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WhatsApp groups: the Nexus between retention, reciprocity, and user satisfaction

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High dropout rates in higher education pose a significant challenge, prompting a need for effective retention strategies. Research shows promoting students' engagement as key factor in retention. This is most effectively nurtured through regular activities that explicitly connect to academic goals and involve all students. This study proposes to investigate the role of reciprocity which involves the exchange of knowledge and resources on the basis of mutual benefits, and considers WhatsApp groups as an interactive medium for connecting and sharing. Data from an online questionnaire of 309 university students was used to test the research model. Data analysis was performed using the partial least squares method. The findings revealed that that information quality (IQ) and service quality (SERQ) exert a positive influence on satisfaction (SAT), while system quality (SQ) does not. Similarly, reciprocity has a positive influence on both SAT and intention to stay (INTENT). Moreover, our study reaffirmed the established positive relationship between SAT and INTENT. Online platforms like WhatsApp groups, supported by reciprocity and a higher quality of contents and services, can promote satisfaction and knowledge sharing among students, ultimately addressing the challenge of student retention in higher education.

KEYWORDS

intention to stay, information quality, system quality, reciprocity, service quality, satisfaction, retention, a sense of belonging

1 Introduction

Our daily lives are being revolutionized by mobile application. Commencing in 2004, the rise of the internet, particularly with the advent of the Internet with web 2.0, epitomized by platforms like, YouTube, Facebook, Twitter, etc., ushered in a new paradigm of individual and social life. This shift has enabled a myriad of online interactions, including microblogging, collaborative projects, social networking chats, and virtual communities, voice-over-IP talk, and mobile instant messaging (Kaplan and Haenlein, 2010; So, 2016; Ali et al., 2017; Chugh and Joshi, 2020). This trend shows no signs of slowing down, with studies predicting 5.7 billion mobile users globally by 2025 (Li et al., 2023).

The incorporation of mobile instant messaging in educational settings has been around over a decade (Bakker et al., 2007; Quan-Haase, 2008). Beyond familiar lecture halls, mobile devices are used for online interactions such as discussions and knowledge sharing (Ujakpa et al., 2018), learner participation (Rambe and Bere, 2013), and cooperative learning (Yuan and Wu, 2020). Similarly, short message service (SMS), online forums, mobile instant messaging, chat applications are classified as collaborative learning tools (Peramunugamage

et al., 2023). For a particular interest, mobile instant messaging systems capture the attention of Generation Z. It is fast, free, and less disturbing to the users (Quan-Haase, 2008; Hou, 2015), classified as quasi-synchronous communication – both synchronous and asynchronous (So, 2016), and enriched by exchanges of voice, text, and video communication as well as emotional stickers (Huang and Lin, 2023). The combination of such text and emoticon communication brings playfulness to our interactions (Hsieh and Tseng, 2017). Modern examples of instant messaging software include the WeChat, iMessage, Line, Kik, Viber, Snapchat, Telegram, and WhatsApp (Figueroa Jacinto and Arndt, 2018; Li et al., 2023).

The quest for instant and convenient communication has fueled the development of numerous tools, but few have achieved the ubiquity and impact of WhatsApp, the world's leading instant messaging tool (Suárez-Lantarón et al., 2022), and the third largest social media tool after Facebook and YouTube, according to Forbes (Frobes.com). WhatsApp is a mobile application (as well as a desktop application) that runs on almost all modern devices and operating systems (Bouhnik and Deshen, 2014; Figueroa Jacinto and Arndt, 2018; Gazit and Aharony, 2018). Studies underline WhatsApp's expanding influence in various spheres, including facilitating smooth school-to-work transition (Pimmer et al., 2019, 2021), promoting social presence (Robinson et al., 2015), enhancing communication (Ujakpa et al., 2018), information sharing (Luaran et al., 2016), and in teaching and learning (Enakrire and Kehinde, 2022).

The use of WhatsApp for an educational purpose stems from the formation of "groups—students alone or including the teacher" (Suárez-Lantarón et al., 2022), where members of the group seamlessly exchange digital resources, with live discussions and online meetings (Enakrire and Kehinde, 2022). This sets the stage for understanding WhatsApp's impact on education, which unfolds into two key areas: its direct use in learning, and the positive outcomes it fosters (Iranmanesh et al., 2022). Its direct use in education is exemplified by the provision of learning resources, enhanced student-teacher interaction, learning beyond traditional classrooms, and collaboration among students. The outcomes include increased student creativity, enhanced language skills in terms of vocabulary and writing, and the encouragement of project-based learning. Other forms of outcomes also involve improving academic performance (Afful and Akrong, 2020) and a sense of belonging to the learning institution (Pedler et al., 2022; Thompson, 2022; Crawford et al., 2024).

Studies signify that quality factors such as information quality, social usefulness and trust remarkably enhance student satisfaction and thereby their loyalty to university (Iranmanesh et al., 2022). Similarly, group importance, subject quality, and usage feature as key drivers in their participation (Gazit and Aharony, 2018). Ahmad et al. (2023) highlighted the significance of usefulness, ease of use, technology acceptance and being an active WhatsApp member. Elsewhere, "System quality, information quality, and service quality all have a positive influence on student's perceived satisfaction" (Al-Fraihat et al., 2020), while satisfaction was widely recognized as a key predictor of students' retention (Schertzer and Schertzer, 2004; Arizzi et al., 2020).

