‘What do you meme?’: Exploring students’ engagement with the use of emojis, memes and GIFs in higher education teaching

Tessa Graftdijk, Royal Holloway, University of London, Tessa.graftdijk.2021@live.rhul.ac.uk
Mariam Sayagh, Royal Holloway,University of London, Mariam.sayagh.2021@live.rhul.ac.uk
Sara Arent, Royal Holloway, University of London, Sara.arent@live.rhul.ac.uk
Sana Rehman, Royal Holloway, University of London, Sana.rehman.2021@live.rhul.ac.uk
*Dr Beatrice Hayes, Royal Holloway, University of London, Beatrice.hayes@rhul.ac.uk

Abstract

Emojis, memes and gifs are digital tools that are becoming increasingly incorporated within higher education (HE) learning. Whether it be through online communication (e.g, emails) or via learning resources (e.g., PowerPoint slides), emojis, memes and GIFs are used by HE teaching staff to convey meaning. Our understanding of how effective emojis, memes and gifs are in engaging students remains limited. To explore this, we conducted an online survey with undergraduate students (N= 115, M_{age}= 19.10 years) exploring student engagement scores when presented with emojis, memes and gifs via either private online communication environments (e.g., emails) or public online learning content (e.g., PowerPoint slides). Following a two-way repeated measures ANOVA, our findings highlight that, combined, emojis and memes are perceived as the most engaging digital tool overall. Our findings also highlight that these digital tools are viewed as more engaging when presented within private online communication environments. Our study presents important pedagogic findings that will benefit HE teaching staff in utilising digital tools appropriately within their communication with students and learning resources.

Keywords: emojis, memes, gifs, digital, online, learning, engagement.

Introduction

Globally, HE students are typically aged from 18-24 years (HESA, 2023) and fall within the developmentally sensitive stage of 'emerging adulthood' (Sawyer et al., 2018). Emerging adults know only a digitally connected world (Hayes, 2024; Stockdale & Coyne, 2020) and thus differences exist between HE teaching staffs and students' perceptions of digital tools (e.g., communicating online; Hayes & Fatima, 2024; Waycott et al., 2010). We know that digital tools are integrated within the HE environment such as online communication (e.g., emails, direct messaging forums) and learning tools (e.g., PowerPoint slides, videos; Office for Students, 2022). If miscommunication occurs, through HE teaching staff's use of digital tools, this can be negatively associated with student engagement (Hayes & Fatima, 2024, Draxler-Weber et al., 2022).

Digital visual communication tools such as emojis, memes and graphical interchange formats (GIFs) are heavily used in the daily lives of emerging adults (Horgan & Sweeney, 2012). Emojis (see Figure 1) are static illustrations of objects, facial expressions, and broader contextual representations such as political ideology (Kralj Novak et al., 2015; Tandyonomanu & Tsuroyya, 2018). Meanwhile, memes (see Figure 2) are often accompanied by a short text, linked to a well-known reference within popular culture and are intended to be humorous (Brown, 2020). GIFs (see Figure 3) are animation sequences that narrate a moment or expression and are often taken from well-known media or pop culture (Jiang et al., 2018). On the one hand, integrating emojis, memes, and GIFs within HE learning content may aid student engagement (Klein et al., 2019) and in turn this may have a beneficial effect upon students' learning experience. On the other hand, using these digital tools may be

viewed negatively by students resulting in disengagement and an impairment upon the learning experience. Within this study, we aim to explore whether student engagement scores differ between emojis, memes, and GIFs.

Figure 1. Examples of emojis.

Figure 2. Examples of memes.

Figure 3. An example of a GIF.

HE teaching staff who utilise emojis when initially contacting a student may be perceived more positively than those who do not utilise them (Kim et al, 2022; Vareberg et al., 2022) possibly because this may make HE teaching staff appear more friendly and approachable (EVOLVE, 2020; Newell & Adam, 2022). Positive perceptions of HE teaching staff are associated with greater student engagement over time (Amerstorfer & Freiin von Münster-Kistner, 2021; Quin, 2017), therefore utilising

emojis within online communication with students may be beneficial for student engagement. In terms of learning content more specifically, Moffitt et al. (2021) found that students interacted more with their feedback and viewed their lecturer more positively when they used emojis in assessment feedback. However, the use of emojis can be perceived as unprofessional. Students may misinterpret the nature of the chosen emoji; for example, they may view a ‘thumbs up’ as sarcastic (Hayes & Fatima, 2024), and this may disengage students from their learning. If perceived negatively, emojis may even impair students’ perception of HE teaching staff resulting in views of incompetence (Vareberg et al., 2022).

Using memes when contacting students can also be perceived as engaging particularly through the humour typically found in memes (Pranoto, 2021). In fact, using memes in learning content can help with knowledge retention (Tidy et al., 2024). It is important to note that this relationship is contingent on the choice of memes selected. HE teaching staff must specially select memes that match their audience drawing upon preliminary knowledge (often pop culture) to understand the content of the meme (Tammi & Rautio, 2023). If a mismatch exists between the choice of meme and students’ knowledge it can be perceived as unprofessional (Hayes & Fatima, 2024) or confusing (Kayali & Altuntas, 2021) and this may disengage students.

GIFs may also facilitate engagement. With regards to learning content, Bakhshi et al. (2016) found GIFs to be the most effective form of engagement due to the various components of GIFs (such as narration, sound, and animation) making them more engaging. They highlighted that GIFs may be more engaging due to the short display

time and video summarisation, and we know that emerging adults are used to short engaging clips inspired by TikTok (Wacks & Weinstein, 2021). These findings are supported by Shu et al. (2021), who found that student engagement was higher when HE teaching staff used GIFs due to their ability to convey a message in a short, looped video as students perceived the condensed information as easier to follow and digest. Similarly to emojis and memes, though, if the lecturer misjudges the nature of the content of the GIFs (e.g., an outdated joke that is no longer viewed as politically correct) this may be perceived as unprofessional to students (Hayes & Fatima, 2024).

