



Anonymity, Systems Characteristics, and Feedback Provision in Online Learning Communities

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ABSTRACT

The growing ubiquity of the internet has attracted various studies on the various issues concerning online communities for education. These studies assume that systems characteristics do not play any major role in the behaviours exhibited in such online spaces. Consequently, they focus on group impetus and personality traits of members. Further, the role of anonymity in feedback provision in online communities for education is inconclusive. The purpose of this paper is to develop and test a model that explains learners' feedback provision in online learning communities. The model includes anonymity and relevant system characteristics such as system quality and information quality. Survey data analysed using partial least squares structural equation modelling and revealed two main findings. First, the higher the assurance of anonymity for learners on online learning, the better their system credibility and quality. Second, system characteristics such as aesthetics and perceived system quality predict feedback provision. The implications to research and practice are discussed.

KEYWORDS

Anonymity, Feedback, Feedback Provision, Online Communities, System Characteristics, Web-Based Learning

1. INTRODUCTION

With the ever-growing ubiquity of the Internet, newer channels through which people interact, communicate and access information have evolved. Online communities are now preferred platforms for communication and information exchange in many educational societies. According to Jones & Rafaeli (2000), online communities are online spaces that augment member-generated content integration and interpersonal relationships. Online communities advance the scope of traditional communities by overcoming barriers such as distance and cost. Thus, they allow the social aggregation of large and geographically dispersed community networks of learners (Li, 2015). Google Classroom, Moodle, and Sakai afford the creation of online spaces which can grow into online communities for various purposes including education. Indeed, many educational institutions continue to implement

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these tools because they see online communities as cost-effective approaches for facilitating learner interaction and participation (Alenezi & Yaiesh, 2018).

As a result, previous studies highlight varied elements that explain learner interaction patterns on online communities for education. Many of these studies have focused on group impetus and the personality traits of members. For instance, extant studies (Koranteng & Wiafe 2019; Koranteng, Wiafe, & Kuada 2019; Budu 2018; Li 2015; Chiu, Hsu, & Wang 2006) have explained learner behaviour (such as collaboration, knowledge sharing, engagement, and feedback provision) in online communities under the lenses of the social capital, social cognitive and social exchange theories. Only a few studies have explored the effect of system characteristics despite many established theories (e.g. DeLone & McLean 2002) highlighting the relevance of system features on user behaviour.

Specifically, studies that explore the influences of system characteristics in online communities for education are still limited. Aside from the traditional features enabled in systems to improve performance, contemporary systems are being upgraded with newer concepts to induce target behaviour. For instance, persuasive design principles have been integrated into online community platforms to encourage target behaviour (Wiafe et al., 2020). Moreover, other platforms such as 2channel thrive on anonymity to facilitate content sharing.

Yet, relevant investigations do not account for these integrated features. They have predominantly focused on traditional system qualities such as ease of use. Such findings become obsolete since they fail to align with contemporary system features. In this light, new research approaches that tackle the challenges in existing literature becomes paramount. In this paper, anonymity and persuasive design principles are integrated with relevant system features (system quality and information quality) which have been established to influence user behaviour to develop a research model. This model is applied to explain learners' feedback provision in online learning communities, specifically, Google Classroom. The model is evaluated using quantitative data and techniques from Partial Least Structural Equation Modelling (PLS-SEM). The analysis reveals that, contrary to previous studies, the higher the assurance of anonymity for learners on online learning, the better their system credibility and quality. Further, system characteristics such as aesthetics and perceived system quality predict feedback provision.

This paper continues with a review of the assumptions in previous relevant literature to point out areas that need further research. The literature review ends with a formulation of a research model and hypotheses. The next section presents the detailed methodology with respect to sampling technique, sample, data collection, and data analysis. This is followed by an assessment of the measurement model and assessment model towards accepting or rejecting the hypotheses. The last but one section presents the conclusion and implications for research and practice. The last section suggests new areas for future research.

2. LITERATURE REVIEW

2.1. Overview of Online Communities

Generally, and from a technology-oriented definition, online communities are spaces on the Internet where people interact. However, because online communities exist in various forms and for diverse purposes, they have been described differently. Rheingold describes online communities as “virtual communities that are cultural aggregations that emerge when enough people bump into each other often enough in cyberspace.” (1993:57). This broad definition was based on Rheingold's experience in an early online community. Again, online communities have been described as “any virtual social space where people come together to get and give information or support, to learn or to find company” (Preece, 2001: 248). Rheingold (2000) describes online communities as social aggregations emergent from increased participation in public discussions on the Internet which is supported by emotions and personal relationships. Relatedly, others define online communities as computer-mediated spaces that enable user content generation and integration with the primary aim of facilitating inter-personal

relationships (Hagel, 1999; Jones & Rafaeli, 2000). The common factor in these definitions is the emphasis on people or group interactions facilitated by an Internet-enabled medium. Nonetheless, online communities can be motivated by commercial or non-commercial benefits. For instance, commercial online communities target future sale generation by engaging customers with product details and designs (Weiger et al., 2017). On the other hand, many non-commercial online communities exist mainly for educational purposes. Google Classroom is a popular platform that augments learner interactions. It provides useful spaces and infrastructure that enable learners to ask and respond to questions as well as share learning materials (Koranteng et al., 2020).

