

**TECHNOLOGY ACCEPTANCE FACTORS IN THE USE OF  
INSTITUTIONAL REPOSITORIES: THE CASE OF THE UNIVERSITY  
OF SWAZILAND (UNISWA)'S FACULTY OF AGRICULTURE AND  
CONSUMER SCIENCES**

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**Abstract**

*Institutional Repositories (IRs) have become essential infrastructures for freely disseminating scholarly output to researchers' world over without any access barriers. IRs were introduced to ease information access constraints which were faced by libraries worldwide in the 1990s. These included excessive library budget cuts, annual increases in journal prices above inflation rates, and the devaluation of local currencies. These made it difficult for libraries to maintain their journal subscriptions. Librarians thereby expected IRs to be accepted and fully embraced by users. This however, has not been the case. Factors including the ease of navigating IRs, perceived usefulness, the use of IRs by peers, and the availability of resources to support the usage of IRs have influenced user's decisions to adopt and use IRs. This paper therefore examined technology acceptance factors likely to promote or inhibit UNISWA faculty from using their IR. It further highlighted how these factors could be mitigated to promote the effective dissemination of library information resources through IRs. Questionnaires were used to collect data from academic staff. This paper was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT), which assessed what happened as users interacted with the IR, and predicted their future usage intentions. Research findings revealed that performance expectancy, effort expectancy, and facilitating conditions influenced UNISWA faculty's intentions to accept and use the repository. Social influence however, did not influence faculty's decisions to use the IR. The discussed issues have implications on research, policy enhancement and theory in developing country contexts.*

**Keywords:** *Institutional Repositories; Information Technologies; Technology Acceptance; University libraries; Swaziland.*

## Introduction

The development of networked communication and digital technologies radically changed the way researchers create, distribute, and access scholarly work (Dubinsky, 2014). Prior to the advent of the internet and information technology, scholarly communication was very slow. Information technological developments thus brought about effective ways to create, store and disseminate scholarly content (Ammarukleart, 2017). One development central to the advances in information technologies is the establishment and growth of institutional repositories (Dubinsky, 2014). IRs are defined as a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members (Lynch, 2003). According to Abrizah (2009), and Buehler & Boateng (2005) institutional repositories have played a vital role in freely providing online access to a wide range of scholarly resources (including peer-reviewed journal articles, book chapters, and conference papers) produced by scholars from universities across the world. Abdelrahman (2017) avers that through capturing, preserving and disseminating universities' intellectual outputs, IRs serve as a meaningful indicator of an institution's academic quality.

Institutional repositories emerged in response to information access constraints which were faced by universities and libraries across the world in the "1990s". These included library budget cuts, annual increases in journal prices above inflation rates, and the devaluation of local currencies, which made it difficult for libraries to continue maintaining their journal subscriptions (Hoskins, 2009). The high annual inflation rates required library budgets to be increased yearly. This resulted in many academic libraries, particularly those with limited budgets, failing to continue maintaining their journal subscriptions, and thereby fewer resources for scholars (Hoskins and Stilwell, 2010). Other academic libraries retaliated to this crisis by increasing the proportion of their budget devoted to journal subscriptions, a situation which left them with less money to purchase monographs and other essential library resources (Young, 2009). Librarians expected IRs to be accepted and optimally utilized to ease the above-mentioned information constraints. However, faculty from various institutions have been slow in embracing the idea of contributing to IRs (Casey, 2012). Such reluctance is a worldwide phenomenon (Mark & Shearer, 2006, and Hazzard & Towery, 2017). Even where there are institutional mandates in place to motivate faculty to deposit their articles, this still does not guarantee their engagement (Hazzard & Towery, 2017).

Literature cites several reasons why IRs have not been effectively utilised by target audiences. These include the lack of awareness about the existence of IRs, fears of violating publisher's copyright requirements, and concerns that work archived in IRs might be regarded by publishers as prior publications (Swan & Brown, 2005, and Mark & Shearer, 2006). Nielsen (2012) further avers that if

information systems including IRs are difficult to use or fail to specify services they offer, they are often rejected by users. Ammarukleart (2017) asserts that insufficient knowledge of technology acceptance and adoption at individual level is partly responsible for the underutilisation of innovations and information systems. Tibenderana, (2010) argues that for an information system to add value to a country, organization or individual, it should be accepted and used by the target audiences. Tibenderana (2010) further opines that in order to predict and explain the acceptance and use of technologies, it is essential to understand why people use or do not use them. This study applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to investigate factors contributing to the acceptance and use of the UNISWA IR by members of faculty from faculties of Agriculture and Consumer Sciences.

