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Demographic factors influencing the adoption and use of social media in university libraries in Ghana: A unified theory of acceptance and use of technology (UTAUT) approach

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ABSTRACT

The purpose of this study is to examine the influence of demographics as moderators of the factors influencing library workers' and library patrons' behavioral intention toward the use of social media in university libraries in Ghana. The theoretical model for this study was based on the unified theory of acceptance and use of technology (UTAUT). The study employed a cross-sectional survey and quantitative data was collected from a total of six-hundred and five usable responses obtained from the sampled respondents using a pre-tested questionnaire. Statistical analyses were carried out using the t-test analysis (using Levene's Test for Equality of Variances) and the structural equation modeling (SEM) technique. Key findings were that although partial relationships were established, the mediating roles of the demographics of library workers and patrons on factors influencing the intention to use and actual use of social media in the university libraries were significant. Establishing the effect of the user demographics on factors influencing social media use in the context of the UTAUT is novel within the Ghanaian university library setting and thus contributes new knowledge to methodological discussions to improve practices and policies on social media adoption and use. However, since this study was largely quantitative, future research could include both quantitative and qualitative research approaches to explore any other important constructs that fit into the context and can explain adoption in further detail. Recommendations based on findings are provided in the article.

KEYWORDS

Social media; UTAUT; moderators; demographics; structural equation modeling; university libraries; Ghana

Social media is a phenomenon that represents a major shift in the collaboration and communication among people and professionals around the globe and it has been a globally dominant trend for communication and information sharing over the last couple of years. Broadly defined, the term “social media” refers to online platforms that enable the process of creating and sharing information through the engagement of users by participating in, commenting on and creating content as a means of communicating with their social group, other users and the public via virtual communities and networks (Harrison et al., 2017). Indeed, the traditional barriers to information provision have been enfeebled by the use of social media such that, in less than a decade, the influence of the traditional media has dwindled, while the adoption and use of social media have been deployed at an unprecedented rate globally. Today, as pointed out by Raza et al. (2017), the evolving paradigm of social media is perceived as a breakthrough in the development

of corporate information sharing because, among other factors, the use of social media applications increases logarithmically among both casual and academic users.

University libraries and the library profession have not been excluded from the drive to deploy social media platforms that create the environment for individuals and organizations to exchange information in real time via chat. Essentially university libraries have increasingly acknowledged social media as a vital communication space for their survival. For a university library, social media is about a set of web-based applications that allows patrons to engage with library content and to assist in building a community with library users that will promote library issues and events (Smeaton & Davis, 2014).

Research demonstrates that the use of and gratification derived from innovations such as social media differ according to user characteristics such as age, gender and experience (Khan et al., 2017). Indeed, literature has considered gender (e.g. Lin & Yeh, 2019), age (e.g. Hwang et al., 2019) and experience (e.g. Suki & Suki, 2017) as the most commonly tested moderators of factors influencing the behavioral intention to adopt and use a given innovation, and these factors have produced mixed results. Yet, while mixed results from past research hint that these variables may or may not moderate the factors influencing the intention to use technology, there seems to be a paucity of literature on their relationships with regard to social media use in university libraries. Accordingly, investigating the moderating effect of the demographics of library workers and library patrons on factors influencing the adoption and use of social media in university libraries—both for providing library services and for contacting the library—cannot be underestimated.

Study purpose

This study sought to determine the impact of demographic variables as moderators of factors influencing the adoption and use of social media in university libraries in Ghana. Specifically, the study sought to:

- i. assess the moderating effect of age on factors influencing the intention to use and actual use of social media in university libraries in Ghana.
- ii. assess the moderating effect of gender on factors influencing the intention to use and actual use of social media in university libraries in Ghana.
- iii. assess the moderating effect of experience on factors influencing the intention to use and actual use of social media in university libraries in Ghana.

Theoretical framework

The underlining theory of this study is the UTAUT as proposed by Venkatesh et al. (2003). The UTAUT has been identified as the most popular and current referenced framework in studying the acceptance and use of new technologies (Bawack & Kamdjoug, 2018) and it has been described as a new but promising model, partly because of its capacity to explain seventy per cent (70%) of intention to use technology. After consolidating shared perceptions of theorists on the adoption of innovations, UTAUT included four moderating variables to expound their association with its four key predicting variables (performance expectancy, effort expectancy, social influence and facilitating conditions) with two outcome variables (behavioral intention and use behavior).

Jaradat and Atyeh (2017) admitted that these moderators permit inferences and explanations regarding behavioral intention and have been noted to play an important role as control variables, especially for investigating and understanding factors influencing the intention to use technology. Nevertheless, despite the prevalence of the application and citation of the UTAUT in a large number of studies within the field of information science, there have been fewer attempts to actually consider the use of these moderating factors. In Ghana, the influence of the moderators of

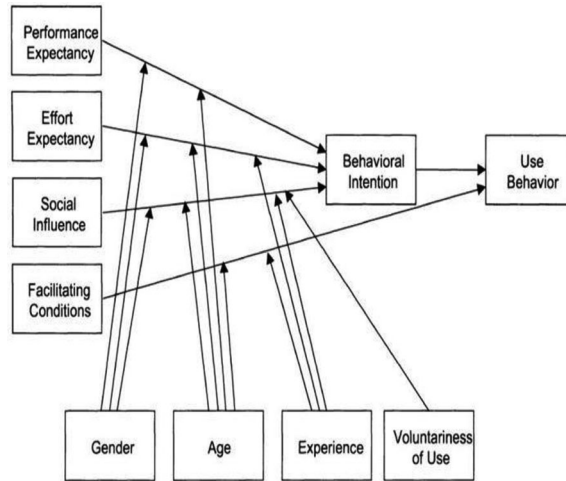


Figure 1. Original UTAUT model.
Source: Venkatesh et al. (2003).

the UTAUT on its key constructs relative to social media adoption and use in university libraries has not received any attention in prior studies.

In terms of moderators, the UTAUT theory assumes that the path from its key predicting constructs to the outcome variables are moderated by personal characteristics such as age, gender, experience and voluntariness of use. From the UTAUT, gender is hypothesized to moderate performance expectancy, effort expectancy and social influence such that the effect is stronger for females than for males in relation to effort expectancy and social influence. Conversely, for performance expectancy the effect on males is stronger than for females (Venkatesh et al., 2003). Age is theorized to moderate effort expectancy, performance expectancy, social influence and facilitating conditions such that the effect on younger workers is stronger for performance expectancy and stronger for older workers in relation to effort expectancy, social influence and facilitating conditions.

Experience is postulated to moderate effort expectancy, social influence and facilitating conditions such that the impact on workers in their early stages of experience is high for effort expectancy and social influence, and a higher influence on workers with increasing experience with respect to facilitating conditions. Voluntariness of use is however anticipated to moderate only social influence, such that the impact on workers particularly in compulsory settings will be stronger.

Figure 1 provides an illustration of the original UTAUT model showing its constructs, moderators and interrelations. Nevertheless, the voluntariness of use is not included in this study, as the use of social media is not mandatory for providing and accessing library services and resources in university libraries in Ghana. In other words, although university libraries in Ghana are expected to use social media for the provision library services there are no prescribed actions to be taken against library workers or patrons who resist using the system. As such, to increase the model's projected validity, and given that the use of social media is voluntary among users of university libraries in Ghana, gender, age and level of experience were incorporated as moderating variables in the research framework (Venkatesh et al., 2003). Furthermore, in their original model, Venkatesh et al. (2003) did not project the influence of the moderators such as age, gender and experience on the path from behavioral intentions to use behavior.