Students intention to remain at the university is measured in terms of return rates from one year to another throughout the educational journey (Addison and Williams, 2023). Keeping students enrolled and maximizing their learning experience are two driving forces in higher learning institutions (Tight, 2020). Studies reveal a clear link between belonging and students' engagement, and their intention to stay at the university

(Hausmann et al., 2007; Gillen-O'Neel, 2021; Pedler et al., 2022). Other studies demonstrated the reciprocal effects of both students–school interaction (Bean and Kuh, 1984; Kim and Sax, 2017), and school-to-school collaboration (Wu et al., 2024) on learning outcomes. Not only institutions, students among themselves can also foster inclusivity and connection by welcoming newcomers, organizing social events, and reciprocal connection.

Reciprocity, grounded in the exchange of social support (Bowling et al., 2005), encourages knowledge sharing where participants mutually benefit and learn from each other (Aslam et al., 2013). Embracing a reciprocal approach to information sharing is likely to encourage sustained retention, given availability of a ubiquitous messaging platform such as WhatsApp. The use of informal WhatsApp groups for academic purposes is relatively understudied (Lakmali et al., 2021). Based on elaborations made above, the present study serves to answer the following questions:

- What are the impacts of WhatsApp groups on student satisfaction and their intention to stay at the university?
- What is the role of reciprocity in enhancing student satisfaction and student retention

The contribution of this study is 4-fold: (i) investigating the potential to promote student retention by leveraging satisfaction and reciprocity within WhatsApp groups, (ii) examining WhatsApp groups' quality through DM model theory, (iii) Evaluating students' satisfaction from the unique perspective of its relationship with reciprocity, (iv) proposing a research model and laying the groundwork for future research.

The following sections detail the structure of this article. Section 2 introduces the conceptual model, Section 3 presents the hypotheses, Section 4 describes the methodology, Section 5 presents the results, Section 6 discusses the findings, and Section 7 concludes the study.

2 The conceptual model

A key perspective embraced by both "Computer-mediated communication (CMC) and social software research" is the socio-technical approach (Hong et al., 2013). The socio-technical perspective views information systems (IS) as a complex interplay between people, their environment, and the system's technical components (Whitworth and De Moor, 2003). From connectivism theory's point of view, learning is conducted through formation of networks within learning community (Siemens, 2007), and is actuated by learners connecting to this network (Goldie, 2016). In this regard, members of the same learning communities can consciously collaborate on the basis of mutual aid (Fernandes-Jesus et al., 2021). The concept of mutual aid was originally coined by Kropotkin (1902).

Several studies, including (e.g., Whitworth and De Moor, 2003; Campbell, 2008), emphasize the reciprocal relationships between "users, the social environment, and technology as key factors for successful social software adoption." Sugden (1984) highlighted that individuals have obligations toward members of any group from which they derive benefits. Such reciprocal membership challenges traditional power structures and promotes mutual understanding and respect (Dominguez, 2023). Reciprocity is essential for fostering effective knowledge sharing in online communities (Zhang et al.,

2021), and fostering their overall satisfaction (Cheung et al., 2013). This importance of user satisfaction is further underscored by its pivotal position in the influential DeLone and McLean (DM) IS theory (Pang et al., 2020).

The DM IS theory, conceived by its eponymous authors in their quest for independent variables driving information system success (DeLone and McLean, 1992), originally comprised six constructs. Subsequent refinements integrated the service quality dimension, solidifying the centrality of user satisfaction and user intention in the model's assessment of information system effectiveness (DeLone and McLean, 2003). Also, organizational impact and individual impact have been conceptualized into net benefits. The updated model consisted the following six variables: "Information, system, and service quality; intention to use; user satisfaction; and net benefits" (Urbach and Müller, 2012).