Yet, learners' sharing behaviour in these spaces is questionable. Research indicates that learners rarely participate in discussions on these platforms. Whereas some lurk (Sun et al., 2014), others scarcely interact and rarely contribute their thoughts (Meishar-Tal & Pieterse, 2017). According to Wiafe et al. (2020), system characteristics affect knowledge sharing. On online communities such as Google Classroom, learners' responses to queries from teachers and colleagues may be affected by the system's features. Unfortunately, very few studies have explained feedback provision on online communities for education from a systems' characteristics perspective. This is disappointing given that interactions on these systems are computer-mediated. Therefore, investigations into how system features affect feedback provision become essential in an attempt to develop strategies that engender information sharing and participation in the communities created on these platforms.

2.2. Related Works

Feedback includes teacher and peer responses to learners' knowledge production (Halim, Wahid & Halim (2021), and informs the learner whether responses are correct or incorrect (Tricomi & DePasque, 2016). Feedback provision as used in this study refers to the teacher informing the learners about whether their responses in a learning exercise or assessment are correct or incorrect, with the aim of guiding learning. Arguably, the learning gains associated with feedback provision as a teaching and learning strategy are undoubted. Extant studies confirm from both students' and teachers' perspectives that feedback strongly influences learning outcomes (such as performance and engagement) as well as student/student and student/teacher relationships (Hung, 2016; Zimbardi et al., 2017). However, as indicated earlier, the challenge has also been the ability to motivate feedback provision, particularly in online communities. Perhaps, this is as a result of persistent false information, bullying, and trolling that occur in cyberspace.

As a result, relevant studies have examined patterns of interaction among members of online communities. Many of these studies explore how personal and/community-related factors (such as trust, reciprocity, social interaction ties, identification, altruism, reputation, share vision and language, empathy, and self-efficacy) influence feedback and sharing behaviour (Nahapiet & Ghoshal 1998; Wasko & Faraj 2005; Kankanhalli, Tan, & Wei 2005; Chiu et al. 2006; Chang & Chuang 2011; Tseng & Kuo 2014; Koranteng & Wiafe 2019; Koranteng et al. 2019). In addition, the effects of technological factors have also been investigated. Ma & Agarwal (2007) offered insight into the role of information technology (IT)-based features in online communities. The study observed that perceived identity verification strongly influenced knowledge contribution. On the contrary, Budu (2018) observed that the lack of anonymity on Google Classroom discouraged students from giving feedback. In a related study, Wiafe et al. (2020) explored how persuasive social principles are been integrated into online community platforms to enhance information exchange. From their findings, dialogue support and social support are significant factors.

Evidently, the role of system features in online community platforms is underexplored. Studies that explore system features and their impact on information exchange are inadequate and need support. System characteristics influence behaviour in online communities (Wiafe et al. 2020). Therefore, the features enabled by online communities for education should play a key role in any attempt to encourage feedback provision. As such, Ma & Agarwal (2007) call for increased attention to the role of IT-based features in online communities. Moreover, findings from existing studies seem

to contradict. For instance, whereas Budu (2018) advocates for anonymity, Ma & Agarwal (2007) believe that verifiable identity will boost information exchange in online communities. To address these gaps, this study explains the role of system features in online communities for education. In addition, it sheds light on the significant/non-significant role of anonymity in feedback provisions. The next section discusses the research model and hypotheses for the study.

3. RESEARCH MODEL

Information Systems (IS) development continues to experience rapid changes due to increased variations in user requirements. IS researchers are, therefore, required to develop novel theories to complement these changes (Markus & Saunders, 2007). Accordingly, this study integrates constructs from established theories to develop a model that explains the effects of system characteristics on feedback provision. DeLone & McLean (2002)'s IS Success Model, projects that users accrue net benefits when they are satisfied and use a system. Moreover, information quality, system quality, and service quality influence user behaviour and intention to use. Two key constructs (information and system quality) directly relate to system characteristics hence, are adopted as part of the research model. On the other hand, service quality is concerned with organizational resources, hence, not relevant within the context of the study. Information Quality is the quality of output generated by the online community for education whereas System Quality describes the usability features of the platform.

Moreover, contemporary IS designs are informed by persuasive principles intended to induce target behaviour. Oinas-Kukkonen & Harjumaa (2009) present that Dialogue Support, Primary Task Support, and Credibility are key qualities essential for encouraging preferred user behaviour. This has been confirmed by a number of studies (Drozd et al., 2012; Lehto & Oinas-kukkonen, 2015). Consequently, these constructs have been integrated into the research model.