### ***Study aims and Objectives***

The paper sought to address the following research objectives:

- (i). To examine the influence of technology acceptance factors including effort expectancy, performance expectancy, social influence and facilitating conditions, on the adoption and use of UNISWAs institutional repository by faculty from Agriculture and Consumer Sciences.
- (ii). To assess faculty member's future intentions to use the UNISWA IR.

### ***Theoretical Background***

Theories and models are important in directing any research process (Kiwanuka, 2015). This study is underpinned by the UTAUT theory, which was developed by Venkatesh, Morris, Davis, & Davis in 2003. This theory was established based on eight theories of technology use behaviour and technology acceptance. These include the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Motivational Model (MM), Combined TAM and TPB (CTAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT) (Wasitarini & Tritawirasta, 2015). The UTAUT theory explains user's intentions to use an information system and their subsequent behavioural intentions. This theory identifies four critical constructs which are direct determinants of usage and behavioural intention. These include: Effort Expectancy (EE), Performance Expectancy (PE), Social Influence (SI), and Facilitating Conditions (FC) (Santos-Feliscuzoa & Himang, 2011). These authors define EE as the level of convenience or ease associated with the use of a system; PE as individual's beliefs that using a particular information system will help them achieve gains in performance; SI as the degree to which an individual perceives the importance of the social environment in the use and adoption of a new system; and FC as a person's belief

that organizational and technical facilities are available to support their use of an information system. Figure 1 below shows the UTAUT theory.

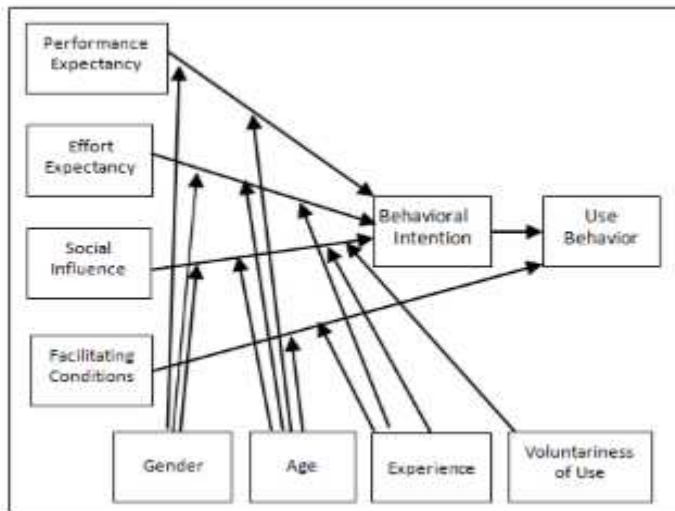


Figure 1 The UTAUT theory (Source: Venkatesh et al., 2003)

According to Kasim (2015), UTAUT includes variables such as gender, age, experience and voluntariness of use which moderate and strengthen the relationships of the four main UTAUT constructs. Venkatesh et al. (2003) avers that UTAUT has been applied and empirically tested in different domains. UTAUT underpins this study because it is robust than any other technology acceptance model in evaluating and predicting technology acceptance. This is probably because the theory consolidates eight other technology acceptance theories. Shortcomings from a certain theory are therefore likely to be neutralised by other theories. Taiwo & Downe (2013) assert that although UTAUT has been widely used, tested and validated, the outcomes from empirical studies have been inclusive regarding the magnitude, direction, and significance of the relationship amongst the model. Taiwo & Downe (2013) further assert that even though the issue of mixed outcomes from various UTAUT studies is uncommon, this does not undermine the accuracy of the model. UTAUT has also been criticised for lacking the trust aspect as one of its constructs, and failing to incorporate “attitudes” amongst mediating factors, when adoption is strongly influenced by anticipated benefits. UTAUT is gaining popularity in LIS.