While emojis, memes and GIFs have been investigated separately, these forms of visual content have also been researched in combination. Wagener (2020) suggests that the combined use of GIFs and memes yields engagement in communication within online spaces due to their condensed form. This suggests that while individually, digital visual communication tools can increase student engagement, research like Wagener's (2020) indicates that combined use may also increase student engagement as students perceive the content as interactive and easier to follow. Wagener (2020) does highlight that GIFs are more appropriate in certain fields such as digital communication due to the need for reactions to be expressed. Therefore, engagement may be higher in the context of online communication rather than online learning. Nevertheless, this area of literature is still limited and comparisons have not been made to understand whether using one digital stimulus or a combination is more effective in increasing student engagement, and in which context. Importantly, our understanding of this topic is missing from HE research.

Previous literature shows that the use of emojis, memes and GIFs by HE staff can be viewed positively but also have the risk of being interpreted negatively by students.

Staff may therefore be unsure regarding whether to include these digital stimuli in students' learning. This study aims to explore which digital tools are more or less appropriate regarding student engagement, and whether this is effective in private communication or general learning content. The current study investigates the association between student engagement and emojis, memes, and GIFs. Through an online survey, the study explores firstly whether viewing emojis, memes, GIFs and plain text (control) is associated with a continuous measure of student engagement and, secondly, whether student engagement varies depending on whether emojis, memes, and GIFs and plain text (control) are viewed in private online communications (e.g., emails, direct message) or general public online learning content (e.g., PowerPoint slides). Based on the research to date, we predict the following three hypotheses.

1. Students will rate emojis, memes, and GIFs as more engaging than plain text.
2. Students will rate combinations of emojis, memes, and GIFs as more engaging than plain text, but certain combinations will be rated more or less engaging than others.
3. Students will rate combinations of emojis, memes, and GIFs as more engaging than plain text, but ratings will differ between private online communication and public online learning content.

Findings from this study will inform HE teaching staff around best practice regarding online communication and learning. In turn, this may encourage student engagement and subsequent attainment.

Method

Participants

Complete data was collected from 115 participants with a mean age of 19.10 years (SD=1.34). The sample comprised 74% female, 16% male and 8% non-binary/third gender participants. Most participants were studying Psychology or Psychology as part of a joint honours course (95%) at undergraduate level (90%). All participants were recruited from one U.K. HE institution. Ethical approval was granted through a U.K. Department of Psychology Research Ethics Committee and the British Psychological Society's ethical guidelines were followed throughout.

The predominant sampling methods used were opportunistic and snowball sampling as authors posted adverts on social media sites (Facebook, Instagram, Twitter, Reddit, and LinkedIn) and a scientific recruitment platform (SONA) inviting participants to complete the survey. Authors also advertised the survey via physical posters which were distributed in the communal spaces of one U.K. HE institution.

Materials

Following completion of demographic items, participants were invited to complete an online survey via the Qualtrics platform (Qualtrics, Provo, UT). The online survey comprised 96 stimuli depicting either a fictional depiction of private online communication between a university staff member and student (64 stimuli) or a fictional depiction of a public online digital learning resource (32 stimuli). The private online communication stimuli were further divided into depictions of either emails (32 stimuli of Microsoft Outlook; see figure 4) or direct messages (32 stimuli of Microsoft

Teams; see figure 5); this was important in capturing the two common types of online communication between university staff members and students. The public online learning content comprised PowerPoint slides (see figure 6). The contents of the private online communication stimuli comprised generic conversations including arranging an online meeting (16 stimuli: 8 emails, 8 direct messages), explaining when/how to submit an assignment (16 stimuli: 8 emails, 8 direct messages), signposting to the admin team (16 stimuli: 8 emails, 8 direct messages) and confirming lecture attendance (16 stimuli: 8 emails, 8 direct messages). The names of the university staff members in these stimuli were kept gender-neutral to avoid any gender bias (Conaway & Bethune, 2015). The contents of the public online learning content stimuli comprised generic lecture content that could apply to any subject including tips for time management (8 stimuli), study skills (8 stimuli), resource repositories (e.g., where to source lecture notes; 8 stimuli) and how to structure a report (8 stimuli). The 96 stimuli were divided into 8 conditions with 12 stimuli in each: 1) just text, 2) text with one emoji, 3) text with one meme, 4) text with one GIF, 5) text with one emoji and one meme, 6) text with one emoji and one GIF, 7) text with one meme and one GIF, 8) all combined: text with one emoji, one meme and one GIF.

Following the presentation of each image, participants were asked ‘How engaged do you feel?’ and invited to respond to a 5-point Likert scale ranging from ‘Very disengaged’ to ‘Very engaged’. Continuous mean scores were forward coded (ranging from 0 to 4) to measure engagement in response to each image with higher scores indicating greater engagement.

Figure 4*.* An example of private online communication stimuli (Microsoft Outlook email) of just plain text.

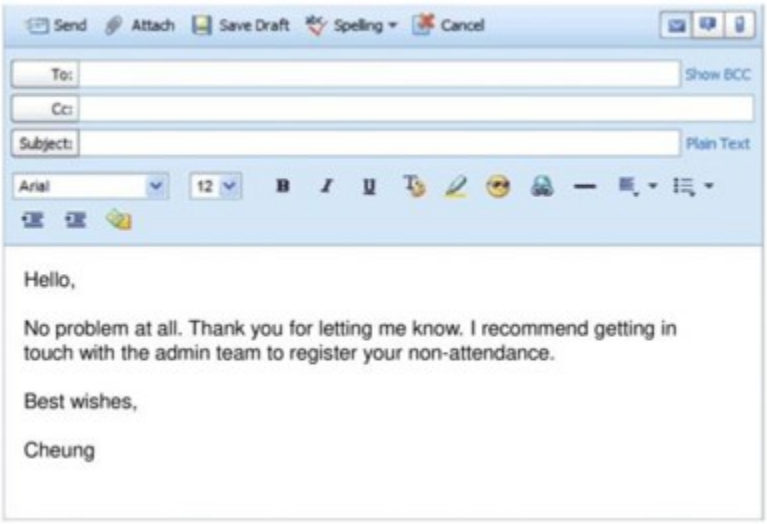


Figure 5. An example of private online communication stimuli (Microsoft Teams direct message) of just plain text.

