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Do emojis really help us to communicate better? Investigating instructor credibility, students' learning motivation, and performance

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Abstract
Extensive research has been conducted to investigate the role of emojis in interpretation, impression, perceptions, personality and relationship building. However, in the higher education sector, few studies have examined how emojis influence the learning motivation and performance of students. Using the theories of source credibility and stimulus organism response, a model was created to explain how the emojis used in text-based electronic-mediated communication (TEMC) impact instructor credibility, learning motivation, and learning performance. Data obtained from students ($N = 348$) indicates that the use of emojis in TEMC affects their perceptions of instructor credibility (expertise, trustworthiness, likability) and learning motivation. Furthermore, perceived instructor credibility was found to mediate the relationship between the use of emojis in TEMC and students' learning motivation. Finally, the study also demonstrates that students' learning motivation significantly enhances their learning performance. The research findings illustrate the importance of emoji use in TEMC between instructors and students in enhancing students' learning motivation and performance at higher education institutions (HEIs). The findings have significance for instructors and HEIs who engage in TEMC with students. This paper also discusses the implications and limitations of the study, along with potential future research.

Keywords Learning performance · Learning motivation · Emoji · Text-based electronic-mediated communication · Instructor credibility

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1 Introduction

The current student cohort in higher education institution (HEIs) is comprised primarily of members of Generation Z, who have been raised in an age of social media, smartphones, and the Internet. This implies they learn both in-person and virtually as they use mobile devices extensively for learning and research. Nevertheless, the majority of HEI academic staff are from Generation X (HESA, 2015). This generation, also known "digital immigrants", are more cynical about the use of technologies as they try to adapt to the digital world, such as when utilizing learning management systems in teaching or emojis in text-based electronic-mediated communication (TEMC). Thus, generational gaps have been created between these two groups, especially in TEMC. This can be evidenced by the study by Prada et al. (2018), which revealed that younger (compared to older) participants used emojis more frequently and were more inclined toward technology use. These findings were further supported by those of a previous work, which indicated that the use of technology is inversely associated with age (Hauk et al., 2018; Forgays et al., 2014) and emoji usage frequency (Oleszkiewics et al., 2017). Correspondingly, Steinmetz (2017) highlighted how young people preferred to use emojis compared to words.

The exploration of emoji use forms part of a growing body of knowledge in different fields, such as education, marketing, psychology, medicine, computer science, and linguistics. The extant literature examining emoji use in HEIs has focused on diverse areas, including self-efficacy among English as a Foreign Language students (Chen & Hsu, 2022), student wellbeing (2022), the learning effectiveness of students of English as a Foreign Language (Chen et al., 2022), perceived instructor impressions (Clark-Gordon et al., 2018; Vareberg et al., 2023), impromptu speaking (Helen-Hart & Carlson, 2021), building relationships and maintaining attention in online classrooms (Kim et al., 2022), and improving textual feedback (Wook, 2019). However, little is known about how the extent of emoji use in TEMC influences students' motivation to learn and their learning performance.

In terms of students' impressions of instructors, previous studies in Australia have investigated the salience of emoji use in TEMC as a predictor of an instructor's personality (Grieve et al., 2019; Moffitt et al., 2021). Marder et al. (2019) revealed that emoji usage in computer-mediated communication with the younger generation in the higher education sector in Portugal increased perceived warmth and task behaviors, but not competence. In a similar context in the United States of America (USA), Vareberg and Westerman (2020) explored the use of paralinguistics (e.g., emojis) in out-of-class technologically mediated interactions between instructors and students, finding that instructors who used paralinguistics were perceived as more caring but less competent. Conversely, researchers such as Clark-Gordon et al. (2018) and Beattie (2017) conducted research in the USA on emoji use in giving assessment feedback. They reported that the use of emojis had no significant relationship with students' perceptions of either the feedback or the instructors. In summary, instructors who used emojis in TEMC were

perceived as less competent by students. Given these inconsistent findings, it is critical to undertake a study on emoji use in TEMC. Vareberg and Westerman (2020) suggested that further research should be conducted to disentangle the cues of source credibility, especially in the mediated environment of the higher education sector.

As noted above, most of the existing research on emoji use in TEMC has been conducted in low-context cultures such as the USA and Australia, with most studies skewed toward settings in Western countries. However, there are cross-cultural differences in emoji use between low-context and high-context cultures. For example, Togans et al. (2021) elucidated that East Asians are more concerned with face-management than Americans are, particularly in threatening situations. As such, the former use more computer-medicated communication cues (emoticons and emojis) than Americans do. Previous studies (Guntuku et al., 2019; Sun et al., 2023) have also revealed cross-cultural variances in emoji usage and perception. These outcomes and the current state of knowledge meant that a study was warranted to investigate how HEI students perceived their instructor credibility in a high-context culture such as Malaysia. Future research should focus on emoji usage in high-context cultures, particularly among students at higher education institutions (Bai et al., 2019; Vareberg & Westerman, 2020).

1.1 The present study

Despite a variety of research findings on the use of emojis in TEMC in HEIs, a trade-off exists between perceived warmth and competence (Mader et al. 2019). Thus, a conflict exists between upholding professionalism and adopting the use of emojis in TEMC. Furthermore, a gap was identified in the literature regarding the impact of students' perceptions of instructor credibility on their learning outcomes in HEIs. The present study bridges this gap by identifying the element of instructor credibility as a catalyst for students' learning motivation and, consequently, their learning performance.

