**Researchers and Social Networking Sites usage: the application of UTAUT theory**

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**Abstract**

**Aim:** This study aims to investigate the use of SNS by researchers and their behaviours when conducting research-related activities by applying the UTAUT theory.

**Design/methodology/approach:** An online survey was distributed. This study's design is derived from the UTAUT framework's questionnaire items. The sample of this study comprised 216 respondents from 40 universities in the United Kingdom. Descriptive statistics were used to analyse the data.

**Findings:** Respondents revealed a positive relationship between the four constructs of the UTAUT framework (performance expectancy, effort expectancy, social influence, and facilitating condition) associated with their intention to use SNS.

**Research limitations/implications:** Most of the respondents were from the University of Strathclyde, so we cannot generalize the findings to other universities.

**Practical implications**: The findings will offer an extensive understanding of the value of social networking sites, which will aid researchers to increase their visibility, and research activities online.

**Theoretical Implications:** This research will continue to expand UTAUT to better reflect the exploration of social networking use within research practices. The results will increase researchers’ awareness of how social networking sites can be used to improve research collaboration.

**Originality (Practical and Theoretical value):**  Practical value: The results will provide an in-depth knowledge of the importance of social networking sites, helping scholars to become more visible and engage in online research. A number of factors impacted how researchers behaved on social networking sites and what they intended to use for research-related activity. School administrators, experts, and other sponsors could take action to promote the use of social networking sites (SNSs) in educational settings based on the findings. The study's findings offer insightful knowledge to those who create SNS websites. By using this information, they will be able to improve these sites for research and study and gain a better understanding of the demands of SNS users.

Theoretical value: By applying the UTAUT to researchers' usage of social networking sites, this study contributes to the limited literature on this topic. Moreover, Venkatesh, Thong, and Xu (2016) recommended using the UTAUT in a different subject and setting. By applying it to the educational setting and examining how researchers use social networking sites for research-related purposes, this paper filled up this gap.

**Keywords:** Social Networking Sites (SNSs), Researchers, UTAUT

1. **Introduction**

Numerous new services and products are introduced in the areas of technology and the Internet. Some of these products include wikis, forums, social networking sites, and microblogging. Higher education institutions use social media to promote teaching and learning, encourage students to participate actively and build connections within the university community, all of which have a positive impact on the educational process (Christos Papademetriou, 2022). Moreover, it enables academics and researchers to interact, connect, and stay abreast of the most recent developments in many different kinds of subject areas of study (Meishar-Tal & Pieterse, 2017).

Some of the previous research has investigated the use of these sites by academics and researchers and how they use them for their research/study activities. It enables academics to collaborate and share their work with others. Moreover, reading the most recent papers of other researchers and the publication of their papers (Thelwall & Kousha, 2017). Furthermore, it meets the needs of researchers by providing publications and communication with other researchers all over the world (Meishar-Tal & Pieterse, 2017).

Additionally, it was obvious that SNS was incredibly beneficial for students in their academic lives as the world dealt with a pandemic (COVID-19). Interactivity between students, teachers, and their colleagues is directly improved by the use of social media for collaborative learning and student involvement (Omar A. Alismaiel, 2022).

Even though researchers use social networking sites (SNS) to communicate and gather information, their behaviours on these sites are unclear. This may be due to a lack of adoption of new technologies. Using the Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical framework, this paper investigates the use of social networking by researchers and their behaviours when conducting research-related activities.

1. **Literature review**
	1. *Social Networking Sites*

The widespread use of computers, as well as the expansion of the Internet and related programs, such as social networking sites, have transformed how users seek information in a variety of sectors. Furthermore, it alters how researchers and scholars get knowledge in their fields of interest. Because of the researcher's use of the Internet in their daily lives, it's necessary to look at their objective of using the Internet to get information. Also, as how they acquire, seek, use, and exchange information.

Boyd and Ellison define social networking sites as ‘Web-based-services that allow individuals to

1. construct a public or semi-public profile within a bounded system,
2. articulate a list of other users with whom they share a connection, and
3. View and traverse their list of connections and those made by others within the system’, (Boyd & Ellison, 2007)

 Furthermore, social networking sites are web-based services that allow users to read, engage with, and visit other users' content (Boyd & Ellison, 2007).

Social networking sites (SNSs) must become one of the most common and essential sites for sharing information and enabling communication among users around the world. It attracted more users from around the world to participate and collaborate. Additionally, (Waechter, Subrahmanyam, Reich, & Espinoza, 2010) found social networking sites provide users with the opportunity to share resources and find shared interests in addition to promoting issues and causes.

