



The Role of Nonverbal Communication in Asynchronous Talk Channels

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Abstract

With the increased adoption of online learning (even greater as a result of the COVID-19 pandemic), online asynchronous discussions have become a mainstay of many online learning platforms. As teachers struggle to communicate and connect with students due to the forced transition online, we can better appreciate the differences between traditional nonverbal communication in a face-to-face environment and that of online nonverbal communication. Because digital literacy underpins the whole online learning experience, and because nonverbal communication (NVC) cues such as body language and paralinguistics are not visible in asynchronous text-based online learning, this paper presents the relationship (if any) between electronic nonverbal communication (eNVC) and teaching/social presences and digital literacy, as well as its role in student motivation and engagement. A correlational study was conducted using surveys to gather data from 88 Level 5 Business Area students. The data was analysed using a Pearson's correlation analysis. The study has found that there is a correlation between eNVC and the social/teaching presence and digital literacy in the asynchronous online discussions, and that eNVC is related to teaching and social presences, but not to digital literacy.

Keywords: online learning; electronic nonverbal communication; eNVC; asynchronous talk channels; online communication

Introduction

Since the start of the COVID-19 pandemic, online learning has become even more critical for delivering education (Lederman, 2018; Khalil et al., 2020). This is reflected both in the burgeoning size of the market (Technavio, 2021), and student preference for online delivery remaining high (Bashir et al., 2021). Asynchronous online delivery still dominates online learning as the main means of delivery (Schaffhauser, 2017), and talk channels are a key feature of such systems. These are often designed as avenues for students to conduct meaningful discourse with their teachers and fellow classmates, to demonstrate their grasp of relevant topics, and to share their personal experience and reflections. Thus, they are often described as the "heart of the virtual classroom".

However, the sudden shift to online learning has also meant that some teachers struggle to communicate and connect with students (Carrillo & Flores, 2020; Moorhouse, 2020). This is partly because of the differences between traditional nonverbal communication in a face-to-face environment and that of online nonverbal communication (Khalil et al., 2020).

Background

The relationship between nonverbal communication cues and learning has been well documented (Schneider et al., 2022; Wahyuni, 2018). Hence, it is not surprising that positive nonverbal communication cues are associated with improved academic performance, student engagement, and motivation (Schneider et al., 2022; Wahyuni, 2018). However, nonverbal communication in the online learning environment is traditionally thought to happen insufficiently often in online learning to be a factor of consideration (McBrien et al., 2009).

Because online activities continue to integrate with every aspect of life, Al Tawil (2019) recognised that nonverbal communication cues exist significantly in online asynchronous learning environments. A follow-up pilot study in 2021 (Koh, 2021) has indicated that these nonverbal communication cues not only exist online, but there is significant correlation between the teacher and social presences, and student engagement and motivation.

Given the recent developments, we ask the following research questions.

1. What is the correlation between nonverbal communication in the asynchronous online talk channels and the presences (teacher/social/digital) of online learning?
2. What is the correlation of nonverbal communication in the asynchronous online talk channels and student motivation and engagement?

Literature review

Given that nonverbal communication in online learning environments has recently been noted to play a significant role in online learning outcomes, let's look at an expanded view of the literature on electronic nonverbal communication, pedagogical theories of learning in technological environments, and discussions about the technology and asynchronous discussion/talk channels.

Electronic nonverbal communication (eNVC)

Al Tawil (2019) coined the term “eNVC” for nonverbal online communication. She argues that because it is distinctly different from face-to-face nonverbal communication (due to the absence of body language and paralanguage), the distinction between the terms should be made clear. eNVC can be viewed in the context of being text based and non-text based. Text-based eNVC is based on the actual words and text used in the communication. This includes word choice, sentence structure, and phrasing. Emoticons and emojis are also considered to be text-based eNVC because they convey an emotion or feeling (Gajadhar & Green, 2005).

Non-text-based eNVC is viewed as being any information that is communicated outside that of the words used. This includes the profile picture, the font choice and style, and the perceived effort and tone of the communication. This is because additional meaning is implied and assigned to the communication to psychologically paint a more complete picture in the reader's mind (Al Tawil, 2019). These eNVC cues are presented in four main aspects: tone, style, effort, and timeliness (T.E.S.T).

Tone is the perceived manner of online communication. The interpretation of tone goes beyond the choice and phrasing of words—it includes multiple layers of cultural and societal context (Sheerman-Chase et al., 2011), in which words have different connotations and so communicate different messages in context.

Style refers to the stylistic choices of how discussions are presented. For instance, a sentence in uppercase seemingly “shouts” at the reader and communicates aggression. Style also extends to the length of responses and choice of font.

The amount of *effort* that students perceive their teachers to have invested in the communication also matters. Long, standardised replies to a query are usually perceived as being inauthentic. Conversely, single word responses communicate disinterest and a lack of genuineness on the part of the teacher to engage with students. Genuineness looks at how “real” the teacher is perceived to be. The level of genuineness perceived by students also communicates a picture of the teacher, and communicates what they are trying to say with their words (Al Tawil, 2019).