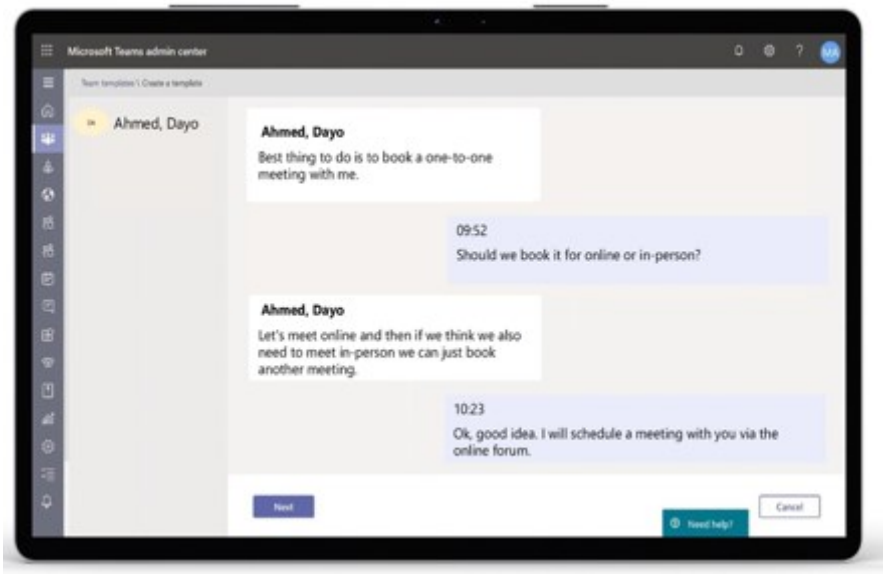
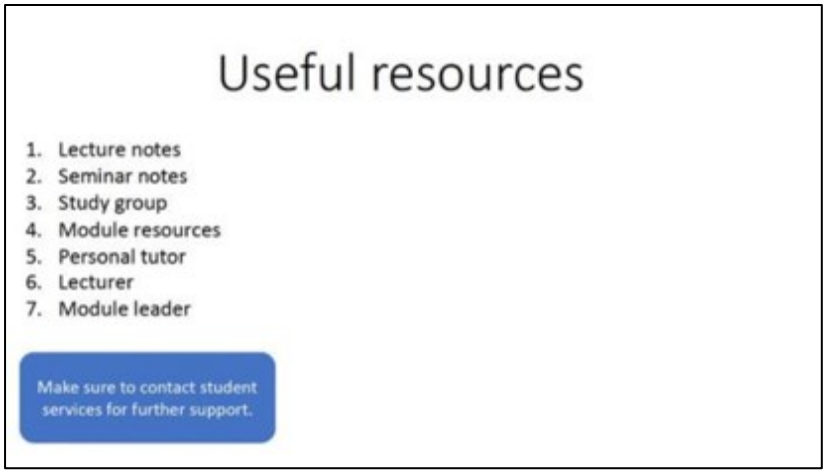


Figure 6. An example of public online learning content stimuli (Microsoft Teams direct message) of just plain text.



Procedure

Data was collected via an online survey conducted on the Qualtrics platform (Qualtrics, Provo, UT). Participants were directed to the survey via an anonymous one-time access link or scanning a QR code. They were asked to read an information sheet outlining the procedure of the study and the opportunity to provide consent to participate. Following consent, participants were then presented with demographic questions including their age, gender, course title and student status (undergraduate, postgraduate, other). Following the demographic questions, participants were presented with the following brief:

'You are going to be presented with images depicting an online learning environment. In response to each image, please outline how engaged you feel. Please indicate how you feel based upon the specific image you are presented with. Try not to consider any images you have seen prior or your own general opinions

towards online learning. Below, you will be presented with an example; as an attention check, please select 'neither engaged nor disengaged'.

Participants were then presented with an example private online communication environment (text only to avoid potential priming) and the 5-point Likert scale (ranging from 'Very disengaged' to 'Very engaged'). Participants who did not select 'neither engaged nor disengaged' failed the attention check and were directed to the debrief screen at the end of the survey. Participants who correctly selected 'neither engaged nor disengaged' proceeded to complete the rest of the survey.

All participants viewed each of the 95 stimuli one by one in a randomised order and responded via a Likert scale to each stimulus. Participants were then debriefed upon completion of the study and provided with the email address of the corresponding author for any further questions. All data has been recorded anonymously with no identifying information being collected or stored.

Data analysis

Data were exported from Qualtrics into an Excel spreadsheet for cleaning. The initial dataset comprised 218 responses. Following the removal of 76 blank responses and 11 responses with a completion rate below 80% (as recommended by Sivo et al., 2006) the dataset comprised 131 responses. A total of 16 responses were then removed due to suspicion of bot activity (extremely quick completion time; Xu et al., 2022) or (ironically) disengagement with the survey (e.g., all responses as 'Very disengaged'; Andreadis, 2014). The final cleaned dataset therefore comprised 115 responses.

Following cleaning, data were imported into SPSS for analysis. A two-way repeated measures ANOVA was conducted. The independent variables comprised the type of online environment: private online communication environment or public online learning content, and the visual stimuli condition: plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, all combined (text with emoji, meme and GIFs). The dependent variable was a continuous measure of engagement (0 to 4). Bonferroni post-hoc corrections were also applied.

Results

All assumption checks were met except Mauchly's test of sphericity ($\chi 2$ (27) = 241.97, $p < .001$) and thus the Greenhouse-Geisser correction was applied. Overall, participants scored the text with emoji and meme condition as the most engaging (M= 2.61, SD= .05), whilst plain text was scored as the least engaging (M= 1.78, SD= .07). When this was broken down by the environment, however, slightly different conditions arose as more or less engaging. When responding to stimuli within the private online communication environment (emails and direct messages), participants scored the text with emoji and GIFs condition as the most engaging (M= 2.63, SD= .06) but again plain text was scored as the least engaging (M= 1.89, SD= .08). When responding to stimuli in the public online learning content environment (PowerPoint slides), participants scored the text with emoji and meme condition as the most engaging (M= 2.59, SD= .06), but again plain text was scored as the least engaging (M= 1.52, SD= .08). Please see Table 1 for a full breakdown of the descriptive data per environment and condition.