Additional system features (Anonymity and Aesthetics) which have been established to influence behaviour (Budu, 2018; Ramakrisnan et al., 2016) but rarely explored in online communities for education are also included as part of the research model. In summary, the relationships between Information Quality, System Quality, Dialogue Support, Primary Task Support, Credibility, Anonymity, and Aesthetics and their effects on feedback provision are explored in a research model. Table 1 summarizes the modified definitions and the sources they were adopted from.

3.1. Hypotheses

3.1.1. Anonymity

Anonymity is the state of being unknown. It is the extent to which the system conceals the identities of learners on an online community for education. It is measured by non-identifiability and non-accountability (Wallace, 1999). In online environments, the issue of anonymity always raises behavioural questions. It introduces security awareness in interpersonal interactions (Bodle, 2013). Anonymity has been associated with anti-social behaviour. Many negative online behaviours such as cyberbullying and trolling result from anonymity (Wright, 2020). Consequently, some scholars have concluded that anonymity hinders online information sharing (Chen et al., 2019). Google Classroom enables learner identification hence posts are easily attributable. This discourages many negative behaviours. Such systems may be regarded as credible and of high quality. Nonetheless, Budu (2018) opines that because learners can be identified, it discourages them from providing feedback. There is the need to further expand the discourse on the role of Anonymity in online communities. The paper hypothesizes that:

H₁: Anonymity has a positive impact on System Quality.

H₂: Anonymity has a positive impact on Credibility.

Table 1. Construct Definitions and Sources

Construct	Definition	Source
Anonymity (AN)	The ability of the online community for education to conceal the identities of learners.	(Wallace, 1999)
Dialogue Support (DIAL)	The capability of the online community for education to provide motivating feedback to users.	(Oinas-Kukkonen & Harjumaa, 2009)
System Quality (SQ)	The processing capabilities of the online community for education measured with reliability, responsiveness, and ease of use.	(DeLone & McLean, 2002)
Information Quality (IQ)	The extent to which the information generated by the online community for education is complete, understandable, and useful.	(DeLone & McLean, 2002)
Credibility (CRED)	The ability of the online community for education to promote trust, believability, and dependability.	(Oinas-Kukkonen & Harjumaa, 2009)
Primary Task Support (PRIM)	The degree to which the online community for education is equipped with the required functionalities to provide feedback.	(Oinas-Kukkonen & Harjumaa, 2009)
Aesthetics	The extent to which the online community for education is appealing, pleasing, and beautiful.	(Oyibo & Vassileva, 2020)
Feedback Provision	The propensity of a learner to provide feedback on the online community for education.	(Budu, 2018)

3.1.2. Dialogue Support

To achieve the objective of any system, users must be kept active and motivated on the system. Thus, interactions between the system and learners must be effective. Dialogue support defines the key principles that inspire and engage learners during system use (Oinas-Kukkonen & Harjumaa 2009). Computers are social entities. Hence, how users interact with them may be interpersonal. In other words, learners' interactions with computers are similar in other social situations (Wiafe et al., 2020). Therefore, the principles for supporting such interactions cannot be underestimated in online communities for education. Indeed, relevant research confirms that Dialogue Support is effective for influencing behaviour (Dabi et al., 2018; Lehto & Oinas-kukkonen, 2015). Human-computer dialogue may exist in a form of prompts, reminders, and personalized messages. When such features are evident, learners may have a pleasant feel about the system. Moreover, because some of the messages may be personalized, learners are likely to receive information relevant to them. It is, however, proposed that:

H₃: Dialogue Support has a positive impact on Information Quality.

H₄: Dialogue Support has a positive impact on Aesthetics.

3.1.3. System Quality

According to DeLone & McLean (2002), system quality mainly describes the processing capabilities of a system. In this paper, it is defined by reliability, responsiveness, and ease of use. These features are known to strongly inform performance (Abdullah et al., 2016). Moreover, the technology acceptance model posits that the usability features of a system affect users' perception of its usefulness (Davis, 1989). Thus, when online communities for education possess favourable system qualities, learners will deem them as effective for their tasks (Rui-Hsin & Lin, 2018). Similarly, Kanwal & Rehman

(2017) are of the view that the extent to which learners will perceive the system to support their tasks is informed by the system's characteristics. The following hypothesis is consequently developed:

H₅: System Quality has a positive impact on Primary Task Support.

3.1.4. Information Quality and Credibility

Information quality denotes the surety that information found on online communities for education is relevant and accurate (DeLone & McLean, 2002). It can also be described as the degree to which the information generated on the platform is complete, understandable, and useful. When these characteristics are confirmed on online communities, it assures learners of the system's dependability (Koranteng et al. 2019). Moreover, users are inclined to trust a system based on the quality of output it produces (Lee & Levy, 2014; McKnight et al., 2017). This presupposes that there is a relationship between information quality and system credibility. In addition, one of the main motives for online communities is information exchange. Members are drawn to use online communities when they afford members information-sharing functions. Systems are only fit for tasks they are designed for (Goodhue & Thompson, 1995). Therefore, learners will be drawn to use online communities for feedback provision when they deem that the system supports their tasks. In light of this, it is proposed that:

H₆: Credibility has a positive impact on Primary Task Support.