* 1. Researchers' Use of Social Networking Sites

For various objectives, researchers use various social networking sites. Worldwide, scholars and researchers have been interested in Twitter and a number of other social networking sites. To comprehend the user's behaviour, various research has been carried out. Nonetheless, there aren't many studies that are connected to educational and research activities.

According to studies (Al-Daihani, Al-Qallaf and AlSaheeb, 2018, Amany M. Elsayed, 2016b), the majority of academic members used ResearchGate as their platform of preference. Moreover, Velitsianos and Kimmons (2016), the usage of social media for scholarship indicates that academics have only looked into a small number of scholars' online activities, possibly ignoring other aspects of an online presence.

To sum up, this paper uses the Unified Theory of Acceptance and Use of Technology (UTAUT) to investigate how researchers use social networking sites.

1. **The Unified Theory of Acceptance and Use of Technology (UTAUT)**

Figure 1 illustrates the framework that Venkatesh et al. (2003) established to explain the user's acceptance to use and adopt a specific information system.

Eight information technology acceptance models and theories form the foundation for this framework. These include the following: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT) (Venkatesh et al., 2003).

Performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) are the four main variables as explained below.



*Figure 1: Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)*

Performance expectancy (PE) is the first construct which is defined as ‘the degree to which an individual believes that using the system will help him or her to attain gains in job performance.’ (Venkatesh et al., 2003, p. 447).

The second construct is effort expectancy (EE) which is defined as, ‘the degree of ease associated with the use of the system’(Venkatesh et al., 2003, p. 450).

The third construct is the social influence (SI) which is defined as, ‘the degree to which an individual perceives that important other believe he or she should use the new system’ (Venkatesh et al., 2003, p. 451).

The final construct is facilitating conditions (FC) which are defined as, ‘the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system’ (Venkatesh et al., 2003, p. 453).

In addition, it contains four moderators: gender, age, experience, and voluntariness of use as explained below:

* Gender is defined as ‘gender roles have a strong psychological basis and are relatively enduring, yet open to change over time.’ (Venkatesh et al., 2003, p. 450).
* Age is defined as, ‘age is theorized to play a moderating role on attitudes’ (Venkatesh et al., 2003, p. 450)
* Experience: Venkatesh classified experience into three levels based on time: ‘post-training (T1), one month after implementation (T2), and three months after implementation (T3).’(Venkatesh et al., 2003, p. 437)
* Voluntariness of use is defined as ‘the degree to which use of the innovation is perceived as being voluntary, or of free will.’ (Moore & Benbasat, 1991, p. 195).

Some previous studies have been conducted to investigate the use of SNS using the UTAUT framework while excluding/including the moderating factors. For example, students use social networking sites for learning because of their ease of use, positive perceptions of their use, and aid in the development of their learning, (Odewumi, Yusuf, & Oputa, 2018; Tan, 2013).

(Gruzd, Staves, & Wilk, 2012) explored why and how academics use social media to disseminate information and communicate. They reported that they are using social media tools for professional work since these tools are more efficient for building new connections with peers, collaborating, and disseminating research.

Additionally, academics are increasingly adopting and using social networking sites. This has eliminated geographical barriers, helped form new connections, expanded the scholarly community, and enhanced research (Al-Aufi & Fulton, 2015; Al-Daihani et al., 2018; Amany M Elsayed, 2016; Gruzd & Goertzen, 2013; Mansour, 2015)

Although the UTAUT was the best model to explain usage intention 70% and usage behaviours 52% (Tang & Chen, 2011), the investigations of some of the previous studies revealed a lack of theoretical framework.

It was also suggested that UTAUT be used in a new field and setting (Venkatesh, Thong, & Xu, 2016). As a result, this suggestion assists this research in using the UTAUT framework to investigate how researchers use social networking sites when doing research or studies.

* 1. *Researcher usage of social networking sites*

Different social networking sites were used by the researchers for various goals such as Twitter, bloggers, ResearchGate, and LinkedIn. The most common reasons for using social networking sites were sharing and obtaining information, cooperating with others, socializing, sharing publications, and staying up to date. Furthermore, academics are increasingly accepting and popularising the use of social networking sites, which has erased geographical barriers, aided in the formation of new relationships, expanded the scholarly community, and enhanced research (Al-Aufi & Fulton, 2015; Al-Daihani, Al-Qallaf, & AlSaheeb, 2018; Elsayed, 2016; Gruzd & Goertzen, 2013; Mansour, 2015)

According to (Veletsianos, 2012), scholars used Twitter to share resources, information, and media related to their professional practice; to share information concerning their classroom and their students; to ask for and offer help from others; to engage in social discussions; to manage their identity and impressions, and to network and connect with others.