This study however, attempts to expand the current literature by providing empirical evidence of the role of these moderators on the behavioral intention to use social media in the context of academic library services delivery in Ghana. Hence, it is postulated that gender, age and different levels of experience with social media will result in different adoption and use behavior relative

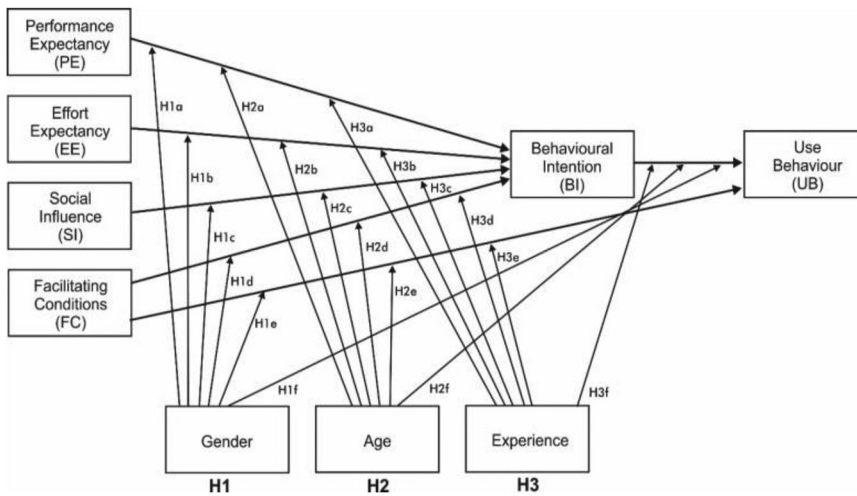


Figure 2. Proposed framework. Source: Venkatesh et al., 2003. Adapted from Venkatesh et al. (2003) UTAUT model.

to performance expectancy, effort expectancy, social influence and facilitating conditions in Ghanaian university libraries (see Figure 2).

Review of pertinent literature

Given that quite a number of studies have employed the UTAUT to explain the use of technology in general research, employing the UTAUT to examine the influence of its moderators on the use of social media in academic libraries is scanty and even more limited in academic libraries in Ghana. Generally, studies deploying the UTAUT to a framework do not examine the relationship between the theory's key construct(s) and moderators in relation to social media acceptance in this context (e.g. Mhina et al., 2019; Salloum et al., 2018). To the best of the researchers' knowledge, this is an early attempt toward a holistic approach to consider the moderators of the UTAUT in the assessment of the factors influencing the adoption and use of social media in academic libraries in Ghana. Consequently, this study largely reviews existing literature on the influence of the moderators of the UTAUT on the use of technology in general.

Moderating influence of gender

"Gender" is defined as a set of characteristics that distinguish between males and females (Faqih & Jaradat, 2015). Social Psychology literature (e.g., Bandura, 1986) acknowledges noteworthy behavioral differences between female and male groups in various decision-making situations.

Gender differences have been observed to lead to different decision-making and information processing (Lim et al., 2017), and gender continues to be a key moderator of technology behavioral intention, with varying effects in different environments (Venkatesh & Davis, 2000). Generally, gender issues in technology adoption and usage decisions have been recognized as significant concerns in the technology acceptance literature, with a number of empirical reports on the varying levels of acceptance of technology between males and females.

Although the literature offers some understanding of gender variances in technology acceptance and use behavior (e.g. Lin & Yeh, 2019), little attention has been given to the understanding of these factors across genders in the use of social media for library services. Essentially, the literature regarding gender differences and preferences in social media adoption and use is still in

its infancy and there are very few studies clearly addressing gender differences in the acceptance of social media in university libraries.

According to the gender model, males are supposedly encouraged to be brave and independent, while females are inclined to be more social, emotional and caring of others (Tana & Ooi, 2018). Males have been noted to have more favorable attitudes toward the acceptance and use of technology than females, as females tend to exhibit greater risk aversion and less trust in the use of technology than men (Lim et al., 2017). In support of this viewpoint, Venkatesh et al. (2012) demonstrated that pragmatic and task-oriented traits are more prominent in male groups, which make them easier to be influenced by the utility and expected performance of technology than females. Thus, compared with males, females tend to have greater anxiety when using technology and lower levels of computer aptitude (Venkatesh & Davis, 2000). In harmony with this viewpoint, the UTAUT hypothesized that the path from performance expectancy, effort expectancy and social influence to behavioral intention is moderated by gender, with a stronger influence for women than for men (Venkatesh et al., 2016). This norm could perhaps be attributed to the long-standing recognition of technology as a “boy toy” or a “male-dominant ritual,” developed exclusively by men for men (Weiser, 2000).

However, the phenomenon of the use of technology as a male-dominated syndrome is rapidly diminishing as more and more females are using technology. Today, notwithstanding the differences in the purpose of use, both females and males appear to make equal use of technology.

A host of previous studies have tried to explore gender differences in adopting new technology in order to manage the development and utilization of new technology in diverse fields. However, results of the gender effect on technology perception and acceptance in these studies are inconsistent. In some studies, little or no gender difference was found, whereas other studies suggested the existence of gender differences. For example, based on the UTAUT model, Khan et al. (2017) recorded no significant influence of gender on the adoption of digital reference services among the university librarians in Pakistan.

Equally, in examining the acceptance of electronic voting machines in India, Chauhan et al. (2018) found no gender differences in terms of how performance expectancy, effort expectancy and social influence affect voters' intention to use technology. Similarly, Arif et al. (2018) found little or no gender differences in factors affecting the use of web-based services among students in Pakistan. Likewise, Tana and Ooi (2018) reported an insignificant relationship between the path from performance expectancy, effort expectancy, facilitating conditions and social influence to behavioral intention and use behavior of Malaysians' mobile tourism shopping via mobile devices.

In contrast, the results of other previous studies suggested the important moderating role of gender in the adoption and use of technology (e.g. Heinrichs et al., 2016; Hwang et al., 2019; Lim et al., 2017; Lin & Yeh, 2019; Ohannessian, 2018). For instance, in an attempt to explain the role of gender as a moderator of the factors influencing the use of electronic retail websites among two culturally diverse countries, namely the United States of America and Saudi Arabia, Heinrichs et al. (2016) found gender to be a significant moderator of the relationships proposed in their theoretical model and hence highlighted the importance of developing and designing different marketing strategies for males and females. Equally, in the study of Lim et al. (2017), findings based on a structural equation analysis confirmed gender as a significant moderator of the factors affecting the users' assessment and use of social media sites, such that females showed significantly stronger relationships than did males.

In the mid-Atlantic United States, Ohannessian (2018) collected data from 441 11th and 12th grade students in order to examine the moderating role of gender in the relationship between video games and anxiety. They found the moderating role of gender to play video games was stronger for girls than for boys, such that boys who played video games had lower levels of anxiety, while girls playing video games as much had higher levels of anxiety. Similarly, Hwang et al. (2019) study of 324 restaurant patrons (out of a total of 2,794) in Korea reported gender as an

important moderating variable of the factors influencing the attitude and behavioral intention to use drone food delivery services.

Shao et al. (2019) analyzed 740 valid questionnaires from Alipay and Wechat pay users in China to determine whether there is a significant difference between female and male consumers regarding continuous intention to use mobile payment platforms. The authors showed that gender moderated the four constructs of e-payment adopted, such that the influence was stronger for females than for males.

In China, Lin and Yeh (2019) investigated the moderating role of gender in the relationship between perceived usefulness (performance expectancy) and ease of use (effort expectancy) in using virtual-reality-supported technology for mental rotation learning among college and undergraduate students, comprising 36 men and 35 women. They found that gender plays a significant moderating role in the relationship between the two constructs. In other words, while perceived usefulness was stronger for men than for women, women tended to regard the technology as more playful and easier to use (ease of use). Park et al. (2019) examined gender differences in the adoption of multimedia technology for learning, using data collected from web-based questionnaires sent out to students. They found that gender significantly moderated the relationship between perceived usefulness, perceived ease of use and behavioral intention with regard to intention to use and actual use.

Regardless of the fact that the influence of gender has not yet been proven conclusively, the UTAUT suggests that gender is an important contextual factor from a theoretical standpoint. It is clear, therefore, that the effect of gender on technological acceptance needs to be explored further (Lin & Yeh, 2019). Extrapolating from the theoretical and empirical backgrounds, gender differences are expected to be observed in university libraries' decisions about the adoption and use of social media, such that females may be more strongly influenced by their perceived interest to use social media for provision and access to library services and resources. Consequently, the researchers formulated the following hypotheses in this study:

H1: The path from performance expectancy, effort expectancy, social influence and facilitating conditions to behavioral intention and use behavior is moderated by gender such that the influence is stronger for females than for males.