The theory has been applied to various contexts, including social media systems. For example, study conducted by Hong et al. (2013), signify the strong impact of systems quality on user's intention to use instant messaging systems. Similarly, system quality and service quality are conceptualized into the context of user loyalty with mobile instant messaging (Tang and Lee, 2015). In our context, we investigate the influence of system quality, information quality, and service quality on student satisfaction which in turn leads to their intention to remain enrolled. We further propose that sustained satisfaction and student retention are fostered by reciprocal relationships, generating net benefits for both students and the university. Our proposed model is shown in Figure 1.
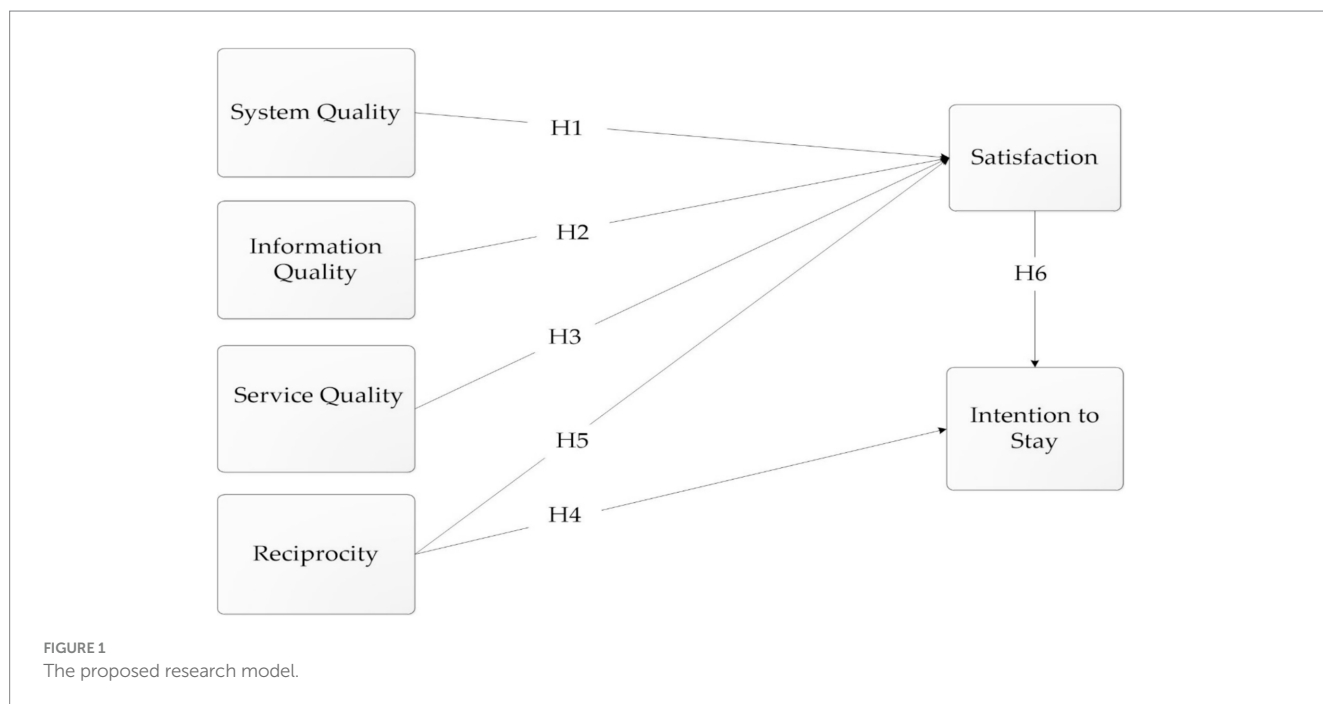
3 Hypothesis development

The DeLone and McLean model identifies "system quality, information quality, and service quality" as key attributes of IS success (DeLone and McLean, 1992, 2003; Petter et al., 2008; Urbach and Müller, 2012). System quality is related to the performance of an information system, including response time, navigation, dependability, and convenience, while information quality describes the information attributes such as being accurate, relevant, timely and comprehensive (Gao and Bai, 2014). Service quality is defined as the degree of assistance received from IS staff, and it is evaluated using measures like empathy, assurance, and responsiveness (DeLone and McLean, 2003).

Existing literature often discusses information quality and system quality together, sometimes neglecting service quality. Iranmanesh et al. (2022) examined system quality and information quality in context of WhatsApp. In their study, they found that information quality exerts a positive influence on user satisfaction. Conversely, their study signified system quality does not influence user satisfaction, this even though, according to Hong et al., (2013), it is considered a technical component of IS that collaborates with the social aspect of IS to collectively shape user intention to use social media software. Recent research by Al-Rahmi et al. (2021) confirms a positive link between information quality, system quality, and user intention to use social media software. According to this study, user intention is positively impacted by user satisfaction. Gao and Bai (2014) highlight that user satisfaction mediates the relationship between information/ system quality and user intention to use, acting as a key driver of sustained usage. Users are thus motivated to adopt and utilize systems that offer optimal technical efficiency and expected accuracy (Azzahra et al., 2023).

Studies examining the impact of IS dimensions (system quality, information quality, service quality) on user satisfaction and usage intention show inconsistent results. This inconsistency may be partly explained by the different research domains where these studies are conducted. For example, a recent study in the context of student information systems found that information quality, system quality, and service quality did not positively influence user satisfaction (Çelik and Ayaz, 2022). In contrast, Safitri et al. (2020) found a significant relationship of the same three constructs with user satisfaction and

FIGURE 1
The proposed research model.

usage intention within the context of academic information systems. Similar findings are available in in eLearning context (Almaiah and Alismaiel, 2019; Efiloğlu Kurt, 2019; Al Mulhem, 2020; Nuryanti et al., 2021; Dangaiso et al., 2022; Khera, 2023), and in the context of mobile learning (Srivastava et al., 2023).

> *H1*. Higher system quality leads to higher student's satisfaction of WhatsApp Group

> *H2*. Higher information quality leads to higher student's satisfaction of WhatsApp Group

> *H3*. Higher service quality leads to increased student's satisfaction of WhatsApp Group

Social media facilitates content sharing, emotional expression, opinion diffusion, and audience engagement (Shwartz-Asher et al., 2020). Understanding why individuals share knowledge is crucial, and the concept of reciprocity plays a significant role in this understanding (Chen and Hung, 2010; Zhang et al., 2021). The concept of reciprocity is founded on "give and take" and the expectation of that the individual's effort will be rewarded when the roles are swapped (Di Gangi et al., 2012). The reciprocity theory states that individuals are never obligated to contribute more than others in the group, thereby addressing "the unfairness that arises from the principle of unconditional commitment" (Sugden, 1984). In addition, the level of the reciprocity has a beneficial effect on knowledge contribution in a given group (Kim et al., 2006).