Accordingly, the objective of this study is to enhance the inconclusive and unexplored field of research and practice by developing an integrated model that can be employed to investigate the use of emojis in TEMC and its impact on students' perceptions of their learning motivation, performance, and instructor credibility. The overlooked aspect of instructor credibility as a mediating variable is examined since it has not been adequately addressed in previous studies. The present study contributes to the education literature in three ways. First, from a theoretical perspective, the study deconstructs the detrimental impacts of using emojis in TEMC on students' perceptions of instructor credibility in HEIs. Second, this study enhances the understanding of emoji usage in TEMC towards improving students' learning motivation and performance in a high-context cultural environment. Third, the source credibility theory is extended through the examination of instructor credibility as a mediating variable between emoji usage in TEMC and students' learning motivation. The results confirmed a full mediation of the above-mentioned correlation. From a practical standpoint, results from this study indicate that instructors' use of

emojis when communicating with students in HEIs increases their expertise, trustworthiness, and likeability. As a result, this culminates in an increase in students' motivation to learn, which in turn enhances their academic achievement. Hence, the findings offer valuable insight to HEI management regarding the significant role of emojis in TEMC. This enables them to develop specific guidelines for adopting emojis in TEMC, thereby motivating students to learn more and improve their academic performance. In summary, the present paper answers four research questions:

1. Does emoji use in TEMC influence students' perceptions of instructor credibility (expertise, trustworthiness, and likability)?
2. Does perceived instructor credibility among students influence students' learning motivation?
3. Does the perception of instructor credibility among students mediate the relationship between TEMC and students' learning motivation?
4. Does learning motivation among students influence their learning performance?

The remainder of this paper is structured as follows. First, we discuss the theoretical underpinning of the study: source credibility theory and stimulus-organism-response (S-O-R) theory. Second, we present the literature review and hypothesis development. Third, the methods and results are explained. Fourth, the implications are discussed, including the contributions of the study. Finally, we consider the limitations of this study and suggest avenues for future research.

2 Literature review and hypothesis development

2.1 Theoretical underpinning

2.1.1 Source credibility theory

Source credibility theory is generally employed in marketing research. Kelman (1961) proposed that credibility is a product of expertise and trustworthiness. Source expertise is defined as source quality, including the skills or knowledge needed to devise particular aims about a particular subject (McCroskey & McCain, 1974), while trustworthiness refers to the degree of confidence in a source's intent to communicate the assertions, they consider the most true and valid (Hovland et al., 1953). Several marketing studies have reported that source expertise and trustworthiness have significant persuasive effects on consumers' attitude, behavioral intention, and actual behaviors (Ismagilova et al., 2020; Nafees et al., 2021; Senecal & Nantel, 2004). Attractiveness (or likability) was then included as a third component of credibility because it was reported to play a crucial role in the persuasion process and affect credibility perceptions of the source (Guyer et al., 2019; Patzer, 1983). Those perceived as more friendly, warm, intelligent, and interesting were discovered to be more likely to be considered attractive (Clifford & Walster, 1973). In essence, marketing researchers have identified three major components of source credibility

that have significant persuasive effects on the perception and behavior of consumers: expertise, trustworthiness, and attractiveness (Nafees et al., 2021; Serman & Sims, 2022; Wang et al., 2021).

In this study, the notion of source credibility theory was adopted to examine the influence of instructor credibility on students' learning motivation in the context of higher education. As far as the researchers are aware, no prior studies have investigated the credibility of higher-education instructors from the perspective of source credibility theory. The classroom can be conceived as a persuasive context, where the instructor functions as the agent who persuades and motivates students. Successful learning depends on students' motivation to learn. Instructor credibility promotes effective instructor-student communication and relationships. Students who perceive their instructors as credible are more academically engaged (Amerstorfer & Münster-Kistner, 2021). In essence, the present study finds the theory of source credibility particularly pertinent as it offers valuable insights into students' perceptions and responses towards the instructor's use of emoji. In addition, this study also provides insight into whether the use of emojis can enhance students' perceptions of instructor credibility. By recognizing the factors that contribute to instructor credibility, instructors and HEIs can collaborate to motivate students to learn and, ultimately, foster exceptional learning outcomes.

2.1.2 Stimulus-Organism-Response (S-O-R) theory

S-O-R theory is a highly popular and influential approach in predicting individual and group behavior in response to stimuli, which can be new and emergent external stimuli (Mladenović et al., 2023). The theory was created by Mehrabian and Russell (1974), who argued that environmental stimuli are associated with behavioral responses through emotional responses such as pleasure and dominance. This theory has been utilized by researchers in various fields, including education, to investigate different aspects such as consumer behavior, psychological behavior, and students' behavior. Examples of past studies to have used S-O-R theory in education include: Anwar et al. (2023), who investigated how entrepreneurship education (stimulus) affected students' entrepreneurial passion and how motivation (organism) affected entrepreneurial intention (response); Peng et al. (2023), who used S-O-R theory to examine students' psychological changes and attitude to the M-learning process in relation to learning intentions and learning behavioral responses; and Kwok et al. (2022), who tested the role of the teacher in influencing students' motivation and the learning progress in an online learning environment.

