Behaviour & Information Technology

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/tbit20

# Assessing the impact of persuasive features on user's intention to continuous use: the case of academic social networking sites

Isaac Wiafe, Felix Nti Koranteng, Ferdinand Apietu Kastriku & Gifty Oforiwaa Gyamera

**To cite this article:** Isaac Wiafe, Felix Nti Koranteng, Ferdinand Apietu Kastriku & Gifty Oforiwaa Gyamera (2022) Assessing the impact of persuasive features on user's intention to continuous use: the case of academic social networking sites, Behaviour & Information Technology, 41:4, 712-730, DOI: 10.1080/0144929X.2020.1832146

**To link to this article:** https://doi.org/10.1080/0144929X.2020.1832146

Published online: 15 Oct 2020.

BEHAVIOUR & INFORMATION TECHNOLOGY
2022, VOL. 41, NO. 4, 712–730
https://doi.org/10.1080/0144929X.2020.1832146

Taylor & Francis
Taylor & Francis Group



# Assessing the impact of persuasive features on user's intention to continuous use: the case of academic social networking sites

Isaac Wiafe [a], Felix Nti Koranteng[b], Ferdinand Apietu Kastriku[a] and Gifty Oforiwaa Gyamera[c]

[a]Department of Computer Science, University of Ghana, Accra, Ghana; [b]Department of Information Technology Education, University of Education, Kumasi, Ghana; [c]Department of Development Policy, Ghana Institute of management and Public Administration, Accra, Ghana

**ABSTRACT**

Social networking sites enable people to connect, communicate and share ideas. These sites have therefore become key for information sharing. Particularly, academics and researchers have adopted them for networking and collaborations. This study seeks to investigate how embedded persuasive features on social networking sites designed for academics and researchers affect continuous use intention. The study adopted an existing model for assessing the effectiveness of persuasive features on systems and sampled 416 participants who are engaged in academic research and analyzed their responses. The results indicate that Social Support, Computer–Human Dialogue Support and Primary Task Support significantly impact how users perceive social networking sites designed for effective academic work. Contrary to existing knowledge that Perceived Credibility, Perceived Effectiveness, Perceived Effort and Perceived Social Support all impact an individual's Intention to Continuous Use of a system, only Perceived Credibility was observed to impact Intention to Use continuously. The findings also proved that affective ties and mutual support on academic social networking sites influence behaviour.

**ARTICLE HISTORY**
Received 2 August 2018
Accepted 30 September 2020

**KEYWORDS**
Academic social networking sites; persuasive technology; persuasive systems design; academic collaboration; use continuance

## 1. Introduction

Knowledge sharing has become critical in the present era of globalisation and internationalisation. Subsequently, Social Networking Sites (SNS) have become key means for information and knowledge sharing. SNS can broadly be perceived as an internet or mobile-based social space where people connect, communicate, create and share content with others (Boyd & Ellison, 2007) . The design of online social networks and their features can influence the formation of users' behavioural and social norms. However, the functionalities enabled by a particular social networking site may not be fit for all purposes and users (Papacharissi 2009). For example, whilst YouTube is a video-sharing social network and a key platform for disseminating multimedia information, Mendeley is not conducive for the viral posting of videos. Hence, users on these platforms may exhibit different behavioural norms. Yet, social network use is highly pervasive within education society (Abrahim et al. 2019). Some researchers have argued that social network use has become one of the vital daily activities performed by researchers (Boumarafi 2015; Del Valle et al. 2017). Academics who seek to share knowledge or learn through social networks are encouraged to adopt academic specific social networking sites (Jeng, He, and Jiang 2015; Koranteng, Wiafe, and Kuada 2019).

Academic Social Networking Sites (ASNS) are online social platforms designed purposely to enable academics articulate their professional network and simplify activities including collaborative research (Oh and Jeng 2011). They are designed to facilitate effective and efficient knowledge sharing. Benbasat (2010) described them as neutral, because they do not have any agenda of their own except what they were built for. Recently, scholars have highlighted the increasing importance of ASNS within the scholarly community (Bardakci, Arslan, and Ünver 2017; Jeng, He, and Jiang 2015; Meishar-Tal and Pieterse 2017). Knowledge sharing, participating in a broader network of contacts, and enhanced visibility of the opportunities in academic community have all been listed as benefits of ASNS use (Bardakci, Arslan, and Ünver 2017).

Despite its numerous benefits, ASNS have also been criticised. For example, Meishar-Tal and Pieterse (2017) and Collins, Shiffman, and Rock (2016) have all reported that social interaction that facilitates knowledge sharing is rare on ASNS, rather users predominately use such systems to consume information. Though there are diverging opinions on whether or

**CONTACT** Isaac Wiafe iwiafe@ug.edu.gh Department of Computer Science, University of Ghana, P O Box LG163, Legon, Accra, Ghana

not ASNS facilitate knowledge sharing or information consumption, there is no ambiguity on their ability to transfer information within academia. Both knowledge sharing and information consumption involve knowledge transfer. What is lacking are the factors that seek to promote continuous use of these websites. Currently, existing studies on continuous use of social networking sites mostly focus on generic sites (Christy, Pui-Yee, and Lee 2011; Ferebee and Davis 2009; Ku, Chen, and Zhang 2013). Again, although some studies have shown behavioural changes resulting from persuasive technology (Orji 2014), studies that specifically uncover the persuasive features of ASNS and their relationships to use Continuance Intention is lacking.

This study therefore explores the persuasive features that influence continuous use of ASNS. It adopted a research model proposed by Lehto and Oinas-kukkonen (2015) to evaluate the impact of the various persuasive features of academic social network sites on their continuous use. The discussions in this paper are presented as follows: first a review of related literature, followed by the formulation of hypothesis, the methodology adopted for the study and analysis of the data collected. The findings, discussion of the implications of the findings and conclusions were finally presented.

## 2. Related literature

### 2.1. Use continuance intention of social networking sites

As mentioned earlier, existing evidence on use continuance intention on social networking sties have focused on generic SNS. Some existing studies have demonstrated that the main factors that impact continuance use intention of SNS are effectiveness (Kwon and Wen 2010; Lin and Lu 2011a), social interaction ties, trust and shared values (Lin and Lu 2011b). In other studies, perceived enjoyment, perceived ease of use, satisfaction and subjective norms are the major contributors to intention to continuous use (Chang et al. 2015; Hong and Barry 2018; Mouakket 2015). Similarly, social presence and personality traits have also been concluded to impact use continuance intention among students (Christy, Pui-Yee, and Lee 2011; Mouakket 2018). In all these studies, Facebook was used as the main social networking site. Hence the findings cannot be generalised. More importantly, other studies have provided conflicting results. Ku, Chen, and Zhang (2013) explained that gratifications, perceived critical mass, subjective norms, and privacy concerns influence SNS perceived effectiveness with regional differences serving as moderating factors.

Studies into social networking platforms designed for games have found that, social norms do not predict use continuance (Shu and Lin 2017). Others also demonstrated that flow experience plays a mediating role and it produces indirect effects in predicting continuance use of SNS (Chiao-Chen 2013). In particular, users' intention to use SNS games is impacted by their optimal experience which is achieved through a user's personal interaction with the system or his/her social interactions with other users (Choi and Kim 2004). Although this provides some amount of information regarding use continuance intention of SNS, it is a challenge to conclude that similar factors may apply in ASNS. For example whereas prior generic SNS studies posit that ease of use strongly influence use continuance intention, Salahshour Rad et al. (2017) found the reverse on ASNS. Perhaps, this is because users' motivations for using SNS are often different from ASNS (Megwalu 2015). Indeed, many studies have shown that researchers do not prefer SNS for academic purposes (Roblyer et al. 2010; Segado-Boj, Chaparro Domínguez, and Castillo Rodríguez 2015) but rather ASNS. This is due to its versatility and support for academic activities. It provides social affordance that promotes or reinforces a self-monitoring culture among academics: a position that most universities policies emphasise (Duffy and Pooley 2017). The next section discusses some of the major characteristics and differences between ASNS and SNS.

### 2.2. Academic social networking sites

The introduction of Internet has undeniably transformed knowledge sharing and transfer: it has enabled personalisation of learning (de Hond and Rood 2017). Particularly, the capabilities of social networking sites and platforms further enhance the ubiquitous and viral spread of information. It has been proven that its ubiquitous property has permeated tertiary institutions by providing students and faculty with a platform that supports collaboration and knowledge sharing (Dabner 2012). Academics and researchers tend to engage more through the use of SNS, learn actively and also share knowledge on these sites (Azeta, Eweoya, and Ojumah 2014). Although, generic SNS support academics and researchers, the full potential of these platforms have not been exploited appropriately within the academic community (Bala 2018). Some scholars argued that designers fail to meet the requirement of academics and researchers in their designs (Neville, Heavin, and Walsh 2005). One major objective of scholars is the presentation of new knowledge which must be verified by other scholars (Megwalu 2015). They uphold facts: a key value in their profession. Accordingly, members

of scholarly communities are directly associated with the contents they produce, and this enables an established system of meritocracy. Communication medium influences the content of communication. In other words, contents of generic SNS fail to reflect these scholarly norms (Thelwall and Kousha 2014). Consequently, scholars are unable to physically authenticate the validity and relevance of the huge amount of information posted on SNS (Bright, Kleiser, and Grau 2015). This makes it unattractive to them.

ASNS, as defined earlier, facilitate academic related activities (Meishar-Tal and Pieterse 2017). They promote knowledge sharing amongst academics and researchers (Koranteng and Wiafe 2019) by providing a platform for distributing articles and publications, research agenda, citation scores, etc. Although existing generic SNS such as Facebook, Twitter, YouTube, etc., can be used for similar activities, ASNS have been considered more effective (Jeng, He, and Jiang 2015). Their user interfaces, schemas, and other properties afford these activities with ease. Arguably, the behavioural norms exhibited on generic SNS are different from those exhibited on ASNS (Koranteng and Wiafe 2019). For instance, whilst a post by a user regarding a red card a player received during a match may receive responses on sites such as Facebook and Twitters, it will hardly receive any response from sites such as Academia.edu or ResearchGate if it does not demonstrate any research agenda.

As compared to generic SNS, existing ASNS are provided, controlled and supported by research publishing outlets, academic institutions or organisations interested in academic and research activities. This support makes them popular among research community. In addition, ASNS provide better methods for profile management by mapping user details to their achievements. Publications, scholarly projects and citation indexes which are not part of most generic SNS are part of a user's profile on ASNS. Additionally, academic seniority can be measured on these platforms as they are directly correlated to the number of nodes a user have within the network (Jordan 2014). Consequently, most academics prefer to use ASNS to connect with other scholars (Elsayed 2016; Nández and Borrego 2013). Although there are studies on ASNS, most have focused on issues relating to citation networks and bibliometrics (Li, Thelwall, and Giustini 2011), with less attention on how the features and properties of ASNS promote its continuous use. This is worrying, particularly considering that a recent study on ASNS by Koranteng and Wiafe (2019) demonstrated that features that promote knowledge sharing on generic SNS are different from that of ASNS.