- H1a: The path from performance expectancy to behavioral intention is moderated by gender, such that the influence is stronger for females than for males.
- H1b: The path from effort expectancy to behavioral intention is moderated by gender, such that the influence is stronger for females than for males.
- H1c: The path from social influence to behavioral intention is moderated by gender, such that the influence is stronger for females than for males.
- H1d: The path from facilitating conditions to behavioral intention is moderated by gender, such that the influence is stronger for females than for males.
- H1e: The path from facilitating conditions to use behavior is moderated by gender, such that the influence is stronger for females than for males.
- H1f: The path from behavioral intention to use behavior is moderated by gender, such that the influence is stronger for females than for males.

Moderating influence of age

Age is another critical demographic factor noted to play an important role in explaining consumer behavior. It influences the acceptance of technology and it is associated with usefulness, usability, and ease of innovations (Aharony, 2012). Age, as a variable, has been emphasized by the traditional literature as one of the most important personal traits that moderates the decision either to adopt or reject a new technology.

Literature has proven the influence of age differences in adopting new technology and has reported a negative relationship between increasing age and intention to adopt a new technology (Hwang et al., 2019). In other words, because younger individuals are fairly competent in using technological devices, it has been suggested that they are more receptive and have greater experience regarding the intention to use and the subsequent use of technology, as opposed to older individuals. Hardy and Castonguay (2018) emphasized that lack of experience with technology use among older users usually demotivates them from evaluating the advantages that a given technology offers.

In terms of the UTAUT, the path from performance expectancy, effort expectancy, social influence and facilitating conditions to behavioral intention and use behavior is moderated by age, such that the influence is stronger for older people than for younger people (Venkatesh et al., 2003). Nevertheless, although age has been observed to influence the initial decision regarding whether to consider or accept a particular technology or not—and, as such, it is considered a relevant variable in influencing the behavioral intention to use technology—literature on the moderating effect of age has not been able to define a common line of reasoning in defence of the moderating effect of the construct, as hypothesized in the UTAUT model.

While some studies identify a positive relationship (e.g. Isaias et al., 2017; Sobti, 2019) between the key constructs of the UTAUT and the age of the user—and the probability of their adopting and using varied technologies—others have obtained mixed results (e.g. Bawack & Kamdjou, 2018; Chauhan et al., 2018) and even an inverse correlation (e.g. Arif et al., 2018; Palau-Saumell et al., 2019). In the same way, some studies have included age as a relevant variable in the explanation of social media adoption behavior (e.g. Yuvaraj, 2016; Hoffmann, Suphan, & Meckel, 2016). Therefore, it might be inferred that age is a relevant moderating factor when observing the adoption and use of social media in university libraries in Ghana.

In Thailand, a study of 600 university students from three different universities in Bangkok was conducted to explain the use of social media among Thai students. The researchers reported age as an important moderator of the behavioral intention to use social media, since younger users were the least affected (Suksa-Ngiam & Chaiyasoonthorn, 2015). Likewise, on the basis of a review of three classical models (TAM, TRA and UTAUT), Liébana-Cabanillas et al. (2014) investigated the moderating effect of age on the impact of the Zong mobile payment system among a national panel of 2,012 internet users with profiles on social media networks.

Using a questionnaire survey with items measured on a 7-point Likert scale, the results of the Structural Equation Modeling (SEM) analysis showed that the age of social network users has an important effect on their behavior in terms of social media acceptance. Grouping the age of respondents into two categories, namely younger users (i.e. 35 years and below, totaling 835 respondents and older users (≥ 35 years, totaling 1,177 respondents), the study generally established younger users as being more predisposed to accepting and using new technologies, including social media, than were older users.

Employing the UTAUT as a theoretical framework, Yueh et al. (2015) claimed that although age moderates or influences the factors contributing to the intention to use social media such as Facebook, younger adults are more likely to spend more time on social media than older ones because as users age, they become increasingly selective about their social media patterns. Hoffman, Suphan and Meckel Venkatesh et al. (2016) also collected data from 492 politicians and revealed a significant difference between social media behavioral intention and use behavior, suggesting that performance expectancy, effort expectancy, social influence and facilitating conditions are influenced by the age of politicians in Switzerland, such that the influence is stronger for older politicians than for the younger ones.

In a more recent study, Hardy and Castonguay (2018) investigated the moderating effect of age from an analysis of the Venkatesh et al. (2016) general social media survey at the University of Chicago and reported that while the relationship was positive for respondents who were 30 years

and older, it was negative for those who were in the 18–29-year age group. The relationship between social media use and the younger group produced a negative coefficient ($b = -0.55, p < 0.01$), while the intersection between older respondents produced a positive one ($b = 0.37, p < 0.01$). Therefore, age had a positive influence on behavioral intention to use social media, with younger individuals being more likely to adopt and use social media than older individuals.

In contrast, some studies employing the UTAUT seem to report no significant difference between younger and older individuals in relation to their social media use. For instance, applying the UTAUT to social media adoption, Kaba and Toure (2014) found that age was not a significant moderating factor in terms of performance expectancy, effort expectancy, social influence and facilitating conditions on the behavioral intention and use behavior of 1,030 students in selected African countries. Similarly, Yuvaraj (2016) and El Ouiridi, El Ouiridi, Segers and Pais (2016) have reported that, apart from performance expectancy, age as a moderating variable has no significant influence on the key constructs of the UTAUT relative to the acceptance of social media applications in recruiting and selecting processes in India and Europe respectively. Consequently, the researchers in this study hypothesize as follows:

H2: The path from performance expectancy, effort expectancy, social influence and facilitating conditions to behavioral intention and use behavior is moderated by age, such that the influence is stronger for older people than for younger people.

H2a: The path from performance expectancy to behavioral intention is moderated by age, such that the influence is stronger for older people than for younger people.

H2b: The path from effort expectancy to behavioral intention is moderated by age, such that the influence is stronger for older people than for younger people.

H2c: The path from social influence to behavioral intention is moderated by age, such that the influence is stronger for older people than for younger people.

H2d: The path from facilitating conditions to behavioral intention is moderated by age, such that the influence is stronger for older people than for younger people.

H2e: The path from facilitating conditions to use behavior is moderated by age, such that the influence is stronger for older people than for younger people.

H2f: The path from behavioral intentions use behavior is moderated by age, such that the influence is stronger for older people than for younger people.

Moderating influence of prior experience

Experience signifies a continuous opportunity to use a given innovation over time from the first time of use (Jones & Harvey, 2019). As individuals, the level of experience gained in using technology might influence the level of effect regarding its use (Jaradat & Atyeh, 2017). However, Jaradat and Atyeh (2017) submit that increased experience in the use of technology such as social media would result in a stronger effect on intention to use and actual use over time, because as users gain more and more experience in the use of technology, the effect on behavioral intention and subsequent use behavior will attenuate over time.

Essentially, individuals with low levels of experience prefer innovations necessitating insignificant effort (Venkatesh et al., 2003). As such, individuals with less experience in using technology would be more concerned about how easy the technology is to operate (Chua, Rezaei, Gu, Oh, & Jambulingam, 2018).

It is theorized that different levels of experience lead to varied opinions about performance expectancy, effort expectancy, social influence and facilitating conditions regarding behavioral intention to use technology (Venkatesh et al., 2003). Nevertheless, studies employing the UTAUT as a theoretical framework have either supported (e.g. Gan et al., 2017; Ukut & Krairit, 2019) or refuted (e.g. Arif et al., 2018; Humaid & Ibrahim, 2019) the hypothesis that users' level of

experience has a significant influence on the relationship between technology acceptance and the UTAUT determining factors of behavioral intention and use behavior.

For instance, as part of the literature reviewed by Ukut and Krairit (2019) on using the UTAUT, level of experience served as a moderator between performance expectancy and behavioral intention. Furthermore, Gan et al. (2017) highlighted that, although the level of experience of students from Finland moderated the effect of performance expectancy, social influence and facilitating conditions on behavioral intentions and use behavior of mobile learning technologies, the effect was stronger for individuals who adopted mobile learning early on.

