly, Raat et al. (2013) suggest as well as having the capacity to improve a student's self-efficacy, social comparisons also have the potential to diminish it.

## *5.2 Does Position Matter?*

Perhaps surprisingly the position in the cohort was not a good way to predict how a particular student responded to seeing their social comparison data. Justine who was 15th in the group of 178 felt upset and angry by being given information about her position in the group:

> 14 other people have still done better than me…I had thought I'd really, really topped it, I've maxed out here. And it's taken away a bit from that feeling of elation. (Justine, 15th out of 178)

At the end of the interview, when Justine was asked if there was anything else she wanted to add, she returned to he topic of social comparison:

> If I'd have been eighty out of a hundred and seventy-eight I might've thought, oh okay that's fine, but because I know now actually how many people did better than me it makes me feel a little bit worse actually. (Justine, 15th out of 178)

In contrast, whereas India, who was at the bottom of her group, interpreted her information more positively and focussed on a holistic picture of where she was overall and the broader ways of interpreting the data that would support her in moving forward:

> India: I think it gives me motivation to try harder
>
> Interviewer: You pointed out straight away to the on-track slider
>
> India: Straight away, yeah. This is what I'm more focused on…I want to see the overall, where I am working at the moment. (India, 16th out of 16)

These examples illustrate that negative impact on a students' self-esteem was not necessarily predicted by position in the cohort. Justine, despite being a high attainer (15th out of 178), focusses on the negative aspects of being 15th with 14 people ahead of her, rather than reflecting on her success of her high-achieving score of 83% which was above the average of her other module marks and hence was bringing up her overall grade point average (GPA) score.

The majority of students, by definition, will appear to be in the middle of a cohort rather than being towards the top (as was Justine) or towards the bottom (as was India). For these students they grappled with the notion of being 'average':

> I'm closer to average. It's annoying anyway because I feel I've always been average, so this to me is more personal. (Jenny, 9th equal out of 16)
>
> Yeah, I would like to know that information, yeah, because I want to be on the average board with everyone else as well. Because if they're able to do it … ..I think I'll be able to do it as well. (Harry, 5th out of 16)

The process of identifying yourself as 'average' differs between students and results from upward and downward comparison. Jenny appears to see herself as an above-average student, so was disappointed by her dashboard displaying her scores as being average. This discussion supports the idea that students should be given

choice as to the 'frame of reference' that preferred by the student, a position also supported by Roberts et al. (2017). The data also suggest both the fragile nature of the identity work that students engage in as they negotiate their position in the cohort and also the significance that students take from finding out this information. As Festinger's social comparison theory notes, being able to know where you stand amongst your peers is both sought out as a normal part of being in a group and also a mechanism to that helps to reduce uncertainty (Festinger, 1954): as Harry comments, he likes to know where he is in the group. The challenge for dashboards is to support this process of social comparison but to do so whilst promoting positive approaches to self-esteem and well-being. We return to this notion in the section on implications for dashboard design.

## *5.3 Motivation to Act Differently*

As students interpreted their dashboard, it invoked a range of ways that they would act in response. This section looks broadly at the responses to dashboards that showed students' intention to act on the basis of receiving their data, as well as examining how the notion of competition played out through providing social comparison.

For some students it appeared as though the social comparison stimulated and reinforced competition that already existed within the group (Esme) whereas for others (Sarena) were less competitive in their response.

> I think it's actually a good idea [getting comparative data] … Because I think, especially in my course, we're all quite competitive with each other …. I feel like it would definitely push us. (Esme, 9th out of 16)

> Yeah, I never expect to be top anyway…..Well I'm more or less average with everybody else. (Sarena, 8th out of 16)

This finding was also found in Tan et al.'s (2016) study in that some students saw the dashboard as positively stimulating competition, therefore encouraging students to do better, whereas other students were demoralised by them.