Some scholars have recommended the use of persuasive features on online networks (Wiafe, Nakata, and Gulliver 2011), whereas others have shown that some social networks exhibit characteristics that suggest that their designers factored persuasive features (Fogg 2009). Current studies have argued that the effectiveness of persuasive strategies in social networking sites is dependent on a user's profile da Silveira, Nobre, and Cardoso (2014). Although ASNS possess characteristics such as simplicity and accessibility and this makes it ideal for persuasion (Oduor and Oinas-Kukkonen 2015), not all persuasive principles can be effective on these sites (Adaji and Vassileva 2016b), considering that different forms of gratifications determine how these sites are used (Sheldon et al. 2017). This raises the need for identifying various principles that are effective for the different tasks on ASNS.

With this backdrop, this study seeks to investigate features that support continuous use of ASNS. It is expected that the findings will provide pertinent information to both designers and researchers on how to better design ASNS. The next section is a discussion on the research model and hypothesis adopted for the study.

## 3. Research model and hypothesis

Persuasive systems are systems that incorporate various strategies aimed at influencing users' behaviour for a targeted outcome (Fogg 2007; Torning, Hall, and Oinas-kukkonen 2009). Researchers have demonstrated that incorporating persuasive features into systems in different domains such as e-commerce (Kaptein and Eckles 2012), health (Jalil and Orji 2016; Orji, Nacke, and Di Marco 2017; Wiafe and Nakata 2012a, 2012b), pro-environmental interventions (Midden & Ham, 2018), education (Dabi et al. 2018), safety and user training (Chittaro 2012; Forget and Chiasson 2008) promotes behaviour and attitude change. They operate either as computer-mediated persuasion or computer–human persuasion. In computer-mediated persuasion, persuaders influence users via computers (e.g. email, discussion platforms, social network systems) whereas in computer–human persuasion, the intention of the persuader is transferred into a computer or a device to persuade the user (Fogg 2007; Torning, Hall, and Oinas-kukkonen 2009). Oinas-Kukkonen (2010) conceptualised these systems as Behaviour Change Support System(s) (BCSS), since they facilitate human behaviour change. Despite the growing interest in the domain, a limited number of empirical studies exist (Lehto and Oinas-kukkonen 2015). However, one of the main challenges of persuasive systems is how they are designed to engage its users (Wiafe, Nakata, and Gulliver 2014).

This is because most of the existing designs are ad hoc and thus do not follow any design principles (Wiafe and Nakata 2012a, 2012b).

Arguably, ASNS can be classified as persuasive systems since the intent of the designer is to provide a primary support (Oinas-Kukkonen and Harjumaa 2009; Lehto and Oinas-kukkonen 2015) for academics and researchers to facilitate research work through social interactions. It is evident that ASNS exhibit some level of persuasive activities. Particularly, it depends on social influence, which is part of Perceived Social Support (explained later) from other academics and researchers to promote knowledge sharing. Yet, much is not known about how the persuasive features on these sites facilitate continuous use. The study therefore uses a model proposed by Lehto and Oinas-kukkonen (2015) to investigate how persuasive features of ASNS impact its use continuance.

### 3.1. Construct definitions

As mentioned in the previous section, this study adopted Lehto and Oinas-kukkonen's (2015) model. The constructs in the model have been proven to be effective for studying persuasive features of systems. It has also been successfully used to analyze Perceived Persuasiveness of a student Enterprise Resource Planning (ERP) system in a Higher Educational Institution (Dabi et al. 2018). Figure 1 is a diagrammatic representation of the adopted research model. The model consists of Computer–Human Dialogue Support (DIAL), Social Identification (SOID), Perceived Social Support (SOCS), Primary Task Support (PRIM), Perceived Credibility (CRED), Perceived Effort (EFFO), Perceived Effectiveness (EFFE) and Continuance Use Intention (CONT). Table 1 presents the various constructs and their definitions from literature.

### 3.2. Hypothesis formulation

#### 3.2.1. Social identification (SOID)

Social Identification is an individual's sense of belonging to a community. It is the perception of self-inclusiveness in a group (Fujita, Harrigan, and Soutar 2018; Bagozzi and Dholakia 2002). The Social Identity theory (Tajfel and Turner 1986) argues that people categorise themselves into social groups and through group actions, they perceive themselves as members in a group. Consequently, this perception creates a norm where members treat each other as allies (Fujita, Harrigan, and Soutar 2018; Hsu and Lin 2008). According to Ellemers, Kortekaas, and Jaap (1999), identification fosters loyalty and faithfulness in a group. Thus, group recognition facilitates the development of sense of attachment and affective support in groups. Jeng et al. (2012) argued that the existence of affective ties between members of groups on

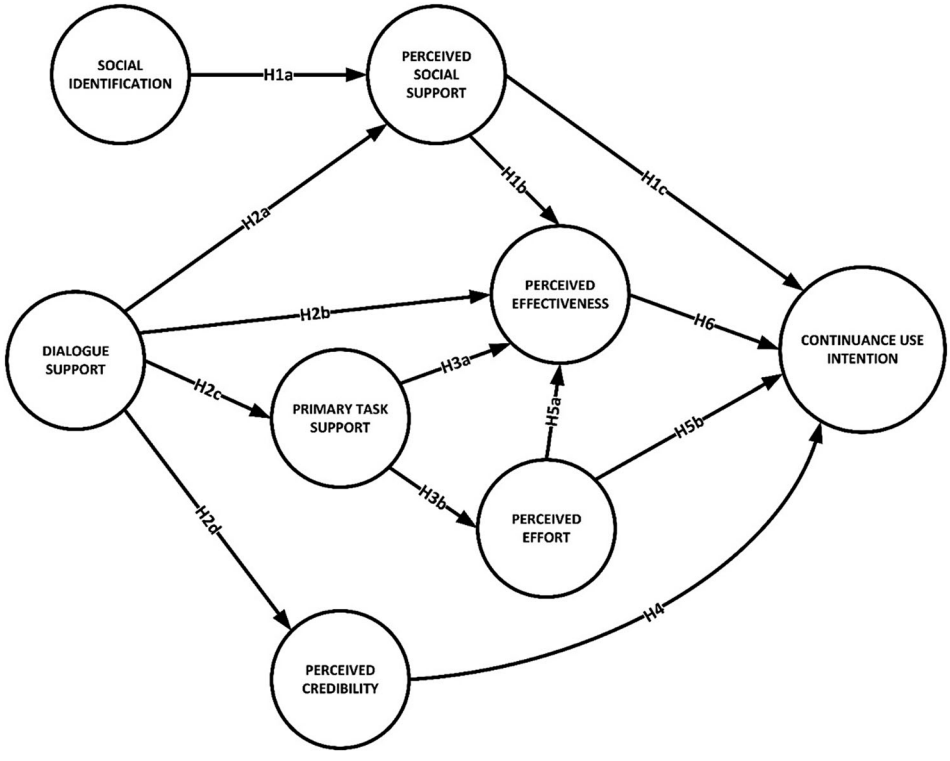


**Figure 1.** Research model.

ASNS facilitate the creation of mutual devotion towards groups. Thus, it is hypothesised that:

H1a: Social Identification positively influences Perceived Social Support on Academic Social Networking Sites.

### 3.2.2. Perceived social support (SOCS)

The social cognitive theory (Bandura 1989) asserts that a person's behaviour is partly shaped and influenced by their personal cognition (e.g. expectations) and influences from social systems. This indicates that the support, encouragement and motivation an individual receives from other social actors influence their behaviour (Hwang et al. 2010). Dabi et al. (2018) added that the reciprocal exchange of resources between parties with the aim of improving the well-being of recipients also defines social support. Such reciprocal exchanges increase mutual support among group members (Tseng and Kuo 2014). Yet, there is a significant relationship between anticipated reciprocal relationship and intention to participate in online communities (Bock et al. 2005; Hamari and Koivisto 2013; Mafukata, Dhlandhlara, and Kancheya 2017). This intention is built on the presumption that users perceive systems as useful when there is exchange in Perceived Social Support (Lehto and Oinas-kukkonen 2015). Therefore:

H1b: Perceived Social Support positively influences Perceived Effectiveness of Academic Social Networking Sites

H1c: Perceived Social Support positively influences continuance use intention of Academic Social Networking Sites

### 3.2.3. Computer–human dialogue support (DIAL)

Computer–Human Dialogue Support defines the key principles targeted at keeping users active and motivated when using a system. It support users to reach their intended behaviour (Oinas-Kukkonen and Harjumaa 2009; Lehto and Oinas-kukkonen 2015). Information Systems are social actors and as such people perceive their interaction with them to be similar to other social situations (Lee 2009; Nass and Moon 2000; Oyibo, Orji, and Vassileva 2017). It is therefore imperative to provide measures that support interactions between users and information systems (Oinas-Kukkonen and Harjumaa 2009). Computer–Human Dialogue Support may occur via system-to-user prompts, notifications, reminders and positive feedback from the system to the user. Thus, they facilitate how users perceive social support. Accordingly, it is hypothesised that:

H2a: Computer- Human Dialogue Support positively influences Perceived Social Support on Academic Social Networking Sites.

Computer–Human Dialogue support may be further enhanced, for example by virtually notifying users of their accomplishments. This increases users' positive attitude and encourages them to use these systems in performing their primary task (Lehto and Oinas-Kukkonen 2011). Hence, Computer–Human Dialogue Support promotes the performance of primary task. It is therefore hypothesised that:

H2b: Computer–Human Dialogue Support positively influences Perceived Effectiveness of Academic Social Networking Sites

H2c: Computer–Human Dialogue Support positively influences Primary Task Support of Academic Social Networking Sites

Again, when members of a network are able to demonstrate their benevolence and integrity, it informs other members of their trustworthiness (Evans, Wensley, and Frissen 2015). Accordingly, online networks enable users to showcase their abilities and veracities. These characteristics are common on ASNS (Barbour and Marshall 2012), and they make users perceive the information on these sites as credible. Particularly, the provision of positive feedback and affective messages influence user confidence (Kahn and Isen 1993). Jeng et al. (2012) argued that affective ties on ASNS increases members' commitment. Hence, Computer–Human Dialogue Support will influence a user's confidence in ASNS. It is therefore hypothesised that:

H2d: Computer–Human Dialogue Support positively influences Perceived Credibility of Academic Social Networking Sites

### 3.2.4. Primary task support (PRIM)

System characteristics have been found to affect its effectiveness (Koranteng et al. 2019). Arguably, the most important feature of a system that enhances its persuasive experience is Primary Task Support (Lehto, Oinas-Kukkonen, and Drozd 2012). Primary Task Support is the medium made available by a system to enable a user perform his or her objective task (Oinas-Kukkonen and Harjumaa 2009). It is relatively synonymous to cognitive fit (Vessey and Galletta 1991), task-technology fit (Goodhue and Thompson 1995) and person-artefact-task fit (Finneran and Zhang 2003). In essence it aims at increasing the self-efficacy of users while reducing the cognitive burden of system use (Lehto, Oinas-Kukkonen, and Drozd 2012; Koranteng, Sarsah, Kuada & Gyamfi 2020; Webster and Ahuja 2006). It also increases

positive affect (Derrick, Jenkins, and Nunamaker Jr 2011) which augments the persuasiveness of the source (Angst and Agarwal 2009). However, prior studies have established a relationship between perceived persuasiveness and Perceived Effectiveness (Shang and Seddon 2000). Therefore, in this study, it is hypothesised that:

H3a: Primary Task Support positively influences Perceived Effectiveness of Academic Social Networking Sites

H3b: Primary Task Support positively influences Perceived Effort of Academic Social Networking Sites

#### 3.2.5. Perceived credibility (CRED)

In information systems, trust and credibility are major predictors of continuance use (Everard and Galleta 2006; Shin, Ahn, and Kim 2013). For a system to be deemed credible, it must build trust in users. Thus, Perceived Credibility affects the believability of a system (Lehto, Oinas-Kukkonen, and Drozd 2012). It is strengthened by recommendations from renowned sources as well as the subjective judgements of users after their first interaction with the system (Drozd, Lehto, and Oinas-Kukkonen 2012). Since, interactions on ASNS replicates the normal educational structure and enable users to build credible professional reputation (Barbour and Marshall 2012), users are inclined to believe the information on these sites. Also, ASNS employ various levels of security features which reduces users' privacy concerns and trust (Rauniar et al. 2014). Although some users emphasise security and privacy concerns on social media (Koranteng et al. 2019; Rauniar et al. 2014), studies have confirmed a significant relationship between system credibility and intention to use (Dwyer, Hiltz, and Passerini 2007; Rauniar et al. 2014). It is therefore hypothesised that:

H4: Perceived Credibility positively influences Continuance Use Intention of Academic Social Networking Sites.