Awwad and Al-Majali (2015) collected data from 575 students from public universities in Jordan on the application of the UTAUT in the context of electronic library (e-library) services, and they reported mixed results regarding the moderating effect of experience on the construct of the UTAUT. According to this study, the path from performance expectancy to behavioral intention was significantly moderated by experience, with the influence of experience being more salient in the early stages of e-library adoption. The study did not, however, find any significant relationship between the moderating effect of experience on social influence and behavioral intention, as well as on the path from facilitating conditions to use behavior.

Likewise, Suki and Suki (2017) claimed that the user's experience with a given technology exerts a significant amount of effect on the path from performance expectancy and effort expectancy to behavioral intention, but not from social influence to behavioral intention. In contrast, Khechine et al. (2014), Isaias et al. (2017), Bawack and Kamdjoug (2018) reported that the path from performance expectancy, social influence and facilitating conditions to behavioral intention and use behavior was not significantly moderated by the level of experience in the use of technology.

Similarly, Humaid and Ibrahim (2019) reported that the moderating effect of experience on performance expectancy, effort expectancy, social influence and facilitating conditions was not salient among Saudi business entrepreneurs. The researchers in this study therefore hypothesize the following:

H3: The path from performance expectancy, effort expectancy, social influence and facilitating conditions to behavioral intention and use behavior is moderated by experience, such that the influence is stronger for persons with increased experience.

- H3a: The path from performance expectancy to behavioral intention is moderated by experience, such that the influence is stronger for persons with increased experience.
- H3b: The path from effort expectancy to behavioral intention is moderated by experience, such that the influence is stronger for persons with increased experience.
- H3c: The path from social influence to behavioral intention is moderated by experience, such that the influence is stronger for persons with increased experience.
- H3d: The path from facilitating conditions to behavioral intention is moderated by experience, such that the influence is stronger for persons with increased experience.
- H3e: The path from facilitating conditions to use behavior is moderated by experience, such that the influence is stronger for persons with increased experience.
- H3f: The path from behavioral intention to use behavior is moderated by experience, such that the influence is stronger for persons with increased experience.

Method

A quantitative approach was considered suitable for the study. A total of 31,157 participants comprising of 110 library workers and 31,047 library patrons from 4 accredited university libraries in Ghana were targeted as the study population.

Library workers included professionals and paraprofessionals whose core duties were directly related to library services provision and library social media activities.

The library patrons consisted of the primary users of the libraries, namely: teaching staff totaling 1,041 and students totaling 30,006. Third and fourth-year students were selected based on the assumption that they had spent more than a year in the universities and would be more familiar with social media tools used by their university libraries for the provision of library resources and services. Teaching staff also comprised of only academic teaching staff who have full-time contract with their respective universities. This was done to avoid a teaching staff member answering more than one questionnaire since a teaching staff member can have only one full-time teaching status but several part-time appointments in different universities.

Although the study population was 31,157, its constituents were very homogeneous since they included students and members of comparable occupations (teaching staff and librarians) and therefore a smaller sample size was required to make it effective (Neuman, 2014, p. 270; Ngulube, 2015). Indeed, larger samples do not guarantee a representative sample especially when the population is homogenous (Bryman, 2012, p. 200) and could result in a waste of resources (Ngulube, 2015), because as the size of the population grows, the returns in precision for sample size decreases (Neuman, 2014, p. 270). So, Neuman (2014, p. 270) opined that an increase in sample size for small samples produces a bigger gain in accuracy than for large populations.

Consequently, although there are several methods to determine the samples for a given population, this study triangulated the census and published tables' approaches as the methods for selecting the sample size for this study, which stood at a total of seven hundred and sixty-seven (767). Due to the size of the population of the library staff category (110), the census approach is applied. This implies the enumeration of the entire population of library staff as sample size to achieve a desirable level of precision and closer representation of the population category. On the other hand, for the library patrons totaling thirty-one thousand and forty-seven (31,047), including thirty thousand and six (30,006) students, and one thousand and forty-one teaching staff (1041), the Krejcie and Morgan's published table for determining sample sizes of a given population was applied to select the sample sizes. Based on Krejcie and Morgan (1970) table, for a given population of 30,006 and 1,041, a sample size of 379 and 278 is adequate to provide enough accuracy for students and teaching staff respectively (see [Appendix A](#)).

Measurement items for the questionnaires administered to the study participants were derived from information obtained from Venkatesh et al. (2003). These were, however, modified to suit the context of the study. To ensure the survey's validity, questionnaires designed were pilot tested on 36 participants conveniently selected from the target population.

The questionnaire had 2 main parts. The first part was designed to obtain respondents' demographics such as gender, age, and level of experience in the use of social media. The second part consisted of statements used to measure key constructs of the UTAUT model deemed to be moderated by individuals' demographics, and were self rated on a five-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). A total of 94 from the library workers representing a response rate of 85.5% ($n=110$) and 511 from the library patrons representing a response rate of 77.8% ($n=657$) completed the questionnaires administered. Hence a usable questionnaire data of 605, representing a total response rate of 78.6% ($n=767$), were analyzed using descriptive statistics and the SEM analysis.

Researchers (e.g. Hoffmann et al., 2016; Bawack & Kamdjoug, 2018) have relied on and used the SEM to estimate the relationships and correlations between theoretical constructs from the UTAUT to understand behavioral intentions and use behavior. In particular, the use of the SEM is predominantly acceptable in Social Science research (Khan et al 2019). The SEM normally comprises of two forms of model analysis, namely the measurement model signifying the theory that identifies how measured constructs come together to denote the theory and the structural model signifying the theory that demonstrates how variables are associated to other variables (Hox & Bechger, 1998), thus rendering the SEM a suitable statistical tool for testing the study's hypotheses.

Ethical considerations

Ethical clearance was obtained from the universities where the study was conducted. Being a part of a doctoral research conducted in fulfillment for the award of a Doctor of Philosophy Degree in Information Science at the Department of Information Science in University of South Africa (UNISA), permission was sought and granted by the Research Ethics Committee, at UNISA.

Respondents were informed and briefed about the purpose of the study, not forced to partake in the study, and were given permission to withdraw from the study at any point they felt like doing so, but were assured of the confidentiality and anonymity of their responses.

Results

The findings are presented according to the hypotheses formulated, and response supplied to each of the hypothesis. The study does not seek to compare the responses from the various respondents (i.e. library staff and library patrons), and hence presents the findings from the respondents as one homogenous group.

Besides, given that the questions for the various categories of respondents were same, presentation of findings on a particular set of questions addressing a particular research hypothesis are presented together. This is done for easy collation of the research findings, and to avoid repetition of the same questions and responses on a particular hypothesis.

Of the 605 usable responses, 347 (57.4%) were males and 258 (42.6%) were females. Analysis of the ages of the respondents indicated that, 325 (53.7%) were between the ages of 18–35, whilst those above 35 years were 280 (46.3%). Two hundred and eighty (34.4%) seven of the respondents had at least used social media for less than five years whilst the remaining 318 (52.6%) had used such platforms for more than five years.

To evaluate the differential effects of the respondents' demographics (age, gender and level of experience), the t-test analysis and the Levene's Test for Equality of Variances were assessed in terms of the difference in degrees of freedom (df).

Gender as moderator of factors influencing the adoption and use of social media

Participants were divided into two groups according to their gender (i.e. male and female).

Results of analysis as presented in [Table 1](#) and [Appendix C](#) reveal that apart from effort expectancy and use behavior, there was no statistical significant difference between female and male respondents on all variables relative to performance expectancy, social influence, facilitating conditions and behavioral intentions.

For performance expectancy, males recorded a high mean (\bar{x}) of 21.50, with standard deviation (sd) of 4.64, like that of females who also recorded ($\bar{x} = 21.88$, $sd = 4.60$), $t(603) = -995$, $p = .320$.

