



'We have learning objectives, not enjoyment objectives': the role of enjoyment in Life Sciences teaching and learning

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Abstract

Positive emotions such as enjoyment are often overlooked in higher education (HE) despite being important and prioritised in school-level policy. Enjoyment has been reported to have a positive impact on multiple aspects of learning – it can facilitate deep-learning strategies, boost confidence and encourage long-term interest. Many educators recognise the value of positive emotions in everyday life and for wellbeing. In addition, staff enjoyment of teaching is often overlooked in favour of a student-only perspective that may limit a holistic understanding of emotion in HE, given strong links between staff and student emotion and empathy. In the current HE climate, where students face huge pressure to achieve, and staff workloads are increasing, a focus on enjoyment could bring substantial benefits.

This study provides a STEM-specific context and focuses on staff and student enjoyment of teaching and learning at a research-intensive university. Through interviews with teaching staff and Life Sciences students, this study explores what contributes to staff and student enjoyment of teaching and learning. Commonalities between staff and student enjoyment were identified and include the importance of relational pedagogy and positive relationships, as well as the freedom to be creative and explore a subject. Both themes have implications for learning development and teaching practice, including more intentional design of groupwork and small group teaching, and level of choice around topics and pedagogic approaches within programmes. Recommendations from this study include working towards relational and 'emotionally literate' pedagogy with potential implications for education practitioners and students in STEM and across HE.

Keywords: enjoyment; emotion in higher education; relational pedagogy; flow.

Introduction

Enjoyment is valued in teaching and learning but is something often not researched and discussed. There are many more studies on negative emotions such as anxiety in teaching and learning than positive emotions (Pekrun et al., 2010).

In primary education, it is recognised that learning should be enjoyable, so much so that this constitutes a key policy aim of school education, on a par with safety (Department for Education and Skills, 2003; Department for Children, Schools and Families, 2008). However, positive emotions such as enjoyment are relatively rarely considered and prioritised in higher education (HE) (Lumby, 2011) compared to negative emotions (Pekrun et al., 2010), which could partly be a result of our tendency to focus on the negative affects that are frequently attributed to issues of wellbeing in HE (Fredrickson, 2001). Positive emotions do exist in university teaching and learning settings.

Positive emotions, including enjoyment, impact multiple elements of learning. They can lead to deep learning strategies (Holmes, 2018), boost confidence (Ritchie and Tobin, 2018), encourage long-term interest (Krapp, 2005; Hidi and Renninger, 2006) and lead to improved learning outcomes (Pekrun, 2017). Pekrun (2017) highlights how enjoyment promotes students' intrinsic motivation to learn, as well as interest in material, both things educators encourage in students. Similarly, enjoyment and similar emotions can lead to wellbeing gains (Haworth, 1997; Hascher, 2012; Frederick and Lazzara, 2020). In a HE environment, where the mental wellbeing of students may be worse than the general population (Royal College of Psychiatrists, 2021), we should arguably be focused on ways to improve student wellbeing, especially if this might simultaneously involve learning gains.

Staff emotions within HE are even less explored, perhaps partly because many teaching staff in an HE context do not primarily identify as teachers (Malcolm and Zukas, 2009; Van Lankveld et al., 2017). Staff emotions are known to impact students (Frenzel et al., 2009) and are therefore a key part of understanding the student perspective, though notably Frenzel's work, grounded in appraisal theory (Frenzel et al., 2020) is situated in the context of schools. Equally, staff emotions are important in their own right (Hagenauer and Volet, 2014). It has been shown that happier staff are more productive (Bellet, De Neve and Ward, 2019) and the link between emotion and wellbeing equally applies to staff.

Although enjoyment specifically has not been the focus of many studies, particularly in higher education, there has been substantial research on emotions in learning. Not only do emotions exist in an educational context, but emotion has been argued to be 'integral to transformative learning' (Walker and Palacios, 2016; p.187) and necessary for learning (Immordino-Yang, 2015).