#### 3.2.6. Perceived effort (EFFO)

Perceived effort is the degree of ease associated with the use of a system (Venkatesh et al. 2003): in this case ASNS. Two of the most used technology acceptance theories; Technology Acceptance Model (Davis 1989) and Unified Theory of Acceptance and Use of Technology (Venkatesh et al. 2003) have demonstrated that perceived effort significantly impacts one's conception to use a system for a desired goal. Arguably, most ASNS users may be familiar with generic social networking sites and perceived them to be easy to use (Paliktzoglou and Suhonen 2014; Sun et al. 2014). It is expected that ASNS will also be perceived to be easy to use. Thus, it is hypothesised that:

H5a: Perceived Effort positively influences Perceived Effectiveness of Academic Social Networking Sites

H5b: Perceived Effort positively influences Continuance Use Intention of Academic Social Networking Sites

#### 3.2.7. Perceived effectiveness (EFFE)

According to Venkatesh et al. (2003) perceived effectiveness is closely related to performance expectancy and it is a strong predictor of Intention to Use. It conceptualises users' perceptions as to whether the system is useful for performing a specific task (Wiafe, Koranteng, Tettey, Kastriku & Abdulai, 2019). Thus, it measures users' opinion about the successful use of ASNS for research and scholarly activities. ASNS are useful because they enable users to connect with others and share scholarly information (Kwon and Wen 2010). In particular, they facilitates the formation and maintenance of new and existing relationships (Bardakci, Arslan, and Ünver 2017; Curry, Kiddle, and Simmonds 2009). They also enable users to build valid academic reputation and demonstrate their research ability (Barbour and Marshall 2012). As mentioned earlier, there is a relationship between effectiveness of generic social networking sites and user's intention to use (Kwon and Wen 2010; Lin and Lu 2011b). To confirm these findings on ASNS, it is hypothesised that:

H6: Perceived Effectiveness positively influences Continuance Use Intention of Academic Social Networking Sites.

## 4. Research methodology

An English questionnaire was developed using Google Forms and links were sent via emails, WhatsApp, Facebook, etc. Convenience sampling was used to recruit participants. Participation was purely voluntary. The cover page of the questionnaire contained a short letter that briefed respondents about the purpose of the survey. The questionnaire sought to gather respondents' demographics and their perceptions on the various factors discussed. Their perceptions were measured using a five-point Likert scale. All the constructs were adopted from prior studies (as shown in Table 1). To ensure consistency and reliability of responses, a minimum of 3 questions were used to measure perception and attitude related questions. The questions were carefully designed to ensure anonymity and confidentiality. The questionnaire was pretested with 10 respondents (these respondents were excluded from the main study). The Cronbach's Alpha and Composite Reliability of all

**Table 1.** Definition of constructs.

| Construct | Definition | Sources |
|---|---|---|
| Social Identification (SOID) | The degree to which ASNS provide a means for users to identify themselves with other system users who share characteristics and common interest. | Lehto and Oinas-kukkonen (2015), Aslam et al. (2013), Ma and Agarwal (2007) |
| Perceived Social Support (SOCS) | The degree to which ASNS motivate users by leveraging social influence and providing a means for other users to support each other. | Lehto and Oinas-kukkonen (2015), Chiu, Hsu, and Wang (2006) |
| Computer-Human Dialogue Support (DIAL) | The degree to which ASNS are capable of providing relevant motivating feedback to users. | Adaji and Vassileva (2016a), Lehto and Oinas-kukkonen (2015), Fogg and Nass (1997) |
| Primary Task Support (PRIM) | The degree to which ASNS provide support for the main goal or task of the individual user. Complex tasks are reduced into smaller subtasks. | (Dabi et al. 2018; Lehto and Oinas-kukkonen 2015; Goodhue and Thompson 1995) |
| Perceived Credibility (CRED), | The degree to which ASNS promote trust, believability, reliability and credibility. | Lehto and Oinas-kukkonen (2015), McKnight, Choudury, and Kacmar (2002) |
| Perceived Effort (EFFO) | The degree of ease associated with the use of ASNS. | Dabi et al. (2018), Lehto and Oinas-kukkonen (2015) |
| Perceived Effectiveness (EFFE) | The degree to which using ASNS provide benefits to the user in relation to the primary task. | Dabi et al. (2018), Lehto and Oinas-kukkonen (2015) |
| Continuance Use Intention (CONT) | The degree to which users intend to continue using ASNS. | Lehto and Oinas-kukkonen (2015), Bhattacherjee (2001), De Guinea and Markus (2009) |

items recorded during the pretest phase were greater than 0.7. See appendix 1 for question items.

A total of 418 responses were received after 3 months of administering the questionnaire. It was sent to 613 candidates. This suggests an effective response rate of 68.2%. A non-response bias test was performed by comparing responses of the first 25% early responses to the 75% late responses. The findings indicated no significant difference between the two groups (see appendix 3). Only respondents who have subscribed to at least one ASNS (i.e. Academia.edu; ResearchGate; Mendeley or Kudos) were allowed to complete the entire questionnaire and their responses were subsequently included in the analysis. All questions were mandatory. Majority (82.1%) of the respondents were males. Table 2 shows a summary of descriptive statistics of respondents.

## 5. Analysis and findings

The proposed relationships between the latent variables were analyzed using Partial Least Square Structural Equation Modelling (PLS-SEM). PLS-SEM is ideal for studies that seek to predict relationships between constructs (Hair et al. 2016). Moreover, it provides potent techniques for evaluating non-normally distributed samples (Gefen, Rigdon, and Straub 2011). It requires that the sample size should be at least ten times larger than the number of structural paths directed at a target construct in a structural model. SmartPLS 3.0 was used for the analysis.

**Table 2.** Demographics of respondents ($N = 418$).

| Demographics | Value | Frequency | Percentage |
|---|---|---|---|
| Sex | Male | 343 | 82.1% |
| | Female | 75 | 17.9% |
| Age | Below 30 | 308 | 73.7% |
| | 30–40 | 92 | 22.1% |
| | Above 40 | 18 | 4.2% |
| Highest education level | Postgraduate | 334 | 80% |
| | Undergraduate | 84 | 20% |

### 5.1. Measurement

Missing values check, and normality test were also performed to ensure that the data is normally distributed. The values of the skewness and kurtosis is presented in appendix 2. The results indicate that there were no missing data and hence treatments of missing values were not required. The research model consisted of eight (8) constructs and twenty-seven item indicators. The PLS analysis indicated that kurtosis values ranged from −0.884 (CONT2) to 3.253 (EFFO4) and Skewness ranged from −0.35 (SOCS3) to 1.233 (PRIM1). This conforms to Kline (2005) assertion for normalised data: kurtosis and skewness values should be lesser than 10 and 3 respectively.

All item loadings met the reliability threshold of 0.7 as required (Barclay, Higgins, and Thompson 1995). Details of item loadings is attached in appendix 1. Internal consistency was measured with Cronbach's Alpha and Composite Reliability. The results (as shown in Table 3) indicate that all constructs were valid (with values above 0.7). An evaluation of the convergent validity confirmed that Average Variance Extracted (AVE) of all constructs were above 0.5 as required (Wixom and Watson 2001). Furthermore, discriminant validity was evaluated with both Fornell and Larcker (1981) criterion and Heterotrait-Monotrait Ratio Test. Using the Fornell and Larcker (1981) criterion, the square root of AVE of latent variables were matched against correlations with other latent variables. The highlighted diagonal elements in Table 3 indicate that the square roots of AVEs of the latent variables were greater than the correlations with other latent variables as required.

**Table 3.** Construct validity and reliability.

| | CA | CR | AVE | CONT | CRED | DIAL | EFFE | EFFO | PRIM | SOCS | SOID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CONT | 0.835 | 0.923 | 0.857 | 0.926 | | | | | | | |
| CRED | 0.882 | 0.927 | 0.808 | 0.380 | 0.899 | | | | | | |
| DIAL | 0.710 | 0.838 | 0.634 | −0.041 | 0.310 | 0.796 | | | | | |
| EFFE | 0.824 | 0.883 | 0.653 | 0.010 | 0.344 | 0.480 | 0.808 | | | | |
| EFFO | 0.817 | 0.877 | 0.641 | −0.019 | 0.184 | 0.263 | 0.297 | 0.801 | | | |
| PRIM | 0.773 | 0.855 | 0.598 | 0.113 | 0.503 | 0.542 | 0.514 | 0.303 | 0.773 | | |
| SOCS | 0.775 | 0.816 | 0.597 | 0.102 | 0.232 | 0.282 | 0.475 | 0.179 | 0.529 | 0.773 | |
| SOID | 0.784 | 0.822 | 0.607 | 0.138 | 0.335 | 0.359 | 0.523 | 0.300 | 0.496 | 0.631 | 0.779 |

Note: CA, Cronbach's Alpha; CR, Composite Reliability; AVE, Average Variance Extracted.

As already indicated, discriminant validity was also assessed using Heterotrait-Monotrait Ratio (HTMT). The values in Table 4 suggests that the required maximum threshold of 0.85 was met for all constructs (Clark and Watson 1995). The possibility of multicollinearity was also evaluated with Variance Inflation Factor (VIF). The results (as shown in Table 5) indicated that all values were below 3 as required by Hair et al. (2016). Thus, collinearity did not influence the outcome of the study.

### 5.2. Structural model

Figure 2 shows the analysis of the hypothesised model. The bootstrapping (5000 samples) technique was adopted to test the significance of path coefficients and variances of the model. This is because Hair et al. (2016) recommend the bootstrapping technique for sample size greater than 100. Path coefficients are considered significant if the $p$-values are less than 0.05. All the constructs were modelled as reflective and tested with multiple indicators.

The findings indicate that Computer–Human Dialogue Support and Social Identification explained 40.2% of the variance in Social Support. Computer–Human Dialogue Support also accounted for 39.4% and 9.6% of the variances in Primary Task Support and Perceived Credibility respectively. Primary Task Support also explained 9.2% of the variance in Perceived Effort. Together, Social Support, Computer–Human Dialogue Support, Primary Task Support and Perceived Effort accounted for 39.3% of the variance in Perceived Effectiveness. Social Support, Perceived Effectiveness, Perceived Effort and Perceived Credibility jointly explained 17.1% of the variance in Continuance Use Intention. Table 6 presents a summary of significant relationships observed from the study.