More broadly the study showed that some students' responses indicated that they would take action in response to seeing their data presented in this format. The quotations appear to demonstrate that many students felt more motivated and determined to do better and to prioritise their academic study:

> I think as soon as I saw it I decided I'm taking a month off [paid] work to just get on with my dissertation. (Marcia, 53rd out of 178)

> I'd work even harder to get my last module to be like, so hopefully I would get a first type of thing. (Sarah, 65th out of 178)

> I'd definitely just do more reading and work a little bit harder than I already do. It's a bit of a kick up the backside. But then on the other side it's a little bit demotivating at the same time. (Esme, 9th out of 16)

Much of the literature on use of dashboards has focussed on their potential to support self-regulated learning, such as goal setting, meta-cognition, and motivation (Jivet et al., 2017), and our data also suggest there is some potential for this, for instance, Marcia saying she would take time off paid work and Sarah and Esme saying they would work harder. However, as Esme comments that is not the whole story and she also feels demotivated. Dashboard visualisations have significant limitations: they do not guide and support in the way that highly personalised feedback can do. As Esme alludes, it only gives part of the picture; it does not provide structure and support that will help to enhance attainment. Whilst motivation is part of what students need, students also need opportunity to make sense of the data, to understand what it means for them, and to identify actionable insights that will lead to improvements in performance.

There is a danger that the data-driven information that is provided via a dashboard might lead to action that might be of questionable value. The largest number of comments focussed on attendance data, its accuracy, and the fairness of self-reported absences and needing to remember to self-report absences. This investment in time to correct attendance data could be seen as effort that could be better spent on other learning-related activities. It also appeared to raise anxiety levels:

> The absences are because I've lost my card. I've not officially missed any …It just shows that I'm always losing things and that I need to go and get them [the absences authorised]. (Sannah, 1st out of 16)

> The three per cent absent makes me quite cross, and that's because there was a problem, my card wasn't swiping me in. (Jayne, 74th out of 178)

It illustrates MacFarlane's (2017) notions of student presentism, whereby students feel compelled to attend lectures because they are being monitored rather than because they believe that they will be a valuable learning opportunity and demonstrates how an institution's policies and practices shape students' behaviours. Hence providing students with more data about their performance might not lead to productive time spent on task, but rather to compliant behaviours or increased worry based on 'obsessively check[ing]' (Fritz, 2011, p.92).

## *5.4 Implications for Dashboard Design*

Our findings illustrate that students' responses to their learner dashboard is highly individual and reflects their individual disposition influenced by their personal history (compare Justine and India's responses), and other studies support this (see, e.g. Tan et al., 2016; Raat et al., 2013; Schneider & Schupp, 2014). Students cannot be treated as though they are a homogenous body or as though there is an inevitability in the way that they respond to seeing their achievements and behaviours presented back to them. Instead, our findings illustrate the need for a more nuanced picture. Sutton talks about grades being polysemic, in that they signify different

meanings to different students (Sutton, 2012), and this polysemic nature of student's response to learner dashboards is one of the significant findings from this study.

Our findings suggest the potential of learner dashboards to support student motivation but draw attention to the need to implement with caution in relation to how social comparison is operationalised. Whilst for most students they appeared to support a positive response, there were one or two who felt that comparing their performance to others in their cohort was unnecessary and/or emotionally challenging. We suggest that students need to be given choice in the ways of viewing their data that suits their personal dispositions: this would enable the competitive student to see how they were fairing alongside their cohort and allow a student who finds competition off-putting to focus on their personal trajectory. Hence students need to make appropriate choices and customisation whether they see their performance compared to others and also who they are compared to, the frame of reference, a position supported by Roberts et al. (2017). In a previous paper, we also argue that learner dashboards need to be designed with student agency and empowerment as central tenet of their design (Bennett & Folley, 2019).