Anwar et al. (2023) contended that behavior responses could also be affected by other indirect stimuli or external factors. These could contribute mediating effects that might cause the subject (organism) to behave differently. As such, S-O-R theory was employed in the current study to predict how emoji use in TEMC would affect the learning motivation and performance of students, with instructor credibility as a mediating effect.

Taken together, both the theories of source credibility and S-O-R are crucial in this study for two reasons. First, they facilitate researchers in gaining a greater understanding of students' learning behavior in relation to the use of emojis in the

context of TEMC in HEIs. Second, the theories can potentially fill gaps in the literature by identifying the variable of instructor credibility as a booster that enhances students' learning motivation and, subsequently, their academic performance. Until now, there have been no previous studies in the field of emojis that have employed both the source credibility and S-O-R theories to predict and understand students' learning motivation and academic performance.

2.2 Influence of emoji use in TEMC on perceived instructor credibility (expertise, trustworthiness, and likability)

There is growing evidence that digital emotional cues are used in educational settings. These cues contain nonverbal cues which can further enhance TEMC content. A recipient's perception of a sender's competency is referred to as expertise (Vareberg et al., 2023). This term also refers to an instructor's knowledge of and expertise in a particular subject matter (Chilemba & Bruce, 2015; Shaari et al., 2014). The findings on emoji use in TEMC and perceived instructor expertise have been inconsistent. For example, Marder et al. (2019) elucidated that emoji use in emails did not negatively impact perceived instructor expertise. Similarly, Moffitt et al. (2020) concluded that instructor expertise was rated significantly highly when three 'happy face' emojis were presented in the feedback. In contrast, Vareberg and Westerman (2020) posited that emoji use in teaching and learning decreased perceived instructor expertise.

Trustworthiness means a recipient's perception of the sender's honesty. In general, students trust their instructors, which may explain why emojis might not influence perceived instructor trustworthiness (Vareberg & Westerman, 2020). Kaye et al. (2016) argued that emojis served interpersonal communication functions; for instance, they decreased ambiguity and increased trustworthiness. Nevertheless, others have claimed that emoji use in TEMC can cause message trustworthiness to decline (Willoughby & Liu, 2018).

In addition, Boutet et al. (2021) highlighted that adding a positive emoji when messaging will increase the perceived warmth of the sender. An instructor's use of emojis in emails is believed to increase their likability among the students. Likability refers to the positive feelings that develop toward a person, which could mean they are seen as friendly, helpful, attentive, loyal, likable, and kind (Hendriks & van Meurs, 2022). Marder et al. (2019) studied emoticon use in email exchanges between instructors and students, noting that doing so was linked to increased student compliance with instructor requests and increased views of educator kindness. Vareberg et al. (2023) conducted a study linking emoji use in email with students' perceptions of instructor likability. Their findings revealed that instructors' emoji use increased their perceived likability. Scholars have claimed that students tend to display different behavior in their class performance if they like an instructor, such as greater engagement in class activities (Myers et al., 2018) and more effective learning (Frymier, 2016). Congruent with the previous studies, we postulate that emoji use in TEMC would positively influence instructor expertise, trustworthiness, and likability.

H1: Emoji use in TEMC has a positive and significant influence on students' perceptions of instructor expertise.
H2: Emoji use in TEMC has a positive and significant influence on students' perceptions of instructor trustworthiness.
H3: Emoji use in TEMC has a positive and significant influence on students' perceptions of instructor likability.

2.3 Influence of perceived instructor credibility on students' learning motivation

Pintrich and Schunk (2002, p.5) defined motivation as "the process whereby goal-directed activity is instigated and sustained." Students exhibit a higher level of learning motivation when they perceive their teachers as highly credible (Froment & de-Besa Gutiérrez, 2022; Martin et al., 1997; Pogue & Ah Yun, 2006).

To the best of the current researchers' knowledge, no past studies have examined higher-education instructor credibility using the lens of source credibility theory. The proponents of this theory advocated that credibility comprises expertise, trustworthiness, and likability or attractiveness (Nafees et al., 2021; Serman & Sims, 2022; Wang et al., 2021). Most previous educational studies on this topic examined the individual associations between these attributes and students' academic motivation. For instance, students who trusted their instructors were reported as being generally more motivated to learn (Platz, 2021; Wentzel, 2009). Siegle et al. (2013) found that instructors with an extensive depth and breadth of content knowledge were better at fostering student motivation. Myers and Huebner (2011) revealed that students were motivated to communicate with their instructors when they considered the latter to be socially and physically attractive. In addition, students' in-class participation was found to be positively correlated with perceived instructor attractiveness (Marici et al., 2023; Myers et al., 2009). In contrast to the approaches used in past studies, this study examined the collective influence of these three components - expertise, trustworthiness, and likability (attractiveness) - on learning motivation among students. In the higher education context, the instructor is conceived as a highly credible source who persuades and motivates students. Accordingly, the following hypotheses were proposed:

H4: Students' perceptions of instructor expertise have a positive significant influence on student learning motivation.
H5: Students' perceptions of instructor trustworthiness have a positive significant influence on student learning motivation.
H6: Students' perceptions of instructor attractiveness have a positive significant influence on student learning motivation.