This work explores what contributes to staff and student enjoyment of Life Sciences teaching and learning, and the extent to which staff and student perspectives on enjoyment align.

Methods

The research took place in the Department of Life Sciences at a research-intensive STEM-focused UK university. Ethical approval for this study was granted by the university's Education Ethics Review panel. Semi-structured interviews were undertaken with final-year students (completing Biological Sciences or Biochemistry/Biotechnology degrees), and staff members who teach undergraduates, between January and March 2023.

I have been fortunate to be able to prioritise enjoyment in my education and career and acknowledge the privilege that comes with this. Realising that this was not necessarily the case for all students and colleagues sparked my interest in this area and initiated this study. This study adopted a qualitative and phenomenological approach (Langdridge, 2007) to explore staff and student experiences. Semi-structured interviews allowed for similar questions to be asked of all participants within a group (i.e. staff or students), whilst allowing for flexibility for interviewees to discuss other relevant areas (Savin-Baden and Howell Major, 2012).

Final-year students were the focus of interviews due to their having some ability to reflect on their journey through their undergraduate degree. Department teaching staff (from research and teaching, and teaching-only job families) were invited to participate. Staff and students were invited to in-person or online (Microsoft Teams) interviews, according to preference and availability. Nine staff and 6 student interviews were conducted (see

Appendix 1 for total numbers of invited participants), each lasting approximately 40 minutes. All participants gave informed consent.

Interviews were transcribed automatically using Microsoft Teams and manually checked for errors. Following transcription and familiarisation, thematic analysis was used to analyse and understand the data, following approaches outlined by Braun and Clarke (Clarke 2018; Braun and Clarke, 2012; 2021). In-depth coding was carried out using NVivo 12 (QSR International, 2017). Codes were refined, edited and grouped, using the research questions to focus the analysis. Following further refinement, themes and subthemes were generated.

Results

Two core themes were shared between staff and student participants and highlighted as important for enjoyment in Life Sciences in HE:

1. Relational pedagogy and positive relationships
2. Creativity and freedom to explore the subject.

Subthemes are highlighted in Table 1. The following section outlines these themes and subthemes in more detail, through quotes from staff and student participants.

Table 1. Themes identified from staff and student interviews.

Key factors in staff and student enjoyment of Life Sciences HE	
Relational pedagogy and positive relationships	Creativity and freedom to explore subject
<i>Sub themes</i>	<i>Sub themes</i>
Interaction with others	Creativity and discipline exploration
Reciprocal enthusiasm	Links to application
Sense of community	Finding flow

Relational pedagogy and positive relationships

The role of relationships

Almost all staff participants identified interactions with students as an important part of what makes teaching enjoyable:

There is zero enjoyment in having no people interaction (Staff 1).

The aspects that I absolutely love are just the interactions with the students... interacting with students in any way is just so much fun (Staff 2).

This raises the question of what is it about interactions with other people that contributes to enjoyment? Staff participants commented on characteristics of students, such as being bright, that contributed to their enjoyment. Staff commented that working with students means that '[students] see things that you don't see and you have to reflect and get it better the next time or on the spot' (Staff 6) – this participant described enjoying this challenge, though others may find this intimidating. Staff commented on enjoying interactions particularly with students of typical undergraduate age:

There's an innate enthusiasm linked to naivety of students, people between 18 and 20-something. And you hope that you can sort of at least delay the extinguishing of that flame... by some time until they end up being cynical employees or cynical academics (Staff 7).

In these cases, it is not necessarily one-to-one interactions and individual conversations that staff are attributing their enjoyment to, but a general sense of interacting with a cohort of enthusiastic students, for example through micro-interactions, such as students asking questions in a lecture or being engaged in a tutorial. When these interactions are missing, such as due to non-interactive teaching, lack of sustained engagement or large class sizes, staff members struggle to enjoy their teaching:

Teaching is a little bit faceless. I go in and I deliver something to 100-200 people. I see them maybe like a couple of times... There's no vested interest, there's no real engagement there because the class is too big... I don't get any real... interaction with students (Staff 1).