H₇: Information Quality has a positive impact on Credibility.

H₈: Information Quality has a positive impact on Primary Task Support.

H₉: Information Quality has a positive impact on Feedback Provision.

3.1.5. Aesthetics

Aesthetics encompasses the degree to which learners perceive the system as appealing, pleasing, and beautiful. Naturally, humans are attracted to beautiful things. Many behavioural factors such as happiness, joy, and enjoyment arise from aesthetics (Norman, 2004). This suggests that learner behaviour can be influenced by the appealing nature of system interfaces. Indeed, Oyibo & Vassileva (2020) assert that aesthetics is critical when influencing behaviour. Other studies have also found that websites with interactive interfaces affect attitudes, satisfaction, and perceived credibility (Jiang et al., 2016; Oyibo et al., 2018; Stone et al., 2017). However, the role of aesthetics in IS design is often relegated to the background. Some researchers believe that scientific disciplines should emphasize efficiency and utility rather than glitz and style (Tractinsky et al., 2000). There is, however, doubt on the relevance of system aesthetics on feedback provision. To put clarity on this phenomenon, it is hypothesized that:

H₁₀: Aesthetics has a positive impact on Feedback Provision.

3.1.6. Primary Task Support

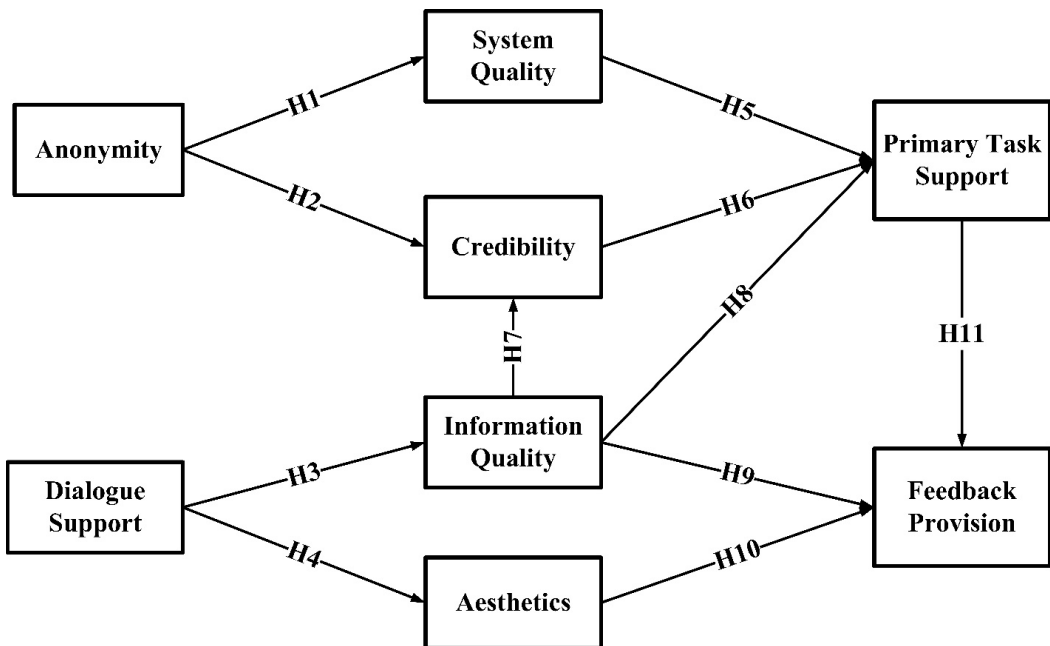
To reiterate, many online communities are set up to support information exchange. Hence, for learners to provide feedback via online communities such as Google Classroom, the system must have functionalities that support these activities. In other words, primary task support is the extent to which the functions enabled by online communities facilitate feedback provision (Oinas-Kukkonen & Harjumaa, 2009). According to the Cognitive Fit theory, when the features of a technology fit the task to be performed, users will have favourable affect and intentions (Vessey & Galletta, 1991). Similarly, learners are inclined to use a system for the required activities when there are existing features that augment their goals and objectives (Ouyang et al., 2017). Koranteng et al. (2020) established a positive relationship between Primary Task Support and learners' intention to collaborate on collaborative

software. Likewise, such a relationship may be recorded for feedback provision on online communities. The study, therefore, proposes that:

H₁₁: Primary Task Support has a positive impact on Feedback Provision.

In summary, all relationships are projected to be positive and will be estimated using Partial Least Square path modelling techniques. The diagrammatical representation of the proposed relationships is shown in Figure 1.