Perceived Credibility was the strongest predictor of Continuance Use Intention ($p$-value: 0.000). In contrast, Perceived Effectiveness, Perceived Effort and Perceived Social Support were not significant predictors of Continuance Use Intention with $p$-values; 0.308, 0.181 and 0.088 respectively. Computer–Human Dialogue Support strongly predicted Perceived Credibility ($p$-value: 0.000), Primary Task Support ($p$-value: 0.000) and Perceived Effectiveness ($p$-value: 0.035). The relationship between Computer–Human Dialogue Support and Perceived Social Support was not statistically significant ($p$-value: 0.077). Similarly, there was no significant relationship between Perceived Effort and Perceived Effectiveness ($p$-value: 0.048). However, Perceived Social Support ($p$-value: 0.001) and Primary Task Support ($p$-value: 0.441) had a strong effect on Perceived Effectiveness. Finally, there was a strong relationship between Social Identification and Perceived Social Support ($p$-value: 0.000).

The total effects and effect sizes (Cohen's $f^2$) were also studied (see Table 7). Stone-Geisser ($Q^2$) predictive relevance was also analyzed since they are more reliable than $R^2$ (Lehto, Oinas-Kukkonen, and Drozd 2012). The relationship between two constructs is considered valid when $Q^2$ is greater than zero. From Table 7, $Q^2$ values for all relationships were greater than zero thus confirming their validity. However, effect size (Cohen's $f^2$) determine whether the effect is irrelevant (<0.02); small (0.02); medium (0.15) or large (0.35) (Cohen 2013). Table 7 also indicates that the effect of Perceived Effort and Perceived Social Support on Perceived

**Table 4.** Discriminant validity test with Heterotrait-Monotrait Ratio (HTMT).

| | CONT | CRED | DIAL | EFFE | EFFO | PRIM | SOCS |
|---|---|---|---|---|---|---|---|
| CRED | 0.432 | | | | | | |
| DIAL | 0.244 | 0.387 | | | | | |
| EFFE | 0.092 | 0.417 | 0.607 | | | | |
| EFFO | 0.102 | 0.232 | 0.323 | 0.331 | | | |
| PRIM | 0.139 | 0.602 | 0.727 | 0.613 | 0.362 | | |
| SOCS | 0.247 | 0.339 | 0.406 | 0.609 | 0.251 | 0.747 | |
| SOID | 0.199 | 0.445 | 0.522 | 0.668 | 0.414 | 0.697 | 0.801 |

**Table 5.** Collinearity testing with variance inflation factor (VIF).

| | CONT | CRED | DIAL | EFFE | EFFO | PRIM | SOCS |
|---|---|---|---|---|---|---|---|
| CRED | 1.151 | | | | | | |
| DIAL | | 1.000 | | 1.438 | | 1.000 | 1.148 |
| EFFE | 1.462 | | | | | | |
| EFFO | 1.107 | | | 1.119 | | | |
| PRIM | | | | 1.862 | 1.000 | | |
| SOCS | 1.302 | | | 1.389 | | | |
| SOID | | | | | | | 1.148 |

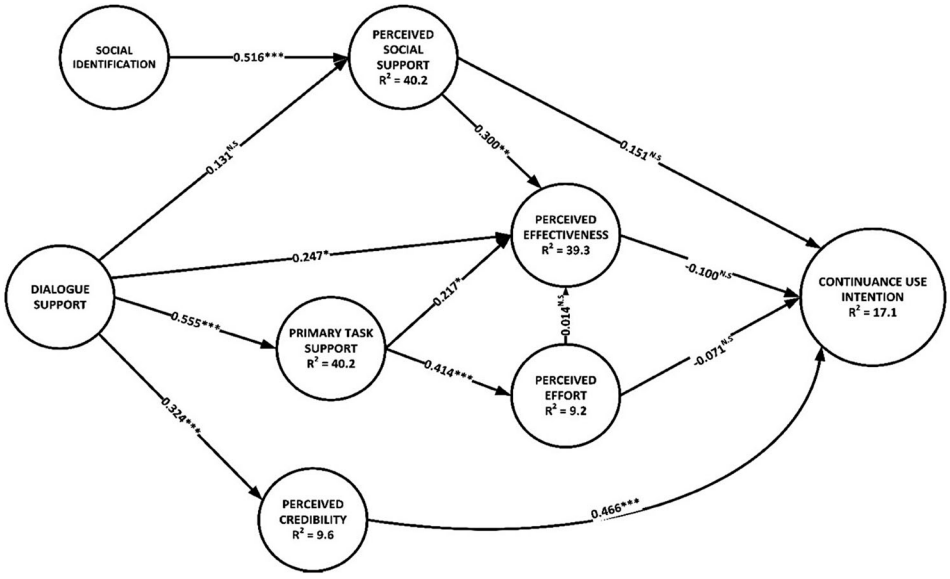


**Figure 2.** Analysis of research model. $p^{***} < 0.005$; $p^{**} < 0.05$; $p^{n.s}$-non-significant.

Effectiveness were less than 0.02 hence irrelevant. Perceived Effectiveness had a small effect (0.021) while Perceived Credibility moderately (0.191) influenced Continuance Use Intention. The strongest relation was between Social Identification and Perceived Social Support with effect size 0.539.

## 6. Discussion

The use of academic social networking sites is rapidly gaining acceptance in higher educational institutions (Bardakci, Arslan, and Ünver 2017). This is because they facilitate knowledge sharing and collaboration among researchers (Koranteng and Wiafe 2019; Oh and Jeng 2011). As explained earlier, ASNS have the ability to link distances, and boost cross-disciplinary and cross-border collaborations. This is similar to interactions academics experience at conferences and other academic gatherings. They also facilitate the creation and expansion of academic professional networks. The present study adopted constructs from a model proposed by Lehto and Oinas-kukkonen (2015) to explain

**Table 6.** Significance of path coefficients.

| Proposed relationships | Original sample (O) | T statistics (\|O/STDEV\|) | *P* values | Supported |
|---|---|---|---|---|
| H1a: Social Identification positively influences Perceived Social Support on Academic Social Networking Sites. | 0.516 | 4.988 | 0.000 | Yes |
| H1b: Perceived Social Support positively influences Perceived Effectiveness of Academic Social Networking Sites | 0.300 | 3.091 | 0.001 | Yes |
| H1c: Perceived Social Support positively influences continuance use intention of Academic Social Networking Sites | 0.151 | 1.355 | 0.088 | No |
| H2a: Computer- Human Dialogue Support positively influences Perceived Social Support on Academic Social Networking Sites. | 0.131 | 1.426 | 0.077 | No |
| H2b: Computer-Human Dialogue Support positively influences Perceived Effectiveness of Academic Social Networking Sites | 0.247 | 1.816 | 0.035 | Yes |
| H2c: Computer-Human Dialogue Support positively influences Primary Task Support of Academic Social Networking Sites | 0.555 | 6.875 | 0.000 | Yes |
| H2d: Computer-Human Dialogue Support positively influences Perceived Credibility of Academic Social Networking | 0.324 | 3.357 | 0.000 | Yes |
| H3a: Primary Task Support positively influences Perceived Effectiveness of Academic Social Networking Sites | 0.217 | 1.665 | 0.048 | Yes |
| H3b: Primary Task Support positively influences Perceived Effort of Academic Social Networking Sites | 0.414 | 5.085 | 0.000 | Yes |
| H4: Perceived Credibility positively influences Continuance Use Intention of Academic Social Networking Sites. | 0.466 | 5.636 | 0.000 | Yes |
| H5a: Perceived Effort positively influences Perceived Effectiveness of Academic Social Networking Sites | 0.014 | 0.148 | 0.441 | No |
| H5b: Perceived Effort positively influences Continuance Use Intention of Academic Social Networking Sites | −0.100 | 0.910 | 0.181 | No |
| H6: Perceived Effectiveness positively influences Continuance Use Intention of Academic Social Networking Sites. | −0.071 | 0.502 | 0.308 | No |

**Table 7.** Total effect (Stone-Geisser $Q^2$) with effects size (Cohen's $f^2$).

| | Continuance use intention | Perceived credibility | Computer-human dialogue support | Perceived effectiveness | Perceived effort | Primary task support | Perceived social support | Social identification | $Q^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Continuance use intention | | | | | | | | | 0.137 |
| Perceived credibility | 0.427 (0.191) | | | | | | | | 0.081 |
| Computer-human dialogue support | | 0.310 (0.106) | | 0.407 (0.084) | | 0.542 (0.416) | 0.063 (0.006) | | |
| Perceived effectiveness | −0.160 (0.021) | | | | | | | | 0.202 |
| Perceived effort | −0.086 (0.005) | | | 0.120 (0.021) | | | | | 0.088 |
| Primary task support | | | | 0.220 (0.030) | 0.303 (0.101) | | | | 0.168 |
| Perceived social support | 0.046 (0.008) | | | 0.280 (0.093) | | | | | 0.136 |
| Social identification | | | | | | | 0.609 (0.539) | | |

Note: Total effects (effect size).

and predict factors that impact Continuance Use Intention of ASNS. The results validated some of the hypothesised relationships and refuted others. Below is a discussion on the implications of the findings.

### 6.1. Implications of significant hypothesis

Computer–Human Dialogue Support significantly affects Primary Task Support, Perceived Effectiveness, and Perceived Credibility. This is supported by Lehto and Oinas-kukkonen (2015). The findings suggest that users of ASNS perceive their interactions with computers as similar to human-human interactions. Thus, effective dialogue support influences users' perceptions and behaviour. ASNS such as ResearchGate actively engage users to improve their research impact via notifications and alerts on user rating and profile updates. Hence, users are mostly motivated to performing research tasks on such platforms. This proves that users are more capable of performing their primary tasks (i.e. research work) when their interactions with the system is optimised. Moreover, the provision of effective dialogue principles creates the perception that ASNS are effective and credible. Computer–Human Dialogue Support features on ASNS also facilitate interactions between peers and colleagues. Research indicates that possible interactions between parties influence perceptions of trustworthiness (Koranteng et al. 2019). As explained earlier, majority of interactions on ASNS are between members who are supporting each other's academic and research work. Within ASNS, credibility increases as Computer–Human dialogue increases. However, as discussed previously, dialogue in ASNS are skewed towards computer mediation. Users perceive ASNS to be credible although they interact with humans (their peers). Accordingly, designers of ASNS may need to implement features that support Computer–Human dialogue. The provision of some level of artificial intelligence into ASNS can serve as a motivator to increase credibility. In particular, if such features are capable of providing accurate responses to challenging questions in the user's domain of research.

Social Identification was observed to significantly impact Perceived Social Support. This indicates that the design of ASNS enable users to connect with peers and colleagues with similar experiences. For example, based on a user's profile, ResearchGate, Mendeley and Kudos are able to suggest projects, available funding and scholarships from other researchers, which are relevant to a user's domain. By this means, researchers are able to identify and join relevant groups. As argued by Oinas-Kukkonen and Harjumaa (2009), members' inclusiveness in group activities increases when there is a common objective. Thus, users will support each other by sharing ideas and brainstorming on complex concepts when they perceive themselves as part of a group. An individual's perception of inclusiveness and mutual support fosters faithfulness and commitment towards groups (Jeng et al. 2012).