Students equally identified interactions with staff as an enjoyable part of their learning experience and valued informal conversations sometimes more than formalised interactions such as tutorials, for example, commenting: 'That was an amazing module because it was more a conversation with the convenors' (Student 6). Some staff participants seem aware that these interactions are enjoyed by students, for example:

I think they enjoy the opportunity to talk to someone they see as a working scientist... a lot of them have come to university so enthusiastic that they enjoy just the ability to talk about high level scientific subjects with other people... sometimes that's you and sometimes that's their peer group (Staff 2).

As alluded to here, interactions between student peers are also important. In particular, groupwork seems to promote enjoyment through facilitating students 'being able to bounce... ideas off other people' (Student 2) and work with others. Groupwork also has its challenges, which students highlighted in this study, including communication issues, language barriers, and unequal input in group assessment (Dommeyer, 2007; Popov et al., 2012). One student reflected with maturity on the reciprocal benefits that working with peers can provide:

Working in teams is nice... I always learn from how people do things.... little tricks that you can pick up from people. And I'm sure people have learned little things from me (Student 6).

Positive academic relationships with staff can influence students' decisions and trajectories. Anecdotally, many students end up choosing a university course or A-levels based on positive relationships with schoolteachers. Similarly, participants in this study made key academic decisions, such as module choices, based on their relationship with staff:

I only chose Ecology [...] even though I hated it, because all the Ecology people are actually nice (Student 5).

All my modules this year I have chosen based on professors (Student 6).

As educators, we therefore play an important role in how much or what our students enjoy in their education and impact their futures. As Lampport writes, 'faculty members are the prime agents of personal and intellectual influence in the lives of students' (1993; p.975), though peer-relationships can also be very influential. However, there are many factors that can inhibit building positive relationships with students. In this study, the pandemic and class sizes were commonly cited inhibitors for staff.

Reciprocal enthusiasm

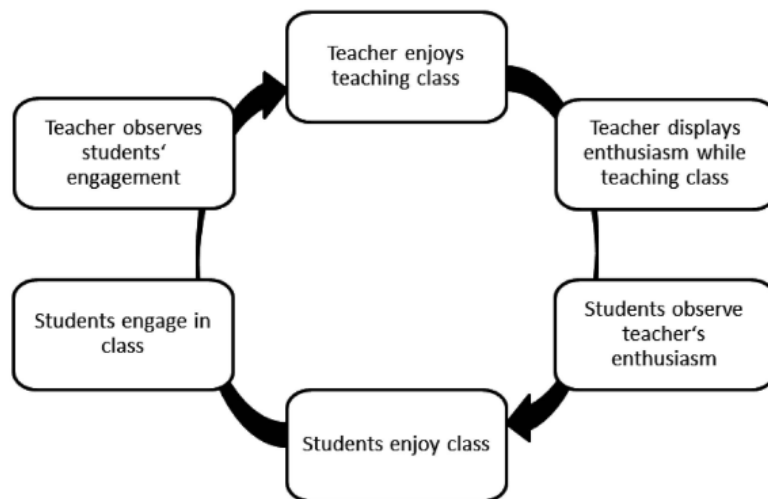
Almost all staff participants in this study commented that their enjoyment develops, at least in part, because of student enjoyment or enthusiasm:

I enjoy interacting with the students when they are enthused and interactive (Staff 8).

What I enjoy about teaching is sharing the excitement of knowledge and seeing it, as in measuring reciprocal excitement in the person who's doing the learning (Staff 4).

Such comments emphasise that staff and student emotions strongly influence each other. This supports Frenzel's model of reciprocal enthusiasm (Frenzel, 2014; Frenzel et al., 2018) which is based on a social-cognitive understanding of emotion (Pekrun, 2000; Frenzel et al., 2009) and involves a positive feedback loop between student and teacher enjoyment (Frenzel et al., 2018, Figure 1).

Figure 1. Feedback loops exist between student and teacher emotion (Frenzel et al., 2018).