Timeliness, or chronomatics, is another important factor in how eNVC cues are communicated. A slow response, or no response, is often taken very negatively (e.g., a “read” receipt on a WhatsApp message). Interestingly, an immediate response also communicates a lack of authenticity or that the answers are likely to be from a databank of templated answers (Koh, 2021).

In traditional face-to-face teaching, nonverbal communication has been shown to have a significant impact on the success of teaching (Bambaeroo & Shokrpour, 2017), but in an online e-learning environment, these nonverbal elements have even greater importance and impact on the way students learn, adopt, and (by extension) predict student success (Al Tawil, 2019; Koh, 2021)

Community of inquiry (CoI) model

In the context of online learning, the CoI model is a framework designed specifically to better understand learning through an online medium (Garrison, 2017). This constructivist framework captures the dimensions of higher education in computer-based online education succinctly, defining them as social, cognitive, and teacher presences. Each presence, and the interactions between them, constitutes an aspect of the online educational experience (Fig. 1). The *social presence* looks at the ability of students/participants to express a projection of themselves which is “most authentic”. The *cognitive presence* looks at the ability to derive meaning and purpose. The *teaching presence* looks at how the design and facilitation of the processes help students to achieve a certain learning outcome(s).

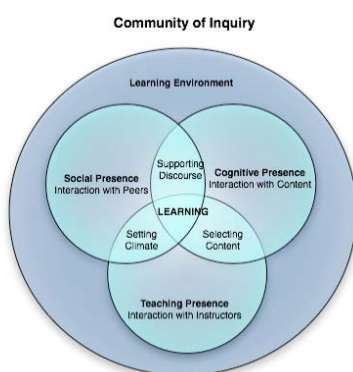


Figure 1 Community of Inquiry model

Note: This model is adapted from Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education*, 2(2-3), 87-105.

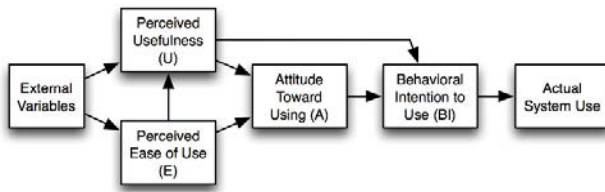


Figure 2 Technology acceptance model

Each dimension is complemented with a 4-phase model of practical inquiry; that is, triggering an event, exploration, integration, and resolution. In most computer-based online education environments, the primary medium of communication would be via a text-based, asynchronous learning management system (LMS). In such a learning environment, it is not clear if the communication will be as effective as more traditional media of oral and face-to-face communication. Traditionally, teaching presence is thought to be more central to CoI, and influences both social and cognitive presence.

Moore's transactional distance theory

Moore's transactional distance theory (Moore, 1991) takes a more humanistic approach to viewing the educational experience by viewing it in terms of "transactional distance", which is defined as a psychological and communication gap that exists due to physical separation.

Moore viewed the distance as consisting of three sets of variables. The first set looks at the "structure"—the design elements of what is to be learned. Structure is often seen as being "rigid" or "flexible", depending on the extent of goal prescription, model of delivery, nature of the course, and the ability to adapt to learner needs.

The second set of variables looks at the interaction or communication among and between the teachers and students. This includes teacher–student and student–student interactions. Key considerations of this set of variables are the quantity (i.e., frequency) and quality of interactions. The quality can be viewed via the lens of the ability to resolve a student's questions and problems.

The third set of variables is the "autonomy" of the student—the student's ability and confidence to learn. Learner autonomy is very closely affected by individual self-determination and self-direction, which, in turn, is affected by the two other aspects of the theory.

Moore's transactional distance theory posits that the three aspects have an inverse relationship, meaning an increase in one aspect can lead to decreases in the other aspects.

Technology acceptance model (TAM)

The technology acceptance model (TAM) was developed by Davies (Davis, 1989) and has since been used widely in many studies of the behaviour arising from the acceptance of technology. The basic premise of the model is that the primary components of the TAM (perceived ease of use; perceived usefulness) affect attitudes towards adoption which, in turn, affects the behavioural intention and actual use of the system. It draws a causal relationship between the perceptions and attitudes and behavioural outcomes.

TAM has been used extensively in the context of online learning (Mulwa et al., 2012; Sheng et al., 2008). Causal links were drawn between the perceptions and behavioural outcomes. Although TAM is still a technology-focused model, there have been some limited applications in communication spaces (Maican et al., 2019). The perception and subsequent adoption of online

communication and collaboration tools are one of the factors that help to predict academic success (Maican et al., 2019)

Asynchronous discussions

As online learning developed, online discussion channels were created so that distance learners who were learning asynchronously would have an avenue for reflection, debate, and critical discourse of topics with another person (Hew & Cheung, 2013). In addition, the messages, or “posts”, are visible to all participating students and give them the option of either actively participating (i.e, replying or writing new posts) or participating passively (i.e., just reading the exchanges). Students can engage with each other more “meaningfully” and at a deeper level because they are not penalised for a delayed response and can take more time to structure and compose better responses (Garrison, 2009; Putman et al., 2012).