This elaboration is particularly meaningful in WhatsApp groups, where the principle of reciprocity can help maintain a balanced and fair exchange of contributions among members. For English language classes, groups formed in WhatsApp outperformed conventional groups, given that they are properly guided and controlled (Farahian and Parhamnia, 2022). Likewise, graded WhatsApp assignments in courses can foster active, collaborative learning pre- and post-lectures, boosting engagement and understanding (Dahdal, 2020). Social media users with a genuine intention to share and receive information are more active in creating and sharing knowledge than those who lack purpose (Shwartz-Asher et al., 2020). Similarly, students "can understand and appreciate each other, and this reciprocal understanding can reach the point where they are willing to do everything on behalf of the other" (Tamjidyamcholo et al., 2013). While reciprocity fosters belonging (Wu et al., 2023), its absence is associated with exhaustion, burnout, and diminished commitment (Schaufeli et al., 1996; van der Ross et al., 2023). At the same, students who consider dropping out from universities has weaker sense of belonging compared to those who did not (Pedler et al., 2022). Building on this discussion, this study proposes the following hypothesis:

> *H4*. Higher level of reciprocity leads to stronger student's intention to say at the university

Investigating the relationship between norm reciprocity and student satisfaction with their current learning institutions, this study hypothesizes a positive influence, aiming to contribute valuable insights into the dynamics of group interactions within educational settings. Studies examining both informational reciprocity and its link to student well-being (Li et al., 2015; Liu et al., 2023), and generalized reciprocity's connection to basic psychological needs (Liu et al., 2021) support this positive influence. Upholding group norms, like respecting diverse opinions and maintaining positive communication, creates a predictable and supportive environment, contributing to student satisfaction with the group dynamics. This perhaps more evident in the crisis times. For example, mutual aid groups have played a vital role in the public response to the COVID-19 pandemic (Fernandes-Jesus et al., 2021). This understanding aims to enhance insights into the nuanced relationships shaping interactions within WhatsApp group settings. Therefore, we propose the following hypothesis:

> *H5*. Higher level of reciprocity leads to increased student's satisfaction

When universities prioritize fostering student satisfaction, they create a fertile ground for successful students who are far more likely to see their journeys through to completion. Extensive body of literature exists on this concept (Schertzer and Schertzer, 2004; Levy, 2007; Gaskell, 2009; Lee and Choi, 2013; Arizzi et al., 2020). Higher education is increasingly assumed as business-like services industries which prioritize meeting customer needs (Gruber et al., 2010; Calma and Dickson-Deane, 2020). But unlike other service industries that focus on satisfaction as target goal, universities view it as a stepping stone toward student motivation, retention, and recruitment (Schreiner, 2009). Al Hassani and Wilkins (2022) proposed a model where student satisfaction plays a central role, directly influencing two key outcomes: intention to stay and supportive intentions. Drawing upon this, we put forward the following hypothesis:

> *H6*. Higher student's satisfaction leads to stronger intention to say at the university

4 Methodology

4.1 Data collection and sampling

This study used purposive sampling, a non-probability method that involves choosing participants based on specific criteria. Daniel (2011) highlighted that purposive sampling involves the deliberate selection of research participants who satisfy precise inclusion and exclusion criteria. This method assumes that individuals with particular experiences or backgrounds offer valuable and various perceptions on the research topic (Campbell et al., 2020). Therefore, this study employs purposive sampling, selecting final-year students who are active on WhatsApp, a popular social media platform among students as noted by Lakmali et al. (2021), to investigate the understudied topic of how reciprocity and satisfaction can lead to student retention in higher learning institutions.

To ensure an adequate sample size for the study, we employed G*Power software which is used for computing sample size and power for a number of statistical methods (Kang, 2021). Accordingly, G*Power 3.1.9.2 software, using Cohen's parameters (Cohen, 1988),

with an effect size (f^2) of 0.33, alpha (error type I) of 0.05, and beta (error type II) of 0.80, suggested a minimum sample size of 309 respondents for a two-tailed independent samples t-test. An online questionnaire was developed to test the research hypothesis. Prior research as in DeLone and McLean (2003), Wasko and Faraj (2005), Tamjidyamcholo et al. (2013), Arizzi et al. (2020) was used to support the development of the questionnaire, with necessary modifications made to align with the objectives of the present study. The study population included final-year students at SIMAD University. The study specifically targeted final-year students from faculty-created and administered WhatsApp groups. The distribution of the questionnaire with 5-point Likert scale was made on December, 2023, and it lasted about one month. 309, fully-filled questionnaires were received, which were all considered to be included into the analysis. The questionnaire consisted of two sections. The first section included demographics (age, gender, marital status, education level, WhatsApp use frequency) as presented in Table 1. The second section presented questions related to study's main constructs.

4.2 Construct measurement

In this study, we employed a set of key constructs to comprehensively explore the dynamics within WhatsApp groups. The primary constructs under investigation include User Satisfaction, Reciprocity, System Quality, Information Quality, Service Quality, and Intention to Stay. The constructs and measurement items of the original questionnaire are shown in Appendix 1. To measure System and Information Quality, we adapted scales sourced from reputable sources, including (DeLone and McLean, 1992, 2003; Gable et al., 2008; Urbach and Müller, 2012; Albaom et al., 2022; Iranmanesh et al., 2022). The four-item scale for Service Quality was drawn from (DeLone and McLean, 2003; Urbach and Müller, 2012). Satisfaction

TABLE 1 Demographics.