2.4 Influence of students' learning motivation on their learning performance

In theory, motivation "is the antecedent of action rather than achievement" (Dörnyei & Ushioda, 2021, p. 201). Students' learning motivation refers to the effort and persistence employed in performing an academic task, which can

lead to the respective task being achieved more effectively (Dörnyei & Ushioda, 2021). However, these researchers argued that the relationship between motivation and achievement could be indirect as the latter is also determined by various factors. Lin et al. (2018) discovered that motivation in learning did not contribute significantly to students' learning performance in a business simulation system. In fact, they found that learning motivation played an important mediating role in learning performance through the effect of the learning method. Law et al. (2019) obtained a similar result in a blended learning setting, discovering that motivation in learning had no direct effect on students' learning performance. Meanwhile, Parker et al. (2021) performed a more detailed study by investigating how three different types of motivation profiles impacted achievement perceptions and performance. They found that students at high control-enjoyment levels achieved greater success than others. In addition, Hosen et al. (2021) stated that aspects of individual motivation - such as reputation - have positive and significant effects on learning performance. Congruent with the outcomes of the extant research, we believe that a student's learning motivation would influence their learning performance.

H7: A student's learning motivation has a positive significant influence on their learning performance.

2.5 Perceived instructor credibility as a mediator

Several past studies have demonstrated the mediating role of instructor credibility in education. For instance, Schrodt et al. (2009) found that instructor credibility partially mediated instructor prosocial communication behaviors and student learning outcomes; Wheeles et al. (2011) reported that instructor credibility was a mediator of instructor enthusiasm, homophily, nonverbal immediacy, and student persistence; and Pachler et al. (2019) showed that trust in the instructor served as a mediator in the association between transformational teaching and increased degrees of student engagement, creativity, and task performance. By drawing inferences from past studies, the authors contend that perceived instructor credibility could potentially mediate the relationship between emoji use in TEMC and student learning motivation. A credible instructor was hypothesized as being able to comprehend their students' needs and expectations, while he/she would use emojis to communicate or respond in TECM; this would consequently trigger the students' motivation to learn. As such, the following novel hypotheses were developed:

H8: Students' perceptions of instructor expertise mediate the relationship between emoji use in TEMC and students' learning motivation.
H9: Students' perceptions of instructor trustworthiness mediate the relationship between emoji use in TEMC and students' learning motivation.
H10: Students' perceptions of instructor likability mediate the relationship between emoji use in TEMC and students' learning motivation.

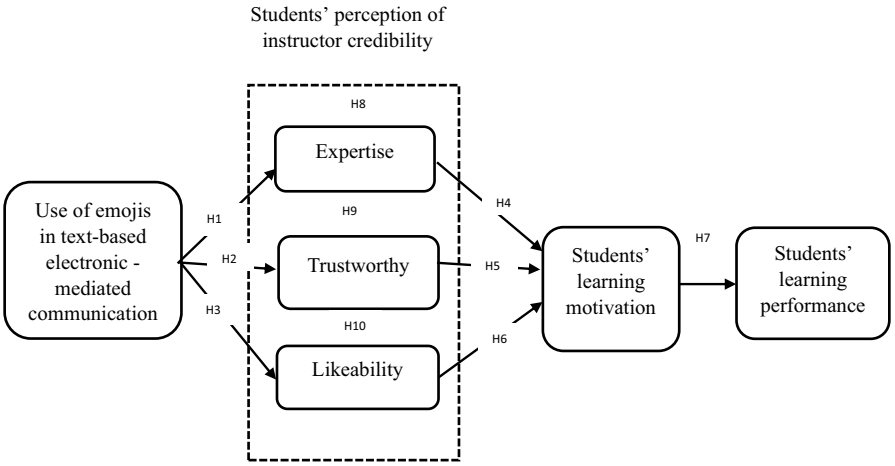

Fig. 1 Conceptual model

A conceptual model was proposed based on the hypotheses presented above, as illustrated in Fig. 1.

3 Methods

3.1 Sampling and data collection

The sample in this study comprised full-time students aged 18 years old or older who were enrolled in HEIs in Malaysia within the study's timeframe. The study utilized a convenience sampling method, where respondents were selected based on their readiness and willingness to participate. Data collection involved using an online survey platform, Google Forms, which was deemed suitable for investigating emoji usage in TEMC due to its relevance. The questionnaire comprises a comprehensive set of 34 questions. The survey includes two filter questions to ascertain whether the respondents meet the eligibility criteria pertaining to age and enrollment in Malaysian HEIs. To ensure question clarity, a pre-test was conducted to address any potential ambiguities and ascertain whether respondents were able to comprehend the intended questions. Prior to the actual survey, respondents were provided with the study's details, including the researchers involved, the research objectives, and respondents' choice of participation in or withdrawal from the survey. Willing respondents were required to indicate their voluntary participation in a consent statement before proceeding with the survey. After the data-cleaning process, a total of 348 valid responses were obtained. Thus, a sufficient number of responses were obtained to fulfill the sample size requirement determined by G*power analysis, with an 80% power level and an effect size of 0.15.