There is a tension between the motivational potential of social comparison and its potential for negatively affecting some students. Jivet et al. (2018) have suggested that there is a need to tread cautiously in relation to implementing social comparison. However, once social comparison is enabled, the clock cannot be turned back, and, like an itch that demands to be scratched, human nature suggests that students will be drawn to looking at comparisons even if they know that they are likely to be demoralising, or worse emotionally destabilising. As Fassl et al. (2020) note, students who have low self-esteem tend to engage in social comparison processes more frequently. We suggest that institutions only implement social comparison features if they have a well-established approach to well-being. This, we suggest, should include a strong personal academic tutorial programme whereby students meet with a member of faculty regularly to build up a personal relationship that would enable them to discuss their response to the dashboard information and in particular to attend to a student's emotional response to information about where they stand in the cohort. Personal academic tutors would need to be adequately trained so that they were aware of the unpredictable nature of response to social comparison and to be attentive to the impact and how it can be experience from students irrespective of their position in the cohort, rather than the natural tendency to focus on those towards the bottom.

The study raises questions about the use of machine learning to develop predictions about students' outcomes. Our findings demonstrated that students' responses to their data were often unpredictable: for instance, we anticipated that the students with high grades would be positive about their feedback and those with less satisfactory results would react negatively. However, this was not the case, and those with lower results often took a pragmatic approach and found the data motivating, whilst some with average results were delighted in being 'average' and others disappointed.

This lack of predictability in a student's response suggests that machine-derived predictions of students' outcomes and responses are likely to be limited and certainly the research to date has failed to show the accuracy of deriving predictions (Beheshitha et al., 2016; Pardo et al., 2015; Wilson et al., 2017). In addition, there is an ethical question about using predictions because of the emotional impact that data has on students' self-concept, as we have illustrated, that also is likely to affect a student's behaviour in ways that may not be anticipated. For instance, the high-achieving student, such as Justine, may become demoralised by a prediction of a less than top score. Whereas the learning analytics community has argued that we need better algorithms to predict students' responses more accurately (Strang, 2017; Teasley, 2017), instead we argue that simple descriptive dashboards might be preferable to predictive dashboards because of the inaccuracy of prediction and of its power to impact on students' well-being. We suggest that prediction may become more accurate as machine learning improves but the emotional responses to the data will remain far from predictable.

## 6 Limitations of the Study

The study was based on a sample of students from the final year who were studying on a range of courses within an education faculty, and further work is needed to establish the generalisability of the findings. In particular, how do students from first and second year undergraduate and postgraduate courses respond to their dashboard, and how is this different or similar to our study which is based on final year students? In what ways does the discipline and institutional context in which dashboards are used by students shape their potential to support students' positive engagement?

Whilst learner dashboards appear to support student motivation to learn and provide them with particular ways that they might act, for instance, they might suggest taking more books out of the library, or spending longer on the VLE, they do not of themselves guarantee that students will act. As Winstone et al. (2017) have identified, knowing about the support and opportunities available is not the same as having the willingness to make use of it. Similarly, Broos et al. (2019) identified that students liked their dashboard, but it did not change their behaviour or result in deeper learning. Hence further longer-term study would be needed to establish the actual impact that dashboards have on students' behaviour.

## 7 Conclusion

The use of social comparison within learner dashboards is something of a 'Pandora's box' whereby once the potential is released the impact may be different from what was intended. The intention behind using dashboards with students is to support

their motivation and hence to enhance their well-being, yet this chapter has shown that their use results in a range of potential responses. Many are positive and motivational, reinforcing Festinger's theory of social comparison which suggests people need to know where they sit in a group (Festinger, 1954), and it reduces their uncertainty to do so. However, for a few it was shown to have a negative impact on their emotions. Interestingly the chapter has highlighted that the position in the cohort is not always the main determinant of how a student responds to the social comparison aspect of the dashboard, that is, those at the top of the cohort might be negatively impacted, and those at the bottom respond more positively to being compared to the rest of the cohort. Hence predicting the emotional and motivational responses based on position appears to be inaccurate, and responses are more nuanced being influenced by individual disposition and their personal history. Previous studies have called for caution when implementing the emotional challenges of social comparison (Jivet et al., 2018) and to allow students to choose their 'frame of reference' for the comparison (Roberts et al., 2017), and the evidence from this study supports this. However, our study has shown that social comparison invoked strong emotional responses so we argue that it is important that an institution has a well-embedded approach to student well-being to complement the use of social comparison.

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