Asynchronous talk channels intentionally encourage sharing of, and debate about, experiences and knowledge by allowing students to proactively participate in self-enforcing collaborative learning (Kozan & Richardson, 2014). Discussion posts also remain online, allowing students to revisit them as often as necessary (Garrison, 2009). Due to the time-delayed nature of asynchronous discussions, students can also do more research before posting their responses online. This elevates the level of discussion and gives a greater sense of understanding of the topics. The time delay also means that students can identify the critique on their responses as critiques rather than personal attacks (Kemp & Grieve, 2014). This encourages more online learner participation. Arguably, active participation has led to higher levels of student academic achievement and student satisfaction (Romero et al., 2013).

Methodology

Before we discuss the methodology of the research, we will explore some context on the theoretical paradigm underpinning this project. A pragmatist approach (e.g., Dewey, 1938) is most suitable for this project. Pragmatism, as defined by the *APA Dictionary of Psychology*, is “a philosophical position holding that the truth value of a proposition or a theory is to be found in its practical consequences” (APA, n.d.). This project is designed primarily as an applied project, so having a paradigm that allows for both theoretical rigour and flexibility will be suitable . Because there is an expectation that the project will contribute in theory, practice, methodology, and policy, it will be more useful if the findings can be generalised and broadly applied, rather than relating to just a small focused sample group. This new knowledge would also be grounded in practicality and be nuanced enough for the results to be interpreted accurately.

Research process

To meet the research goal and answer the research questions, this project will undertake the research in three stages, as seen in Fig. 3.

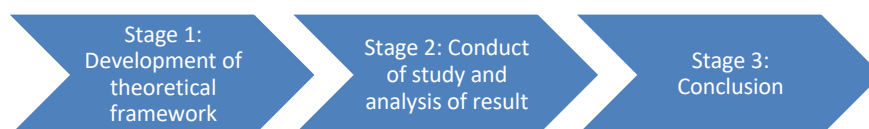


Figure 3 Research process flow

Stage 1: Development of theoretical framework

The first step in Stage 1 is to build the theoretical framework. This guides the study and frames how it will proceed. The theoretical framework will leverage the literature review and synthesise the information and models into a working model for this study.

Stage 2: Conduct of survey and analysis of results

The next stage is the conduct of the study. In line with the pragmatist approach, a semi-structured survey was used due to its speed, efficiency, and cost-effectiveness (Gürbüz, 2017). By adapting the survey instrument by Arnaugh et al. (2008) to account for digital literacy, the 40-question survey instrument aims to explore the impact of eNVC on student outcomes. This survey was administered via an online cloud-based survey software over 14 days.

Students from a New Zealand-based fully online distance provider studying Level 5 business courses were invited to participate in the project. In total, 850 invitations were sent out. Having students from the same course lessens the possible variability of experience due to subject areas and delivery methods. It also means that the experience of the students can be attributed to similar events that have happened at the same time. To mitigate the concerns of power differential between students and researchers/teachers, the survey was non-identifiable and confidential. Students from the researchers' courses were excluded.

Using the data collected, a correlational analysis was then conducted. The Pearson's Product Moment Correlation (Pearson r) was selected to compute the coefficient of correlation due to its reliability and ease of use because it is based on the method of covariance (Creswell & Plano Clark, 2017). It provides information about the magnitude and direction of the relationship. A 95% confidence interval was selected for this study as that is mostly commonly used.

Qualitative data was thematically synthesised with the analysis of the quantitative data collected. The integration strategy used was the data linking strategy, where data was combined (or linked) to each other via "association, comparative or relational analyses" (Bazeley, 2018). This allowed for more nuance in the way both sets of data corroborate, elaborate and/or illustrate each other, and allowed for easier detection of group patterns, relationships, and differences (Bazeley, 2018).

Stage 3: Conclusion

Once the analyses were completed, a final conclusion could be drawn on the relationship between eNVC, online learning, and student outcomes. Although this stage also meant the conclusion of the scope of this project, the final product can be disseminated and incorporated into existing and new workshops, courses, and public scholarship. This will ideally help to propagate the theoretical framework and provide a possible solution to online teaching.

Theoretical framework

The CoI, TAM, and eNVC models have led and illuminated the way forward for many studies, although each model has its limitations. Used in the context of an online teaching framework, they sit too narrowly within their own philosophical underpinnings and applications. Because the theoretical framework had to reach across the approaches, a pragmatist approach was suitable (Evans et al., 2011; Ryu, 2020).