3.2 Instrument

The survey instrument employed in this study was built on established research and has been validated across various studies in different contexts, thus ensuring its high level of reliability and validity. Respondents rated the items using a seven-point Likert scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*, which allowed them to express their degree of agreement. The survey comprised two parts: (1) construct measurement, which assessed variables such as emoji use in TEMC, perceived expertise, perceived trustworthiness, perceived likability, students' learning motivation, and students' learning performance; and (2) demographic information, including gender, age, current program, local/international student status, and the name of the higher education institution. The data collection was based on students' general impressions of emojis. The definition of emoji usage in TEMC is clearly outlined in the questionnaire. In this study's context, the use of emojis in TEMC denotes those used in written messages through electronic devices like computers, smartphones, or tablets on various digital platforms, which encompass communication channels in the form of emails, instant messages, text messages, and learning management systems (LMS), such as Blackboard or Moodle. Furthermore, digital platforms extend to virtual classrooms employing applications like Zoom, Google Meet, and Microsoft Teams. In their respective studies, Sia et al. (2023) and Tan et al. (2023) made necessary adjustments to the measuring items in order to assure their relevance and application to the research environment. The questionnaire items and their respective sources are provided in Appendix.

3.3 Common method bias

To address potential concerns related to common method bias (CMB), the authors followed the procedural remedies suggested by Podsakoff et al. (2003). Participants were explicitly assured that their responses would remain anonymous, ensuring their identities were protected and encouraging honest feedback. Additionally, respondents were informed that there were no correct or incorrect answers to the survey questions. This communication was intended to emphasize that responses would not be evaluated against societal norms. As a result, respondents were less likely to be influenced by evaluation apprehension, thereby reducing the potential for socially desirable or lenient answers (Podsakoff et al., 2003). To assess CMB, Harman's one-factor test was performed. This examines the extent to which a single dominant factor accounts for the variance in the overall responses. The findings suggested that no individual factor accounted for over 50% of the variance, suggesting minimal evidence of significant CMB (Podsakoff et al., 2003).

3.4 Data analysis

To assess the research model, this study employed structural equation modeling (SEM), a statistical technique that combines factor analysis and multiple regressions.

SEM was chosen for its capacity to handle latent variables with multiple predictor and criterion variables (Hair et al., 2006). The Partial Least Squares Structural Equation Modeling (PLS-SEM) method was selected as the analytical approach for this study for several reasons. Initially, Covariance-Based Structural Equation Modeling (CB-SEM) is commonly used in confirmatory research to validate theories (Hair et al., 2011). On the other hand, PLS-SEM is particularly suitable for exploratory studies that emphasize theory development, such as expanding an existing theory (Hair et al., 2017). As this study sought to explore a newly integrated theoretical model investigating the impact of instructors' emoji use on students, PLS-SEM was deemed appropriate for exploratory research purposes. The present study utilizes PLS-SEM, which is known for its ability to handle complex models and small sample numbers. This method ensures accurate results, even when data assumptions are not fully met (Hair et al., 2017). This corresponds to the present study, which encompasses several latent variables and mediation analysis. As per the guidelines provided by Hair et al. (2017), the measurement model and structural model assessments were conducted using SmartPLS version 3.2.7.

3.5 Respondents' profile

The respondent profile for this study is presented in Table 1. The sample consisted of 348 full-time students aged 18 years or above who were enrolled in

Table 1 Respondent profile ($n = 348$)

	Frequency	Percentage (%)
Gender		
Male	103	29.6
Female	245	70.4
Age (years)		
18–24	309	88.8
25 and above	39	11.2
Institution		
Public	166	47.7
Private	182	52.3
Program		
Form 6/STPM/Certificate	15	4.3
Diploma/Foundation/A-level	46	13.2
Bachelor's degree	263	75.6
Master	17	4.9
Doctorate	7	2.0
Year		
1	92	26.4
2	124	35.6
3	86	24.7
4 and above	46	13.2

HEIs in Malaysia at the time of the study. Of the respondents, 70.4% indicated their gender as female, while 29.6% reported being male. The majority of the participants (88.8%) ranged in age from 18 to 24, while 11.2% were aged 25 or above. The distribution of the respondents across different types of institutions was relatively balanced. More specifically, 47.7% were enrolled in public higher education institutions, while 52.3% belonged to private institutions. The distribution of academic programs among the respondents was as follows: 17.5% were pursuing certification, pre-university, or diploma qualifications; 75.6% were pursuing a bachelor's degree; 4.9% were in master's programs; and 2.0% were enrolled in doctorate programs. Regarding their year of study, 26.4% of the participants were in their first year, 35.6% were second-years, 24.7% were third-years, and 13.2% were in their fourth year or above.

4 Results

4.1 Measurement model

The measurement model assessment yielded robust findings, demonstrating the reliability and validity of the research model (Hair et al., 2017). The outer loadings, indicating the strength of relationships between the latent variables and observed indicators, were significant and well above the recommended threshold of 0.708. Moreover, the average variance extracted (AVE) surpassed the 0.50 threshold for all the latent variables, confirming the convergent validity of the model. Additionally, the composite reliability (CR) values for all the constructs exceeded the acceptable threshold of 0.70, indicating the high internal consistency and reliability of the measurement model. These results collectively validated the adequacy and accuracy of the measurement instruments employed in this study. Table 2 shows the evaluation outcomes for the outer loadings, AVE, and CR. To gauge the discriminant validity of the measurement model, the heterotrait-monotrait ratio of correlations (HTMT) was utilized, as depicted in Table 3. The findings revealed that all the HTMT values remained below the 0.85 threshold, thereby confirming adequate discriminant validity (Gold et al., 2001).