With a focus on Ph.D. students, (Baruffaldi, Di Maio, & Landoni, 2017) discovered that Ph.D. holders moving into the industry are more likely to create a LinkedIn account and to have a greater network of LinkedIn contacts. Furthermore, if they have co-authors from other countries, they are more likely to use LinkedIn. In addition, if they have moved overseas after receiving their Ph.D., they have a larger network.

Another study by (Al-Daihani et al., 2018; Elsayed, 2016), found that ResearchGate (RG) was the most popular platform among faculty members. However, a study (Muscanell & Utz, 2017) found that ResearchGate (RG) use was linked to productivity and stress rather than career satisfaction or informative gains.

For the bloggers, reading such blogs not only kept them up to date on research and issues in their field but also helped them get to know other researchers who were interested in the same subjects (Bonetta, 2007).

In addition, many researchers found that they all shared a common objective in exploring social networking sites’ usage and how the sites are used by postgraduates, lecturers, and academics. So, to conclude, this paper investigates their usage and behaviours when they conduct their research-related activities.

1. **Ethic procedure**

The Department of Computer and Information Science at the University of Strathclyde's Ethics Committee provided their ethical approval. Once this approval was received, data gathering started.

1. **Methodology**
	1. *Research design*

In accordance with the study's objectives, the items were modified from the UTAUT framework's original creator, and some terms were added. Every construct contains certain items that aid in understanding how people behave and intend to use technology (Venkatesh et al., 2003).

* 1. *Research method*

A quantitative technique approach was used in this study to address the research questions. An online survey was employed. The framework known as the Unified Theory of Acceptance and Use of Technology (UTAUT) was utilised. It included insightful details about researchers' attitudes, behaviours, and views regarding the use of SNSs for their research purposes.

* 1. *Research sample*

There were 216 participants in the study, making the sample size actually useable. 102 participants, or most of them, were from the University of Strathclyde, Glasgow, United Kingdom. As a general guideline, Roscoe (1975, Hill, 1998) stated that experimental study should have a sample size of at least thirty.

* 1. *Data collection*

The questionnaire design consists from two sections. The first section asks the participants about demographic information, the university studied in, their position, and experience of using SNSs.

The UTAUT items, which comprised the second section, were scored on five-point Likert scales. In order to meet the study's objectives, the items were modified from the UTAUT framework's original developer. Every construct of the UTAUT has some items that aid in understanding people's intentions and behaviour when utilising technology (Venkatesh et al., 2003).

Qualtrics, an online survey platform, was used to collect data. First, the author emailed the survey link to the administrators of the departments at the University of Strathclyde, who then distributed it to all of the university's academics, researchers, and postgraduate students. The invitation email includes a link to the survey as well as some background information on the study and the researcher. In addition, the researcher employed the WhatsApp tool to distribute to university student groups to recruit and attract a larger number of respondents. As another method of recruiting more respondents, they were invited to forward the link to their friends or colleagues.

Second, the researcher of this study used Twitter and WhatsApp to distribute the survey to other universities in the UK, to reach a larger audience.

* 1. *Data analysis*

379 replies were obtained from the questionnaire, which was sent to forty universities in the United Kingdom. 163 incomplete responses and 216 complete responses were received. So, the total number were 216 responses.

IBM SPSS V27 was used to analyse the data in this study (Statistical Package for the Social Sciences). Descriptive statistics, the Normality test, the Reliability test, and the Kruskal-Wallis test, as well as CCA (Canonical Correlation Analysis), were all used.

This survey was designed using UTAUT framework items. Each construct has some items that help to understand people's behaviours and intentions when they use technology (Venkatesh et al., 2003). The questionnaire was divided into two sections. The first section consisted of closed-ended questions with the ability for respondents to provide their answers. Age and gender were among the demographic data collected. There were also non-users of the SNS for their research, and questions were included to find out why they weren't using it. The UTAUT items were measured using five-point Likert scales in the second section.

For the validity of the data, a test was carried out to determine them (Venkatesh et al., 2003). Data were collected from eight organizations after the preliminary test for cross-validation of the UTAUT framework. All internal consistency reliabilities (ICRs) were more than.70, indicating that the scales were reliable.