This section further presents technology acceptance studies from the library and information Science field, which were underpinned by the UTAUT theory. Literature was obtained from sources including books, journal articles and thesis/dissertations. A study by Chang (2013) which was conducted from Taiwan University libraries, revealed that undergraduate and postgraduate students’ intention to adopt library mobile applications were influenced by performance

expectancy, effort expectancy, social influence, and facilitating conditions. In the same vein, Santos-Feliscuza & Himang (2011) assessed undergraduate and postgraduate student's intentions to accept the library's periodical indexing software. They discovered that all the four UTAUT constructs had a significant effect on user's behavioural intention to use the indexing software. Similarly, Adeleke (2017) examined factors influencing the adoption of automated systems by public library users. Likewise, it was revealed that performance expectancy, effort expectancy, social influence, and facilitating conditions determined the acceptance and use of automated systems. Another study by Wasitarini & Tritawirasta (2015) which investigated the acceptance of the closed library system revealed that performance expectancy, effort expectancy, social influence and facilitating conditions influence usage intentions. In a similar study, Awwad & Al-Majal (2015) assessed the determinants of use behaviour regarding electronic library services, with data obtained through a questionnaire from students from public universities in Jordan. The results revealed that students' intentions to use electronic library services were dependent on performance expectancy, effort expectancy, and social influence, while students their use behaviour was dependent on facilitating conditions, and intention to use.

Slightly different findings were obtained in a study by Ammarukleart (2017) who investigated factors affecting faculty's intentions to accept and use the university of Thailand's institutional repository. The findings revealed that performance expectancy, social influence, and resistance to change directly determined faculty's intentions to use the IR. Behavioural intentions and altruism were also found to be major determinants of actual usage behaviour. On the same note, a study by Rahman (2012) was conducted from Malaysia to investigate factors influencing postgraduate student's willingness to use digital libraries. It was revealed that performance expectancy, effort expectancy, and information quality were positively related to the continued usage of digital libraries. Similarly, Dulle, Minishi-Majanja, & Cloete (2010) examined the extent to which researchers from Tanzanian Universities believed that open access enhanced the accessibility and dissemination of scholarly content. They discovered that effort expectancy, performance expectancy, attitudes, and awareness were key determinants and predictors of Tanzanian researchers' behavioural intention to use open access IRs. They further discovered that social influence and facilitating conditions were significant predictors and had direct effects on the use of open access facilities by researchers.

## **Methodology**

A post positivist paradigm was adopted for the study. The quantitative method was applied using a survey research design. Kiwanuka (2015) opines that original authors of the UTAUT theory expressed their research mathematically (quantitatively), in order to validate them empirically. The target population

consisted of all 68 members from the faculties of Agriculture and Consumer Sciences.

Figure 1 below presents the gender of respondents.

<b>Gender</b>	<b>Frequencies</b>	<b>Percentage (%)</b>
Male	27	60
Female	18	40
Total	45	100

Table 1 Gender of Faculty

According to Israel (1992) a census should be used for smaller populations (for example 200 or less). Forty-five (45) out of the 68 distributed questionnaires were returned, and correctly filled. The study was conducted at the University of Swaziland, Luyengo campus, from March to April 2017. The questionnaire was designed based on the UTAUT theory using Likert-type questions (e.g. 5=strongly agree, 4=Agree, 3=Neutral, 2=Disagree, 1=strongly disagree). The data collected from questionnaires was coded and analysed using the statistical package for social sciences (SPSS) version 24. Data was presented using tables and figures (bar graphs). Results of the study were interpreted and discussed based on themes of the study.