The CoI model is invaluable as a pedagogical framework for online education because it describes the educational experience. However, although it has been validated by many later studies (Burgess et al., 2010; Fiock, 2020; Lin & Reigeluth, 2019), the CoI model does not, by itself, indicate a causal link between one aspect of communication and the outcomes. Additionally, the concept of educational experience is not well explored in the CoI model, and it does not explore individual aspects of the educational experience. Moreover, not all real-world applications of the CoI model have resulted in the predicted levels of success (Jézégou, 2010).

This has however, been attributed to implementation issues, rather than weakness in the model itself (Garrison et al., 1999).

The TAM model, on the other hand, draws a link between the technology and behaviour well. Online learning is predicated on student’s digital literacy, because that determines the student’s autonomy in their learning. This also harks back to the CoI model where the context, and the medium of communication on which the communication happens ,is important to the educational experience (Koh et al., 2022). The technology acceptance model has also been linked to positive educational experiences (Mulwa et al., 2012). However, the obvious weakness of TAM is that it is designed primarily as a model of technological acceptance behaviour, rather than as a model of pedagogical outcomes. While some studies have shown the relationship between technology acceptance and improved academic success (Maican et al., 2019), these studies tend to be limited in scope, focusing too narrowly on system use as the outcome, and the attitudes that get to that outcome.

However, the two models need to be underpinned by a pedagogical model for more pedagogical coherence. Moore’s transactional distance theory provides a good underpinning as it allows the models the space to interact. Each model has aspects that can map clearly and coherently onto Moore’s theory.

And yet the three models do not account for the existence and presence of eNVC. Nonverbal cues affect the overall student experience significantly (Koh, 2021) and should be included in how communication, especially online, should be framed. A more nuanced and balanced manner of communication can be conducted using the T.E.S.T model, but T.E.S.T is also not without its weaknesses. It is a communication-based model but relies on the validity of the CoI model that informs it.

In short, by using a pragmatist approach and synthesising the three models, a theoretical framework can be drawn (Fig. 4). This approach has the distinct advantage of drawing from several fields of study that can contribute greatly to students having better student outcomes and an improved experience.

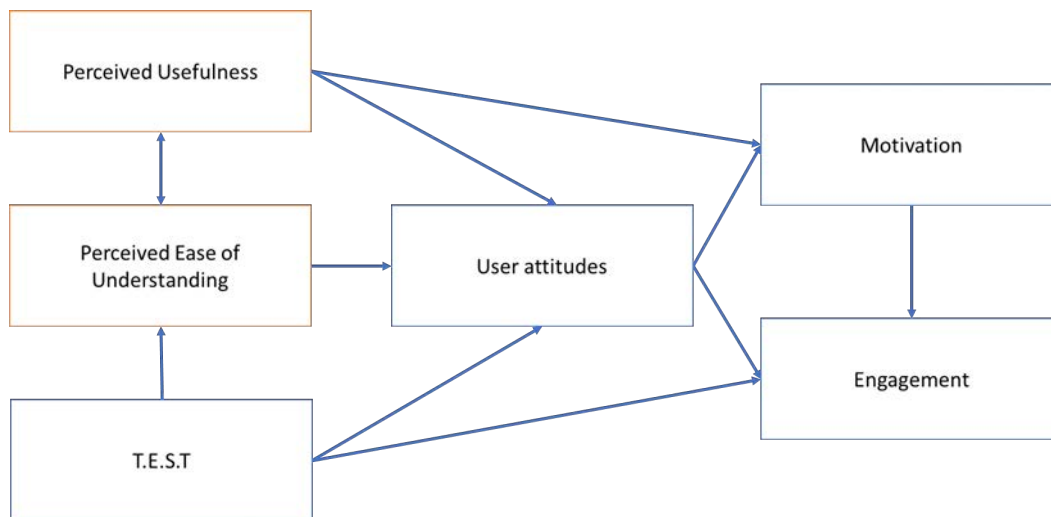


Figure 4: Proposed theoretical framework

Research findings

After cleaning for duplicates and incomplete surveys, a total of 88 responses were deemed suitable. This was a response rate of approximately 10.35%. There were more female (75%) than male respondents (25%), and there was a roughly representative spread of respondents across the age bands (Table 1). The data seems to be distributed normally, fitting the requirements of having the z value for the variables within the range of -3.29 to +3.29 (Aryadoust & Raquel, 2019). The z values are obtained by dividing the skewness and kurtosis by the relevant standard errors.

Table 1 Spread of the participants

Age band	Number	Male	Female
18-24	9 (10.23%)	1	8
25-29	19 (21.59%)	2	17
30-34	24 (27.27%)	7	17
35-39	11 (12.5%)	2	9
40-49	16 (18.18%)	3	13
50-59	9 (10.23%)	3	6

On average, the number of courses that the students have taken range from 1 to 20, with an outlier at 50. Most respondents (90.7%) have taken more than one course online, indicating a level of familiarity with online learning.