4.2 Structural model

The results of the structural model assessment are shown in Table 4. The findings indicate that all the hypotheses were supported. The results revealed significant relationships between the variables, demonstrating that instructors' emoji use influenced students' perceptions and learning outcomes.

More specifically, H1 (EMO ◊ EXP) and H2 (EMO ◊ TW) revealed the strong and positive effects of instructors' emoji use on students' perceived expertise ($\beta = 0.581$, $p < 0.001$) and perceived trustworthiness ($\beta = 0.439$, $p < 0.001$). These findings suggest that the incorporation of emojis in TEMC by instructors positively influences students' perceptions of their instructors' expertise and contributes to

Table 2 Loadings, AVE and CR

Construct	Items	Loadings	AVE	CR
Use of Emoji (EMO)	EMO1	0.952	0.921	0.958
	EMO2	0.969		
	EMO3	0.958		
Perceived Expertise (EXP)	EXP1	0.944	0.917	0.975
	EXP2	0.942		
	EXP3	0.961		
	EXP4	0.956		
	EXP5	0.958		
Perceived Likeability (LIKE)	LIKE1	0.960	0.848	0.978
	LIKE2	0.947		
	LIKE3	0.955		
	LIKE4	0.966		
	LIKE5	0.959		
Learning Performance (LP)	LP1	0.927	0.849	0.956
	LP2	0.939		
	LP3	0.927		
	LP4	0.936		
	LP5	0.874		
Learning Motivation (MOT)	MOT1	0.934	0.872	0.942
	MOT2	0.941		
	MOT3	0.912		
	MOT4	0.898		
Perceived Trustworthiness (TW)	TW1	0.942	0.907	0.963
	TW2	0.934		
	TW3	0.934		
	TW4	0.952		
	TW5	0.906		

Table 3 Heterotrait-monotrait ratio of correlations (HTMT)

	EMO	EXP	LIKE	LP	MOT	TW
EMO						
EXP	0.601					
LIKE	0.265	0.526				
LP	0.468	0.472	0.579			
MOT	0.388	0.593	0.719	0.713		
TW	0.456	0.753	0.713	0.628	0.717	

students perceiving them as trustworthy. Similarly, H3 (EMO ◊ LIKE) indicated the positive effect of emoji use on likability perceptions ($\beta = 0.257$, $p < 0.001$), highlighting how emoji use might shape students' perceptions of instructors' likability.

Table 4 Structural model assessment

Hypothesis	Relationship	Std. Beta	Std. Error	t-value		p-value	Decision	VIF	R2	f2
H1	EMO -> EXP	0.581	0.038	15.382	***	0.000	**Supported**	1.000	0.338	0.510
H2	EMO -> TW	0.439	0.042	10.381	***	0.000	**Supported**	1.000	0.192	0.238
H3	EMO -> LIKE	0.257	0.045	5.677	***	0.000	**Supported**	1.000	0.066	0.071
H4	EXP -> MOT	0.141	0.063	2.241	*	0.013	**Supported**	2.137	0.569	0.022
H5	TW -> MOT	0.292	0.077	3.808	***	0.000	**Supported**	3.024		0.065
H6	LIKE -> MOT	0.417	0.066	6.347	***	0.000	**Supported**	1.922		0.210
H7	MOT -> LP	0.677	0.042	16.115	***	0.000	**Supported**	1.000	0.458	0.844
H8	EMO -> EXP -> MOT	0.082	0.037	2.205	*	0.014	**Supported**			
H9	EMO -> TW -> MOT	0.128	0.036	3.609	***	0.000	**Supported**			
H10	EMO -> LIKE -> MOT	0.107	0.028	3.815	***	0.000	**Supported**			

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Meanwhile, H4 (EXP ◊ MOT), H5 (TW ◊ MOT), and H6 (LIKE ◊ MOT) demonstrated the significant positive effects of perceived expertise ($\beta = 0.141$, $p < 0.05$), trustworthiness ($\beta = 0.292$, $p < 0.001$), and likability ($\beta = 0.417$, $p < 0.001$) on students' motivation to learn. This suggests that students' perceptions of their instructors' expertise, trustworthiness, and likability would influence their motivation to engage in learning activities. Moreover, H7 (MOT ◊ LP) exhibited how students' learning motivation has a strong positive effect on their learning performance ($\beta = 0.677$, $p < 0.001$), signifying that higher motivation is associated with better learning outcomes.

Additionally, the indirect effects of instructors' emoji use on students' learning motivation through the mediating variables of perceived expertise, trustworthiness, and likability were examined. H8 (EMO ◊ EXP ◊ MOT), H9 (EMO ◊ TW ◊ MOT), and H10 (EMO ◊ LIKE ◊ MOT) demonstrated the significant indirect link between emoji use and learning motivation through perceived expertise ($\beta = 0.082$, $p < 0.05$), trustworthiness ($\beta = 0.128$, $p < 0.001$), and likability ($\beta = 0.107$, $p < 0.001$). As such, all the developed hypotheses were supported. The Variance Inflation Factor (VIF) values, standing at less than 3.3, additionally substantiated that multicollinearity concerns were not significant (Hair et al., 2017).