It was also observed that Primary Task Support had a significant impact on Perceived Effectiveness and Perceived Effort. Thus, the provision of support for the main task or the reduction of complex task into smaller subtasks provides benefits to users of ASNS. Moreover, this provision eases the research activity. Primary Task Support describes the medium enabled by the system to support a user to complete a task. Accordingly, the

provision of features that enable a user to perform the basic objectives or requirements lead to the perception that a system is easier to use. Academics use ASNS to augment existing relationships as well as facilitate interactions among colleagues. Consequently, they consider ASNS as effective platforms for conducting research. Several research works are made available on ASNS and academics do consider this as an effective approach for searching scholarly articles. ASNS provide accessibility to research articles and also initiate collaborations and discuss research findings. Arguably, discussions on research findings, ideas and challenging concepts are more informative on ASNS platforms when compared to physical academic gatherings. This is because physical gatherings are limited to time and audience. However, this limitation is not present on ASNS platforms. In particular, the lack of face-to-face discussions, enables new and novice researchers to confidently present their ideas and contributions on these platforms. This eases the burden of academics in their quest to aggregate knowledge.

The findings validated the hypothesis that Perceived Social Support significantly affected Perceived Effectiveness and support earlier studies by Bagozzi and Dholakia (2002) and Kankanhalli, Tan, and Wei (2005). The findings re-echoe the existence of affective ties and mutual support on ASNS (Jeng et al. 2012) and their influences on an individual's behaviour (Hwang et al. 2010). Reciprocal exchanges such as encouragement and motivation positively affect the well-being of group members (Dabi et al. 2018). Consequently, it can be inferred that users will perceive ASNS as effective for their activities when they observe that other members take concern and support each other towards a common goal. Although designers of ASNS cannot influence social support directly, they must provide features that will influence social support indirectly. They must encourage those who only consume information from these sites but do not contribute.

Among the proposed antecedents of Continuance Use Intention (i.e. Perceived Social Support, Perceived Effectiveness, Perceived Effort and Perceived Credibility), only Perceived Credibility was observed to positively impact Continuance Use Intention. Academics find ASNS as credible for academic activities and ASNS provide more effective methods for managing and verifying user profiles and also the content they post. They emulate normal education structure and reduce users' privacy concerns, thus influencing intention to continuously use them. The presence of other researchers of high reputation, and relevance of discussions that are characterised with these sites play a major role on users' perception on the systems credibility and continuous usage. Considering this, designers of ASNS must ensure that their systems demonstrate factors that users will consider to be credible. Accordingly, designers of ASNS who seek to ensure continuous usage of their websites should provide features that support credibility.

### 6.2. Implications of non-significant hypothesis

Contrary to existing knowledge, Perceived Social Support, Perceived Effectiveness and Perceived Effort did not significantly impact Continuance Use Intention. Thus, although these constructs may predict Continuance Use Intention in traditional persuasive systems (Lehto and Oinas-kukkonen 2015), the same cannot be confirmed on ASNS. Academic social networking sites mimic the functionalities on generic SNS, as such comprise features that academics are already familiar with. This makes it easier to use. Wu and Chen (2017) argued that such situations lessen the influence of some features on Continuance Use Intentions. This might have accounted for the insignificant influence of Perceived Effort on Continuance Use Intention. Again, users' continuous intention to use a system is strongly dependent on the confirmation of their expectations of its effectiveness (Al-Emran, Arpaci, and Salloum 2020). However, although ASNS have similar characteristics as generic SNS, ASNS incorporate additional mechanisms which promote academic-specific information exchange (Ovadia 2013). Based on this, it is possible academics' expectations toward the effectiveness of ASNS exceed their experiences on ASNS platforms.

Perceived Social Support did not impact Continuance Use Intention. This is contrary to existing knowledge. A key aim of ASNS is to foster sharing of academic resources to promote knowledge acquisition and dissemination. Thus, although current features on ASNS that are designed to foster social support is promoting users' perception on system effectiveness, they do not promote continuous use. Ideally, individuals are motivated when they are recognised for their impact and contribution (Danish and Usman 2010). Social support may be considered as a bidirectional (giving and taking support) or a unidirectional (either giving support only or taking support only). In this study, social support was considered to be a reciprocal event (i.e. bidirectional). Thus, users who provide support but do not receive support, may not perceive social support as a feature that promotes continuous use. In addition, when social support backfires, they introduce unnecessary stress, tension and anxiety (Orji et al. 2019) and this discourages system use intentions. More importantly,

this finding provokes the need for further studies to ascertain the casual effect of this observation. Particularly, studies have found that the provision of features that enable support from other academics and researchers should motivate users' positive intentions (Wiafe et al. 2020). Perhaps, there are confounding variables that serve as moderators which have not been identified in the case of ASNS.

Findings on the relationship between Computer–Human Dialogue Support and Perceived Social Support were contrary to existing knowledge. Most communication methods for most ASNS (e.g. ResearchGate) are text-based. Generic SNS platforms, however, use multiple channels and methods for promoting dialogue. Specifically, they include the use of videos and audios: these are seldomly used on ASNS platforms. Replicating human to human social support on computing devices using on text is challenging. As such, it limits the amount of social support ASNS provides to its users. For instance, YouTube effectively facilitates social support (Frohlich and Zmyslinski-Seelig 2012). The visual details it provides to users through videos, audios, emojis and animoji enhance user's perception on social support. This therefore suggests that existing methods available on ASNS that seek to promote or facilitate dialogue is inadequate to promote social support. Accordingly, there is the need to incorporate other forms of dialogue on ASNS platforms.

## 7. Conclusion

Although existing research has discussed factors that impact Continuance Use Intention, this study is novel because it sought to investigate how persuasive features embedded in Academic Social Networking Sites promote Continuance Use Intention. The findings confirmed some existing known relationships and refuted others. It is acknowledged that convenience sampling was used for the study, hence the findings cannot be generalised to all ASNS. Existing studies have argued that the main antecedents of Continuous Use Intention include Perceived Social Support, Perceived Effort and Perceived Effectiveness (Adaji and Vassileva 2017; Lehto, Oinas-Kukkonen, and Drozd 2012; Lehto and Oinas-kukkonen 2015). However, findings from this study proved otherwise. None of these significantly predicted Continuance Use Intention. It is however, acknowledged that existing research investigated users of a single or different system as compared to this study that sought to investigate a collection of systems (selected academic social networking sites). Thus, there is the need for further studies to be conducted to investigate why some of these relationships did not hold on academic social networks sites.

In addition, whereas Primary Task Support had a significant impact on Perceived Effort, it failed to affect Perceived Effectiveness. Computer–Human Dialogue Support on the other hand, did not influence Perceived Social Support, yet it confirmed that the provision of dialogue support features in ASNS shall impact users' perception on the effectiveness of the system. Considering that ASNS platforms mostly focus on computer-mediated dialogue rather than Computer–Human Dialogue Support, there is the need for further investigations on how computer-mediated dialogue impacts Perceived Social Support: this study did not address that. It would be intriguing if further studies can investigate whether users of ASNS perceive computer-mediated dialogue as human–computer dialogue.

In addition, it can be observed that the sample used for the study was skewed in terms of sex. That is 82.1% of males. Due to this analyzing the relationships among the various construct in terms of their sexes may not provide non-trivial findings. Consequently, there is the need for future studies to examine how the relationships vary between the different sexes using a non-skewed sample.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## ORCID

*Isaac Wiafe* http://orcid.org/0000-0003-1149-3309

## References

Abrahim, S., B. A. Mir, H. Suhara, F. A. Mohamed, and M. Sato. 2019. "Structural Equation Modeling and Confirmatory Factor Analysis of Social Media use and Education." *International Journal of Educational Technology in Higher Education* 16 (1): 32. doi:10.1186/s41239-019-0157-y.

Adaji, I., and J. Vassileva. 2016a. "Evaluating Personalization and Persuasion in E-commerce." In *CEUR Workshop Proceedings*, 107–113.

Adaji, I., and J. Vassileva. 2016b. "Persuasive Patterns in Q&A Social Networks." In *International Conference on Persuasive Technology*, 189–196.

Adaji, I., and J. Vassileva. 2017. "Perceived Effectiveness, Credibility and Continuance Intention in E-commerce: A Study of Amazon." In *International Conference on Persuasive Technology*, 293–306.

Al-Emran, M., I. Arpaci, and S. A. Salloum. 2020. "An Empirical Examination of Continuous Intention to Use m-Learning: An Integrated Model." *Education and Information Technologies* 25: 2899–2918.

Angst, C. M., and R. Agarwal. 2009. "Adoption of Electronic Health Records in the Presence of Privacy Concerns: The Elaboration Likelihood Model and Individual Persuasion." *MIS Quarterly* 33 (2): 339–370. http://dl.acm.org/citation.cfm?id=2017424.2017430.

Aslam, M. M. H., K. Shahzad, A. R. Syed, and A. Ramish. 2013. "Social Capital and Knowledge Sharing as Determinants of Academic Performance." *Journals of Behavioral and Applied Management* 15 (1): 25–42.

Azeta, A. A., I. O. Eweoya, and S. Ojumah. 2014. "Enhancing Educational Learning with Social Network Platform." In *6th International Conference on Adaptive Science and Technology*, 1–4.

Bagozzi, R. P., and U. M. Dholakia. 2002. "Intentional Social Action in Virtual Communities." *Journal of Interactive Marketing* 16 (2): 2–21.

Bala, M. 2018. "Use of ICT in Higher Education." *Multidisciplinary Higher Education, Research, Dynamics & Concepts: Opportunities & Challenges For Sustainable Development* 1 (1): 368–376. http://conference.nrjp.co.in/index.php/MHERDC/article/view/64/65.

Bandura, A. 1989. "Human Agency in Social Cognitive Theory." *American Psychologist* 44 (9): 1175–1184. doi:10.1037/0003-066X.44.9.1175.

Barbour, K., and D. Marshall. 2012. "The Academic Online: Constructing Persona Through the World Wide Web." *First Monday* 17 (9): 1–10. doi:10.5210/fm.v0i0.3969.

Barclay, D., C. Higgins, and R. Thompson. 1995. "The Partial Least Squares (PLS) Approach to Casual Modeling: Personal Computer Adoption and Use as an Illustration." *Technology Studies* 2 (2): 285–309.

Bardakci, S., Ö Arslan, and T. K. Ünver. 2017. "How Scholars Use Academic Social Networking Services." *Information Development* 34 (4): 334–345. doi:10.1177/0266666917712108.

Benbasat, I. 2010. "HCI Research: Future Challenges and Directions." *AIS Transactions on Human-Computer Interaction* 2 (2): 16–21.

Bhattacherjee, A. 2001. "Understanding Information Systems Continuance: an Expectation-Confirmation Model." *MIS Quarterly* 25 (3): 351–370.

Bock, G.-W., R. W. Zmud, Y.-G. Kim, and J.-N. Lee. 2005. "Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate." *MIS Quarterly* 29 (1): 87–111.

Boumarafi, B. 2015. "Social Media Use in Algerian Universities: University of Constantine 2 Case Study." *IAFOR Journal of Education* 3 (SE): 31–41. doi:10.22492/ije.3.se.02.