## **Findings**

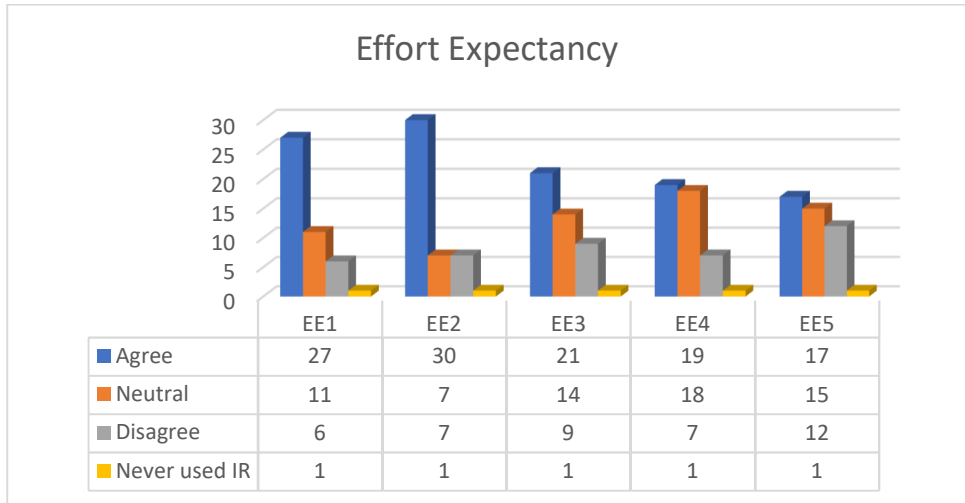
### ***UTAUT Constructs***

Technology acceptance data was assessed based on constructs from the UTAUT theory, including effort expectancy, performance expectancy, social influence, and facilitating conditions (see figures 1 to 5 below).

### ***Effort Expectancy***

EE examined the effortlessness or ease of using UNISWAs institutional repository. This was based on variables including: learning how to use the IR is easy (EE1); It is easy to become skilful in using the IR (EE2); I am comfortable using the IR on my own (EE3); It is easy to interact with the IR (EE4); and I can do what I want with the IR (EE5). The results are presented in Figure 1 below.

**Figure 1 Effort Expectancy construct**

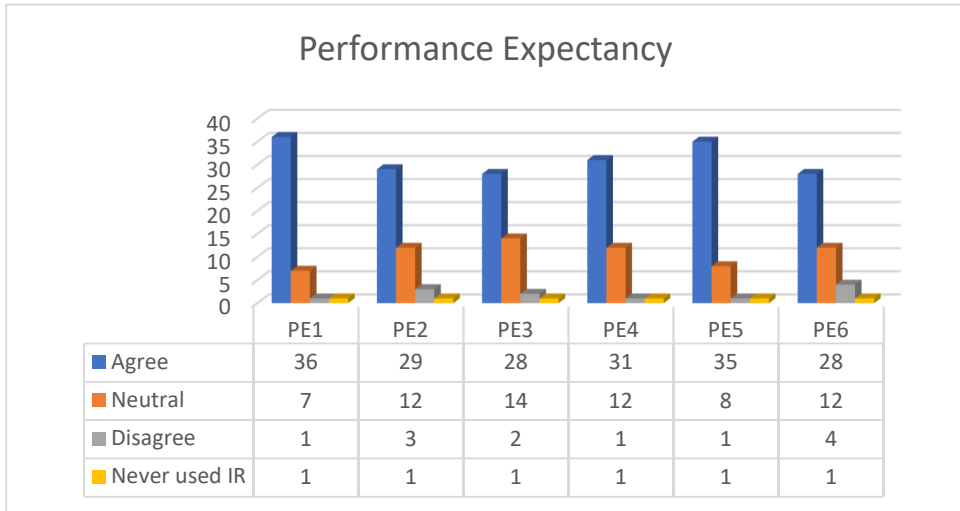


The findings presented in figure 2 revealed that majority of faculty agreed that using the UNISWA IR. is easy and effortless. Out of the 45 respondents, many 27 (60%) of faculty members agreed that it is easy to learn how to use the IR, followed by those who agreed that it is easy to become skilful with the IR, 30 (66.7%); comfortable using the IR on their own, 21 (46.7%); and can do what they want with the IR, 17 (37.8%). Almost the same number of respondents either agreed, 19 (42.2%) or gave a neutral response, 18 (40.0%) regarding the ease of interacting with the IR. Fewer respondents disagreed on the ease of using the UNISWA IR. These findings suggest the usage of the UNISWA IR by faculty from Agriculture and Consumer Sciences is likely to be influenced by the effort expectancy construct.