Students were aware that staff enjoyment or enthusiasm altered their own emotions:

I'm not going to enjoy anything if you put me in a room with a lecturer and they don't wanna be there. But if they wanna be there, I'll enjoy it... whatever the lecturer does alters my response (Student 5).

Some professors are forced to teach specific material and... they don't enjoy the course. Then we don't enjoy the course and not even enjoy, we stop understanding the course (Student 6) .

Interestingly, the student perspective here puts emphasis on the educator to portray enthusiasm and enjoyment. Students did not generally seem to recognise that their own observable enjoyment or engagement plays a key role in reciprocal enthusiasm and perhaps this is something we could be more explicit about, for example by feeding back on positive student contributions. There was some (albeit limited) awareness from staff participants that their own emotion, or enthusiasm for a topic, impacts students.

Given that emotions need to be observable for Frenzel's model to apply, it is unsurprising that the Covid-19 pandemic and teaching online were cited as barriers to staff and students enjoying education. Staff participants reported missing the cues of student enjoyment and felt this impacted their enjoyment:

You're missing all the nonverbal stuff like eye contact and spontaneity... I found [online teaching] quite limiting. (Staff 6)

Because they all had the videos off... we couldn't tell whether they were enjoying [it] or not. (Staff 9)

On the other hand, returning to an in-person classroom was described as a moment:

when it was joyful, and the difference wasn't what they were learning, it was the fact that we were together, the fact that you get a bit of a buzz off them, and they get a buzz off you (Staff 6).

In addition to the anonymity that was felt teaching online during the pandemic (Fabrizz, Mendzheritskaya and Stehle, 2021; Telyani, Farmanesh and Zargar, 2021), anonymity associated with large undergraduate cohorts also presents a barrier to building relationships and developing reciprocal enthusiasm. Staff members who teach large first-year cohorts, in particular, commented on this:

I don't even know their names. How am I supposed to have an enthusiastic interaction with them when, yeah, they're just part of this anonymous blob? (Staff 8)

Sense of community

In addition to the relationships between teacher and student being important for enjoyment, both staff and student participants commented on the role of community and

interactions within this context. This included interactions with support and professional staff, for example the Education admin office and wider department.

I think [enjoyment] also depends on who you get to meet... how are you kind of integrated and...feel that you are part of the group of friends or the community.... the social aspect plays quite a big part in the whole university experience. (Student 4)

This student reflects here on their own sense of belonging and emotion, but this may not be something all undergraduates reflect on during their degrees. Enjoyment from a sense of belonging or feeling part of a community may be more likely to occur in retrospect. This may particularly be the case in degrees with a capstone final-year project, which is often the most community-focused or small-group element of their degree. In the context in which this study took place, some students complete year-long research placements before final year, and one such participant reflected on their time in a team commenting:

I wasn't treated like just an intern, I was treated as a member of the team (Student 6).

Creativity and freedom to explore the subject

Creativity and discipline exploration

Almost all staff participants commented on enjoying creativity in teaching and having creative freedom to teach how they wanted to. Multiple staff participants who teach on broad first-year modules recognised the importance of enjoying the teaching process themselves for students to value this:

I think you, as a deliverer of content, have to enjoy it. Otherwise, there will be no hope for anyone else to enjoy what you're doing (Staff 1).

The imaginative part of science, almost the creative part, the part where you can start to wonder... that's what I want to stimulate in students (Staff 3).

One staff participant even commented on the creativity involved in putting exam questions together:

I enjoy creating new teaching resources. I almost sometimes actually enjoy writing exam questions; there's a certain amount of craft in putting them together... the creativity in making this stuff. (Staff 8)

Staff participants valued creativity in their research, but research-focused academics often did not view teaching in the same way. Staff members commented that students appeared to enjoy the creativity of a capstone final-year project, though whether this is due to creativity or feeling part of a research team is unclear.

Students did comment on enjoying the 'excitement' of science:

I like to be excited about science. So if the degree makes you not excited about science anymore, well then the degree is doing something wrong (Student 6).