Characteristics		Number of respondents (n = 309)	Percentage (%)
Gender	Male	141	30.2
	Female	61	69.8
Age	20–24 years	188	93.1
	25–29 years	12	5.9
	30–40 years	1	0.5
	41–50 years	1	0.5
Marital status	Married	15	7.4
	Single	187	92.6
Educational level	Undergraduate	193	95.5
	Master	8	4.0
	PHD	1	0.5
Frequency of use	Frequently	45	30
	Rarely	30	20
	Occasionally	14	9
	Very frequently	61	41

with four items was sourced from (DeLone and McLean, 1992, 2003; Urbach and Müller, 2012; Iranmanesh et al., 2022). Reciprocity was evaluated using a scale sourced from (Wasko and Faraj, 2005; Tamjidyamcholo et al., 2013; Li et al., 2023). Intention to stay was adapted from (Arizzi et al., 2020), consisting of three items for evaluation.
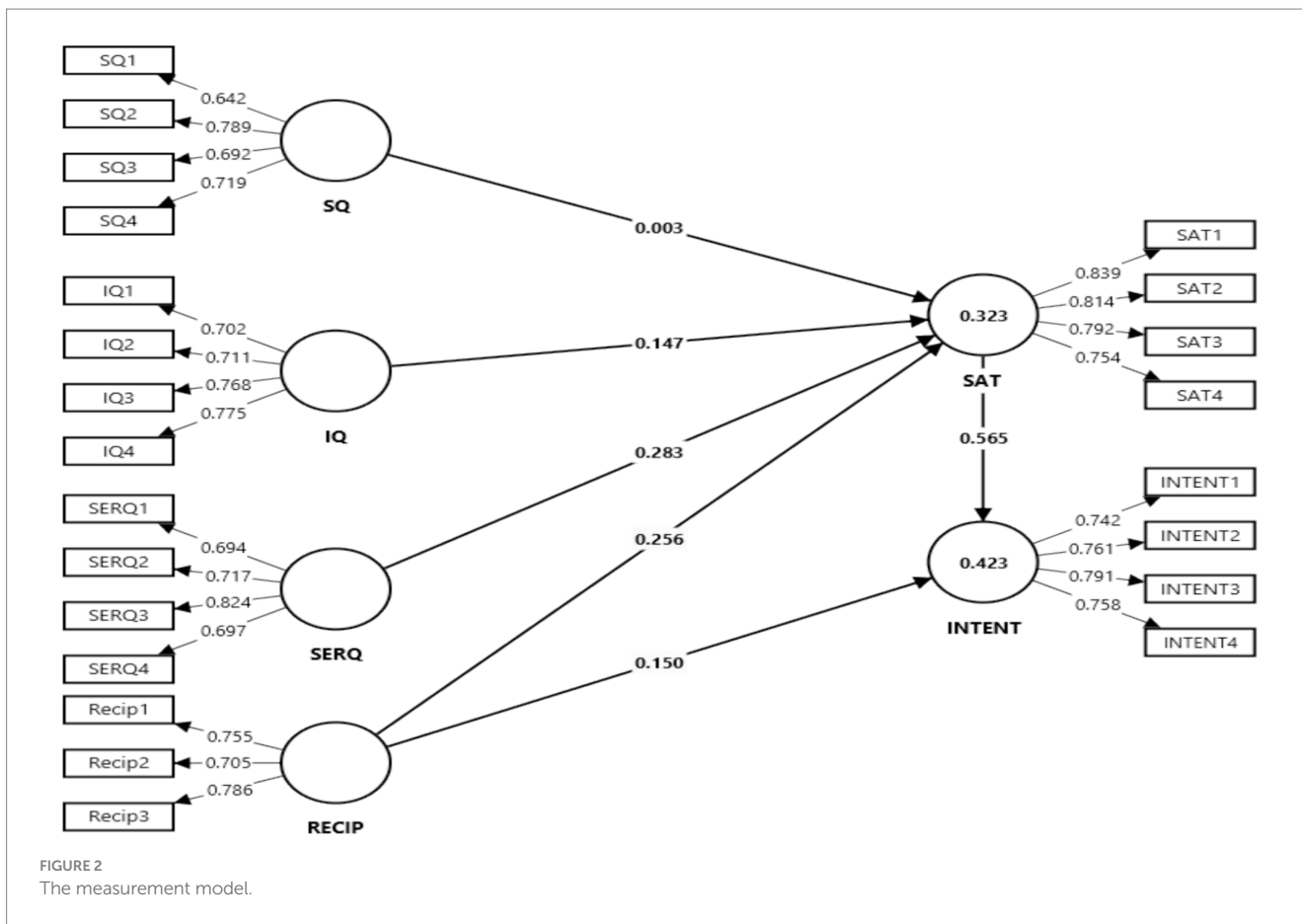
5 Results

Statistical analysis was conducted using two software packages: SPSS Statistics 23 for initial data exploration and descriptive analysis, including generating respondent demographics. Subsequently, PLS-SEM was employed to assess the measurement model (Figure 2) and test the hypothesized relationships in the structural model (Figure 3). PLS-SEM also obtains solutions with smaller sample sizes compared to CB-SEM, and it is enabled by a user-friendly software tool like SmartPLS (Hair and Alamer, 2022).