Table 1. Overall descriptive statistics including mean and standard deviation scores for both environments (private online communication and public online learning content) per condition (plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, and all combined: text with emoji, meme, and GIFs).

	Overall		Private online communication		Public online learning content	
	M	SD	M	SD	M	SD
Plain text	1.78	.07	1.89	.08	1.52	.08
Text with emoji	2.19	.06	2.33	.05	2.10	.07
Text with meme	2.56	.05	2.61	.05	2.46	.06
Text with GIFs	2.54	.05	2.57	.06	2.48	.06
Text with emoji and meme	2.61	.05	2.62	.06	2.59	.06
Text with emoji and GIFs	2.58	.05	2.63	.06	2.49	.06
Text with meme and GIFs	2.47	.07	2.46	.08	2.42	.08
All combined (text with emoji, meme, and GIFs)	2.42	.08	2.43	.08	2.40	.09

Results highlighted a significant difference between the environments (private online communication, public online learning content), F (1.00, 110) = 7.47, p = .007. Participants scored conditions as more engaging within the private online communication environment (M= .14, SE= .05, p = .007).

Results also highlighted a significant difference between the conditions (plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, all combined: text with emoji, meme and GIFs), F (2.28, 251) = 36.02, p < .001. Every condition was viewed as significantly more engaging than plain text. The text with emoji condition was scored as significantly more engaging than plain text (M= .51, SE= .05, p<.001), but significantly less engaging than text with meme (M= -.32, SE= .06, p<.001), text with GIFs (M= -.32, SE= .07, p<.001), text with emoji and meme (M= -.39, SE= .07, p<.001), text with emoji and GIFs (M= -.35, SE= .07, p<.001). The text with meme condition was scored as significantly more engaging than plain text (M= .83, SE= .09, p<.001) and text with emoji (M= .32, SE= .06, p<.001). The text with GIFs condition was scored as significantly more engaging than plain text (M= .82, SE= .10, p<.001) and text with emoji (M= .32, SE= .07, p<.001). The text with emoji and meme condition was scored as significantly more engaging than plain text (M= .90, SE= .09, p<.001) and text with emoji (M= .39, SE = .07, p<.001). The text with emoji and GIFs condition was scored as significantly more engaging than plain text (M= .85, SE= .09, p<.001) and text with emoji (M= .35, SE = .07, p<.001). The text with meme and GIFs condition was scored as significantly more engaging than plain text only (M= .73, SE= .10, p<001).

The all combined (text with emoji, meme and GIFs) condition was scored as significantly more engaging than plain text (M= .71, SE= .13, p<.001) and significantly

less engaging than text with emoji and meme (M= -.19, SE= .06, *p*= .022). Please see Figure 7 for an overview of each conditions' engagement scores.

A significant difference was also highlighted within the interaction between environment and condition (*F* (3.96, 436) = 3.28, *p* = .012.). Participants were most likely to score the emojis and GIFs condition as the most engaging within the private online communication environment (M= 2.63, SE= .06). Participants were most likely to score the text with emoji and meme condition as the most engaging within the public online learning content environment (M= 2.59, SE= .06). Please see Figure 8 for an overview of the engagement scores for each condition (plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, and all combined: text with emoji, meme and GIFs) per environment (private online communication, public online learning content).

Figure 7. Bar graph presenting the descriptive mean engagement scores per condition (plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, all combined: text with emoji, meme and GIFs).