A table of correlations was derived from SPSS and is presented in Table 2—eNVC and teaching presence and social presence have a significant correlation. However, eNVC does not have any significant relationship with digital literacy. This result is similar to the pilot study done in 2020 (Koh, 2021). Breaking it down further by age band (Table 2A), eNVC and teaching presence were most significantly correlated at age 30–35. Other age bands, such as 18–24, are also highly correlated but not statistically significant, mainly due to the number of participants. eNVC and social presence was significantly correlated for the 40–49 age bands. The 35–39 band were also highly correlated, but not statistically significant. Most interestingly, at the 35–39 band, there seems to be an inverse relationship between digital literacy and eNVC. This suggests that as the eNVC decreases, the level of digital literacy actually increases, which seems to be an anomaly.

Table 2 Table of correlations between eNVC and the dimensions

		Teaching presence	Social presence	Digital literacy
eNVC	Pearson's correlation	0.45	0.27	<0.001
	Sig.	<0.001	0.01	0.990

Table 2A Correlations between eNVC and the dimensions by age band

Age band		Teaching presence	Social presence	Digital literacy
eNVC: 18-24	Pearson's correlation	0.65	-0.11	-0.22
	Sig.	0.059	0.787	0.578
eNVC: 25-29	Pearson's correlation	0.33	0.24	0.21
	Sig.	0.167	0.326	0.385
eNVC: 30-34	Pearson's correlation	0.43	0.17	0.03
	Sig.	0.034	0.427	0.887
eNVC: 35-39	Pearson's correlation	0.46	0.51	-0.69
	Sig.	0.158	0.108	0.019
eNVC: 40-49	Pearson's correlation	0.43	0.82	0.02
	Sig.	0.099	<0.0001	0.955
eNVC: 50-59	Pearson's correlation	-0.07	0.29	0.49
	Sig.	0.865	0.443	0.183

Generally speaking, eNVC from the teachers teaching the courses has a significant impact on the students' motivation and engagement. eNVC cues on other aspects have significantly less impact (Table 3). Breaking it down further by age bands (Table 3A), it seems that eNVC in teaching and social presences has a significant effect on student engagement in the 30–34 band. Other areas of significance would be the eNVC in digital literacy for 25–29 year olds. For eNVC in the social presence for the 40–49 age band, engagement is highly correlated, although not statistically significant.

eNVC also has a significant relationship with motivation, especially in the teaching presence. However, the strength of the relationship could be categorised as weak. Interestingly, digital literacy for 25–29 year olds has a significant relationship with motivation (Table 3A). In fact, for that age band, eNVC in digital literacy has a significant impact on motivation and engagement—much more than teaching presence or social presence. Motivation seems to be inversely related to eNVC in the social presence for 40–49 year olds, as the level of eNVC may not encourage motivation.

Table 3 Table of correlation between eNVC and motivation and engagement

		Motivation	Engagement
eNVC: Teaching presence	Pearson's correlation	0.21	0.25
	Sig.	0.05	0.019
eNVC: Social presence	Pearson's correlation	0.11	0.14
	Sig.	0.304	0.196
eNVC: Digital literacy	Pearson's correlation	0.18	0.16
	Sig.	0.101	0.138

Table 3A: Table of correlations between eNVC and motivation and engagement by age band

Age bands		Motivation	Engagement
eNVC: Teaching presence (18-24)	Pearson's correlation	0.19	0.58
	Sig.	0.660	0.104
eNVC: Social presence (18-24)	Pearson's correlation	0.09	-0.12
	Sig.	0.810	0.759
eNVC: Digital literacy (18-24)	Pearson's correlation	0.08	0.05
	Sig.	0.843	0.894
eNVC: Teaching presence (25-29)	Pearson's correlation	-0.37	<0.001
	Sig.	0.121	0.986
eNVC: Social presence (25-29)	Pearson's correlation	-0.02	0.02
	Sig.	0.922	0.940
eNVC: Digital literacy (25-29)	Pearson's correlation	0.47	0.48
	Sig.	0.04	0.036
eNVC: Teaching presence (30-34)	Pearson's correlation	0.28	0.41
	Sig.	0.193	0.046
eNVC: Social presence (30-34)	Pearson's correlation	0.19	0.44
	Sig.	0.373	0.033
eNVC: Digital literacy (30-34)	Pearson's correlation	0.08	-0.09
	Sig.	0.721	0.673
eNVC: Teaching presence (35-39)	Pearson's correlation	0.35	0.06
	Sig.	0.285	0.853
eNVC: Social presence (35-39)	Pearson's correlation	0.48	0.34
	Sig.	0.136	0.305
eNVC: Digital literacy (35-39)	Pearson's correlation	-0.21	-0.26
	Sig.	0.526	0.464

eNVC: Teaching presence (40-49)	Pearson's correlation	0.38	0.48
	Sig.	0.165	0.068
eNVC: Social presence (40-49)	Pearson's correlation	-0.58	-0.42
	Sig.	0.019	0.103
eNVC: Digital literacy (40-49)	Pearson's correlation	0.27	0.24
	Sig.	0.316	0.363
eNVC: Teaching presence (50-59)	Pearson's correlation	0.25	0.09
	Sig.	0.521	0.824
eNVC: Social presence (50-59)	Pearson's correlation	0.09	0.13
	Sig.	0.816	0.741
eNVC: Digital literacy (50-59)	Pearson's correlation	0.01	-0.41
	Sig.	0.986	0.278