***Performance Expectancy***

PE assessed the usefulness of the UNISWA IR based user’s perspectives. Perceived usefulness was examined based on variables including: I find the IR useful (PE1); the IR makes my research easier (PE2); the IR increases the visibility of my work (PE3); the IR is a fast way of sharing my research (PE4); the IR ensures that my research is preserved for future use (PE5); and the IR will contribute towards my career advancement (PE6). Results from the PE construct are displayed in figure 2 below.

**Figure 2 Performance Expectancy construct**



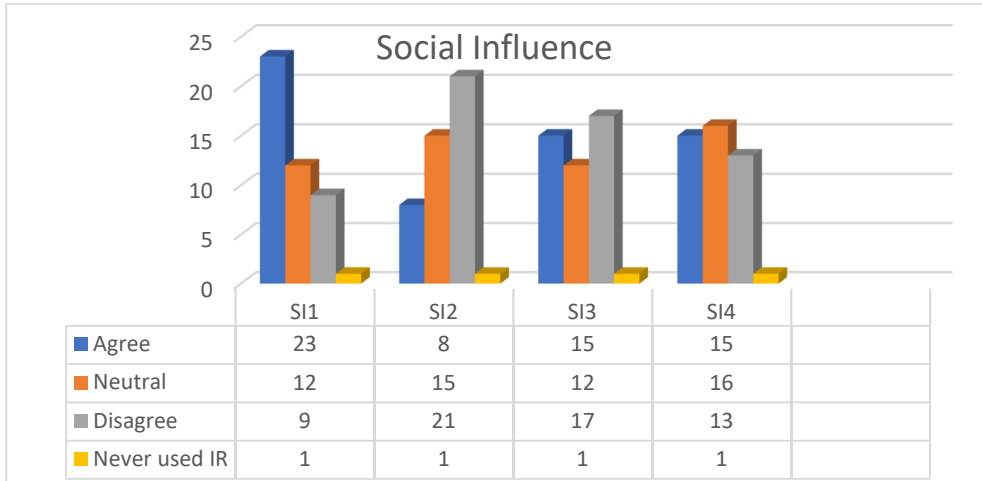
The findings revealed that more than half of faculty agreed that they find UNISWA IR useful. These findings are supported by 36 (80%) out of the 45 surveyed faculty members who pointed out that they find the IR useful. Other respondents pointed out that: the IR makes their researching easier, 29 (64.4%); the IR increases the visibility of their work, 28 (62.2%); the IR is a fast way of sharing their research, 31 (68.9%); the IR ensures that their work is preserved for future use, 35 (77.8%), and the IR contributes towards their career advancement, 28 (62.2%). Very few respondents disagreed regarding the UNISWA IRs usefulness. These results indicate that the PE construct influences UNISWA faculty’s decisions to adopt and use the IR.

***Social Influence***

This construct is assessed based on variables including: people who are important to me think I should use the IR (SI1); my lecturers encouraged me to use the IR (SI2); my peers encouraged me to use the IR (SI3); and researchers who are important to me have their copies in the IR (SI4). Results are presented in figure 3.