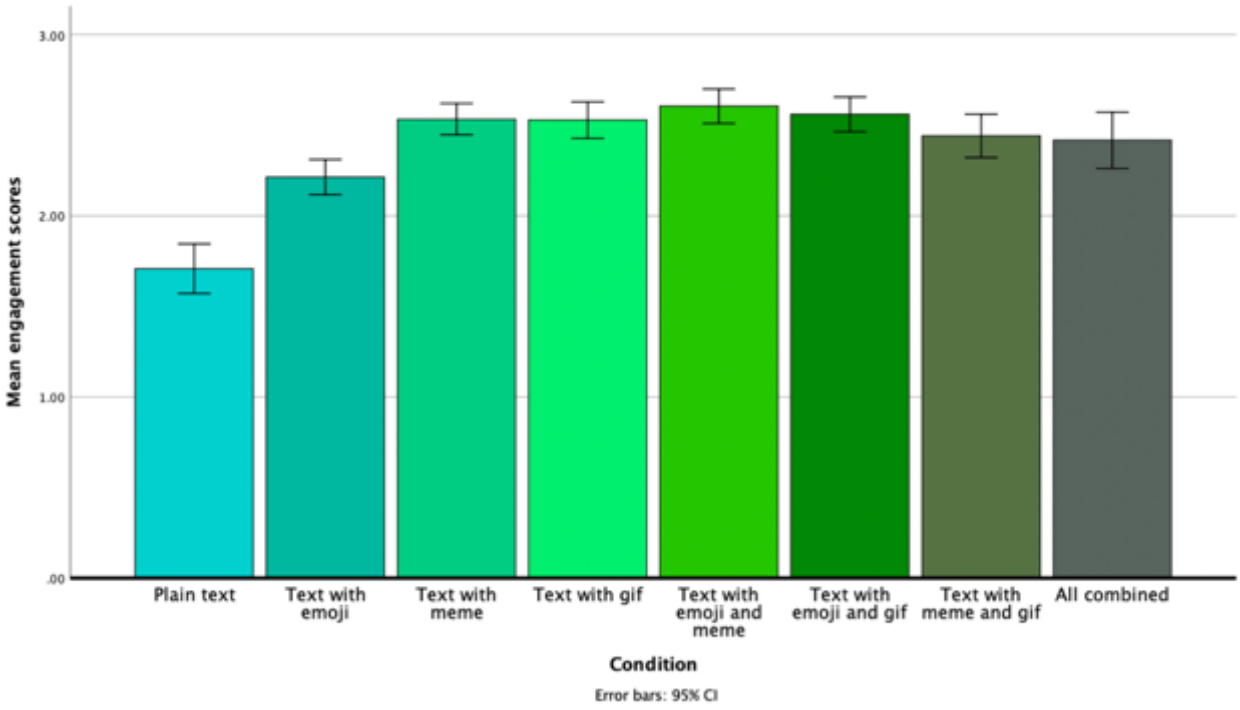
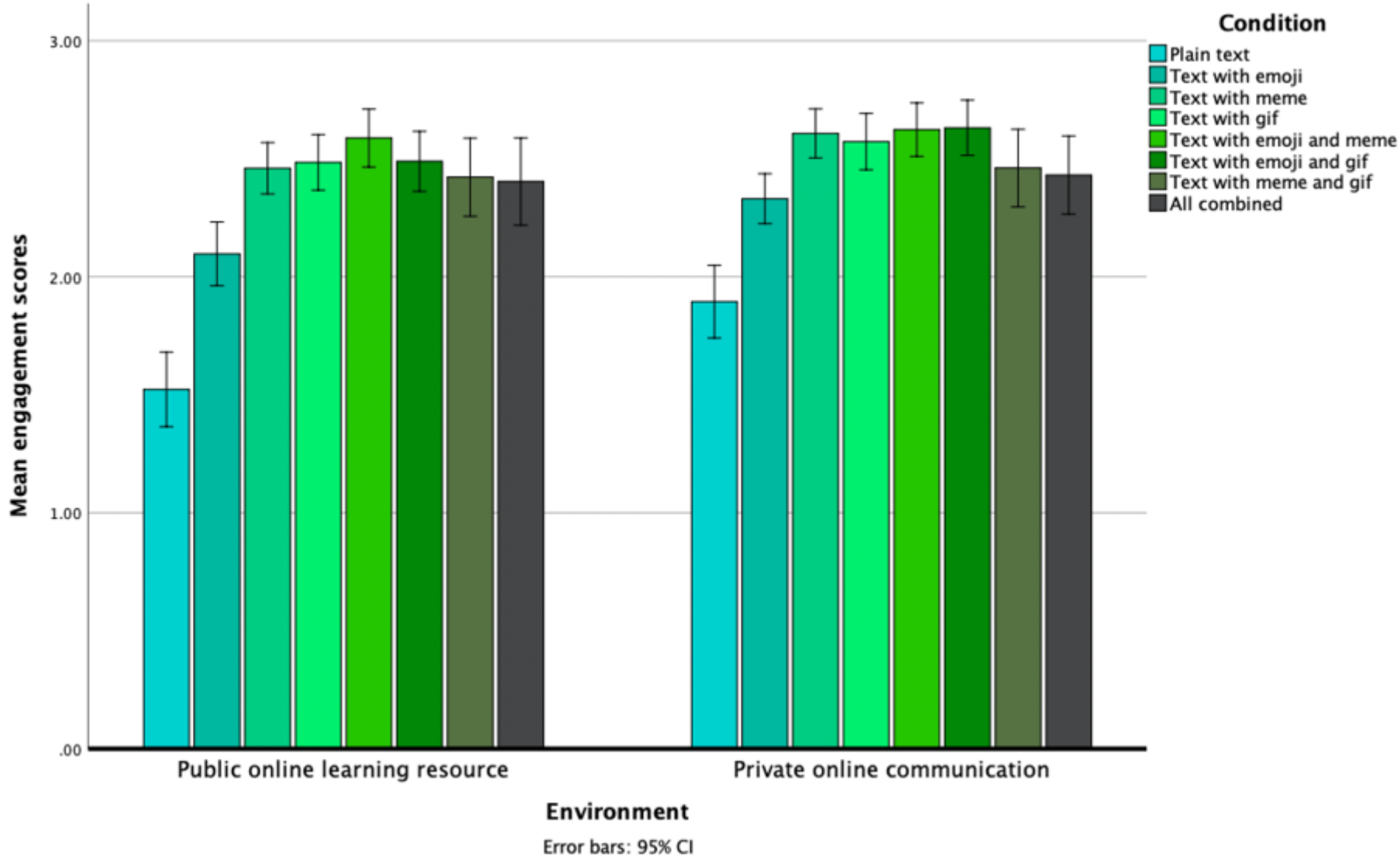


Figure 8. Bar graph presenting the mean engagement scores per condition (plain text, text with emoji, text with meme, text with GIFs, text with emoji and meme, text with emoji and GIFs, text with meme and GIFs, all combined: text with emoji, meme and GIFs) within each environment (public online learning content, private online communication).



Studen

Volum

Discussion

This study is unique in its novel exploration of HE teaching staff's use of emojis, memes, and GIFs within a HE context. Importantly, we explored whether the use of these digital stimuli may be associated with student engagement. We broke this down further by exploring whether there was a difference between HE teaching staff using these stimuli via private online communication or public learning content. Regardless of the context in which the digital stimuli were used, memes, emojis and GIFs individually and combined received higher student engagement scores than plain text. This suggests the pedagogic worth of utilising such digital stimuli in aiding student engagement (Henderson et al., 2017). Our findings highlight that participants found GIFs to be the most engaging individual digital stimuli but emojis and memes were the most engaging digital stimuli overall. Our findings also highlight that using digital stimuli within private online communication is more engaging than via public online learning content.

Considering these digital stimuli individually, GIFs were rated as the most engaging; this supports previous research conducted by Bakhshi et al. (2016) and Aleman and Porter (2016), which similarly found that students found GIFs to be the most engaging digital stimuli. Previous research, however, focused on public online learning environments rather than private, therefore, this research has provided evidence to suggest that GIFs are the most engaging in both avenues of digital communication. Moreover, we found that, combined, using emojis and memes was significantly more engaging for students than plain text; this supports previous research which found that using emojis positively affects student's perception of HE teaching staff (Kim et al,

2022; Vareberg et al., 2022) and consequently increases student engagement over time (Quin, 2017). Our study provides further evidence to suggest that this is also the case through multiple contexts including both private and public communication. Kayali and Altuntas (2021) found that using memes in a classroom setting improved academic performance. It is therefore possible that, over time, utilising these digital stimuli may have a positive association with attainment.