Figure 1. Hypothesized Model



4. RESEARCH METHODOLOGY

4.1. Study Context

From February 2020 to the end of March 2020, an online survey was conducted for a group of learners on Google Classroom. Respondents comprised of students from a public university in Ghana. The questionnaire was designed using Google Forms. Participation was purely voluntary and respondents were not coerced to take part in the research. Additionally, a short cover letter that explained the objective of the study was attached to the questionnaire. Google Forms was used for the questionnaire design. The questions were of two categories; the demographics section and five-point Likert scale items ranging from strongly agree (5) to strongly disagree (1). To ensure anonymity and confidentiality, only relevant demographics were solicited. Moreover, all indicators were adopted from the literature sources provided in Table 1 and modified to suit the context of this study. The questions were modelled as reflective with not less than three measurement items for a construct. The approaches adopted with regards to the structure of the questionnaire are in line with previous studies and implemented to ensure statistical significance. Furthermore, using established methodology enables further studies

to compare the significance of items in different contexts. Moreover, the questionnaire was tested on 20 initial participants to confirm item significance. Expectedly, reviews from these respondents and the results indicated that all items were comprehensible and statistically significant.

4.2. Data Collection

The link to the questionnaire was sent to 1,000 students via email using convenience sampling. After accepting to partake in the study, respondents were asked to click on the questionnaire link. First, a short cover letter that indicated the objectives of the study was presented to respondents. Next, the respondents were requested to present their demographic information. After this, their opinions of key concepts which represent the constructs mentioned above were gathered. Lastly, participants were thanked for participating. No participant was given any gifts for participating. Overall, 498 responses were obtained. This suggests an effective response rate of 49.8%. All responses were valid since all the questions were designated as compulsory. The gender distribution was hugely biased towards males (78.3%) than females (21.7%). Also, in line with the Ghanaian education system, majority (85.5%) of the respondents were undergraduate students whereas the rest (14.5%) were graduate students. Accordingly, 45.2% were below 25 years, 48.2% were 25 to 35 years, 5.4% were 36 to 45 years, and only 1.2% were above 45 years. The summary of the respondents' demographics is represented in Table 2.

Table 2. Respondents Demographics

Demographics	Value	Frequency	Percentage
Sex			
	Male	390	78.3%
	Female	108	21.7%
Age			
	Below 25	225	45.2%
	25 - 35	240	48.2%
	36- 45	27	5.5%
	Above 45	6	1.2%
Education			
	Undergraduate	426	85.5%
	Graduate	72	14.5%

5. DATA ANALYSIS AND RESULTS

Path modelling techniques from Partial Least Squares Structural Equation Modelling (PLS-SEM) were adopted to evaluate the research model. Indeed, PLS is appropriate for estimating the relationship between observed variables (Hair et al., 2013). It is also robust to multivariate errors (Gefen et al., 2011). Some researchers suggest that the minimal sample size for analysis should be at least 10 times the number of items related to the most complex construct (Lehto & Oinas-kukkonen, 2015). The sample size used in this study exceeds this requirement. Also, contrary to earlier studies which suggested that PLS is mainly suitable for predicting rather than testing established relationships (Hair et al., 2013), recent findings by Hair & Sarstedt (2019) proves that PLS is also appropriate

for evaluating established models. The analysis was categorized under measurement and structural model according to the two steps involved in PLS-SEM analysis.

5.1. Measurement Model

In PLS-SEM analysis, the measurement model is evaluated in terms of item loadings, internal consistency, convergent validity, discriminant validity, and multicollinearity. According to Fornell & Larcker (1981), item loadings and internal consistency values greater than 0.7 are preferred. All items loaded above this requirement (see appendix). Moreover, all constructs demonstrated good internal consistency as shown by their Cronbach's Alpha and composite reliability scores (Table 3). Convergent validity was measured using Average Variance Extracted (AVE). Wixom & Watson (2001) posit that AVE minimum threshold of 0.5 is appropriate. As expected, all AVEs of constructs were above this threshold (see Table 3).

Table 3. Construct Validity and Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
AN	0.772	0.781	0.855	0.597
AS	0.873	0.876	0.922	0.797
CRED	0.885	0.885	0.929	0.814
DIAL	0.779	0.781	0.858	0.601
FP	0.853	0.866	0.911	0.773
IQ	0.895	0.909	0.926	0.758
PRIM	0.824	0.836	0.883	0.653
SQ	0.768	0.804	0.851	0.590

With regards to discriminant validity, two measures; Heterotrait-Monotrait Ratio (HTMT) as well as the Fornell & Larcker (1981) criteria were used. Using HTMT as a measure, all values should not exceed a 0.85 threshold proposed by Clark & Watson (1995). The HTMT evaluation summary presented in Table 4 indicates all values met this criterion.