5.1 The measurement model

The measurement model was developed by assessing "the reliability and validity of the constructs" following the procedures recommended by Hair et al. (2021). This assessment included internal consistency, convergent validity, and discriminant validity. In assessing internal consistency, composite reliability was preferred because it considers individual indicator reliability, making it more suitable for PLS-SEM (Hair et al., 2011). For a given construct, the Average Variance Extracted (AVE) and the indicator loadings reflect the degree of convergent validity. As shown in Table 2, all indicator loadings exceeded 0.70 on their respective constructs, with the exception of three items. Although three items had loadings below 0.70, they were retained as "their removal did not improve internal consistency or convergent validity" (Hair et al., 2011, 2021). All constructs demonstrated excellent internal consistency (composite reliability >0.70) and adequate convergent validity (AVE > 0.50). Discriminant validity requires that conceptually distinct constructs should also be statistically different (Henseler et al., 2016). The Fornell-Larcker criterion, shown in Table 3, confirms that each construct measures a distinct concept. Discriminant validity was further assessed using the Heterotrait-Monotrait (HTMT) approach, where HTMT values less than 0.85 indicate satisfactory discriminant validity (Hair et al., 2019). As shown in Table 4, all HTMT values are below 0.85, indicating that our results adequately satisfy discriminant validity using the HTMT approach (Figure 3).

5.2 Structural model

Table 5 examines the hypotheses that SQ, IQ, and SERQ affect student SAT in WhatsApp group, with RECIP posited to impact SAT and INTENT. The statistical analysis supports several relationships within this framework. The relationship between SQ and SAT was not statistically significant. However, IQ has a significant positive effect on SAT (β = 0.173, T-value = 2.693, p-value = 0.007), indicating that higher information quality shared among WhatsApp group members

FIGURE 2
The measurement model.

will drive their satisfaction. RECIP also positively influences INTENT (β = 0.144, *T*-value = 2.743, *p*-value = 0.006). Additionally, SAT significantly influences INTENT (β = 0.568, *T*-value = 10.414, *p*-value = 0.00), while RECIP exerts a positive influence on both SAT (β = 0.253, *T*-value = 4.284, *p*-value = 0.00), and INTENT (β = 0.144, *T*-value = 2.743, *p*-value = 0.006). Similarly, SERQ has a positive impact on SAT (β = 0.284, *T*-value = 4.410, *p*-value = 0.00).

Two other criteria evaluated for the structural model are *R*-Square and *F*-Square. *R*-square, a measure of a model's explanatory power, has a range of values between 0 and 1. Higher values indicate a greater ability to explain the variance in the dependent variable (Urbach and Ahlemann, 2010). Chin (1998) provides guidelines for interpreting *R*-square values: 0.670 or higher is substantial, around 0.333 is average, and 0.190 or below is weak. The adjusted *R*-square values for INTENT and SAT are 0.425 and 0.321, respectively. This means that 42.5% of the variance in INTENT is explained by the independent variables SAT and RECIP. Similarly, 32.1% of the variance in SAT is explained by the independent variables SQ, IQ, and SERQ.

F-square measures the level of effect of an independent variable on a dependent variable in a structural model. Cohen (1988) proposed that F-square values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. In our analysis, SAT demonstrates a substantial effect on INTENT (0.435). RECIP exerts a small effect on both SAT (0.064) and INTENT (0.028). SERQ displays a small to medium effect on SAT (0.134), while IQ has minor effects on SAT (0.021). SQ, on the other hand, exhibits no effect on SAT (0.000).

5.3 Indirect effects

Table 6 shows the analysis of indirect effects on intention to stay (INTENT). IQ (β = 0.084, *T*-value = 2.317, *p*-value = 0.021), RECIP (β = 0.146, *T*-value = 4.097, *p*-value = 0.000), and SERQ (β = 0.161, *T*-value = 3.878, *p*-value = 0.000) all have significant and positive indirect effects on INTENT. Higher levels of each factor contribute to increased user satisfaction, ultimately leading to a greater likelihood of user retention. However, SQ shows no significant indirect effect on INTENT (β = 0.000, *T*-value = 0.006, *p*-value = 0.995).

6 Discussion

The present study aimed to investigate the impacts of WhatsApp groups on student satisfaction and their intention to stay at the university, utilizing the Delone and McLean IS Success Model along with the incorporation of reciprocity. A research model was proposed, followed by the development of a questionnaire specifically designed for testing the model. PLS-SEM was then employed to validate and analyze the proposed model. Our findings revealed a nuanced understanding of the relationships between various constructs. According to the analysis results, H1, which posited a higher positive relationship between system quality (SQ) and satisfaction (SAT), was rejected (β value = 0.041, *T*-value = 0.718, *p*-value = 0.473). This finding aligns with a previous study by Iranmanesh et al. (2022), which similarly demonstrated

TABLE 2 Construct validity and reliability.

Constructs	Items	Loadings	Mean	Composite reliability	AVE
INTENT	INTENT1	0.747	3.489	0.848	0.582
	INTENT2	0.780	3.981		
	INTENT3	0.775	3.854		
	INTENT4	0.774	3.463		
IQ	IQ1	0.718	3.443	0.828	0.547
	IQ2	0.738	3.498		
	IQ3	0.740	3.456		
	IQ4	0.762	3.405		
RECIP	Recip1	0.756	3.508	0.793	0.562
	Recip2	0.706	3.482		
	Recip3	0.784	3.566		
SAT	SAT1	0.839	3.599	0.877	0.641
	SAT2	0.815	3.550		
	SAT3	0.793	3.761		
	SAT4	0.753	3.443		
SERQ	SERQ1	0.688	3.819	0.824	0.540
	SERQ2	0.702	3.693		
	SERQ3	0.830	3.935		
	SERQ4	0.711	3.443		
SQ	SQ1	0.666	4.152	0.804	0.508
	SQ2	0.805	3.757		
	SQ3	0.666	3.262		
	SQ4	0.704	3.670		

TABLE 3 Discriminant validity (Fornell-Larcker criterion).