Boyd, Danah M, and Nicole B. Ellison. 2007. "Social Network Sites: Definition, History, and Scholarship." *Journal of Computer-Mediated Communication* 13 (1): 210–230. http://dx.doi.org/10.1111/j.1083-6101.2007.00393.x.

Bright, L. F., S. B. Kleiser, and S. L. Grau. 2015. "Too Much Facebook? An Exploratory Examination of Social Media Fatigue." *Computers in Human Behavior* 44: 148–155.

Chang, C.-C., S.-W. Hung, M.-J. Cheng, and C.-Y. Wu. 2015. "Exploring the Intention to Continue Using Social Networking Sites: The Case of Facebook." *Technological Forecasting and Social Change* 95: 48–56. Retrieved February 11, 2019. doi:10.1016/J.TECHFORE.2014.03.012.

Chiao-Chen, Chang. 2013. "Examining Users' Intention to Continue Using Social Network Games: A Flow Experience Perspective." *Telematics and Informatics* 30 (4): 311–321.

Chittaro, L. 2012. "Passengers' Safety in Aircraft Evacuations: Employing Serious Games to Educate and Persuade." In *Persuasive Technology. Design for Health and Safety. Lecture Notes in Computer Science*, edited by M. Bang, and E. L. Ragnemalm, 215–226. doi:10.1007/978-3-642-31037-9_19

Chiu, C.-M., M.-H. Hsu, and E. T. G. Wang. 2006. "Understanding Knowledge Sharing in Virtual Communities: An Integration of Social Capital and Social Cognitive Theories." *Decision Support Systems* 42 (3): 1872–1888.

Choi, D., and J. Kim. 2004. "Why People Continue to Play Online Games: In Search of Critical Design Factors to Increase Customer Loyalty to Online Contents." *CyberPsychology & Behavior* 7: 1.

Christy, C. M. K., C. Pui-Yee, and M. K. O. Lee. 2011. "Online Social Networks: Why do Students use Facebook?" *Computers in Human Behavior* 27 (4): 1337–1343.

Clark, L. A., and D. Watson. 1995. "Constructing Validity: Basic Issues in Objective Scale Development." *Psychological Assessment* 7 (3): 309–319.

Cohen, J. 2013. *Statistical Power Analysis for the Behavioral Sciences*. Routledge.

Collins, K., D. Shiffman, and J. Rock. 2016. "How are Scientists Using Social Media in the Workplace?" *PLoS One* 11: 10. doi:10.1371/journal.pone.0162680.

Curry, R., C. Kiddle, and R. Simmonds. 2009. "Social Networking and Scientific Gateways at Supercomputing." In *5th Grid Computing Environments Workshop*, 4.

Dabi, J., I. Wiafe, A. Stibe, and A. Jamal -Deen. 2018. "Can an Enterprise System Persuade? The Role of Perceived Effectiveness and Social Influence." In J. Ham, E. Karapanos, P. Morita, & C. Burns (Eds.), *International Conference on Persuasive Technology*, 45–55. Berlin Heidelberg: Springer.

Dabner, N. 2012. "Breaking Ground in the Use of Social Media: A Case Study of a University Earthquake Response to Inform Educational Design with Facebook." *The Internet and Higher Education* 15 (1): 69–78.

Danish, R. Q., and A. Usman. 2010. "Impact of Reward and Recognition on Job Satisfaction and Motivation: An Empirical Study From Pakistan." *International Journal of Business and Management* 5 (2): 159–167. doi:10.5539/ijbm.v5n2p159.

da Silveira, P. H. B. R., C. N. Nobre, and A. M. P. Cardoso. 2014. "A influência das estratégias persuasivas no comportamento dos usuários no Facebook." In *Proceedings of the 13th Brazilian Symposium on Human Factors in Computing Systems*, 255–264.

Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology." *MIS Quarterly* 13 (3): 319–340.

De Guinea, A. O., and M. L. Markus. 2009. "Why Break the Habit of a Lifetime? Rethinking the Roles of Intention, Habit, and Emotion in Continuing Information Technology Use." *Mis Quarterly* 33 (3): 433–444.

de Hond, M., and T. Rood. 2017. "Flip the School, Forget the Classroom; How to Enable Personalised Learning with the

Help of Information Technology." In Marcus-Quinn A., Hourigan T. (eds) *Handbook on Digital Learning for K-12 Schools*, 317–328. Springer, Cham.

Del Valle, M. E., A. Gruzd, C. Haythornthwaite, D. Paulin, and S. Gilbert. 2017. "Social Media in Educational Practice: Faculty Present and Future Use of Social Media in Teaching." In *Proceedings of the 50th Hawaii International Conference on System Sciences*, 164–173. https://doi.org/http://hdl.handle.net/10125/41169.

Derrick, D. C., J. L. Jenkins, and J. F. Nunamaker. 2011. "Design Principles for Special Purpose, Embodied, Conversational Intelligence with Environmental Sensors (SPECIES) Agents." *AIS Transactions on Human-Computer Interaction* 3 (2): 62–81.

Drozd, F., T. Lehto, and H. Oinas-Kukkonen. 2012. "Exploring Perceived Persuasiveness of a Behavior Change Support System: A Structural Model." In *International Conference on Persuasive Technology*, 157–168. https://doi.org/10.1007/978-3-642-31037-9_14.

Duffy, B. E., and J. D. Pooley. 2017. "Facebook for Academics: The Convergence of Self-Branding and Social Media Logic on Academia.edu." *Social Media and Society* 3: 1. doi:10.1177/2056305117696523.

Dwyer, C., S. R. Hiltz, and K. Passerini. 2007. "Trust and Privacy Concern Within Social Networking Sites: A Comparison of Facebook and MySpace." *AMCIS 2007 Proceedings* 123 (2007): 339–350.

Ellemers, N., P. Kortekaas, and W. O. Jaap. 1999. "Self-categorization, Commitment to the Group and Social Self-Esteem as Related But Distinct Aspects of Social Identity." *European Journal of Social Psychology* 29 (2–3): 371–389.

Elsayed, A. M. 2016. "The Use of Academic Social Networks Among Arab Researchers: A Survey." *Social Science Computer Review* 34 (3): 378–391.

Evans, M., A. Wensley, and I. Frissen. 2015. "The Mediating Effects of Trustworthiness on Social-Cognitive Factors and Knowledge Sharing in a Large Professional Service Firm." *Electronic Journal of Knowledge Management* 13: 3.

Everard, A., and D. F. Galleta. 2006. "How Presentation Flaws Affect Perceived Site Quality, Trust, and Intention to Purchase From an Online Store." *Journal of Management Information Systems* 22 (3): 56–95. doi:10.2753/MIS0742-1222220303.

Ferebee, S. S., and J. W. Davis. 2009. "Factors that Persuade Continued Use of Facebook Among New Members." *Proceedings of the 4th International Conference on Persuasive Technology – Persuasive '09*, 1. https://doi.org/10.1145/1541948.1541994.

Finneran, C., and P. Zhang. 2003. "A Person-Artifact-Task (PAT) Model of Flow Antecedents in Computer-Mediated Environments." *International Journal of Human-Computer Studies* 59 (4): 475–496. doi:10.1016/S1071-5819(03)00112-5.

Fogg, B. J. 2007. "Persuasive Technology." (Vol. 4744, 283). doi:10.1007/978-3-540-77006-0.

Fogg, Brian J. 2009. "The Behavior Grid: 35 Ways Behavior Can Change." In *Proceedings of the 4th International Conference on Persuasive Technology*, 1–5.

Fogg, B. J., and C. Nass. 1997. "Silicon Sycophants: The Effects of Computers That Flatter." *International Journal of Human Computer Studies* 46 (5): 551–561. doi:10.1006/ijhc.1996.0104.

Forget, A., and S. Chiasson. 2008. "Persuasion for Stronger Passwords." In *International Conference on Persuasive Technology*, 140–150. doi:10.1007/978-3-540-68504-3_13.

Fornell, C., and D. F. Larcker. 1981. "Evaluating Structural Model with Unobserved Variables and Measurement Errors." *Journal of Marketing Research* 18 (1): 39–50.

Frohlich, D. O., and A. Zmyslinski-Seelig. 2012. "The Presence of Social Support Messages on YouTube Videos About Inflammatory Bowel Disease and Ostomies." *Health Communication* 27 (5): 421–428.

Fujita, M., P. Harrigan, and G. N. Soutar. 2018. "Capturing and Co-Creating Student Experiences in Social Media: a Social Identity Theory Perspective." *Journal of Marketing Theory and Practice* 26 (1–2): 55–71. doi:10.1080/10696679.2017.1389245.

Gefen, D., E. E. Rigdon, and D. Straub. 2011. "Editor's Comments: An Update and Extension to SEM Guidelines for Administrative and Social Science Research." *Mis Quarterly* 35 (2): iii–xiv.

Goodhue, D. L., and R. L. Thompson. 1995. "Task-technology Fit and Individual Performance." *MIS Quarterly* 19 (2): 213–236.

Hair, J. F., G. T. M. Hult, C. Ringle, and M. Sarstedt. 2016. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks: Sage Publications.

Hamari, J., and J. Koivisto. 2013. "Social Motivations to Use Gamification: An Empirical Study of Gamifying Exercise." In *Proceedings of the 21st European Conference on Information Systems SOCIAL*, 1–12. doi:10.1016/j.chb.2015.07.031.

Hong, I., and I. Barry. 2018. "Social and Personal Dimensions as Predictors of Sustainable Intention to Use Facebook in Korea: An Empirical Analysis." *Sustainability* 10 (8): 2856. Retrieved February 11, 2019. doi:10.3390/su10082856.

Hsu, C.-L., and J. C.-C. Lin. 2008. "Acceptance of Blog Usage: The Roles of Technology Acceptance, Social Influence and Knowledge Sharing Motivation." *Information & Management* 45 (1): 65–74.

Hwang, K. O., A. J. Ottenbacher, A. P. Green, M. R. Cannon-Diehl, O. Richardson, E. V. Bernstam, and E. J. Thomas. 2010. "Social Support in an Internet Weight Loss Community." *International Journal of Medical Informatics* 79 (1): 5–13.

Jalil, S., and R. Orji. 2016. "Integrating Persuasive Technology to Telemedical Applications for Type 2 Diabetes." *CEUR Workshop Proceedings* 1582: 92–100.

Jeng, W., D. He, and J. Jiang. 2015. "User Participation in an Academic Social Networking Service: A Survey of Open Group Users on Mendeley." *Journal of the Association for Information Science and Technology* 66 (5): 890–904.

Jeng, W., D. He, J. Jiang, and Y. Zhang. 2012. "Groups in Mendeley: Owners' Descriptions and Group Outcomes." In *Proceedings of the Association for Information Science and Technology*, 1–4. Wiley Online Library.

Jordan, K. 2014. "Academics and Their Online Networks: Exploring the Role of Academic Social Networking Sites." *First Monday* 19 (11): 1.

Kahn, B. E., and A. M. Isen. 1993. "The Influence of Positive Affect on Variety Seeking Among Safe, Enjoyable Products." *Journal of Consumer Research*. Oxford University Press. Retrieved November 15, 2017. doi:10.2307/2489273.

Kankanhalli, A., B. C. Y. Tan, and K.-K. Wei. 2005. "Contributing Knowledge to Electronic Knowledge Repositories: an Empirical Investigation." *MIS Quarterly* 29 (1): 113–143.