Table 4. Discriminant Validity Results (Heterotrait-Monotrait Ratio)

	AN	AS	CRED	DIAL	FP	IQ	PRIM
AS	0.632						
CRED	0.524	0.312					
DIAL	0.599	0.658	0.478				
FP	0.770	0.682	0.441	0.671			
IQ	0.570	0.258	0.742	0.462	0.477		
PRIM	0.750	0.778	0.537	0.729	0.839	0.331	
SQ	0.633	0.505	0.376	0.413	0.506	0.710	0.475

Table 5 also depicts the discriminant validity results according to Fornell & Larcker (1981) criteria. The highlighted diagonal items show the square roots of the AVEs of the latent variables. Fornell & Larcker (1981) require that the square root of the AVE must be greater than all correlations of other latent variables. These criteria were met as shown in Table 5.

Table 5. Discriminant Validity Results (Fornell and Lacker)

	AN	AS	CRED	DIAL	FP	IQ	PRIM	SQ
AN	0.773							
AS	0.520	0.893						
CRED	0.434	0.273	0.902					
DIAL	0.461	0.549	0.394	0.775				
FP	0.621	0.595	0.384	0.560	0.879			
IQ	0.468	0.228	0.667	0.400	0.420	0.871		
PRIM	0.606	0.678	0.465	0.661	0.719	0.297	0.808	
SQ	0.501	0.413	0.305	0.317	0.419	0.561	0.392	0.768

Finally, multicollinearity was evaluated using Variance Inflation Factor (VIF). Following Hair et al. (2016)'s requirements, all values were beneath the threshold of 3.0. (see Table 6).

5.2. Structural Model

The structural model was analyzed with path modelling techniques. Path Coefficients were used to determine significant relationships. These were complemented with Effect Sizes (f^2) and indirect effects. Adopting a one-tailed t-test approach, path coefficients (β) were assumed to be significant when p-values (p) were lesser than 0.05. Moreover, effect sizes were grouped under large ($f^2 \geq 0.35$), medium ($f^2 \geq 0.15$), small ($f^2 \geq 0.02$) and irrelevant ($f^2 < 0.02$) (Cohen, 2013). From the analysis shown in Figure 2, all proposed relationships were supported. System Quality, Information Quality, and Credibility combined to explain 31.5% of the variance in Primary Task Support. Also, Anonymity and Information Quality accounted for 46.4% of Credibility whereas the former interpreted 25.1% of System Quality's variance. Moreover, 16.0% of the variance in Information Quality and 30.2% of the variance in Aesthetics were explained by Dialogue Support. Finally, Primary Task Support,

Table 6. Multicollinearity Testing with Variance Inflation Factor

	AS	CRED	DIAL	FP	IQ	PRIM	SQ
AN		1.280					1.000
AS				1.854			
CRED						1.824	
DIAL	1.000				1.000		
IQ		1.280		1.099		2.413	
PRIM				1.928			
SQ						1.477	

Information Quality, and Aesthetics accounted for 58.3% of the variance in Feedback Provision. The summary of the path significance together with the effect sizes is shown in Table 7.

Table 7. Significance of Path Coefficients

Hypothesis		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Effect Size (f^2)
AN -> SQ	H1	0.501	0.512	0.091	5.521	0.000	0.335
AN -> CRED	H2	0.157	0.160	0.090	1.736	0.042	0.036
DIAL -> IQ	H3	0.400	0.412	0.094	4.249	0.000	0.190
DIAL -> AS	H4	0.549	0.560	0.074	7.453	0.000	0.432
SQ -> PRIM	H5	0.381	0.396	0.107	3.558	0.000	0.144
CRED -> PRIM	H6	0.527	0.523	0.138	3.813	0.000	0.223
IQ -> CRED	H7	0.594	0.591	0.081	7.359	0.000	0.514
IQ -> PRIM	H8	0.268	0.265	0.158	1.696	0.045	0.043
IQ -> FP	H9	0.221	0.229	0.085	2.596	0.005	0.106
AS -> FP	H10	0.188	0.193	0.100	1.870	0.031	0.046
PRIM -> FP	H11	0.526	0.515	0.112	4.704	0.000	0.345

In addition to the relationships proposed, the indirect effect analysis technique in PLS-SEM was employed to evaluate other significant relationships that were not established in the research model. The results shown in Table 8 indicate that all but one of the indirect relationships are relevant when juxtaposed with Cohen (2013)'s requirements. Specifically, Dialogue Support (0.237) had a medium effect on Credibility. Also, Anonymity (0.273) and Information Quality (0.313) had medium effects on Primary Task Support. Meanwhile, the effect of Dialogue Support on Primary Task Support was irrelevant. Whereas Anonymity (0.144) and Information Quality (0.024) had a small effect, Credibility (0.278), Dialogue Support (0.201), and System Quality all had a medium effect on Feedback Provision.

The analysis of the structural model is graphically depicted in Figure 2. The percentages indicate the variances of the constructs (R^2) whereas the values with asterisks on the arrows represent the path coefficients and their significance.