Discussion

In answering Research Question 1, this study finds that there is a strong correlation between eNVC and online learning, primarily in the areas of teaching and social presence (Table 2). This discovery corroborates the role of teaching and social presences in online learning (Kilis & Yildirim, 2019; Zilka et al., 2018) but, more importantly, it quantifies the correlation. The findings have found that teacher presence and social presence have significant relationships with eNVC, but not for digital literacy. In an online learning environment, the talk channels serve as a more “informal” medium of communication and act as a pre-built “marketplace” where students and teachers can communicate freely. The fact that digital literacy does not have a significant relationship with eNVC is a further indicator of Moore’s transactional distance theory holding true in this study. Translating it to Moore’s theory, asynchronous talk channels provide an avenue for increased “interaction” between students and teachers, and then we would see decreases in the “structure” and “autonomy”. This translates to less transactional distance between teachers and students than in a purely self-driven online course. With the increased interaction, reduced structure and transactional distance in an online asynchronous talk channel, eNVC cues are also picked up and interpreted more acutely. Thus, this translates to a stronger relationship between nonverbal communication in the asynchronous online talk channels and the teacher and social presences of online learning.

When we explore the findings from Research Question 1 in more depth, we see that they also indicate that eNVC has the strongest correlation when it comes to how it influences the teaching presence in online education, indicating that students tend to be more perceptive of eNVC cues in the instructional realm. There are three possible reasons for this phenomenon. The first is the demographics of the student participants, almost all of whom were studying alongside other life and work commitments. This meant that the learners tended to be more transactional in their

approach towards learning (Kara et al., 2019). As they juggled their limited time between work, family, and studying, social connections via talk channels were not a high priority.

Another reason indicated was the possibility of using other asynchronous communication channels external to the school's learning environment. These channels could include private social media groups or forum discussions (e.g., Reddit, Discord) or even comments sections on selected videos (e.g., YouTube). So, although online discussions are happening, they do not include the tutor and might not be focused as sharply on learning.

The third reason for students being more perceptive to eNVC cues due to the teaching presence could be because teachers are the main touchpoints in an isolated online learning experience (Kotera et al., 2021; Menchaca & Bekele, 2008). Students tend to perceive online education as being a more solitary style of study (Jensen et al., 2021). As the "only constant", teachers thus represent a large part of online interactions (Wang et al., 2021). As the transactional distance between learner and teacher decreases, and with the structure of the material already determined, there is more dialogue between teacher and student. As such, students may be better primed and more sensitive to the eNVC cues that teachers can transmit digitally.

Interestingly, although digital literacy and awareness underpins the whole online learning experience, there is no correlation between the level of digital literacy and the interpretation of eNVC cues. This is especially interesting as it shows that eNVC is still primarily a communication issue, and is not affected by the students' level of digital familiarity. This is also suggests that teachers need not be IT experts, or be the most IT savvy person, to be well perceived or presented online. However, we also note that because most of these participants have already studied online, the level of impact of digital literacy on their ability to interpret eNVC cues may have been severely muted.

Research Question 2 looks at the correlation between eNVC and the effect on student motivation and engagement. The results show that eNVC did not have a strong direct correlation with student motivation and engagement. However, if broken down by the eNVC cues interpreted due to each element of online learning, it becomes clear that eNVC cues from the teaching presence play a statistically significant role in student engagement and motivation.

eNVC cues from teaching presences show a higher degree of correlation between engagement than with motivation. This aligns with current literature on motivation and engagement, especially in online learning environments (Chiu, 2022; Kang & Zhang, 2020). This correlation could also be due to the fact that student motivation and student engagement differ greatly in terms of their make-up and determinants.

Student engagement is viewed as the psychological investment manifested as participation in the course activities and tasks. Engagement is affected by a multitude of factors, of which the most prominent are motivation, teacher presence (Anghelache, 2013; Kraft & Dougherty, 2013), community of learners (Domun & Bahadur, 2014; Gedik et al., 2013; Kim & Callahan, 2013; Teräs & Herrington, 2014; Trévidy et al., 2017) and eNVC factors (Al Tawil, 2019; Koh, 2021). However, engagement is a manifestation (an outward display) which means that it is not as affected by intrinsic factors. Therefore, communication by teachers here can make a difference in how students decide to engage, even if the engagement is not motivated by the desire to learn.