Likewise, significant differences were also not found between males and females relative to behavioral intention, since variables relative to this concept were similar. Males recorded ($\bar{x} = 12.51$, $sd = 2.96$), which was not significantly different from females who recorded ($\bar{x} = 12.72$, $sd = 2.82$), $t(603) = -912$, $p = .362$. For social influence, males ($\bar{x} = 14.86$, $sd = 6.08$) recorded a higher mean than females ($\bar{x} = 14.29$, $sd = 5.94$) although no significant difference was recorded between the two: $t(603) = 1.132$, $p = .258$.

Mean scores for facilitating conditions ($\bar{x} = 10.96$, $sd = 5.24$) were equally higher than that of females ($\bar{x} = 10.45$, $sd = 5.12$), although the difference was not statistically significant. On the other hand, significant differences were found between males and females relatively on effort expectancy ($p = .000$) and use behavior ($p = .038$).

However, while effort expectancy recorded significantly higher mean for females ($\bar{x} = 16.42$, $sd = 4.12$) than males ($\bar{x} = 17.67$, $sd = 3.21$), $t(601)$, $p < 0.05$, use behavior recorded a higher mean for males ($\bar{x} = 18.12$, $sd = 5.21$) than for females ($\bar{x} = 17.25$, $sd = 4.87$), $t(605)$, $p < 0.05$.

Table 1. Influence of gender on factors influencing the adoption and use of social media.

Factors	Gender groups				N = 605		
	Male (n = 347)		Female (n = 258)		df	T	p-value
	\bar{x}	sd	(\bar{x})	sd			
Performance expectancy	21.50	4.64	21.88	4.60	603	−995	0.320
Effort expectancy	16.42	4.12	17.67	3.21	601	−4.190	0.000
Social influence	14.86	6.08	14.29	5.94	603	1.132	0.258
Facilitating conditions	10.96	5.24	10.45	5.12	603	1.198	0.231
Behavioral intention	12.51	2.96	12.72	2.82	603	−912	0.362
Use behavior	18.12	5.21	17.25	4.87	603	2.078	0.038

Note: Significant level is at $p < 0.05$. \bar{x} = mean; sd = standard deviation.

Table 2. Influence of age on factors influencing the adoption and use of social media.

Factors	Age groups				N = 605		
	Young (18–35yrs) (n = 325)		Old (35yrs+) (n = 280)		df	t	p-value
	\bar{x}	sd	\bar{x}	sd			
Performance expectancy	21.20	4.42	22.20	4.81	603	−2.66	0.008
Effort expectancy	16.59	3.67	17.37	3.93	603	−2.54	0.011
Social influence	15.18	6.55	13.97	5.28	600	2.51	0.012
Facilitating conditions	12.27	4.92	8.96	4.94	603	8.24	0.000
Behavioral intention	12.29	2.83	12.96	2.96	603	−2.85	0.004
Use behavior	20.28	4.37	14.81	4.19	603	15.65	.000

Note: Significant level is at $p < 0.05$. \bar{x} m = mean; sd = standard deviation.

Age as moderator of factors influencing the adoption and use of social media

For easy collation of research findings, participants were divided into two main groups according to their age. Group one comprised of respondents designated as ‘young’, and these were between ages ‘18–35’. Group two comprised of those referred to as ‘old’, and these were respondents who were ‘more than 35 years’.

As displayed in Table 2 and Appendix D, there were no statistically significant differences between the ‘young’ respondents and ‘old’ respondents relative to their views on: performance expectancy (‘young’: $\bar{x} = 21.20$, sd = 4.42; ‘old’: $\bar{x} = 22.20$, sd = 4.81, $t(605) = -2.66$, $p = .008$), effort expectancy (‘young’: $\bar{x} = 16.59$, sd = 3.67, ‘old’: $\bar{x} = 17.37$, sd = 3.93, $t(605) = -2.54$, $p = .011$) and social influence (‘young’: $\bar{x} = 15.18$; sd = 6.55, ‘old’: $\bar{x} = 13.97$, sd = 5.28, $t(605) = 2.51$, $p = .012$).

Significant differences were, however, found between ‘young’ and ‘old’ respondents’ relatively on facilitating conditions, behavioral intentions and use behavior.

Facilitating conditions for ‘young’ respondents’ recorded a mean value of 12.27, which was significantly different from ‘old’ respondents recording a mean value of 8.96, where $t(605) = 8.24$, with a p -value < 0.05 showing a significant difference between younger and older respondents on facilitating conditions as a factor influencing the use of social media for library services.

Similarly, the mean and standard deviation values for ‘young’ respondents ($\bar{x} = 20.28$, sd = 4.37) were higher than that of older respondents ($\bar{x} = 14.81$, sd = 4.19) and show a significant difference $t(605) = 15.65$, $p = .000$ between ‘young’ and ‘old’ respondents on use behavior.

For behavioral intention, although significant difference existed between younger and older respondents at a p -value of .004, the differences in the mean score and standard deviation values for young ($\bar{x} = 12.29$, sd = 2.83) and older respondents ($\bar{x} = 12.96$, sd = 2.96) were very small.

Table 3. Influence of experience on factors influencing the adoption and use of social media.

Factors	User experience levels				N = 605		
	No/or < 5yrs (n = 287)		5yrs and more (n = 318)		df	t	p-value
	\bar{x}	sd	\bar{x}	sd			
Performance expectancy	21.29	4.71	22.07	4.50	603	2.060	0.280
Effort expectancy	16.68	3.88	17.25	3.71	603	1.870	0.655
Social influence	14.19	6.02	15.09	6.02	603	1.857	0.412
Facilitating conditions	10.18	5.14	11.24	5.19	603	-25.5	0.036
Behavioral intention	12.19	2.92	13.05	2.81	603	3.649	0.001
Use behavior	13.81	3.15	15.95	3.69	603	7.678	0.000

Note: Significant level is at $p < 0.05$. \bar{x} = mean; sd = standard deviation.

Experience as moderator of factors influencing the adoption and use of social media

Respondents were divided into two main groups according to their prior experiences in the use of social media, namely: 'Group 1: No/or <5 years; 'Group 2: 5 years and above'. From the analysis of responses summarized and presented in Table 3 and Appendix E, there was no statistically significant difference at $p < 0.05$ for the two experience level groups on performance expectancy: $t(605) = 2.060$, $p = 0.280$, effort expectancy: $t(605) = 1.870$, $p = 0.655$, and social influence: $t(605) = 1.857$, $p = 0.412$, indicating that respondents with varied experience with social media had similar views on performance expectancy, effort expectancy and social influence.

Conversely, there was statistically significant difference at $p < 0.05$ level for the two experience level groups on facilitating conditions: $t(605) = -2.505$, $p = 0.036$, behavioral intention $t(605) = 3.649$, $p = 0.001$, and use behavior: $t(605) = 7.678$, $p = 0.000$.

Further, the mean values (\bar{x}) of the two groups on facilitating conditions, behavioral intention and use behavior indicated significant differences between them. Indeed, as presented in Table 5, all the actual mean scores for 'Group 1: No/or <5years', were lower than those of 'Group 2: 6yrs and above'.

Measurement model fits

Confirmatory Factor Analysis (CFA) is carried out to examine the overall fit of the proposed model. The values obtained, as against the recommended value for each of the model fits index showing an overall acceptable fit of the study's measurement model.

Testing study hypotheses

A SEM analysis was conducted to assess the proposed hypotheses. In these analyses, the predictor variables corresponded to performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC).

The moderating variables corresponded to gender, age and experience. The dependent variables corresponded to behavioral intention (BI) and use behavior (UB). A summary of the results from the SEM analysis presented, in Table 5, shows that overall *H1*, *H2* and *H3* were partially supported.

Hypothesis 1 (H1): The path from PE, EE, SI and FC on BI and UB is moderated by gender, such that the influence is stronger for females than for males

Findings from the SEM analysis shows that the path from performance expectancy (*H1a*) ($\beta = 0.416$, $p < 0.005$), effort expectancy (*H1b*) ($p < 0.005$; $\beta = 0.263$) and facilitating conditions (*H1d*) ($p < 0.005$; $\beta = -0.181$) to behavioral intention and use behavior (*H1e*) ($p < 0.005$; $\beta = 0.196$) are all significantly moderated by gender.