And for reliability, all constructs were determined to be highly consistent and significant (Alpha >.80), (Venkatesh et al., 2003). As a result, Cronbach's alpha was conducted to determine the questionnaire reliability in this study. The reliability analysis of the scales showed that Cronbach's Alpha values ranged between 0.72 and 0.76. Hence, this instrument was considered acceptable for this study as it demonstrated internal consistency.

 **5. Results**

This section presents the results of the descriptive statistical analysis. It includes sample demographics and the impact of UTAUT constructs.

*5.1 Response rate and demographics*

There were 379 responses, with 57% complete responses and 43% incomplete responses. As a result, this study’s actual usable sample size was 216 respondents. Respondents came from forty different universities across the United Kingdom. The majority of respondents (102) were from the University of Strathclyde. There were (31.9% males) and (68.1%females), see Table 1.

The majority of respondents were Ph.D. students, followed by Master’s students (MA, MSc, MPharm, MSc Environmental Entrepreneurship, Master taught student), then graduate students, and finally Academics, see Table 1.

The analysis of respondents' ages showed that the largest age group was those between the ages of 31 and 40, followed by those between the ages of 20 and 30, and finally those over 40, see table 1.

The respondents were drawn from four major faculties at the universities. The majority of them came from the science faculty (91), followed by the humanities and social sciences faculty (68), engineering faculty (40), and business school (17), see Table 1.

According to the respondents' SNS usage experience, (92) have less than one year of experience using SNS for research-related activities, and (124) have more than one year of experience using SNS for research-related activities, see table 1.

Table 1: Respondents’ Demographic Data (N=216)

|  |  |  |
| --- | --- | --- |
| Character | Frequency | Percent |
| Gender (N=216)  | Male  | 69 | 31.9% |
| Female  | 147 | 68.1% |
| Age (N=216)  | 20-30  | 68 | 31.5% |
| 31-40  | 110 | 50.9% |
| Over 40  | 38 | 17.6% |
| Position (N=216)  | Academic  | 25 | 11.6% |
| Ph.D. student  | 121 | 56.0% |
| Master student  | 42 | 19.4% |
| Graduated student  | 28 | 13.0% |
| Faculty (N=216)  | Science  | 91 | 42.1% |
| Engineering  | 40 | 18.5% |
| Business School  | 17 | 7.9% |
| Humanities and Social Sciences  | 68 | 31.5% |
| SNS Usage for their research-related activities (N=216)  | Less than 1 year  | 92 | 42.6% |
| More than 1 year   | 124 | 57.4% |

*5.2 Social networking sites for research-related activities (user and non-user of SNS)*

According to the findings of this study, 70% respondents used SNS for research-related activities, while 30% did not.

Respondents who used SNSs for their research-related activities reported a variety of reasons. Figure 2 shows that 58% of respondents use these sites for keeping up to date, sharing and finding information specific to their research activities 50%, gaining knowledge 43%, sharing their publications 32%, job searching 24%, socializing 23%, and promotion 17%.

Figure 2: Social Networking Sites Usage by the Respondents

On the other hand, respondents who did not use SNSs for their research-related activities reported several barriers that prevented them from using them. Figure 3 displays these barriers.

Lack of interest 15%, followed by a lack of time 11%, a lack of university encouragement 9%, and a lack of facilities 8%, were the most frequent barriers. Distraction, lack of privacy, and information overload, all had the same percentage 7%.

Figure 3: Social Networking Sites Barriers by the Respondents

*5.3 UTAUT constructs*

The Kruskal-Wallis test revealed a statistically significant difference in the three moderators in users' behavioural intentions to use SNS for research-related activities for the moderating factors (age, gender, and experience). Some UTAUT constructs showed statistically significant differences, while others did not.

*5.3.1 Performance Expectancy (PE)*

 *Performance Expectancy* (PE) was statistically significant to the usage of SNS. The behavioural intention to use SNS in the future and regularly was high among researchers who considered the sites beneficial and productive. Additionally, they think that using SNS for research-related activities will give them access to the most recent information on their subject.

*5.3.2 Effort Expectancy (EE)*

*Effort Expectancy* (EE) was statistically influenced by the use of SNS. This demonstrated that researchers with skills, ease of use, and experience with SNS intention to continue using these sites regularly. Additionally, they think that using SNS in their research-related activities is simple to understand and quick to learn.

*5.3.4 Social Influence (SI)*

Social influence (SI) was statistically significant in the use of SNS. This demonstrated that since their institution's team support was beneficial and encouraging, researchers' behavioural intention to use SNS was increasing with time. Researchers also found that their supervisors, friends, and families support them in using SNS for research-related tasks.