**Figure 3 Social Influence construct**

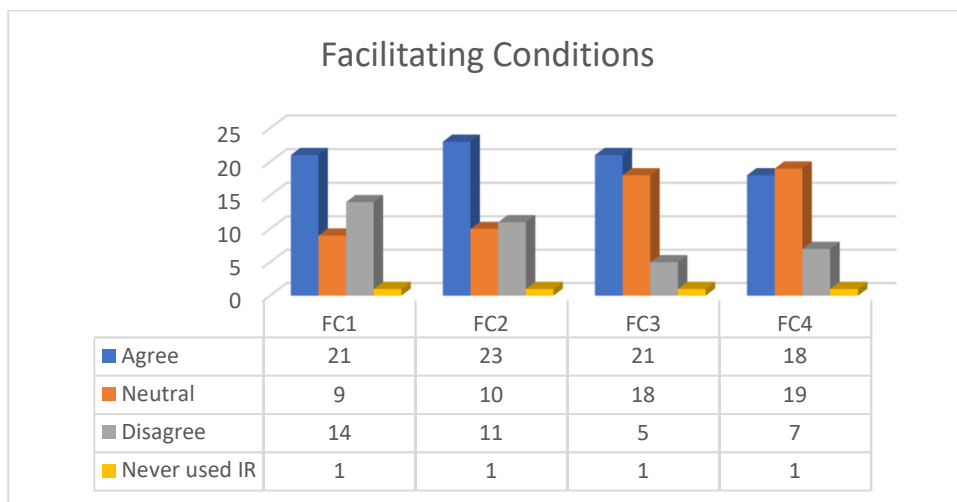


The findings show that slightly more than half, 23 (51.1%) of faculty agreed that they have the required resources to support their use of the IR. Many respondents disagreed to being encouraged by their lecturers to use the IR, 21 (46.7%), followed by 17 (37.8%) who also disagreed to being influenced by their peers to use the IR. These results suggest that the use and acceptance of the IR by UNISWA faculty members from Agriculture and Consumer Sciences is not influenced by the SI construct.

***Facilitating Conditions***

Facilitating conditions include variables such as: I have resources to support my use of the IR (FC1); I have the required knowledge to enable my use of the IR (FC2); the UNISWA IR is compatible with the university software installed in my computer (FC3); and library staff members are available to assist with any difficulties (FC4). Findings for the FC construct are presented in figure 4 below.

**Figure 4 Facilitating Conditions construct**

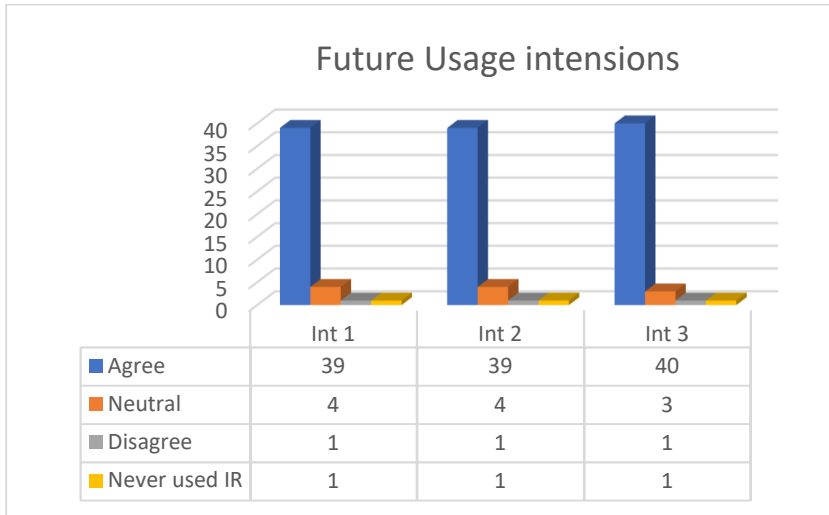


The findings revealed that most respondents agreed that the available conditions are conducive to facilitate the effective running of the IR. Majority of faculty indicated that they have finances and equipment to support their use of the IR, 21 (46.7%); have the required knowledge to enable their use of the IR, 23 (51.1%); the UNISWA IR is compatible with the University’s software installed in their computer, 21 (46.7%); and library staff members are available to assist me with the IR, 18 (40%). Few respondents disagreed nor gave neutral responses regarding the availability of necessary conditions to facilitate the effective usage of the IR. Based on the results, it can be concluded that the facilitating conditions construct influences UNISWA faculty’s decisions to accept and use the institutional repository.

### ***IR Future Usage Intentions***

This section examined whether faculty intended to use the IR or not. The intension to use constructs is comprised of statements including: assuming I can access the IR, I intend to use it in the near future (Int1); I will increase my usage in future (Int 2); and I will encourage my colleagues, friends and students to use the IR (Int3). Findings for the future usage intensions’ construct are presented in figure 5 below:

**Figure 5 IR Future Usage Intentions construct**



The results shown in figure 5 indicate that more than half of UNISWAs faculty from Agriculture and Consumer Sciences gave positive responses regarding their intentions to use the IR. Many respondents agreed that assuming they can access the IR, they intent to use it in future, 39 (86.7%); they will increase their usage in future, 39 (86.7%); and they will encourage their colleagues, friends and students to use the IR, 40 (88.9%). Very few respondents amongst faculty gave neither neutral nor negative responses regarding their future usage intentions.