5 Discussion of results

The results of this study demonstrated some similarities with those of various past studies, in that emoji use appeared to positively impact instructors' expertise, trustworthiness, and likability. H1 was supported, indicating that emoji use in TEMC has a significant positive influence on a student's perceptions of instructor expertise. The result aligns with the outcomes obtained by Moffitt et al. (2020) but contrasts with the findings of Vareberg and Westerman (2020). These inconsistencies could be attributed to several factors, including students' varied preferences for emoji use in an academic context, and the verbal content of the communication. The second hypothesis was confirmed, in that emoji use in TEMC was found to have a significant positive influence on students' perceptions of instructor trustworthiness. This could be due to a decrease in ambiguity (Kaye et al., 2016) and greater trust in their instructors among students (Vareberg & Westerman, 2020), which would increase instructor trustworthiness. In general, H3 was supported by past studies, in that emoji use would likely improve a sender's likability. As such, emoji use in TEMC had a demonstrably significant positive impact on students' perceptions of instructor likability. Thus, students can feel the relative kindness, friendliness, and warmth of their instructors.

These results align with those of past studies, thus attesting to the positive influence of the three components of source credibility – expertise, trustworthiness, and likability - on student learning motivation. Perceived instructor expertise was reported as having a significant influence on learning motivation; thus, H4 was supported. This finding is consistent with that of Siegle et al. (2013), who reported that teachers with an extensive depth and breadth of content knowledge were better at fostering student motivation.

Moreover, a significant positive association was identified between students' perceptions of instructor trustworthiness and students' learning motivation; thus, H5 was supported. Trustworthiness plays a significant role in the instructor-student relationship. Students communicate more with their instructors when they perceive the latter as trustworthy, which in turn enhances student learning motivation. This finding aligns with those of past studies in which trust has been claimed to play an important role in education (Jasmi & Hin, 2014; Lee, 2007; Platz, 2021).

In addition, a significant positive association was noted between students' perceptions of instructor likability and students' learning motivation; thus, H6 was supported. When an instructor is perceived as being more likable, students display more motivation to learn (Marici et al., 2023). Whenever they have doubts, they may be motivated to communicate with likable instructors because a more physically likable person is perceived as being more intelligent than a less likable person (Kanazawa & Kovar, 2004). Altogether, the findings are consistent with those of past studies in which instructor credibility was observed to positively influence student learning motivation (Allard & Holmstrom, 2023; Moore & Richards, 2019). Chory (2007) reported that perceptions of instructor credibility positively predicted perceptions of classroom justice, whereby students are more motivated to learn in a fair and equitable environment.

With regard to the relationship between student learning motivation and learning performance, H7 was supported; a significant positive association was identified between these two proposed variables. This is consistent with some findings of recent studies (Hosen et al., 2021; Parker et al., 2021), although most research has indicated differently. The differences in the findings could be due to the different study contexts.

In relation to the mediating role of perceived instructor credibility between the use of emoji and student learning motivation, H8, H9, and H10 were all supported. This is congruent with outcomes of past studies which reported instructor credibility as being a significant moderator in education (Schrodt et al., 2009; Wheeles et al., 2011). Moreover, these findings affirm the proposed novelty of this study.

6 Implications

By integrating source credibility theory and S-O-R theory, this study provides a novel framework that contributes to the extant literature pertinent to emoji use, perceived instructor credibility, student learning motivation, and student performance in HEIs.

The majority of HEI instructors are Generation X, and therefore digital immigrants; meanwhile, HEI students are predominantly Generation Z, who are known as digital natives. To some extent, this generational gap may create challenges for

effective TEMC. In HEIs, instructor communication with students is generally formal, signifying an interpersonal distance. This may hinder student motivation to communicate with their instructors. One contribution of this present study is the revelation that emoji use by instructors could promote positive perceptions of their credibility, which would have a significant positive impact on student learning motivation. Students were found to perceive instructors as more extraverted and open when emojis are used in TEMC.

The first set of hypotheses referred to how emoji use in TEMC might affect students' perceptions of instructor credibility (H1, H2, and H3). The results confirmed that emoji use in TEMC would improve students' perceptions of their instructors in terms of expertise, trustworthiness, and likability. These findings highlight the importance and practicality of using emojis in TEMC at HEIs, which reveals how the young generation accept receiving TEMC containing emojis from their instructors. Whereas emojis are used in the social media platform, educators could extend this usage in the academic context to enhance TEMC content. This study has demonstrated that a student's learning motivation has a positive and significant effect on their learning performance. This result implies that to enhance their students' learning performance, instructors should devise ways to increase the learning motivation of the former in various respects, including learning environments, the use of learning and teaching technologies, reward systems, feedback, and student-instructor interaction.

In addition, this study offers a novel contribution by illustrating how perceived instructor credibility mediates the relationship between emoji use in TEMC and student learning motivation. To the best of the researchers' knowledge, this is the first study to examine this type of mediating effect. Theoretically, the results indicate that source credibility theory and S-O-R theory are extensively integrated into the HEI context. With perceived instructor credibility as a mediator, emoji use in TEMC (stimulus) appears to positively affect students' learning motivation (organism) and performance (responses).