Constructs	INTENT	IQ	RECIP	SAT	SERQ	SQ
INTENT	0.763					
IQ	0.376	0.739				
RECIP	0.438	0.419	0.700			
SAT	0.633	0.394	0.463	0.800		
SERQ	0.539	0.508	0.584	0.502	0.735	
SQ	0.380	0.482	0.461	0.337	0.532	0.713

TABLE 4 Discriminant validity (HTMT).

Constructs	INTENT	IQ	RECIP	SAT	SERQ
INTENT					
IQ	0.490				
RECIP	0.603	0.592			
SAT	0.809	0.508	0.663		
SERQ	0.705	0.686	0.818	0.627	
SQ	0.526	0.692	0.686	0.450	0.711

an insignificant relationship between system quality and satisfaction. Several potential interpretations can be offered for this counterintuitive outcome. One possibility lies in the widespread adoption of WhatsApp in Somalia, potentially fostering a sense of familiarity and confidence among users. As Hsu et al. (2011) argued, user's experience with a system can diminish concerns about its technical aspects, rendering system quality less critical for overall satisfaction.

In contrast, the statistical analysis provides strong support for hypotheses H2, H3, H4, H5, and H6. H2 specifically shows a highly significant positive association between information quality (IQ) and student satisfaction (SAT). This is evidenced by a β-value of 0.173, T-value of 2.693, and p-value of 0.007. These findings are consistent with the findings of Iranmanesh et al. (2022), which highlighted the pivotal role of information in WhatsApp groups discussions. Within these groups, members freely exchange content and opinions without restrictions, and opinions, as noted by Iranmanesh et al. (2022), are subjective, and there are no clear-cut
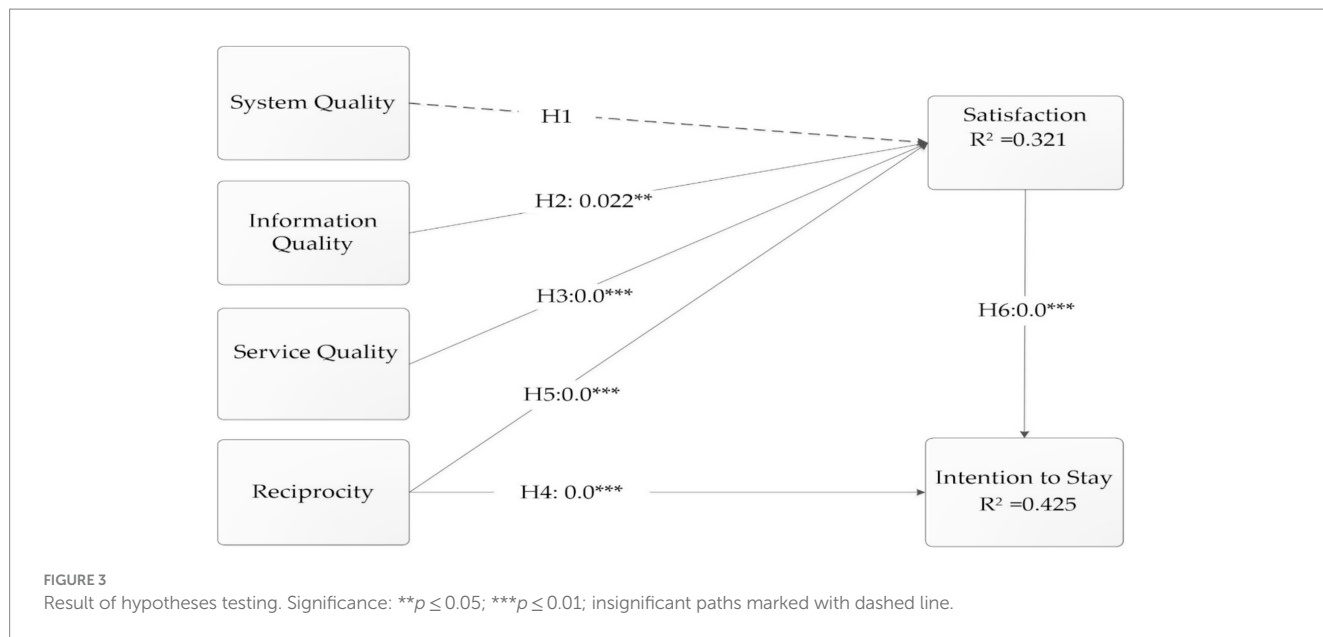
FIGURE 3
Result of hypotheses testing. Significance: **$p \leq 0.05$; ***$p \leq 0.01$; insignificant paths marked with dashed line.

TABLE 5 Hypothesis testing.

Hypothesis	Relationship	β	T-value	p-value	Decision
H1	SQ ➜ SAT	−0.001	0.023	0.981	Rejected
H2	IQ ➜ SAT	0.147	2.298	0.022 (**)	Supported
H3	SERQ ➜ SAT	0.284	4.410	0.000 (***)	Supported
H4	RECIP ➜ INTENT	0.144	2.743	0.006 (***)	Supported
H5	RECIP ➜ SAT	0.253	4.284	0.000 (***)	Supported
H6	SAT ➜ INTENT	0.568	10.414	0.000 (***)	Supported

Significance level: **$p < 0.05$; ***$p < 0.01$.

TABLE 6 User Satisfaction (SAT) mediating the effects of IQ, RECIP, SERQ, SQ on Intention to Stay (INTENT).