However, unlike staff members who are relatively free to teach material as they wish, students' trajectory through their degree is often not particularly creative or exploratory, defined by a fairly rigid curriculum. Instead, some find creativity in the form of more creative assignments. Multiple participants commented on video coursework as particularly enjoyable because:

we were able to just kind of like go wild exploring...just be creative... and designing the whole process' (Student 4).

This has important implications for the organisation and structure of our degrees, as well as assessment types.

Links to application

Whilst staff comments centred around science being enjoyable because it is creative, multiple students described enjoying their course when applied to research or real-life scenarios:

I always enjoyed the more application side, seeing the purpose of why I'm learning this in the first place.... [I] wasn't too interested and then my lecturer started to look at medical applications... that would really really interest me, and I found it easier to remember stuff (Student 2).

For some students, linking topics or content to scenarios that they see as 'useful', often framed in terms of careers and graduate outcomes, was key. Other students seemed to value transferable skills. Given the context in which our students are studying, and with HE now viewed by many as very transactional, it seems that some students 'enjoy' things that they feel will lead to future success. This 'anticipated' enjoyment (Mellers and McGraw, 2001), which could be contrasted with current and retrospective enjoyment (Lumby, 2011), seems more akin to satisfaction and does not necessarily have the same positive emotional benefits as enjoyment. When asked 'what gets in the way of enjoyment?', one student participant commented:

I think the pressure of doing what you really want to do and what you feel you should do for a more purposeful future (Student 3).

This appears to be a sentiment shared by many students and could partly explain why students seem to place so much value on 'applied' science if they feel this brings them closer to career goals. Most staff participants recognised that students enjoy the application of science and often attempt to link to applications and research in their teaching:

I think [it's] quite important to try and bring in aspects of research into teaching, even very early... just putting some research... context to the facts that you're giving them... makes it more real to them (Staff 2).

I try and include devices in teaching that will be a bit of fun. Like show and tells, anecdotes (Staff 6).

What's an interesting story I can tell about this subject material? (Staff 7)

The latter comments indicate teachers trying to make the delivery, rather than content, more engaging or enjoyable. Sometimes, additional anecdotes and stories, if used too heavily, may increase extraneous cognitive load (Sweller, 1988). However, use of stories and examples from an academic's research to indicate the application of a topic, or to capture students' interest, can be helpful. There is a fine line between making these entertaining and using them in a way that enhances enjoyment, as one participant highlights:

I try and pick them reasonably carefully, so it's not just entertainment (Staff 6).

Links to application, real-world scenarios, and sometimes investment of effort, appear to trigger enjoyment, but also, importantly, motivation and interest, for many students:

If you know what you're learning in first-year will be applicable in the workforce... then you're going to be more motivated to keep slogging through...even if the talks are... not particularly enjoyable... But if you never see that purpose of it, you might as well just be like I don't enjoy this, I'm going (Student 2).

I spend more effort on learning things that I enjoy... so in the end I have a better understanding of it. But also my attention is captivated much more by the things that I enjoy, so these things stay in my memory more and I think about them more outside of just the time that I'm... studying (Student 1).

Finding flow

Staff participants described enjoying seeing a 'lightbulb' moment in students when teaching, linking back to the concept of relationships and reciprocal enthusiasm:

I really like when, for instance, they all go like 'oh wow yeah that's true'...sometimes I even get like goosebumps... you can see that Eureka moment for them (Staff 9).

Staff also outlined enjoying creativeness, preparedness and enjoying the sometimes intense classroom environment that puts you on the edge of your comfort zone. One staff participant highlighted the concept of 'flow', coined by Csikszentmihalyi (1990):

You go into state of flow where time vanishes and you're totally immersed in whatever you're doing... It's not a fun state, but it's a deeply fulfilling state... it's the sort of state that you get in when you're doing something that's difficult, but you are sufficiently capable of approaching and tackling that challenge... I definitely enter a flow state when I'm teaching (Staff 5).