### **Discussions**

The findings of the study revealed that technology acceptance factors from the UTAUT theory including effort expectancy, performance expectancy, and facilitating conditions influenced UNISWA faculty’s decisions to use the institutional repository. The results further revealed that the social influence construct did not convince faculty to use the IR. These results are bolstered by findings obtained in a study by Rempel & Mellinger (2015) who investigated how researchers from Oregon State University in the US adopted bibliographic management tools. Likewise, they discovered that performance expectancy, effort expectancy, and facilitating conditions influenced user’s intentions to adopt and use bibliographic management tools. In the same vein, in a study by Jackman (2014) which investigated factors influencing the acceptance of mobile learning technologies amongst undergraduate students from the University of west indies, it was revealed that only PE, EE and FC were major determinants of users’ intentions to adopt mobile learning technologies. Yet another study by Moyo

(2015) which assessed factors influencing the use of electronic resources by Zimbabwean students revealed that while PE, EE, and FC influenced students' decisions to adopt electronic resources, SI was nonetheless, an insignificant predictor.

Conflicting results from those of the current study were obtained in a study by Orji (2010) who examined factors affecting the acceptance of the electronic library system by national and international students from selected Canadian Universities. They found that facilitating conditions, effort expectancy, performance expectancy, and social influence are critical in influencing user's decisions to adopt or reject the electronic library system. These constructs however, had varying effects on international and national students. While PE and SI were significant predictors for international students, EE and FC were significant for both groups. A similar study was conducted by Chang (2013) who assessed factors affecting undergraduate users' adoption of library mobile applications in Eastern Taiwan university libraries. It was revealed that PE, EE, SI, FC and task-technology fit determined users' decisions to adopt and use library applications. Taiwo and Downe (2013) opines that such variations in outcomes from the discussed empirical studies could be attributed to the complexity of human behaviour especially in Social Science studies. Taiwo and Downe (2013) further averred that the mixed results do not undermine the accuracy of the UTAUT theory.

The results of the present study further indicated that UNISWA faculty intended to increase their usage of the IR in future, and to encourage their colleagues, friends and students to use the institutional repository. Similar findings were revealed in a study by Koulouris et al. (2013) who discovered that faculty from the Technological Education Institute of Athens in Greece intended to start submitting their research in the institutions repository. Contradictory findings were nonetheless obtained by Mpoeleng, Totolo, & Jibril (2015) who discovered that librarians from the University of Botswana neither agreed nor disagreed on their future intentions to use web 2.0 technologies.

## **Conclusion and Recommendations**

The study assessed technology acceptance factors affecting UNISWA faculty's decisions to adopt and accept their institutional repository. The paper further investigated user's intentions to continue using the IR. The overall findings of the study revealed that UNISWA faculty's decisions to adopt and accept the IR are influenced by the ease of using the IR, their perceptions of the IRs usefulness, and the availability of resources to facilitate their effective usage of the IR. The use of the IR by friends, colleagues and peers did not influence UNISWA faculty's intentions to adopt the IR. It was further revealed that many amongst faculty pointed out that they intended to increase their usage of the IR in future,

and to encourage their colleagues, friends and students to use the institutional repository.

This study is the first study to address technology acceptance factors affecting the the adoption and use of the UNISWA institutional repository by faculty. The study contributes to theory and the small body of empirical research on the acceptance and usage of IRs in Swaziland and other parts of Africa. This study is thus expected to play a vital role in guiding IR administrators to identify service areas that need to be improved; informing library management on the extent to which IR users from the agricultural campus are utilising the IR; and enabling IR administrators to recognise any barriers impeding users from effectively using the IR. The study recommends that UNISWA library should conduct needs assessments and usability testings in order to clearly understand users' needs. Ammarukleart (2017) asserts that conducting IR user studies could provide invaluable information which is essential not only in improving the existing IR service but also in launching new IR related services which are tailored based on users' needs. The study further commends the need to raise awareness about the IR through advocacy campaigns, and the frequent training of users to guide them on how to effectively use institutional repositories.

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