There are several possible explanations as to why the combination of emojis and memes was rated as the most engaging as opposed to any GIF combination. Firstly, GIFs already convey a large amount of information by themselves, therefore when presented alongside another digital stimulus there may be an overload of information. GIFs are already overly animated and having many animations can be distracting (Aronoff et al., 2002). This may explain why GIFs were rated as most engaging when used individually rather than alongside another digital stimulus. When HE teaching staff misjudge the content of GIFs, they can be perceived as unprofessional to students (Hayes & Fatima, 2024). Emojis and memes were potentially rated as the most engaging combination because these digital stimuli may be easier to combine than other combinations. HE teaching staff who use emojis are perceived more positively (Kim et al, 2022) and using memes increases knowledge retention (Tidy et al., 2024). The combination of positive emotions and being able to retain more information may encourage student engagement and this is possibly why the combination of memes and emojis is optimum. It may be both theoretically and physically easier to match an emoji to a meme and create an appropriate combination than when using GIFs. Compared to GIFs, emojis are more broadly utilised within every digital communication (Gawne & McCulloch, 2019) and so HE staff may be more

familiar with them. It may therefore be easier to create a combination and this may be more appreciated by students.

The use of emojis and memes was seen to be the more engaging than any other condition when used in public online learning content environments. Potentially, the use of GIFs may be adding to the cognitive load that students are already experiencing rather than helping with academic engagement and attainment (Strachan & Liyanage, 2015) hence causing less engagement among students compared to memes and emojis. Nonetheless, in the private online communication environment the use of text in combination with emojis and GIFs was perceived to be the most engaging by students. While this result is novel previous research does suggest that the use of GIFs and emojis is more beneficial in online communication content as there is more of a need for reactions to be conveyed (Wagener, 2020). The presence of reactions in private online communication is essential as they are intimate and personalised conversations that HE teaching staff have with their students regarding general information or student concerns. Topics within private online communication environments tend to be less cognitively loaded and therefore GIFs pose less of a risk of distracting students (Aranoff et al., 2002). Whereas, in public online learning content the purpose is to provide academically heavy information to students. Therefore, GIFs in these instances may be seen as adding another layer of loaded information and distracting.

Limitations and future research

This study is novel in considering how emojis, memes and GIFs may be associated with student engagement within private and public online communication

environments. Our findings add to the pedagogic literature regarding digital learning in HE, which is increasing in importance within a digital age.

We recognise that within this study we measured students' engagement using self-report measures. We did not define the term 'engagement' in this study and so this term may have been interpreted differently across participants. Engagement has been argued to be a multi-dimensional construct that consists of cognitive, behavioural, and emotional components (Eccles, 2016; Fredricks et al., 2004; Smith & Tinto, 2024; Zepke, 2021). Various indicators have been used to measure students' level of engagement, for example in studies that examine the impact of educational technology: a systematic evidence map study found that researchers mainly used the indicators of involvement and participation, achievement, and good communication with peers and staff (Bond et al., 2020). Other indicators included enjoyment, motivation, and deep learning. In the present study, it is unknown which indicators of engagement have been used by students and which dimension of engagement these reflect. Further research could present a clear definition for students before they indicate their level of engagement. Alternatively, studies could examine the impact of using emojis, memes and GIFs on different components of engagement separately by using alternative measures; cognitive engagement, for example, could be measured by eye-tracking or physiological measures (Sinatra et al., 2015).

Although the stimuli in this study were carefully design and piloted with a group of undergraduate students prior to data collection, we recognise that stimuli were inauthentic. Students may have viewed the content of the stimuli differently as the content was not meaningful or valuable to them. Previous studies suggest that higher

relevancy of content has a positive effect on students' motivation and engagement in learning (Frymier & Shulman, 1995; Knoster & Goodboy, 2021). Engagement scores may have therefore differed if the content was more relevant to the participants. Further research could examine students' engagement regarding the use of emojis, memes and GIFs in content that is relevant to them, such as lectures within their chosen modules or real-life text communications with university staff members from different online platforms. Furthermore, it would be interesting to explore the use of emojis, memes and GIFs with postgraduate students. We know that engagement looks different amongst postgraduate students (Lindsay et al., 2002) compared to undergraduate students and therefore the use of emojis, memes and GIFs may be viewed differently. It would be useful to explore this and compare the findings to those of undergraduate students.

We also recognise that emojis, memes or GIFs may be more appropriate in certain contexts than others. For example, Vareberg et al. (2023) used three different emojis across different conditions in a welcoming email from a lecturer: a winking emoji, a laughing emoji with tears of joy, and an emoji with a tongue sticking out. When the researchers asked students open questions about the meaning of the message and how they perceived it, they found that emojis can lead to both positive and negative perceptions of the lecturer. The authors conclude that emojis must match the context because students consider them in relation to the content of the message. Since students' perception of their lecturer may positively impact engagement (Amerstorfer & Freiin von Münster-Kistner, 2021; Quin, 2017), it may be that wrong emoji use in certain contexts can decrease students' engagement. Future research should examine how students interpret specific emojis, memes and GIFs in different

educational contexts and whether, in some contexts, we should consider not using emojis, memes and GIFs at all.

The researchers used an online survey to measure student engagement within various media and different HE situations but did not consider auditory feedback such as voice notes from lecturers. Sarcona et al.'s (2020) findings indicate this would have been vital to assess. The authors investigated 116 undergraduate students' views on written and auditory feedback and concluded that students' preference for feedback was determined by their learning style. Still, the majority preferred written feedback as they found auditory feedback harder to comprehend and follow. Meanwhile, written feedback allowed them to visually see and track their performance on written academic work (Sarcona et al., 2020). This preference indicates that students may be more engaged with written feedback compared to auditory feedback and therefore the results obtained in this study may be an overestimation for the engagement that students exhibit, as written feedback is easier to stay engaged with due to its simplicity. Nonetheless, students' experienced difficulties with auditory feedback may suggest that this feedback mode may benefit even more from supporting media like memes, emojis and GIFs to increase student engagement and help students comprehend their feedback. Improving students' experience with auditory feedback is important given that some students' learning may benefit from such a format due to their learning style. Moreover, auditory feedback can benefit the connection between the students and their HE department and therefore aid building of a personalised trusting relationship (Kirwan et al., 2023). It would therefore be useful for future research to explore the potential of memes, emojis and GIFS across different feedback modes.