Flow states are often associated with high-pressure environments where the context is challenging, but individuals are well prepared to succeed. Staff participants reported this feeling during their teaching, and seem to hope that students also enjoy this:

I hope they enjoy being taken out of themselves a little bit when a session goes well. So they... can for a moment suspend their concerns about exams and assessment and sort of live in the moment (Staff 7).

I wonder if students sometimes go into a state of flow when they're learning.... there are times when students' fulfilment or enjoyment is when they are in a state of flow because they are sufficiently engaged with something that they're really assimilating stuff (Staff 5).

Flow states are often challenging. One staff participant even suggests that they experienced a state of flow during exams, though it is unclear if this is something our students relate to. Some students commented broadly on the creative element, enjoying challenging material or cutting-edge knowledge, but there is some disconnect here with what staff are describing. While expecting our students to enjoy or be in a state of flow during exams might be unrealistic, we might hope that they recognise moments of flow-related enjoyment.

Discussion

Building positive relationships in HE

The focus on relationships in this study supports the notion of relational pedagogy, which centres 'relationships at the heart of teaching and emphasises that a meaningful connection needs to be established between teacher and students, as well as between students and their peers, if effective learning is to take place' (Bovill, Jarvis and Mpamhanga, 2020; p.3). Bovill (2013; Bovill, Jarvis and Mpamhanga, 2020) and others (Zarandi, Soares and Alves, 2022) outline the importance of co-creation, which some staff participants in this study valued as a notably enjoyable part of teaching and which could be further utilised in HE.

Data from this study strongly supports Frenzel's model of reciprocal enthusiasm (Frenzel, 2014; Frenzel et al., 2018), although staff and students in this study did not always recognise the importance of their emotions in impacting the emotions of others. One important characteristic of Frenzel's model (Frenzel et al., 2009; 2018) is that enjoyment or enthusiasm needs to be observable. If either group are unable to detect or observe the other's enthusiasm, this would break the feedback cycle (Figure 1). In practice, this presents a challenge for staff, especially when teaching topics they are not experts or even particularly interested in. To some extent, educators may distinguish enjoying the material

or topic from enjoying delivering the material, which may partly make up for this. As many academic staff are primarily research-focused, this may be a limitation in how far Frenzel's model can be applied.

Another practical implication of Frenzel's model in HE is that of class sizes and student numbers, and associated student anonymity. Student numbers are a known barrier to relational pedagogy (Thayer-Bacon, 2010). Kuh et al (2005; p.288) note: 'as institutions increase in size, it becomes easy to be anonymous'. If opportunities for informal or small-group interactions are missing, the foundations for relational pedagogy become strained. This was raised as a barrier to staff enjoyment of teaching in this study. In many institutions, teaching groups get smaller as students move through their degree, which may facilitate more informal interactions with staff. However, in some contexts, students can remain anonymous throughout their degree and sometimes choose to (Freeman and Bamford, 2004). Whilst offering options for anonymity can be beneficial in terms of inclusivity (Caldes, 2020), given the clear importance of building relationships, I would argue that we instead need to create a learning environment in which we can prioritise building meaningful relationships and avoid teaching becoming 'a little bit faceless' (staff 1).

This study highlights positive emotions associated with feeling part of a community. Literature has shown the benefits of feeling a sense of belonging, including for wellbeing (Baumeister and Leary, 1995) and for academic achievement (Pittman and Richmond, 2007; Ahn and Davis, 2019). Pedler, Willis and Nieuwoudt, (2022) found that HE students with a stronger sense of belonging reported higher motivation and enjoyment, although these emotions are notoriously difficult to measure. For educators in an academic department, it can be easy to overlook the non-departmental aspects of our students' HE experiences, such as their experiences in halls, in societies and with friends. Students' experience of communities within and outside of an academic department, their sense of belonging, and its impact on emotion, therefore need to be considered holistically (Thomas, 2012).