Table 4. AMOS output for fit statistics of the measurement model.

Model fit index	Recommended values	Values obtained		
		Gender	Age	Experience
GFI	>0.90	0.998	0.996	0.998
CMIN	<5	1.008	1.895	1.201
NFI	>0.90	0.996	0.992	0.995
CFI	>0.90	1.000	0.996	0.999
RFI	>0.90	0.977	0.957	0.972
TLI	>0.90	1.000	0.979	0.995
RMSEA	<0.05	0.004	0.039	0.018
RMR	<0.02	0.010	0.016	0.012

GFI = Goodness of fit index, NFI = Normal fit index, RFI = Relative fit index, CFI = Comparative fit index, TLI = Tucker Lewis index, RMSEA = Root mean square error of approximation, RMR = Root mean square residual.

Table 5. Summary of SEM analysis on influence of UTAUT moderators on factors influencing behavioral intention and use behavior of social media in University Libraries in Ghana.

Hypotheses/Moderator	Hypothesized paths	Path coefficient (β value)	p-value	Outcome	Remarks
H1-gender	H1a: PE → Gen ← BI	0.416	0.000	Supported	Partially
	H1b: EE → Gen ← BI	0.263	0.000	Supported	Supported
	H1c: SI → Gen ← BI	0.124	0.397	Not Supported	
	H1d: FC → Gen ← BI	-0.181	0.000	Supported	
	H1e: FC → Gen ← UB	0.196	0.000	Supported	
	H1f: BI → Gen ← UB	0.024	0.596	Not Supported	
H2-age	H2a: PE → Age ← BI	0.408	0.000	Supported	Partially
	H2b: EE → Age ← BI	0.261	0.000	Supported	Supported
	H2c: SI → Age ← BI	0.124	0.000	Supported	
	H2d: FC → Age ← BI	-0.187	0.000	Supported	
	H2e: FC → Age ← UB	0.196	0.000	Supported	
	H2f: BI → Age ← UB	0.024	0.576	Not supported	
H3-experience	H3a: PE → Exp ← BI	0.410	0.000	Supported	Partially
	H3b: EE → Exp ← BI	0.265	0.000	Supported	Supported
	H3c: SI → Exp ← BI	0.128	0.248	Not Supported	
	H3d: FC → Exp ← BI	-0.182	0.000	Supported	
	H3e: FC → Exp ← UB	0.196	0.000	Supported	
	H3f: BI → Exp ← UB	0.024	0.436	Not supported	

Note: Significant level is at $p < .005$.

The path from social influence to behavioral intentions (**H1c**) ($p > 0.005$; $\beta = 0.124$) and from behavioral intentions to use behavior (**H1f**) ($p > 0.005$; $\beta = 0.024$) were, however, not statistically significant (see [Figure 3](#))

Hypothesis 2 (H2): The path from PE, EE, SI and FC on BI and UB is moderated by age such that the influence is stronger for older people than for younger people.

From the results of the SEM analysis, the moderating effect of age on the path from behavioral intentions and use behavior (**H2f**) ($p > 0.005$; $\beta = 0.024$) was not statistically significant.

The path from performance expectancy (**H2a**) ($p < 0.005$; $\beta = 0.408$), effort expectancy (**H2b**) ($p < 0.005$; $\beta = 0.261$), social influence (**H2c**) ($p < 0.005$; $\beta = 0.124$) and facilitating conditions (**H2d**) ($p < 0.005$; $\beta = -0.187$) on behavioral intention, as well as from facilitating conditions and use behavior (**H2e**) ($p < 0.005$; $\beta = 0.196$) were all statistically significant (see [Figure 4](#))

Hypothesis 3 (H3): The path from PE, EE, SI and FC on BI and UB is moderated by prior user experience such that the influence is stronger for persons with increased experience.

The outcome of the SEM analysis on experience as a moderating variable showed that the path from performance expectancy (**H3a**) ($p < 0.005$; $\beta = 0.410$), effort expectancy (**H3b**) ($p < 0.005$; $\beta = 0.265$) and facilitating conditions (**H3d**) ($p < 0.005$; $\beta = -0.182$) on behavioral intention and use behavior (**H3e**) ($p < 0.005$; $\beta = 0.196$) were all statistically significant.

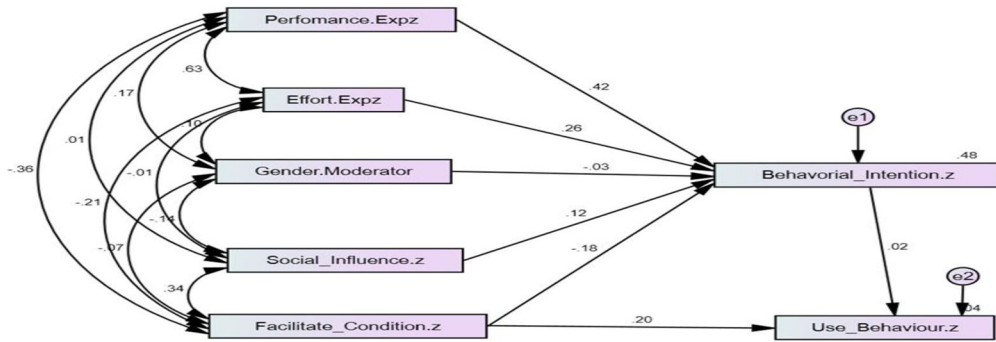


Figure 3. Results for SEM analysis with gender as moderator.

However, the p -values obtained for the path from social influence ($H3c$) ($p > 0.005$; $\beta = 0.128$) to behavioral intention, and from behavioral intention to use behavior ($H3f$) ($p = p > 0.005$; $\beta = 0.024$) were not statistically significant (see Figure 5).

Discussion of findings

The findings of the study are discussed based on the demographics that informed this study.

Gender as moderator of the factors influencing the adoption and use of social media

Following the moderating effect of gender, the results of the SEM analysis showed partial consistency with the study's 1st hypothesis (H1), since gender moderated the path from performance expectancy, effort expectancy, and facilitating conditions to behavioral intention as well as from facilitating conditions to use behavior of social media in the university libraries surveyed. This was, however, opposite in terms of the influence of gender on the path from social influence to behavioral intention and from behavioral intention to use behavior.

These findings are contrary to Hamid and Ibrahim (2019) but consistent with the results of several studies which demonstrate the influence of gender on technology acceptance using the UTAUT (e.g. Hwang et al., 2019; Lin & Yeh, 2019; Shao et al., 2019).

Further, the question of whether males and females differ on their acceptances of technology has received research attention. As shown in the literature reviewed, the argument on the influence of gender behavior largely demonstrates that the adoption and use of technology is more likely to be salient to males than females (Lim et al., 2017; Park et al., 2019; Venkatesh et al., 2012).

In a related study, for example, Odewumi, Yusuf, and Oputa (2018) from Nigeria reported significant difference between female and male postgraduate students' intention to use social media in learning, such that the male students' perception toward the intention to utilize social media in learning was more than their female counterparts.

Likewise, Raja-Yusof, Qazi, and Inayat (2017) reported gender as an important moderator but disclosed that the level of influence of effort expectancy and facilitating conditions on behavioral intention was more evident in females compared to their male participants.