Another possible reason for higher levels of engagement in relation to eNVC is the fact that engagement is easier to measure, and so teachers can gear their communication towards encouraging engagement. Modern LMSs can show when the student last logged in, how many hours they spent studying, the level of learning interactions, the number of mouse clicks, and so on. Teachers can use these metrics as shorthand to see if students are engaged with the course

material, and communicate accordingly. Students can interpret the eNVC cues on the need for more engagement with course activities and talk channel postings, thus resulting in a higher correlation. This also is in line with current literature showing that higher levels of teaching presence lead to higher levels of engagement (Zhang et al., 2016). In lieu of an immediate way to measure motivation levels, engagement levels are often used as a proxy for motivation levels (Harrison et al., 2017).

Despite engagement and motivation being intertwined, it is also important to differentiate that student motivation is fundamentally different. Motivation works multi-dimensionally, and is often defined as “an impetus or inspiration to act toward an end” (Ryan & Deci, 2000). Unlike engagement, motivation is both an art and a science because it can be very hard to deterministically pinpoint what contributes to it, or what generates it. However, many studies over the years have indicated factors that could affect motivation, including teacher presence (Bullock & Fletcher, 2017; Radel et al., 2010) and the community of learners (Bullock & Fletcher, 2017)

Motivation can be viewed through intrinsic and extrinsic lenses. Intrinsic motivation is self-determined and hence not as affected by external influences (Lee et al., 2012). This could explain why eNVC cues do not have such a significant impact on motivation (because it is intrinsically driven). Extrinsic motivation is driven by external factors such as getting good grades, and so is more affected by external factors such as communication from the teacher. As such, eNVC still has a correlation with student motivation, but it is less due to the presence of the intrinsic portion of motivation.

Interestingly, social presence did not show a statistically significant relationship with student motivation and engagement. Like the relationship between eNVC and teaching presence, social presence seems to be affected by the nature of delivery and the demographics of students. Talk channel participation is often viewed as optional and these working adult students will choose to participate only if necessary (Kehrwald, 2008). In addition, students usually enrol in online studies for other than social reasons (Hew & Cheung, 2013). This shows that students do not view the social discussions as critical to their learning in an online environment. More critically, this suggests a lack of intrinsic motivation, which then leads to a lack of student engagement. However, this seems to suggest that a community of learners in an online asynchronous talk-channel environment does not have the same effect as a community of learners in a traditional setting.

The same can also be said for digital literacy. Because of the level of digital literacy, eNVC does not have any significant effect on student motivation and engagement. As online learning students, they have a higher level of self-efficacy. This could explain why eNVC cues have very little effect on the level of engagement (Winne, 2005). Because a student has to have a certain level of confidence in their own digital skills before embarking on an online course, the eNVC cues arising from a lack of digital familiarity may not apply as strongly here, which in turn also explains the statistically insignificant correlation between digital literacy and student outcomes (motivation and engagement). Despite that, most surprisingly, the results showed that digital literacy correlated significantly with motivation and engagement among 20–29 year olds. In fact, the correlation between eNVC arising from digital literacy and student outcomes is much stronger than eNVC cues from teacher and social presences. More research would need to be conducted to have a clearer view of this unusual departure from the norm. One possible reason could be that this age group spends the most time online by a significant margin (Johnson, 2022)

Conclusion

This study has shown that eNVC and the teaching presence are significantly related and that eNVC teaching presence has a significant relationship with motivation and engagement. Hence, it is imperative that teachers understand how their communication affects how students learn.

However, this study is limited by its reliance on self-reported data from the survey. More research will be needed to develop a better understanding of the role of nonverbal communication in a text-based asynchronous online learning environment. Conducting more in-depth qualitative studies will give a better and clearer view of why respondents responded the way they did.

This study will help inform how teachers can “teach” online and even influence how AI teachers could improve their responses to students. Online learning and asynchronous talk channels are here to stay, so understanding the role and importance of eNVC can shape how teachers are trained, the delivery of online teaching, and the pedagogy of teaching education via talk channels.

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Appendix A: Survey questions

Project overview

The purpose of the project will assist us in determining the ways in which nonverbal communication affects student motivation and engagement levels, and the role digital literacy plays in online learning. We intend to present the findings of the research in a journal article and as a presentation at conferences. Nonverbal communication is the way information is transmitted and interpreted in addition to the written text. Specific cues include the response time taken, the tone, style and length of response. Data collected from this survey will remain anonymous. The researchers will maintain confidentiality by restricting access to the data. They will not be collecting the information from the courses the researchers teach. All results will be stored in a secure storage facility.

The survey consists of 40 questions and should take you around 45 minutes to complete.

This survey is broken down into 5 sections.

- Section 1: About you
- Section 2: Teaching Presence
- Section 3: Social Presence
- Section 4: Digital Literacy
- Section 5: Final Questions

By participating in this survey, you agree to the terms and conditions set out in the information sheet.