Within our research team are university students who are aged 18-24 years; because of this we were able to select emojis, memes and GIFs that were neutral in nature for our stimuli, and unlikely to be misinterpreted or perceived negatively by participants. We know that if students perceive the choice of emoji, meme or GIF as inappropriate, this can result in negative perceptions of the lecturer and disengagement with the learning (Hayes & Fatima, 2024). It would therefore be interesting for future research to consider a range of emojis, memes and GIFs and explore the potential opportunities or challenges of different themes within these. It is possible that HE staff may utilise emojis, memes and GIFs with the intention of engaging students but inadvertently disengage them due to misjudging the appropriateness of the content. Developing a broader understanding of the themes around emojis, memes and GIFs may be useful in knowing which types of content are best to avoid or include.

Conclusions

Our study is unique in its examination of the use of emojis, memes, and GIFs within a HE context and to what extent this may shape students' engagement. Our findings provide insights into the complexity behind their use, concluding that these visual stimuli may be perceived as more or less engaging depending upon the nature of the environment (private communication and public learning content). Our findings suggest although student engagement can be fostered with the use of emojis, memes and GIFs, this engagement is sensitive to the nature of the online environment. HE teaching staff should consider our findings within their digital communication with students as well as the design of their digital learning tools.

References

Aleman, K. J., & Porter, T. D. (2016). 10-second demos: Boiling asynchronous online instruction down to the essentials with GIFS graphics. Journal of Library & Information Services in Distance Learning, 10(3-4), 64-78. https://doi.org/10.1080/1533290X.2016.1193414

Amerstorfer, C. M., & Freiin von Münster-Kistner, C. (2021). Student perceptions of academic engagement and student-teacher relationships in problem-based learning. *Frontiers in psychology,* 12, 713057.

Andreadis, I. (2014). Data quality and data cleaning. *Matching Voters with Parties and Candidates. Voting Advice Applications.* Retrieved from: http://www.polres.gr/en/sites/default/files/VAA-Book-Ch6.pdf

Aronoff, J., Spiegel, F., Walsh, P., Aronoff, J., Spiegel, F., & Walsh, P. (2002). Images for Rollovers, Web Page Backgrounds, and Animated GIFs. *Photoshop Elements 2 Most Wanted*, 221-243. https://doi.org/10.1007/978-1-4302-5119-4_11

Bakhshi, S., Shamma, D. A., Kennedy, L., Song, Y., de Juan, P., & Kaye, J. 'Jofish'. (2016). Fast, Cheap, and Good. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. https://doi.org/10.1145/2858036.2858532

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of*

Educational Technology in Higher Education, *17*(1). https://doi.org/10.1186/s41239-019-0176-8

Brown, J. D. (2020). What Do You Meme, Professor? An Experiment Using "Memes" in Pharmacy Education. *Pharmacy, 8*(4), 202. https://doi.org/10.3390/pharmacy8040202

Conaway, W., & Bethune, S. (2015). Implicit Bias and First Name Stereotypes: What Are the Implications for Online Instruction?. *Online Learning*, *19*(3), 162-178.

Draxler-Weber, N., Packmohr, S., & Brink, H. (2022). Barriers to Digital Higher Education Teaching and How to Overcome Them—Lessons Learned during the COVID-19 Pandemic. *Education Sciences*, *12*(12), 870. https://doi.org/10.3390/educsci12120870

Eccles, J. S. (2016). Engagement: Where to next? *Learning and Instruction*, *43*, 71–75. https://doi.org/10.1016/j.learninstruc.2016.02.003

EVOLVE Project Team. (2020). The Impact of Virtual Exchange on Student Learning in Higher Education. *EVOLVE* Retrieved from http://hdl.handle.net/11370/d69d9923-8a9c4b37-91c6-326ebbd14f17

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59–109. https://doi.org/10.3102/00346543074001059

Frymier, A. B., & Shulman, G. M. (1995). "What's in it for me?": Increasing content relevance to enhance students' motivation. *Communication Education*, *44*(1), 40–50. https://doi.org/10.1080/03634529509378996

Gawne, L. & McCulloch, G. (2019). Emoji as digital gestures. Language@ internet, 17(2). Retrieved from https://scholarworks.iu.edu/journals/index.php/li/article/view/37786

Hayes, B. (2024). Exploring university students' online self-presentation techniques and self-disclosure behaviors as predictors of staff response. *Journal of Digital Educational Technology*, *4*(1), ep2405–ep2405. https://doi.org/10.30935/jdet/14169

Hayes, B., & Fatima, S. (2024). 'A language we understand': Students' perceptions of emojis, memes and gifs in higher education teaching. *Student Engagement in Higher Education Journal*, *5*(3), 154-177.

Henderson, M., Selwyn, N., & Aston, R. (2017). What works and why? Student perceptions of 'useful' digital technology in university teaching and learning. *Studies in higher education*, *42*(8), 1567-1579. https://doi.org/10.1080/03075079.2015.1007946

HESA. (2023). *Higher education student statistics: UK, 2021/2022*. https://www.hesa.ac.uk/news/19-01-2023/ sb265-higher-education-student-statistics

Horgan, Á., & Sweeney, J. (2012). University Students' Online Habits and Their Use of the Internet for Health Information. *CIN: Computers, Informatics, Nursing*, *30*(8), 402–408. https://doi.org/10.1097/nxn.0b013e3182510703

Jiang, J., Fiesler, A. C., & Brubaker, J. R. (2018). The Perfect One. *Proceedings of the ACM on Human-Computer Interaction*, *2*(CSCW), 1–20. https://doi.org/10.1145/3274349

Kayali, N. K., & Altuntas, A. (2021). Using Memes in the Language Classroom. *Shanlax International Journal of Education*, *9*(3), 155-160.

Kim, M., Knotts, T. L., Albers, N. D., & James, K. (2022). Emoji use as a catalyst for relationship building and sustaining attention in online classes: An empirical study. *Education Sciences*, *12*(12), 874. https://doi.org/10.3390/educsci12120874

Kirwan, A., Raftery, S., & Gormley, C. (2023). Sounds good to me: A qualitative study to explore the use of audio to potentiate the student feedback experience. *Journal of Professional Nursing*, *47*, 25–30. https://doi.org/10.1016/j.profnurs.2023.03.020

Klein, P., Viiri, J., & Kuhn, J. (2019). Visual cues improve students' understanding of divergence and curl: Evidence from eye movements during reading and problem solving. Physical Review Physics Education Research, 15(1), 010126.