Nevertheless, in the university libraries surveyed, no significant correlations were established between female and male respondents on all variables relative to performance expectancy, social influence and facilitating conditions. This indicates that males and females did not differ on performance expectancy, social influence and facilitating conditions. With regards to effort expectancy and use behavior, while the influence on the former was stronger for females ($m = 16.42$, $sd = 4.12$) than males ($m = 17.67$, $sd = 3.21$), $t(601) = -4.190$, that of the latter was stronger for males ($m = 18.12$, $sd = 5.21$) than for females ($m = 17.25$, $sd = 4.87$), $t(605) = -912$. This implies that, whilst males

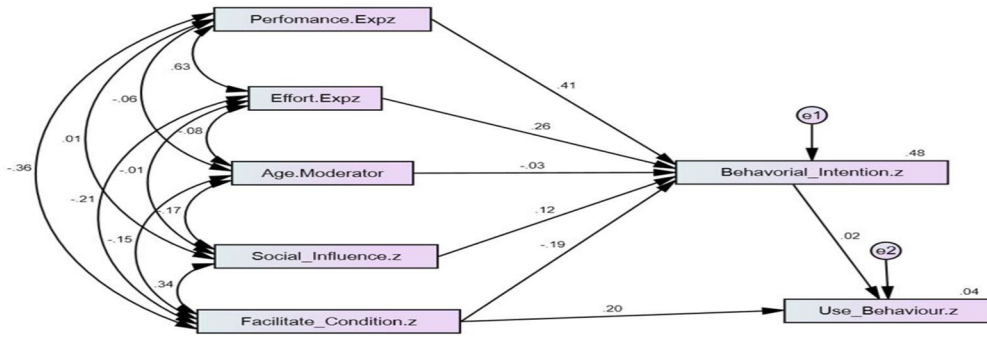


Figure 4. Results for SEM analysis with age as moderator.

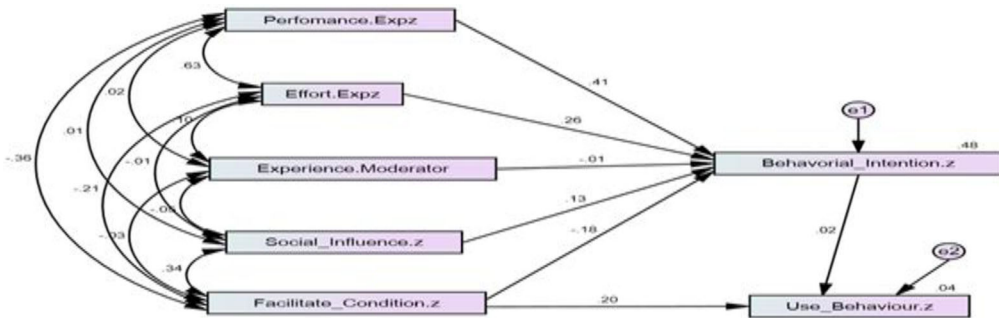


Figure 5. Results for SEM analysis with experience as moderator.

were more likely to perceive the use of social media as an easy to use platform for library services than females, females may use the library social media more often than males.

Age as moderator of the factors influencing the adoption and use of social media

In view of the SEM analysis, age moderated the path from performance expectancy, effort expectancy, social influence and facilitating conditions to behavioral intention as well as from facilitating conditions to use behavior of social media in the university libraries surveyed, but refuted the effect on the path from behavioral intention to use behavior. However, the t-test analysis showed no statistical difference between the age of the respondents relative to performance expectancy, effort expectancy and social influence. In other words, although age had a significant effect on the path from PE-BI, EE-BI, and SI-BI, the influence was not stronger for either younger or older respondents. This implies that the intention to use the library social media based on the belief that it will be easy to use, or will improve library services provision and access, or will be used based on recommendations from important others was not influenced by how old or how young a library worker or library patron is.

On the other hand, relative to facilitating conditions and use behavior, the effect of age was stronger among older respondents than for the younger respondents. Thus, unlike older individuals (35 years plus), younger individuals (18–35 years) in the university libraries surveyed will actually use the library social media for providing services and contacting the library when the needed support for the use of such platforms is provided. Generally, the findings of this study on the moderating effect of age partially supports the research findings of Hardy and Castonguay (2018), and Ameen et al. (2018) but are contrary to findings of other studies (e.g. Chatterjee et al., 2019; Humaid & Ibrahim, 2019; Palau-Saumell et al., 2019; Salahshour Rad et al., 2019).

Experience as moderator of the factors influencing the adoption and use of social media

The 3rd hypothesis of this study postulates that the path from performance expectancy, effort expectancy, social influence and facilitating conditions on behavioral intention and use behavior is moderated by experience, such that the influence is stronger for persons with increased experience. Overall, this hypothesis was partially supported, since results from the SEM analysis show that, although experience moderated the relationship between performance expectancy, effort expectancy, and facilitating conditions on behavioral intention and use behavior, its influence on the path from social influence to behavioral intentions and from behavioral intention to use behavior was statistically insignificant.

In addition, the results of the t-test analysis revealed that the influence of experience was only stronger for persons with increased experience in the use of social media relative to facilitating conditions, behavioral intention and use behavior. Thus, by implication, library workers and library patrons with increased experience in the use of social media platforms will tend to use, and subsequently use such platforms if they are exposed to the necessary skills, support, guidelines, resources, and assistance required in the use of such platforms for accessing and providing library services. Quite a number of studies are in support of this study's findings (e.g. McKeown & Anderson 2016; Palau-Saumell et al., 2019; Suki & Suki, 2017) although others (e.g. Arif et al., 2018; Hamaid & Ibrahim, 2019; Salahshour Rad et al., 2019) found the reverse.

Conclusion

With the progressing millennia, the adoption and use of social media are no doubt a modern-day phenomenon for a university library facilitated by advancement in technology.

Drawing upon the Unified Theory of Acceptance and Use of Technology (UTAUT) theory, this research assessed the moderating effect of personal characteristics such as gender, age and user experience on the factors influencing the adoption and use of social media in Ghanaian university libraries. Overall, from the SEM analyses, the study's hypotheses (i.e., H1, H2, and H3), were partially significant.

Practical implications of the study

Findings of this present study make practical contributions to university libraries that use social media for delivering services to patrons, and may serve as a guide for future researchers in their understanding of the acceptance and use of social media as a service provision platform among university libraries in Ghana. Moreover, the development and use of information technology such as social media require high budget and investment. As such, understanding the factors that influence the behavioral intention to use and use behavior of social media is especially critical for university libraries with often insufficient budget.

Besides, this study suggests that when considering the factors influencing the intention to use social media for library-related activities, university libraries should regard the personal demographic profiles such as age, gender and user experience. This indicates that different cohorts of the library workers and library patrons may attach different weights to various factors that influence their use of the library social media. As such university libraries in Ghana would be able to understand the differences among the moderating variable groups and thus, target the most appropriate groups within the moderating variables. For example, university libraries are recommended to engage younger library workers and patrons with increased experience in the use of social media tools as targets to promote social media for library services delivery and access.

Theoretical implications of the study

Based on empirical evidence, this study provides clues to the moderating effect of the library workers and library patrons profile characteristics such as age, gender, and prior experience in the use of social media. These factors offer guidance in recognizing the determinants that may stimulate the adoption and use of social media by university libraries in Ghana.

Generally, this study is novel, and adds to the few studies that have considered the effect of individual differences (i.e., gender, age, and experience) on the path between the UTAUT model main constructs, while at the same time reporting significant differences. In particular, previous research has not provided evidence of the influence of UTAUT theory in the context of social media acceptance in university libraries in Ghana.

Recommendations for further research

This research was largely quantitative. Future research can be improved by including both quantitative and qualitative research approaches to explore any other important constructs that fit in the context and can explain adoption in further detail.

Data availability statement

The data that supports the findings of this study are available from the corresponding author (M.M), upon reasonable request.

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Appendix A: Krejcie and Morgan’s published table

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10,000	373
65	56	220	136	480	214	1700	313	15,000	375
70	59	230	140	500	217	1800	317	20,000	377
75	63	240	144	550	225	1900	320	30,000	379
80	66	250	148	600	234	2000	322	40,000	380
85	70	260	152	650	242	2200	327	50,000	381
90	73	270	155	700	248	2400	331	75,000	382
95	76	270	159	750	256	2600	335	100,000	384

Note: “N” is population size; “S” is sample size. Source: Krejcie and Morgan (1970).

Appendix B

Questionnaire survey

1. Please tick as appropriate regarding your gender

Male

Female

2. In which age category do you belong?

Below 18 years

18–30

31–35

36–40

41–45

46–50

51–55

56–60

60+

3. How many years have you used social media for personal purposes?

Less than 1 year

1–2 years

3–4 years

5–10 years

10 years+

I do not use social media

Factors influencing acceptance and use of social media

On a scale of 1–5 where 1 = Strongly Disagree, 2 = Moderately Disagree, 3 = Moderately Agree, 4 = Agree, and 5 = Strongly Agree, please answer questions 4 to 8 by indicating the appropriate response that reflects your level of agreement with the statements provided in relation to the adoption and use of social media for the provision of library services and resources, as well as for contacting the library.