6. DISCUSSION

This study developed a research model based on literature and synthesised it to explain the factors accounting for learners' feedback provision on online communities for education. From the findings, the theoretical patterns for all assumed relationships were supported. Table 7 indicates that all p-values were no more than 0.05 thus confirming their significance. Specifically, Anonymity has a positive impact on System Quality and Credibility. Thus, the more online platforms ensure learner anonymity, the more they perceive the system to be credible and of high quality. This fuels Budu (2018)'s argument that the new generation of learners prefers to be anonymous in online spaces. Perhaps, the fear of been judged, bullied and trolled per their submissions accounts for this. This result, therefore, contradicts Ma & Agarwal (2007)'s position. However, it provokes further research on the phenomenon. Learners lose confidence and esteem when they are afraid to lay bare their views.

Figure 2. Structural Model

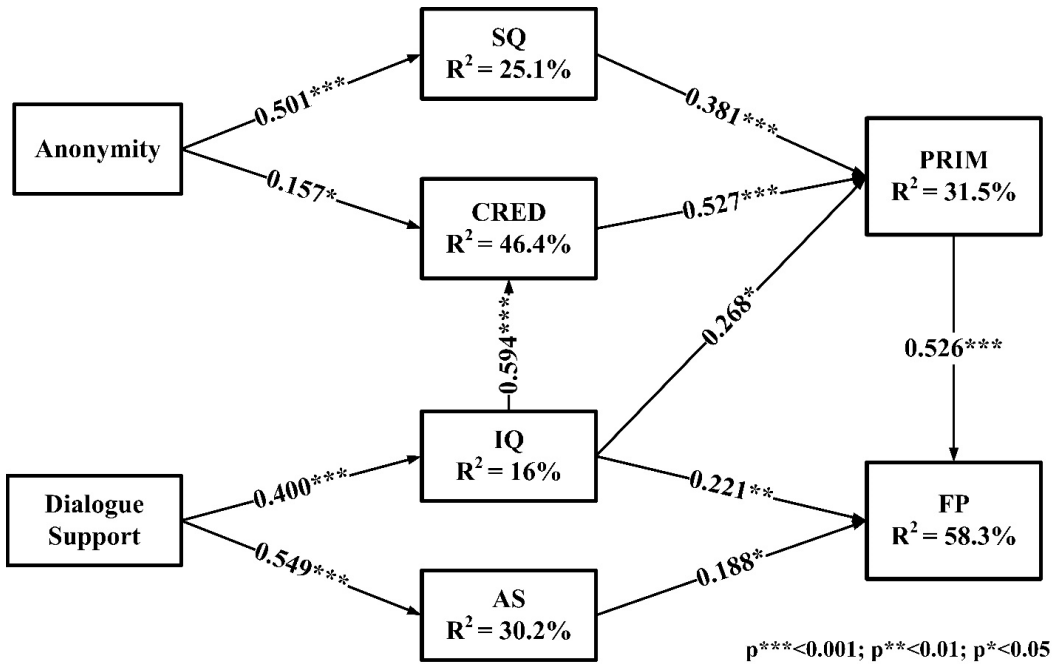


Table 8. Indirect Effects of Constructs

	CRED	FP	PRIM
AN		0.144	0.273
CRED		0.278	
DIAL	0.237	0.201	0.018
IQ		0.024	0.313
SQ		0.201	

Therefore, they are continually been motivated to own and argue their thoughts. Providing anonymity distorts any attempt to boost learners' confidence.

Aesthetics predicted Feedback Provision. This confirms that learners will provide feedback when the platform is attractive. As indicated, style and fashion have long been deemed irrelevant in IS development. However, findings from this study proved the contrary. With the advancement in Information Technologies (ITs), the functionalities afforded by systems exceed the needs of many learners. Nowadays, learners prefer better experiences during system use (Benhamdi et al., 2017). Hence, appearance and symbolic ownership have become important in system development. As Maslow (1981) notes, aesthetics is a strong motivator of behaviour, and as such people seek it out. The expressed desire for personalized interfaces and proliferation of software skin adoption perhaps originate from this concept. Therefore, to motivate feedback provision, designers of online communities targetted for education should incorporate aesthetic attributes into their platforms. Emojis are innovative ways of communicating affection on online platforms. Perhaps, the inclusion of such features on the system will improve the aesthetic feeling of users.

Dialogue Support significantly influences both Information Quality and Aesthetics. With online communities for education such as Google Classroom learners interact via prompts, alerts, and notifications. These are often in relation to learners' activities. For instance, learners may receive notifications for a question they are required to answer. Thus, learners will perceive information quality as high because the information the system generates is based on their actions, hence relevant to them. Moreover, these notifications make learners experience some level of personalization. Prompts in the form of pop-ups are also useful and interactive. Learners, therefore, are inclined to view the system as pleasant to use.