Kaptein, M., and D. Eckles. 2012. "Heterogeneity in the Effects of Online Persuasion." *Journal of Interactive Marketing* 26 (3): 176–188.

Kline, R. B. 2005. *Principles and Practice of Structural Equation Modeling: Methodology in the Social Sciences*. New York, NY: Guilford Press.

Koranteng F, N, Sarsah F K, Kuada E, and Gyamfi S A 2020. "An empirical investigation into the perceived effectiveness of collaborative software for students' projects." *Education and Information Technologies* 25 (2): 1085–1108. http://dx.doi.org/10.1007/s10639-019-10011-7.

Koranteng, F N, and I. Wiafe. 2019. "Factors That Promote Knowledge Sharing on Academic Social Networking Sites: An Empirical Study." *Education and Information Technologies* 24 (2): 1211–1236. doi:10.1007/s10639-018-9825-0.

Koranteng, F N, I. Wiafe, F. A. Katsriku, and R. Apau. 2019. "Understanding Trust on Social Networking Sites Among Tertiary Students: An Empirical Study in Ghana." *Applied Computing and Informatics*. doi:10.1016/j.aci.2019.07.003.

Koranteng, F N, I. Wiafe, and E. Kuada. 2019. "An Empirical Study of the Relationship Between Social Networking Sites and Students Engagement in Higher Education." *Journal of Educational Computing Research* 57 (5): 1131–1159. doi:10.1177/0735633118787528.

Ku, Y.-C., R. Chen, and H. Zhang. 2013. "Why do Users Continue Using Social Networking Sites? An Exploratory Study of Members in the United States and Taiwan." *Information & Management* 50 (7): 571–581.

Kwon, O., and Y. Wen. 2010. "An Empirical Study of the Factors Affecting Social Network Service use." *Computers in Human Behavior* 26 (2): 254–263.

Lee, E.-J. 2009. "I Like You, But I Won't Listen to You: Effects of Rationality on Affective and Behavioral Responses to Computers That Flatter." *International Journal of Human-Computer Studies* 67 (8): 628–638.

Lehto T, and H. Oinas-Kukkonen. 2011. "Persuasive Features in Web-Based Alcohol and Smoking Interventions: a Systematic Review of the Literature." *Journal of Medical Internet Research* 13 (3): e46. Retrieved November 15, 2017. doi:10.2196/jmir.1559.

Lehto, Tuomas, and H. Oinas-kukkonen. 2015. "Explaining and Predicting Perceived Effectiveness and Use Continuance Intention of a Behaviour Change Support System for Weight Loss." *Behaviour & Information Technology* 34 (2): 176–189.

Lehto, Thomas, H. Oinas-Kukkonen, and F. Drozd. 2012. "Factors Affecting Perceived Persuasiveness of a Behavior Change Support System." In *Proceedings of the International Conference on Information Systems (ICIS)*, 1–15.

Li, X., M. Thelwall, and D. Giustini. 2011. "Validating Online Reference Managers for Scholarly Impact Measurement." *Scientometrics* 91 (2): 461–471.

Lin, K.-Y., and H.-P. Lu. 2011a. "Intention to Continue Using Facebook fan Pages From the Perspective of Social Capital Theory." *Cyberpsychology, Behavior, and Social Networking* 14 (10): 565–570.

Lin, K.-Y., and H.-P. Lu. 2011b. "Why People Use Social Networking Sites: An Empirical Study Integrating Network Externalities and Motivation Theory." *Computers in Human Behavior* 27 (3): 1152–1161.

Ma, M., and R. Agarwal. 2007. "Through a Glass Darkly: Information Technology Design, Identity Verification, and Knowledge Contribution in Online Communities." *Information Systems Research* 18 (1): 42–67. doi:10.1287/isre.l070.0113.

Mafukata, M., W. Dhlandhlara, and G. Kancheya. 2017. "Reciprocal Relationship of Social Capital and Microfinance Activities in Nyanga, Zimbabwe." *Development in Practice* 27 (1): 77–89. doi:10.1080/09614524.2017.1260689.

McKnight, H. D., V. Choudury, and C. J. Kacmar. 2002. "Developing And Validating Trust Measure for E-Commerce: An Integrative Typology." *Informatin System Research* 13 (3): 334–359.

Megwalu, A. 2015. "Academic Social Networking: A Case Study on Users' Information Behavior." In *Current Issues in Libraries, Information Science and Related Fields*, 185–214. Emerald Group Publishing Limited. Retrieved February 11, 2019. doi:10.1108/S0065-283020150000039014

Meishar-Tal, H., and E. Pieterse. 2017. "Why do Academics Use Academic Social Networking Sites?" *The International Review of Research in Open and Distributed Learning* 18: 1.

Midden, C, and Ham J. 2018. Persuasive Technology to Promote Pro-Environmental Behaviour. In L. Steg & J. I. M. de Groot (Eds.), Environmental psychology: An introduction (pp. 283–294). Wiley Online Library. https://doi.org/10.1002/9781119241072.ch28

Mouakket, S. 2015. "Factors Influencing Continuance Intention to Use Social Network Sites: The Facebook Case." *Computers in Human Behavior* 53: 102–110. Retrieved February 11, 2019. doi:10.1016/J.CHB.2015.06.045.

Mouakket, S. 2018. "The Role of Personality Traits in Motivating Users' Continuance Intention Towards Facebook: Gender Differences." *The Journal of High Technology Management Research* 29 (1): 124–140. Retrieved February 11, 2019. doi:10.1016/J.HITECH.2016.10.003.

Nández, G., and Á Borrego. 2013. "Use of Social Networks for Academic Purposes: A Case Study." *The Electronic Library* 31 (6): 781–791.

Nass, C., and Y. Moon. 2000. "Machines and Mindfulness: Social Responses to Computers." *Journal of Social Issues* 56 (1): 81–103. http://0-search.ebscohost.com.library.ucc.ie/login.aspx?direct=true&db=ssf&AN=507690933&site=ehost-live.

Neville, K., C. Heavin, and E. Walsh. 2005. "A Case in Customizing e-Learning." *Journal of Information Technology* 20 (2): 117–129.

Oduor, M., and H. Oinas-Kukkonen. 2015. "A System's Self-referential Persuasion: Understanding the Role of Persuasive User Experiences in Committing Social Web

Users." In *International Conference on Persuasive Technology*, 241–252.
Oh, J. S., and W. Jeng. 2011. "Groups in Academic Social Networking Services–An Exploration of Their Potential as a Platform for Multi-Disciplinary Collaboration." In 2011 *IEEE Third International Conference on Privacy, Security, Risk and Trust and 2011 IEEE Third International Conference on Social Computing*, 545–548.
Oinas-Kukkonen, H. 2010. "Behavior Change Support Systems : A Research Model and Agenda." In *Proceedings of the 5th International Conference on Persuasive Technology Persuasive*, 4–14. doi:10.1007/978-3-642-13226-1_3.
Oinas-Kukkonen, H., and M. Harjumaa. 2009. "Persuasive Systems Design: Key Issues, Process Model, and System Features." *Communications of the Association for Information Systems* 24 (1): 28.
Orji, R. 2014. "Exploring the Persuasiveness of Behavior Change Support Strategies and Possible Gender Differences." In *CEUR Workshop Proceedings*, 41–57.
Orji, R., L. E. Nacke, and C. Di Marco. 2017. "Towards Personality-Driven Persuasive Health Games and Gamified Systems." *Conference on Human Factors in Computing Systems – Proceedings*, 2017-May, 1015–1027. doi:10.1145/3025453.3025577.
Orji, R., K. Oyibo, R. K. Lomotey, and F. A. Orji. 2019. "Socially-driven Persuasive Health Intervention Design: Competition, Social Comparison, and Cooperation." *Health Informatics Journal* 25 (4): 1451–1484.
Ovadia, S. 2013. "When Social Media Meets Scholarly Publishing." *Behavioral & Social Sciences Librarian* 32 (3): 194–198.
Oyibo, K., R. Orji, and J. Vassileva. 2017. "Investigation of the Persuasiveness of Social Influence in Persuasive Technology and the Effect of Age and Gender." In *Personalization in Persuasive Technology Workshop, Persuasive Technology*, 32–44. doi:10.1145/3099023.3099071.
Paliktzoglou, V., and J. Suhonen. 2014. "Facebook as an Assisted Learning Tool in Problem-Based Learning: the Bahrain Case." *International Journal of Social Media and Interactive Learning Environments* 2 (1): 85–100.
Papacharissi, Z. 2009. "The Virtual Geographies of Social Networks: a Comparative Analysis of Facebook, LinkedIn and ASmallWorld." *New Media & Society* 11 (1–2): 199–220.
Rauniar, R., G. Rawski, J. Yang, and B. Johnson. 2014. "Technology Acceptance Model (TAM) and Social Media Usage: An Empirical Study on Facebook." *Journal of Enterprise Information Management* 27 (1): 6–30. doi:10.1108/JEIM-04-2012-0011.
Roblyer, M. D., M. McDaniel, M. Webb, J. Herman, and J. V. Witty. 2010. "Findings on Facebook in Higher Education: A Comparison of College Faculty and Student Uses and Perceptions of Social Networking Sites." *The Internet and Higher Education* 13 (3): 134–140. Retrieved February 11, 2019. doi:10.1016/J.IHEDUC.2010.03.002
Salahshour Rad, M., M. Nilashi, H. Mohamed Dahlan, and O. Ibrahim. 2017. "Academic Researchers' Behavioural Intention to Use Academic Social Networking Sites." *Information Development*. 026666691774192. Retrieved February 11, 2019. doi:10.1177/0266666917741923
Segado-Boj, F., MÁ Chaparro Domínguez, and C. Castillo Rodríguez. 2015. "Use of Twitter among Spanish Communication-Area Faculty: Research, Teaching and Visibility." *First Monday* 20: 6. Retrieved February 11, 2019. doi:10.5210/fm.v20i6.5602
Shang, S., and P. B. Seddon. 2000. "A Comprehensive Framework for Classifying the Benefits of ERP Systems." In *Americas Conference on Information Systems (AMCIS 2000 Proceedings)*, 1–39.
Sheldon, P., P. A. Rauschnabel, M. G. Antony, and S. Car. 2017. "A Cross-Cultural Comparison of Croatian and American Social Network Sites: Exploring Cultural Differences in Motives for Instagram use." *Computers in Human Behavior* 75: 643–651.
Shin, G., J.-H. Ahn, and T. Kim. 2013. "IPTV in Korea: The Effect of Perceived Interactivity on Trust, Emotion, and Continuous Use Intention." *Asia Pacific Journal of Information Systems* 23 (3): 55–76. doi:10.14329/apjis.2013.23.3.055.
Shu, W., and C.-S. Lin. 2017. "Continuance of Social Network Services Games." *Business & Social Sciences Journal* 2 (2): 100–114.
Sun, Y., L. Liu, X. Peng, Y. Dong, and S. J. Barnes. 2014. "Understanding Chinese Users' Continuance Intention Toward Online Social Networks: An Integrative Theoretical Model." *Electronic Markets* 24 (1): 57–66. doi:10.1007/s12525-013-0131-9.
Tajfel, H., and J. Turner. 1986. "The Social Identity Theory of Intergroup Behaviour. Psychology of Intergroup Relations." In *In Psychology of Intergroup Relations*, edited by S. Worchel, and W. G. Austin, 7–24. Chicago: Nelson-Hall.
Thelwall, M., and K. Kousha. 2014. "Academia. edu: Social Network or Academic Network?" *Journal of the Association for Information Science and Technology* 65 (4): 721–731.
Torning, K., C. Hall, and H. Oinas-kukkonen. 2009. "Persuasive System Design : State of the Art and Future Directions." In *Proceedings of the 4th International Conference on Persuasive Technology*, 1–8. ACM.
Tseng, F.-C., and F.-Y. Kuo. 2014. "A Study of Social Participation and Knowledge Sharing in the Teachers' Online Professional Community of Practice." *Computers & Education* 72: 37–47.
Venkatesh, Morris, M. G. Davis, G. B. & Davis, and F. D. 2003. "User Acceptance of Information Technology: Toward a Unified View." *MIS Quarterly* 27 (3): 425–478.
Vessey, I., and D. Galletta. 1991. "Cognitive fit: An Empirical Study of Information Acquisition." *Information Systems Research* 2 (1): 63–84. doi:10.1287/isre.2.1.63.
Webster, J., and J. S. Ahuja. 2006. "Enhancing the Design of Web Navigation Systems: The Influence of User Disorientation on Engagement and Performance." *Mis Quarterly* 30 (3): 661–678.
Wiafe, I., F. N. Koranteng, E. Owusu, A. O. Ekpezu, and S. A. Gyamfi. 2020. "Persuasive Social Features That Promote Knowledge Sharing among Tertiary Students on Social Networking Sites: An Empirical Study." *Journal of Computer Assisted Learning*, doi:10.1111/jcal.12433.
I Wiafe, F N Koranteng, T Tettey, F A Katsriku, and J -D Abdulai 2019. "Factors that affect acceptance and use of information systems within the Maritime industry in