Statements	Scale				
	1	2	3	4	5
4. Performance expectancy					
Social media is/will be useful for providing and accessing library services and resources					
Social media will enable/enables faster communication within the library					
Social media will improve/improves communication with the library/patrons					
Social media will enhance/enhances communication with the library/patrons					
If I use social media, communication with the library/patrons is/will be easier					
5. Effort expectancy					
I will use/use the library social media because it is easy to learn how to operate					
I will use/use the library social media because I find it easy to use					
I will use/use the library social media because interacting with it is clear and understanding					
I will use/use the library social media because it is easy to develop the skills required to use such tools					
6. Social influence					
I use/will use the library social media because my colleagues think I should use it					
My colleagues and friends think I should the library social media					
I use/will use the library social media because people who are important to me think I should use them					
I use/will use the library social media because people whose opinions I value think I should use them					
Using the library social media is considered a status symbol among my colleagues.					
I use/will use the library social media because my colleagues think I should use it					
7. Facilitating conditions					
I have the knowledge necessary to use the library social media platforms					
I have the resources to use the library social media platforms					
Someone is available for assistance if I have difficulty with the library social media					
There is available guidance on how to use the library social media the platforms					
8. behavioral intention					
I desire to use the library social media platforms					
I expect to use the library social media platforms					
I predict to use the library social media platforms					
8. Use behavior					
It is worthwhile to use the library social media					
I actually use the library social media platforms					
I will continue using the library social media platforms					
I consistently use the library social media platforms					
I regularly use the library social media platforms					

Appendix C: T-test analysis on gender

Independent samples test		Levene's test for equality of variances		t-test for equality of means (\bar{x})			95% confidence interval of the difference			
		F	Sig.	t	df	Sig. (2tailed)	Mean(\bar{x}) difference	Std.error difference	Lower	Upper
Performance expectancy	Equal variances assumed	1.053	.305	-.995	603	.320	-.37840	.38034	-1.12536	.36855
	Equal variances not assumed			-.996	556.38 2	.320	-.37840	.37986	-1.12454	.36773
Effort expectancy	Equal variances assumed	27.492	.000	-4.043	603	.000	-1.24880	.30889	-1.85543	-.64217
	Equal variances not assumed			4.190	601.58 1	.000	-1.24880	.29802	1.83408	-.66352
Social influence	Equal variances assumed	.868	.352	1.132	603	.258	.56034	.49512	-.41203	1.5327 1
	Equal variances not assumed			1.136	560.92 8	.257	.56034	.49335	-.40870	1.5293 8
Facilitating condition	Equal variances assumed	1.089	.297	1.198	603	.231	.51104	.42664	-.32685	1.3489 2
	Equal variances not assumed			1.202	560.94 7	.230	.51104	.42512	-.32398	1.3460 5
Behavioral intention	Equal variances assumed	1.134	.287	-.912	603	.362	-.21760	.23870	-.68639	.25119
	Equal variances not assumed			-.918	567.59 0	.359	-.21760	.23701	-.68312	.24791
Use behavior	Equal variances assumed	2.467	.117	2.078	603	.038	.86622	.41679	.04767	1.6847 6
	Equal variances not assumed			2.099	572.33 8	.036	.86622	.41272	.05558	1.6768 6

Appendix D: T-test analysis on age

Independent samples test		Levene's test for equality of variances		t-test for equality of means (\bar{x})			95% confidence interval of the difference			
		F	Sig.	t	df	Sig. (2tailed)	Mean(\bar{x}) difference	Std.error difference	Lower	Upper
Performance expectancy	Equal variances assumed	.260	.610	-2.664	603	.008	-1.00000	.37536	-1.73716	-.26284
	Equal variances not assumed			-2.647	571.988	.008	-1.00000	.37772	-1.74188	-.25812
Effort expectancy	Equal variances assumed	.221	.638	-2.538	603	.011	-.78374	.30886	-1.39031	-.17717
	Equal variances not assumed			-2.525	575.792	.012	-.78374	.31044	-1.39347	-.17401
Social influence	Equal variances assumed	29.051	.000	2.468	603	.014	1.20703	.48915	.24639	2.16768
	Equal variances not assumed			2.507	600.454	.012	1.20703	.48149	.26142	2.15265
Facilitating condition	Equal variances assumed	1.139	.286	8.241	603	.000	3.31005	.40166	2.52123	4.09888
	Equal variances not assumed			8.238	589.011	.000	3.31005	.40180	2.52091	4.09920
Behavioral intention	Equal variances assumed	.329	.566	-2.853	603	.004	-.67148	.23534	-1.13367	-.20930
	Equal variances not assumed			-2.844	581.135	.005	-.67148	.23613	-1.13525	-.20772
Use behavior	Equal variances assumed	.519	.472	15.652	603	.000	5.47593	.34986	4.78885	6.16302
	Equal variances not assumed			15.702	596.211	.000	5.47593	.34875	4.79102	6.16085

Appendix E: T-test analysis on experience

User Experience	N	\bar{x}	Std. deviation	Std. error mean	
Performance expectancy	No/ Less than 5 years & 5 years & above	287	21.2956	4.71464	0.26438
Effort expectancy	No/ Less than 5 years & 5 years & above	318	22.0697	4.50043	0.26565
Social influence	No/ Less than 5 years & 5 years & above	287	16.6761	3.87813	0.21747
Facilitate conditions	No/ Less than 5 years & 5 years & above	318	17.2544	3.70524	0.21871
Behavioral intention	No/ Less than 5 years & 5 years & above	287	14.1887	6.00070	0.33650
Use behavior	No/ Less than 5 years & 5 years & above	318	15.0976	6.02479	0.35563
	No/ Less than 5 years & 5 years & above	287	10.1847	5.14653	0.30379
	No/ Less than 5 years & 5 years & above	318	11.2390	5.18972	0.29103
	No/ Less than 5 years & 5 years & above	287	12.1950	2.92704	0.16414
	No/ Less than 5 years & 5 years & above	318	13.0488	2.81437	0.16613
	No/ Less than 5 years & 5 years & above	287	13.8113	3.15763	0.17707
	No/ Less than 5 years & 5 years & above	318	15.9512	3.69526	0.21812

Independent samples test	Levene's test for equality of variances		t-test for equality of means (\bar{x})			Mean (\bar{x}) difference	Std. error difference	95% confidence interval of the difference		
	F	Sig.	t	df	Sig. (2tailed)			Lower	Upper	
Performance expectancy	Equal variances assumed	1.172	0.280	2.060	603	0.040	0.77409	0.37569	0.03627	1.51190
	Equal variances not assumed			2.065	601.097	0.039	0.77409	0.37479	0.03803	1.51015
Effort expectancy	Equal variances assumed	0.199	0.655	1.870	603	0.062	0.57825	0.30915	-0.02890	1.18541
	Equal variances not assumed			1.875	601.036	0.061	0.57825	0.30843	-0.02748	1.18399
Social Influence	Equal variances assumed	0.674	0.412	1.857	603	0.064	0.90888	0.48950	-0.05245	1.87021
	Equal variances not assumed			1.856	596.201	0.064	0.90888	0.48960	-0.05267	1.87043
Facilitate conditions	Equal variances assumed	0.317	0.036	-2.505	603	0.013	-1.05432	0.42088	-1.88088	-0.22777
	Equal variances not assumed			-2.506	597.670	0.012	-1.05432	0.42069	-1.88054	-0.22811
Behavioral intention	Equal variances assumed	2.931	0.001	3.649	603	0.000	0.85381	0.23401	0.39424	1.31338
	Equal variances not assumed			3.656	600.576	0.000	0.85381	0.23354	0.39516	1.31246
Use behavior	Equal variances assumed	18.715	0.000	7.678	603	0.000	2.13990	0.27871	1.59254	2.68726
	Equal variances not assumed			7.617	565.560	0.000	2.13990	0.28095	1.58807	2.69173