Thank you in advance for taking the time to share your experience.

Section 1: About you

Q1: Which country are you taking this survey from?

Q2: What is your age range?

Q3: How many online text-based modules/course/subjects have you undertaken thus far (in your lifetime)?

Q4: How long (how many years) have you been an online learner in a primarily text-based environment?

Q5: What is your general impression towards e-learning in a text-based environment?

Q6: How is/was your experience with e-learning in a text-based environment?

Here are some key definitions that could help you in understanding some of the terms in the questions below.

Nonverbal communication in an electronic context (**NVC**) refers to the communication of messages that are outside that of the written texts. For instance, the use of emoticons and choice of words could convey a message that is more than just the words of the text.

Motivation refers to the impetus to complete the course/module.

Engagement refers to the psychological investment in a course. This can be expressed by participating in the course activities and tasks (e.g., participation in the discussion channels (such as forums etc.) or taking part in the course activities that may or may not be graded.)

Section 2: Teaching presence

Q7: Based on your most recently completed online text-based course/module/subject, to what extent do you feel that the teachers helped you in your e-learning experience?

Q8: Based on your most recently completed online text-based course/module/subject, to what extent did the teacher impact your motivation while learning online?

Q9: Based on your most recently completed online text-based course/module/subject, did you feel that the teachers responded in a timely manner?

Q10: How long do you think should be acceptable for the teacher to take to respond to you?

Q11: Based on your most recently online text-based completed course/module/subject, how genuine did you feel your teacher to be?

Q12: Based on your most recently completed online text-based course/module/subject, to what extent does the teacher's tone (e.g., how things are worded or emphasised with punctuation) impact you positively or negatively?

Q13: Based on your most recently completed online text-based course/module/subject, to what extent does the length of your teacher's response impact your impression of the teacher positively or negatively?

Q14: Based on your most recently completed online text-based course/module/subject, to what extent does the formality of your teacher's style of writing impact your impression of the teacher positively or negatively?

Q15: Based on your most recently completed online text-based course/module/subject, to what extent does the frequency of your teacher's response impact your impression of the teacher positively or negatively?

Q16: Based on your most recently completed online text-based course/module/subject, how comfortable were you in communicating to your teacher online in online talk channels/forums?

Q17: How helpful was your teacher/kaiako in acknowledging you personally as an individual?

Q18: What impact did your teachers have on the way you engaged in learning online in a text-based environment?

Q19: Overall, how did your teachers' presence affect your experience in the course?

Section 3: Social presence

Q20: Based on your most recently completed online text-based course/module/subject, what impact did the online talk channels/forums have on your motivation in online learning?

Q21: Based on your most recently completed online text-based course/module/subject, how frequently did you actively participate in the social aspect of online learning? (e.g., post/reply/comment in the talk channels etc.)

Q22: Did you passively participate in the social aspect of online learning in this online text-based environment? (e.g., read posts)

Q23: What impact did actively engaging in the talk channels with other students have in making you feel like part of the class?

Q24: Did passively engaging in the talk channels with other students make you feel like part of the class?

Q25: What impact did these interactions (both passive and active) have in engaging you to participate in the studying activities (e.g., discussions over the forums/ doing tasks together etc.) of the course?

Q26: What sense of connection/belonging to the course did you feel as you went through the course in this online text-based environment?

Q27: To what extent do you think talk channel/forum interactions should be controlled/regulated by the teacher? (e.g., should your social interactions be managed by the teacher)

Q28: If you knew that your next course would be with the same teacher and students, what impact would that have on your decision to take that course?

Section 4: Digital literacy

Q29: Generally speaking, how digitally savvy do you consider yourself to be?

Q30: Generally speaking, how digitally savvy do you consider your classmates to be?

Q31: Based on your most recently completed online text-based course/module/subject, how digitally savvy do you consider your teachers to be?

Q32: How familiar are you with online etiquette (manners and rules)?

Q33: How often do you misinterpret messages in your online text-based course? (e.g., find out later that you misunderstood something between teachers/students/course material)

Q34: How does misinterpreting messages impact on your engagement to participate in the various activities (e.g., forum discussions) in the same online course?

Q35: How does misinterpreting messages impact on your motivation to complete the course?

Q36: How much impact does your familiarity with digital tools have in making you more willing to engage (in the various activities such as forum discussions etc) with the online course?

Q37: What impact does your familiarity with digital tools have in making you more motivated to complete your course?

Q38: If you were told that that the same technology was going to be used for the next course, how much would that impact your decision to continue online learning?

Section 5: Final questions

Q39: What impact does the online learning experience have on your decision to continue e-learning?

Q40: What impact would having the same combination of these factors (e.g. same teacher, same classmates, same learning management system) have on you continuing to learn in this online e-learning environment?

7-point Likert scale used: 1 = most negative: 7 = most positive)

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