developing countries." *Journal of Systems and Information Technology* 22 (1): 21–45. http://dx.doi.org/10.1108/JSIT-06-2018-0091.

Wiafe, I., and K. Nakata. 2012a. "A Semiotic Analysis of Persuasive Technology: An Application to Obesity Management." In *International Conference on Informatics and Semiotics in Organisations*. Reading.

Wiafe, I., and K. Nakata. 2012b. "Bibliographic Analysis of Persuasive Systems: Techniques, Methods and Domains of Application." In *Persuasive Technology: Design for Health and Safety; The 7th International Conference on Persuasive Technology; PERSUASIVE 2012; Linköping; Sweden; June 6–8; Adjunct Proceedings*, 61–64.

Wiafe, I., K. Nakata, and S. R. Gulliver. 2011. "Designing Persuasive Third Party Applications for Social Networking Services Based on the 3D-RAB Model." In *Communications in Computer and Information Science*, edited by J. Park, L. Yang, and C. Lee, 54–61. Berlin: Springer.

Wiafe, I., K. Nakata, and S. Gulliver. 2014. "Categorizing Users in Behavior Change Support Systems Based on Cognitive Dissonance." *Personal and Ubiquitous Computing* 18 (7): 1677–1687.

Wixom, B. H., and H. J. Watson. 2001. "An Empirical Investigation of the Factors Affecting Data Warehousing Success." *MIS Quarterly* 25 (1): 17–41.

Wu, B., and X. Chen. 2017. "Continuance Intention to Use MOOCs: Integrating the Technology Acceptance Model (TAM) and Task Technology Fit (TTF) Model." *Computers in Human Behavior* 67: 221–232.

# Appendices

## Appendix 1. Question items and loadings

| Construct | Items | Question items | Loading | Source (Adapted) |
|---|---|---|---|---|
| Computer-Human Dialogue Support | DIAL1 | The academic social networking site that I use motivates me to perform my daily activities. | 0.827 | Adaji and Vassileva (2016a), Fogg and Nass (1997) |
| | DIAL2 | The academic social networking site that I use provides me with right feedback on the task I perform. | 0.804 | |
| | DIAL3 | The academic social networking site that I use provides messages of praise when I complete a task. | 0.755 | |
| Primary Task Support | PRIM1 | Academic social networking sites supports me in my daily activities. | 0.703 | Dabi et al. (2018), Goodhue and Thompson (1995) |
| | PRIM2 | With the help of academic social networking sites, I am able to complete my daily activities. | 0.833 | |
| | PRIM3 | It is easier to use a academic social networking site to support you to do your daily activities. | 0.832 | |
| | PRIM4 | Academic social networking sites makes life easier. | 0.715 | |
| Perceived Credibility | CRED1 | I trust all the information I receive on my academic social networking site. | 0.895 | Lehto and Oinas-kukkonen (2015), McKnight, Choudury, and Kacmar (2002) |
| | CRED2 | In my opinion the content on the academic social networking site that I use is believable | 0.897 | |
| | CRED3 | Overall, I consider the information I receive on my academic social networking site as credible. | 0.905 | |
| Perceived Social Support | SOCS1 | Through academic social networking sites, I am able to get support when I need it. | 0.806 | Chiu, Hsu, and Wang (2006), Lehto and Oinas-kukkonen (2015) |
| | SOCS2 | I share my experiences with my friends using academic social networking sites. | 0.784 | |
| | SOCS3 | I learn from the experiences of my peers on my academic social networking site. | 0.725 | |
| Social Identification | SOID1 | Through academic social networking sites, I can relate to the experiences of my colleagues. | 0.795 | Aslam et al. (2013), Ma and Agarwal (2007) |
| | SOID2 | My friends on my academic social networking sites are my peers. | 0.745 | |
| | SOID3 | I care about my friends on my academic social networking site. | 0.796 | |
| Perceived Effort | EFFO1 | Learning to use academic social networking site is easy. | 0.809 | Venkatesh et al. (2003) |
| | EFFO2 | Using academic social networking sites do not require a lot of effort. | 0.889 | |
| | EFFO3 | The academic social networking site that I use is flexible to interact with. | 0.775 | |
| | EFFO4 | Using academic social networking site is not difficult, | 0.720 | |
| Perceived Effectiveness | EFFE1 | Using academic social networking sites enable me to learn effectively. | 0.830 | Venkatesh et al. (2003) |
| | EFFE2 | Using academic social networking sites encourages me to learn. | 0.857 | |
| | EFFE3 | Using academic social networking sites increases my effort towards challenging issues | 0.811 | |
| | EFFE4 | In my opinion academic social networking site is helpful | 0.729 | |
| Continuance Intention | CONT1 | I am considering to stop using academic social networking site. | 0.946 | Bhattacherjee (2001), De Guinea and Markus (2009) |
| | CONT2 | I will prefer to use a different system that is not a academic social networking site. | 0.905 | |

## Appendix 2. Data distribution

| | Missing | Standard deviation | Excess Kurtosis | Skewness |
|---|---|---|---|---|
| DIAL1 | 0 | 0.924 | 0.604 | 1.008 |
| DIAL2 | 0 | 0.707 | 2.331 | 1.067 |
| DIAL3 | 0 | 0.692 | 0.849 | 0.755 |
| SOID1 | 0 | 0.539 | 3.221 | 0.869 |
| SOID2 | 0 | 0.747 | −0.031 | 0.543 |
| SOID3 | 0 | 0.669 | 0.233 | 0.276 |
| SOCS1 | 0 | 0.732 | 1.812 | 0.99 |
| SOCS2 | 0 | 0.801 | 2.106 | 1.21 |
| SOCS3 | 0 | 0.461 | 1.517 | −0.35 |
| PRIM1 | 0 | 0.722 | 1.779 | 1.233 |
| PRIM2 | 0 | 0.794 | −0.26 | 0.612 |
| PRIM3 | 0 | 0.792 | −0.12 | 0.452 |
| PRIM4 | 0 | 0.763 | 0.068 | 0.424 |
| CRED1 | 0 | 1.035 | −0.802 | −0.031 |

(*Continued*)

Continued.

| | Missing | Standard deviation | Excess Kurtosis | Skewness |
|---|---|---|---|---|
| CRED2 | 0 | 0.846 | −0.844 | 0.248 |
| CRED3 | 0 | 0.897 | −0.127 | 0.372 |
| EFFO1 | 0 | 0.571 | 2.691 | 0.688 |
| EFFO2 | 0 | 0.714 | 1.151 | 0.77 |
| EFFO3 | 0 | 0.563 | 1.698 | 0.338 |
| EFFO4 | 0 | 0.602 | 3.253 | 0.913 |
| EFFE1 | 0 | 0.778 | −0.312 | 0.228 |
| EFFE2 | 0 | 0.83 | −0.128 | 0.543 |
| EFFE3 | 0 | 0.78 | 0.957 | 0.891 |
| EFFE4 | 0 | 0.639 | 0.196 | 0.2 |
| CONT1 | 0 | 0.553 | 0.142 | −0.051 |
| CONT2 | 0 | 1.185 | −0.884 | 0.294 |

## *Appendix 3. Non-bias response test*

| | Sample mean (M) Group 1 ($n$ = 104) | Sample mean (M) Group 2 ($n$ = 314) | Standard deviation (STDEV) Group 1 ($n$ = 104) | Standard deviation (STDEV) Group 2 ($n$ = 314) | T statistics (\|O/STDEV\|) Group 1 ($n$ = 104) | T statistics (\|O/STDEV\|) Group 2 ($n$ = 314) | $P$ values Group 1 ($n$ = 104) | $P$ values Group 2 ($n$ = 314) |
|---|---|---|---|---|---|---|---|---|
| CRED -> CONT | 0.469 | 0.487 | 0.091 | 0.091 | 5.119 | 5.124 | 0.000 | 0.000 |
| DIAL -> CRED | 0.325 | 0.317 | 0.104 | 0.086 | 3.119 | 3.767 | 0.002 | 0.000 |
| DIAL -> EFFE | 0.218 | 0.253 | 0.150 | 0.143 | 1.645 | 1.725 | 0.043 | 0.045 |
| DIAL -> PRIM | 0.552 | 0.568 | 0.075 | 0.067 | 7.357 | 8.339 | 0.000 | 0.000 |
| DIAL -> SOCS | 0.124 | 0.126 | 0.105 | 0.094 | 1.254 | 1.390 | 0.108 | 0.085 |
| EFFE -> CONT | −0.017 | −0.083 | 0.142 | 0.129 | 0.499 | 0.549 | 0.310 | 0.293 |
| EFFO -> CONT | −0.143 | −0.109 | 0.116 | 0.117 | 0.861 | 0.847 | 0.197 | 0.200 |
| EFFO -> EFFE | 0.039 | 0.043 | 0.088 | 0.112 | 0.163 | 0.128 | 0.436 | 0.449 |
| PRIM -> EFFE | 0.221 | 0.193 | 0.109 | 0.113 | 1.980 | 1.916 | 0.027 | 0.031 |
| PRIM -> EFFO | 0.438 | 0.438 | 0.075 | 0.087 | 5.498 | 4.742 | 0.000 | 0.000 |
| SOCS -> CONT | 0.121 | 0.173 | 0.099 | 0.098 | 1.526 | 1.533 | 0.067 | 0.066 |
| SOCS -> EFFE | 0.306 | 0.326 | 0.084 | 0.085 | 3.581 | 3.536 | 0.000 | 0.000 |
| SOID -> SOCS | 0.529 | 0.546 | 0.083 | 0.097 | 6.209 | 5.337 | 0.000 | 0.000 |