System Quality, Credibility, and Information Quality are confirmed as antecedents of Primary Task Support. These results are not surprising. For learners' perception of online communities to be fit for feedback provision, it should be measured against some characteristics of quality. Generally, users prefer systems that are less complex to use. Similarly, no learner can use the system when it is not available or responsive. In online communities for education, much synchronous information exchange occur. Generally, learners get frustrated when systems are less accessible and keep experiencing downtimes (Koranteng et al., 2020). This sometimes affects their intentions about the system. Moreover, when learners are less satisfied with the relevance and accuracy of the information generated by the system, their intentions are also affected (DeLone & McLean, 2002). For instance, unnecessary advertisements on online communities for education, in particular, affects learners' cognition about the fitness of the system. Hence, to promote feedback provision, learners must be assured that the system is reliable, dependable, and produces relevant information. As such, adequate processing capacities and alternate servers must be provided by managers of online communities for education to ensure smooth operations. In addition, improved algorithms must be constantly developed to give learners a personalized experience when interacting on online communities for education.

Finally, Primary Task Support and Information Quality have a significant effect on Feedback Provision. This suggests that the features of online communities for education are adequate for supporting learners' provision of feedback. Many online communities for education provide avenues for such activities. On Google Classroom, learners can add different types of files as well as post via comment spaces. In addition, when a question is asked, comments threads are made available for learners such that those who arrived late at the discussion page can follow and make their submissions. These features are, however, essential for feedback provision. Therefore, developers are tasked to be innovative and include more of such functionalities that support learner activities. For instance, to compliment the comments features that are currently enabled, a chat platform that facilitates person-to-person direct synchronous exchanges may be desirable.

7. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This paper began by identifying how previous studies overlook the influences of system characteristics and the inconsistencies in previous results about the role of anonymity in feedback provision in online communities for education. To address these gaps, this paper formulated eleven (11) hypotheses, which led to a research model to explain learners' feedback provision in online learning communities. The model includes anonymity and persuasive design principles which were integrated with relevant system features (system quality and information quality). Further, relevant data were collected using a questionnaire administered via Google Forms and analysed using Partial Least Squares Structural Equation Modelling available in SmartPLS software. The analysis, based on relevant criteria leads to the following conclusions from this study. First, anonymity has a positive impact on System Quality and Credibility; the higher the assurance of anonymity for learners on online learning, the better their system credibility and quality. Second, Aesthetics predicts feedback provision; a platform's attractiveness and beauty attract learners to provide feedback. Third, System Quality, Credibility, and Information Quality are confirmed as antecedents of Primary Task Support. Fourth, Dialogue Support

significantly influences both Information Quality and Aesthetics. Fifth, Primary Task Support and Information Quality have a significant effect on Feedback Provision.

These valuable findings hold some implications for research and practice. In terms of research, this study resolves the inconsistencies found in earlier results about the effect of anonymity in feedback provision. Even though Budu (2018) found that young learners preferred anonymity in online spaces, this study provides good grounds to statistically generalise this assertion. The same applies to the finding concerning the role of aesthetics – a system characteristic – and feedback provision. In terms of practice, this paper's results provide useful evidence for educational institutions that seek to use online learning communities. Specifically, this paper shows the need to enhance anonymity and platform aesthetics if feedback is valued in such online communities. Obviously, feedback will contribute positively to teaching and learning activities online. Therefore, this paper's findings pinpoint two factors that matter in obtaining feedback in the pursuit of objectives for online teaching and learning.

Further, this paper's findings suggest some directions for future research. For instance, this paper's finding about the importance of anonymity in feedback provision needs to be investigated further, especially, because previous studies (e.g. Ma & Agarwal 2007) hold a different view. Perhaps, there are contextual conditions that may account for this seeming inconclusiveness. Therefore, future studies could study the conditions that solicit anonymity as a requirement for feedback provision and vice versa. Similarly, our generalised understanding that anonymity and systems characteristics have an effect on feedback provision can be studied further, especially, using qualitative techniques, to explore how they affect feedback provision. Such a study can analyse narrated lived experiences of online communities for education so we can understand their deeper perceptions of anonymity in feedback provision. A similar study can be done to understand the deeper role systems characteristics play. Finally, the IS success model which was adopted in this study has been combined with technology adoption, and human-centered design principles to extend our understanding of technology use (Zhang & Venkatesh, 2018). This new understanding suggests that systems design principles (such as supporting autonomy and facilitating human-to-human interaction) influence a system's design characteristics, and finally, how a system is used. Unfortunately, these ideas remained untested. This study has provided starting point with anonymity and a few systems characteristics which need furtherance. Consider four of the system design principles i.e. *provide timely and positive feedback, represent human social bond, induce intended emotions via initial exposure to ICT, and induce intended emotions via intensive interaction with ICT*. We see that feedback and the need to foster human social bond are very important. Therefore, future research could evaluate the extent to which online communities incorporate these principles in their design to achieve teaching and learning objectives.

We acknowledge this study's seemingly technical approach to explaining the factors that influence feedback provision in online communities. In other words, this paper does not explain much of the nuances that characterise the social interactions in online communities, especially those for education. However, this limitation could be a promising motivation to use a qualitative case study to explain how and when the factors identified in this paper contribute to feedback provision in online communities for education.

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