The importance of creativity and subject interest

The data from this study highlights the importance of subject interest for staff and students, with both groups valuing creative opportunities that may traditionally be thought of as

limited in STEM disciplines. Allowing students the freedom to explore and engage with their discipline in a way that allows for originality and individuality is clearly important, whether this is through choice of modules in a degree, or authentic and creative assessments and teaching methods. Livingston (2010) argues that we should not be focusing on teaching creativity, but in trying to 'understand, harvest, and build up the very creativity that every student already possesses and uses' (p.61).

If we hope to facilitate long-term motivation in our students, cultivating subject-level interest through enjoyment and creativity is important. Hidi and Renninger's (2006) model of developing interest notes that triggering situational interest is the first stage in developing long-term motivation and subject interest. Learning outcomes are also improved when students are interested and motivated (Holmes, 2018; Ritchie and Tobin, 2018). Data from this study suggests that the link between enjoyment, motivation and subject interest may be stronger in final-year modules, when the topic is more research-linked. The challenge for educators is often to facilitate enjoyment and trigger interest in first- and second-year core modules. Students can lose enjoyment and motivation quickly and, if elective modules are positioned towards the end of the degree, regaining this in the research-focused final-year can be difficult, as students highlighted in this study.

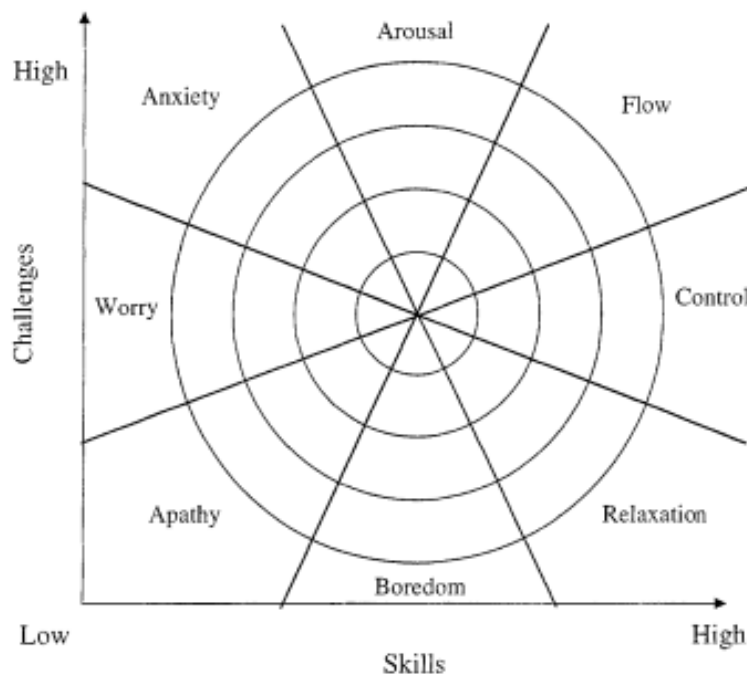
Data from this study highlights a flow state as something that can bring or contribute to enjoyment. To achieve flow, we need to engage in activities that match our skills and interests (which might be why this concept often describes athletes and musicians) (Csikszentmihalyi, 1990). This suggests that for staff, teaching their specialist topic or research material, ensuring they feel prepared, may help to avoid 'teaching dread' that some staff discussed. This may also be why this concept may be less applicable to students; their activities are not necessarily linked to interest. We could usefully demonstrate to students that a deeply satisfying and emotionally positive experience is not always 'fun'. Indeed, research into possible neurocognitive mechanisms contributing to flow highlight that this is a transient state, possibly underpinned by temporary changes in brain function (Dietrich, 2004).

Some of the barriers to enjoyment that students spoke about in this study, such as pressures to perform and worry about finances, grades and careers, seem at odds with a flow state. In a hypothetical situation without the day-to-day pressures our students face,

achieving a flow state may become significantly easier. To experience flow, a situation's challenge level needs to match an individual's skill level (Csikszentmihalyi, 1990; 1997, Figure 2). In practice, this means aligning teaching activities and assessments to students' skill levels, potentially scaffolding to support development (Vygotsky, 1978).

Csikszentmihalyi argues that skill and challenge levels not only need to match, but occur at a high level, otherwise apathy and boredom result (Figure 2, Csikszentmihalyi, 1997).