Knoster, K. C., & Goodboy, A. K. (2021). Making content relevant: a teaching and learning experiment with replication. *Communication Education*, *70*(1), 4–26. https://doi.org/10.1080/03634523.2020.1788106

Kralj Novak, P., Smailović, J., Sluban, B., & Mozetič, I. (2015). Sentiment of Emojis. *PLOS ONE*, *10*(12), e0144296. https://doi.org/10.1371/journal.pone.0144296

Lindsay, R., Breen, R., & Jenkins, A. (2002). Academic research and teaching *quality: The views of undergraduate and postgraduate students. Studies* in Higher Education, 27(3), 309-327. https://doi.org/10.1080/03075070220000699

Moffitt, R. L., Padgett, C., & Grieve, R. (2021). The impact of emoji use and feedback medium on perceptions of marker personality in online assessment feedback. *Learning and Individual Differences*, *92*, 102093. https://doi.org/10.1016/j.lindif.2021.102093

Newell, S., & Adam, E. (2022). 'We've become a little family now': Maximising rapport in an accelerated, fully online learning environment. *ASCILITE 2022 Conference Proceedings*. https://doi.org/10.14742/apubs.2022.63

Office for Students. (2022). *The office for students annual review 2022*. https://www.officeforstudents.org.uk/publications/ annual-review-2022/

Pranoto, B. E. (2021). Insights from Students' Perspective of 9GAG Humorous Memes Used in EFL Classroom. In *Thirteenth Conference on Applied Linguistics (CONAPLIN 2020)* (p. 72-76). Amsterdam, NL: Atlantis Press.

Quin, D. (2017). Longitudinal and contextual associations between teacher–student relationships and student engagement. *Review of Educational Research*, *87*(2), 345–387. https://doi.org/10.3102/0034654316669434

Sarcona, A., Dirhan, D., & Davidson, P. (2020). An overview of audio and written feedback from students' and instructors' perspective. *Educational Media International*, 1–14. https://doi.org/10.1080/09523987.2020.1744853

Sawyer, S. M., Azzopardi, P. S., Wickremarathne, D., & Patton, G. C. (2018). The Age of Adolescence. *The Lancet Child & Adolescent Health*, *2*(3), 223–228. https://doi.org/10.1016/s2352-4642(18)30022-1

Shu, X., Wu, A., Tang, J., Bach, B., Wu, Y., & Qu, H. (2021). What makes a data-GIFS understandable?. *IEEE Transactions on Visualization and Computer Graphics, 27*(2), 1492-1502. https://doi.org/10.1109/TVCG.2020.3030396

Sinatra, G. M., Heddy, B. C., & Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. *Educational Psychologist*, *50*(1), 1–13. https://doi.org/10.1080/00461520.2014.1002924

Sivo, S., Saunders, C., Chang, Q. and Jiang, J. (2006). How Low Should You Go? Low Response Rates and the Validity of Inference in IS Questionnaire Research. *Journal of the Association for Information Systems*, [online] 7(6), pp.351–414. doi:https://doi.org/10.17705/1jais.00093.

Smith, R. A., & Tinto, V. (2022). Unraveling student engagement: Exploring its relational and longitudinal character. Journal of College Student Retention: Research, Theory & Practice, 26(2), https://doi.org/10.1177/15210251221098172

Stockdale, L. A., & Coyne, S. M. (2020). Bored and online: Reasons for using social media, problematic social networking site use, and behavioral outcomes across the transition from adolescence to emerging adulthood. *Journal of Adolescence*, *79*(1), 173–183. https://doi.org/10.1016/j.adolescence.2020.01.010

Strachan, R., & Liyanage, L. (2015). Active student engagement: The heart of effective learning. *Global innovation of teaching and learning in higher education: transgressing boundaries*, 255-274. https://doi.org/10.1007/978-3-319-10482-9_16

Tammi, T., & Rautio, P. (2023). “It was funny at first” exploring tensions in human-animal relations through internet memes with university students. *Environmental Education Research*, *29*(4), 539-551. https://doi.org/10.1080/13504622.2022.2073972

Tandyonomanu, D., & Tsuroyya. (2018). Emoji: Representations of Nonverbal Symbols in Communication Technology. *IOP Conference Series: Materials Science and Engineering*, *288*, 012052. https://doi.org/10.1088/1757-899x/288/1/012052

Tidy, H., Bolton-King, R.S., Croxton, R., Mullen, C., Nichols-Drew, L., Felicity Carlysle-Davies, Moran, K.S. and Irving-Walton, J. (2024). Enhancing the Student Learning Experience Through Memes. *Science & justice*. doi:https://doi.org/10.1016/j.scijus.2024.03.004.

Vareberg, K. R., Vogt, O., & Berndt, M. (2022). Putting your best face forward: How instructor emoji use influences students' impressions of credibility, immediacy, and liking. *Education and Information Technologies*, *28*(5), 6075–6092. https://doi.org/10.1007/s10639-022-11421-w

Wacks, Y., & Weinstein, A. M. (2021). Excessive Smartphone Use Is Associated With Health Problems in Adolescents and Young Adults. *Frontiers in Psychiatry*, *12*(12), 669042. https://doi.org/10.3389/fpsyt.2021.669042

Wagener, A. (2020). The postdigital emergence of memes and GIFs: Meaning, discourse, and hypernarrative creativity. Postdigital Science and Education, 3(3), 831-850.

Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education*, *54*(4), 1202–1211. https://doi.org/10.1016/j.compedu.2009.11.006

Xu, Y., Pace, S., Kim, J., Iachini, A., King, L. B., Harrison, T., ... & Simone, M. (2022). Threats to online surveys: Recognizing, detecting, and preventing survey

bots. *Social Work Research*, *46*(4), 343-350. https://doi.org/10.1093/swr/svac023

Zepke, N. (2024). Mapping student engagement using a theoretical lens. Teaching in Higher Education, 29, 176-193. https://doi.org/10.1080/13562517.2021.1973406