In brief, this study outlines the significant practical implications of emoji use in HEIs. HEIs may consider adding emojis to their communication toolboxes as these symbols have become a norm for Generation Z. Instructors could use emojis as a strategic tool for perception management because the present findings show that emoji use enhances students' perceptions of instructor credibility. Nonetheless, instructors must be careful when using emojis in TEMC because Generations X and Z may interpret certain emojis differently (Yurieff, 2021). For instance, the 'thumbs up' emoji may be a sign of a successful outcome for Generation X, but Generation Z prefers to use the symbol ironically or as a passive-aggressive way to communicate (The Economic Times, 2023). The different interpretations of emojis among students may adversely affect their perceptions of instructors.

7 Conclusion and future research directions

Instructors must prioritize the consideration of students' initial impressions as a form of communication, including paralinguistics. Thus, given the notable occurrence of TEMC among instructors and students, it is imperative to conduct a study on the use of emojis in educational settings. The study examined the influence of emojis used in TEMC within the context of HEIs, drawing upon theories of source credibility and S-O-R. Specifically, the study suggested that the use of emojis in TEMC has a significant impact on the perceived credibility of instructors (i.e., their expertise, trustworthiness, and likability). Furthermore, this study hypothesized that instructor credibility has a significant influence on students' learning motivation, which subsequently affects their learning performance. Finally, the present study determined that perceived instructor expertise, trustworthiness, and likeability influence the correlation between the use of emojis in TEMC and students' learning motivation. Based on a sample size of 348, analysis demonstrated that all 10 hypotheses were statistically accepted.

This study has a number of limitations, despite the intriguing results produced. The study demonstrated that students' learning motivation and performance are influenced by their perceptions of an instructor's credibility. Thus, future researchers could explore the correlation between students' views of instructor credibility, their level of participation in learning, and the impact of this engagement on students' learning performance. Further investigations could also examine the psychological qualities of students when they use emojis during TEMC. Students with distinct personalities may interpret the use of emojis in TEMC in different manners (Ling et al., 2023) perhaps leading to varying degrees of learning motivation and performance. As previously mentioned, Generations X and Z may interpret emojis differently. Hence, future studies could examine whether interpretations of emojis are aligned between instructors and students. Similarly, additional research might be undertaken to examine the effects of emojis in TEMC on performance before and after their use by comparing students' perceptions of learning motivation and their view of instructor credibility. The present study demonstrates that using emojis in TEMC has a noteworthy influence on students' perceptions of their instructors' credibility and their own willingness to learn. Consequently, it can be inferred that emojis facilitate positive, inclusive, and clear communication in the learning environment. This may improve classroom attendance, active classroom participation, and lively discussions with instructors and peers. Therefore, forthcoming investigations could delve into these research avenues and provide pragmatic approaches that are beneficial to HEIs.

Appendix: Questionnaire items

Emoji use by instructor in text-based electronically mediated communication (EMC) (Adapted from Prada et al., 2018)

EMO1: I feel that my instructor often use emoji in text-based electronically mediated communication (EMC) with students.

EMO2: I feel that emoji is always used by my instructor in text-based electronically mediated communication (EMC).

EMO3: I feel that my instructor frequently use emoji in text-based electronically mediated communication (EMC).

Perceived expertise (Adapted from Ohanian, 1990)

EXP1: This instructor appears to be an expert.

EXP2: This instructor appears to be experienced.

EXP3: This instructor appears to be knowledgeable.

EXP4: This instructor appears to be qualified.

EXP5: This instructor appears to be skilled.

Perceived trustworthiness (Adapted from Ohanian, 1990)

TW1. This instructor appears to be trustworthy.

TW2. This instructor appears to be dependable.

TW3. This instructor appears to be honest.

TW4. This instructor appears to be reliable.

TW5. This instructor appears to be sincere.

Perceived likeability (Adapted from Reysen, 2005)

LIKE1. This instructor appears to be friendly.

LIKE2. This instructor appears to be warm.

LIKE3. This instructor appears to be approachable.

LIKE4. This instructor appears to be likeable.

LIKE5. This instructor appears to be nice.

Learning motivation (Adapted from Erhel et al., 2022)

MOT1. I didn't want to disappoint this instructor who asked me to take this class.

MOT2. I would have felt guilty for not conscientiously following this instructor's classes.

MOT3. I felt compelled to conscientiously attend his/her classes.

MOT4. I thought that maybe taking his/her classes seriously could help me improve my academic performance.

Learning performance (Adapted from Hosen et al., 2021)

LP1. The use of emoji in text-based EMC by my instructor improves the learning system and experience.

LP2. The use of emoji in text-based EMC by my instructor upgrades my knowledge of the course materials.

LP3. The use of emoji in text-based EMC by my instructor saves me time in learning course materials.

LP4. The use of emoji in text-based EMC by my instructor improves my understanding about the course material.

LP5. The use of emoji in text-based EMC by my instructor helps me to improves my ability to communicate with them about course material either formally or informally.

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Data availability The datasets analyzed in the study are available from the corresponding author upon reasonable request.

Declarations

Ethics statement Ethical approval for the study was obtained from the academic ethics committee (Approval number: HRE2023-0101).

Conflict of interest No potential of interest was reported by the authors.

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