Figure 2. Skill level and challenge level need to be high and matched to achieve flow.



Concentric rings indicate intensity of the perceived experience. (Adapted from Csikszentmihalyi 1997, image from Nakamura and Csikszentmihalyi, 2002).

Csikszentmihalyi suggested that some personalities may be more prone to achieving flow states, in particular those with an 'autotelic' personality (an individual who generally does things for their own sake) who may be more intrinsically motivated (Baumann, 2012; Nakamura and Csikszentmihalyi, 2014). In student interviews in this study, there was clear variation in students' intrinsic versus extrinsic motivation and emotional competence or awareness. This has implications for educators in supporting students with different personalities to potentially achieve and enjoy a flow state during learning. Given the differing skill levels of students, we may need to provide different levels of challenge within

an activity or assessment, for example. Furthermore, this highlights the importance of building both staff and student emotional literacy (Brackett, 2019), for example through having discussions in our classrooms about enjoyment and positive emotions and ways to achieve or experience these.

Study limitations

During data collection, there may be a self-selection bias – it is likely that those interviewed enjoyed their education or teaching. In addition, particularly in a phenomenological study that explores individual experiences and emotion, conducting single interviews with participants limits data to a snapshot in time, influenced by participants' emotional states on the day.

As this study is situated in a Life Sciences HE context, it may lack some generalisability. However, emotions in learning are universal and the themes identified here are likely to be relevant across contexts. Finally, whilst not a key focus, the recent pandemic may have influenced this study's findings. It was clear in interviews that the pandemic influenced staff and student enjoyment of their teaching and learning experiences. This study therefore must be understood within this context.

Conclusions

This study adds to the limited literature exploring the role of positive emotions, such as enjoyment, in HE, particularly in STEM contexts. Findings highlight common factors that contribute to staff and student enjoyment of Life Sciences in HE and suggest a key role for relational pedagogy, as well as space for creativity in curricula and teaching. Both themes have implications for curriculum design and learning development, including building choice into curricula to allow subject exploration, providing opportunities to build positive staff-student relationships and communities, and increasing our focus on positive emotions in HE. Recommendations from this study include working towards relational and 'emotionally literate' (McVitty, 2022) pedagogy, including discussion about the role of emotion, including enjoyment, in curricula (Ippolito et al., 2020).

Acknowledgements

Thanks to Kate Ippolito for supervising this research. Thanks to my staff and student participants, who gave up time to share their experiences with me.

The author did not use generative AI technologies in the creation of this manuscript.

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Appendices

Appendix 1

The table below shows the total number of invited and interviewed staff and students in the department.

Participant group	Number of individuals in department/invited to participate	Number of participants interviewed
Combined teaching and research and teaching only staff	~ 95	9
Final year students (Biochemistry/Biotechnology and Biological Sciences)	~ 320	6

Appendix 2

Core interview questions for staff and students. These questions provided the starting point for semi-structured interviews, although the semi-structured nature meant follow-up questions were added.

For students:

- What types of learning activities have you enjoyed during your degree? Why? Can you provide examples?
- What do you think other/most students enjoy? Can we generalise?
- Has enjoyment impacted your module/degree choice?
 - Follow up: Did enjoyment impact your choice to do this degree?
- Has your enjoyment changed over the course of your degree?

- Do you think you should enjoy your degree or your time at university?
- What do you think gets in the way of enjoyment?
- What effect do you think enjoyment has on your learning? (positive or negative)

For staff:

- What do you enjoy about teaching? Why?
- What do you think students enjoy?
- Do you aim to facilitate student enjoyment through teaching?
 - Follow up: how?
 - Has this changed over time?
- Is enjoyment something we should prioritise in teaching? (clarify enjoyment for staff or students)
 - Follow up: Why/why not?
- How do you/we know if students are enjoying learning?
- How do you think enjoyment impacts on learning and learners?
- Possible additional Q: Ask about barriers to enjoyment for staff and students.