Relationships	β	T-value	p-values	Decision
IQ ➜ INTEN	0.084	2.317	0.021	Supported
RECIP ➜ INTENT	0.146	4.097	0.000	Supported
SERQ ➜ INTENT	0.161	3.878	0.000	Supported
SQ ➜ INTENT	0.000	0.006	0.995	Rejected

answers. With respect to information quality, WhatsApp content may enhance student participation and facilitate prelogical delivery (Rambe and Bere, 2013), but there remains a concern regarding its accuracy and reliability.

Numerous studies have consistently highlighted a strong link between service quality and user satisfaction (Roca et al., 2006; Wang and Chiu, 2011; Mohammadi, 2015; Chandra et al., 2019; Pham et al., 2019). This connection holds true even in mobile communication and instant messaging, as research by Oghuma et al. (2016) demonstrates that service quality significantly predicts user satisfaction. Our study corroborates these findings, demonstrating that higher service quality in WhatsApp groups leads to greater student satisfaction (β = 0.39, $T = 6.462$, $p < 0.001$). This emphasizes the importance of service quality in WhatsApp groups, suggesting that improving service

standards can enhance student satisfaction and create a more positive learning environment.

Our findings demonstrate a positive correlation between increased student satisfaction and a stronger intention to stay at the university. This aligns with previous research by van der Ross et al. (2023) and Arizzi et al. (2020) who established a clear link between satisfaction and student retention. Similar studies (Schertzer and Schertzer, 2004; Levy, 2007; Gaskell, 2009; Lee and Choi, 2013) further support this connection. Student retention is the responsibility of higher education institutions (HEI) (Tight, 2020). Therefore, it is not surprising that student satisfaction with these institutions is highly prioritized. Benefits of student satisfaction extend even beyond retention. Research by Arizzi et al. (2020) demonstrates that satisfaction can also influence students' willingness to recommend the university to others. This highlights the potential for satisfied students to become advocates for the university, attracting new students and ultimately bolstering the university's reputation.

While student dropouts can be associated with financial constraints, family commitments, and job commitments (Nieuwoudt and Pedler, 2023), numerous studies highlight the crucial role of social factors in academic success. These include social capital (Huang, 2021; Ngoc Ton et al., 2023), a sense of belonging (Pedler et al., 2022; Crawford et al., 2024), feeling of being at home (HeavyRunner and DeCelles, 2002), and, as our study focuses on, reciprocity (Koranteng et al., 2019). Reciprocity

goes beyond simply feeling like you belong. It fosters mutual aid and support. Conversely, a lack of it can lead to exhaustion and burnout as students feel unsupported and their efforts go unrecognized (Schaufeli et al., 1996; van der Ross et al., 2023).

Considering this perspective, reciprocity- a dimension of social capital and the mutual exchange of knowledge perceived as fair by group members (Koranteng et al., 2019), was posited to have an impact on students' intention to stay at their current institution. Our findings confirmed this, demonstrating that reciprocity is highly correlated with the students' intention to stay. This is because recognizing the significance of reciprocity within the realm of student retention opens avenues for educational institutions to enhance social support structures and foster a positive communal environment, ultimately contributing to the overall well-being and success of students in higher education.

7 Conclusion and future work

WhatsApp groups in classrooms are becoming increasingly popular, facilitating easy communication and information sharing among group members. However, despite its growing popularity, the tool has not been utilized strategically for educational purposes. This study provides a novel insight: WhatsApp groups can be devised to address the problem of students dropping out from universities. Information quality, with its influence on satisfaction, underscores the importance of accurate and relevant information exchange within these groups (Iranmanesh et al., 2022). In the same way, providing quality of service to students is also considered a key determinant to satisfaction (Mohammad Salameh et al., 2018). Nevertheless, the quality of WhatsApp as a system does not pose any concerns on student satisfaction. On the other hand, students seem to be more confident and self-assured about the quality of WhatsApp application. The present study establishes a robust connection between satisfaction and students' intention to stay at the university, aligning with broader literature on the positive correlation between satisfaction and retention (Schertzer and Schertzer, 2004; Levy, 2007; Gaskell, 2009; Lee and Choi, 2013). Reciprocity, a dimension of social capital, emerged as a noteworthy contributor to students' intention to stay. The mutual exchange of knowledge perceived as fair by group members played a pivotal role, emphasizing the importance of reciprocity in fostering commitment and preventing exhaustion and burnout.

The findings of this research have practical implications for educational institutions. *First*, educators can play a pivotal role in ensuring high-quality information within WhatsApp groups. This might involve providing curated resources, facilitating discussions around credible sources, and discouraging the spread of misinformation. *Second*, strategies to enhance service quality within these groups could involve establishing clear group norms, assigning dedicated administrators to manage discussions and address concerns, and ensuring prompt responses to student inquiries. *Third*, encouraging active participation, peer-to-peer learning, and knowledge sharing activities can further strengthen the sense of community and reciprocity within WhatsApp groups.

This study offers valuable insights, but limitations exist. The context of SIMAD University and potential cultural impact warrant

further exploration. Future research could investigate these dynamics in different cultural and institutional settings, particularly focusing on how cultural factors interact with the identified influences on student retention.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical approval was not required for the study involving human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

IA: Writing – original draft, Writing – review & editing. MM: Conceptualization, Writing – review & editing. YA: Writing – review & editing, Methodology.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1385278/full#supplementary-material

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