*5.3.5 Facilitating Conditions (FC)*

*Facilitating Conditions* (FC) had been statistically significant in the use of SNS. The fact that researchers have the knowledge and resources required to use SNS as well as other ways to contribute to the solution of systemic problems. In addition, the researcher thinks that having the relevant information will enable them to use SNS for research-related tasks.

As a result, the findings of this study support the research hypothesis, demonstrating that study constructs have a significant impact on behavioural intention. There was a statistically significant correlation between the three items of Behavioural Intention (BI) of SNS usage and the set of measurable variables of the four UTAUT constructs. Three functions were obtained from the analysis, and for each successive function, the squared canonical correlations (Rc 2) were 0.724, 0.295, and 0.198 (Table 2).

Table 2: Canonical Correlation analysis of the relationship between the measurable variables of the four UTAUT constructs, and the three items of (BI) Behavioural Intention of SNSs usage

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Eigenvalue | Canonical Correlation | Squared Correlation |
| 1 | 2.635 | 0.851 | 0.724 |
| 2 | 0.419 | 0.544 | 0.295 |
| 3 | 0.247 | 0.445 | 0.198 |

*5.4 Moderating Factors*

According to the individual test findings based on the researcher's perceptions, the researcher's usage varied statistically significantly depending on gender, age, and experience. The constructs that significantly and insignificantly affected the moderating factors are displayed in Table 3.

Table 3: Moderating factors with their significant constructs.

|  |  |  |
| --- | --- | --- |
| Moderating Factors | Significant Constructs | Insignificant constructs |
| Gender | Effort Expectancy (EE), Social Influence (SI) | Performance Expectancy (PE) |
| Age | Performance Expectancy (PE), Facilitating Condition (FC) | Effort Expectancy (EE), Social Influence (SI) |
| Experience | Effort Expectancy (EE), Facilitating Condition (FC) | Social Influence (SI) |

The user behavioural intention to use SNSs for research-related activities varied statistically significantly among the three moderators, according to the Kruskal-Wallis test. Table 4 shows the significant differences between the UTAUT construct items and the items that had no effect.

Table 4: Results for Moderating Factors

|  |  |  |
| --- | --- | --- |
| **UTAUT Constructs** | **Items had significant differences** | **P-Value** |
| **Age** | **Gender** | **Experience** |
| **Performance Expectancy (PE)** | I find SNSs useful for my research-related activities | **0.009** |  |  |
| Using SNSs enables me to accomplish tasks more quickly |  | **0.046** |  |
| **Effort Expectancy (EE)** | It is easy for me to become skilful at using SNSs |  | **0.002** |  |
| I find SNS easy to use |  | **0.006** | **0.016** |
| Learning to operate SNSs is easy for me |  |  | **0.032** |
| **Social Influence (SI)** | The support team of this university has been helpful in the use of SNSs |  | **0.017** |  |
| In general, the university has supported the use of SNSs |  | **0.008** |  |
| **Facilitating Conditions (FC)** | I have the resources necessary to use SNSs | **0.021** |  | **0.001** |
| I have the knowledge necessary to use SNSs | **0.029** |  | **0.020** |
| SNS is compatible with other technologies I use | **0.005** |  |  |
| **Behavioural Intention (BI)** | I intend to continue using SNSs in the future | **0.023** | **0.001** |  |
| I will always try to use SNSs in my daily life |  | **0.001** |  |
| I plan to continue to use SNSs frequently |  | **0.029** |  |

**6. Conclusion**

This study used a quantitative methodology. The results showed a significant relationship between respondents' intentions to use SNS and the four elements of the UTAUT framework (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions).

The results also demonstrate that the respondents used SNS for various objectives and engaged in a variety of SNS-related activities. Additionally, several obstacles prevented respondents from using SNS for research-related tasks.

The Kruskal-Wallis test revealed that there was a statistically significant difference in the three moderators (age, gender, and experience) for users' behavioural intention to use SNS for their research-related activities. While other elements of the UTAUT constructs had no impact, some of them showed statistically significant changes.

Finally, the results will provide a thorough understanding of the significance of social networking sites, which will help researchers promote their research and activities online. Moreover, the results will provide a comprehensive understanding of the usefulness of social networking sites, assisting researchers in raising their profile and conducting online research. For instance, this study's findings can aid researchers in their understanding of the uses and applications of social networking sites in the context of their academic research projects. Furthermore, it can assist academic staff in their research and teaching activities, as well as in their reflections on the functions and applications of social networking sites, and institutional support teams in providing training courses to help faculty members understand the rapidly developing social networking sites.

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