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INVESTIGATING INFORMATION LITERACY IN BUSINESS MAJORS

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Abstract:

This is a study on information literacy (IL) in Business Majors. A Web-based questionnaire with used to investigate undergraduate Business students on their understanding of IL and assessment of their respective abilities and skills. The study used IL standards adopted by the Association of College and Research Libraries (ACRL). The study adopted the UTAUT model's as a theoretical framework. The findings conveyed that external UTAUT factors (Social Factors and Facilitating Conditions) have positive effect on IL. Moreover, the findings emphasized the importance of the four factors and suggested the IL could be assessed in all contexts. Implications for discipline and practice are shared.

Keywords: Information Literacy, UTAUT, ACRL, IL standards

I. INTRODUCTION

Information Literacy (IL) is a set of competencies (knowledge and skills) that denote one's ability to recognize and satisfy a need for information to solve problems (ACRL, 2000). IL has gained considerable attention because the dependence on information today is increasing continuously (Hollis, 2018; Weiner, 2012; Rockman, 2004). The basic concept of information literacy is that cognitive and technical proficiencies are integrated to become a foundational set of information-centric competencies that include knowledge and skills.

Societal and business changes contributed to an increasing interest in IL (Weiner, 2012). IL is important to individual success, societal empowerment, and workforce readiness. IL is helpful in preparing graduates with information skills they can and will use in their careers (ACRL, 2000), and ethically because it emphasizes the lifelong learning aspect of information. Conley and Gil (2011) investigated the value, relevancy, and implication of information literacy for undergraduate business students. They stressed the importance of information in decision-making by citing Drucker, considered the father of modern management. They shared that Drucker (1994) observed that organizations were becoming information-oriented and needed information-literate workforces. Barnard, Nash and O'Brien (2005) put forth a paper that argued an IL-integrated curriculum that prepares learners within information skills, access and use for decision making "and a foundation for lifetime learning." (p. 2). They listed many benefits of IL that included problem-solving, decision-making and having a basis for lifelong learning.

Both, higher education and businesses acknowledge the importance of IL (Cheuk, 2008; Goad, 2002; Leavitt, 2016; Macy & Coates, 2016). They recognize the need for a college graduate to be able to solve problems, manage information and communicate solutions. With such, IL should be more prevailing in academia and the workplace. Much of the informing science literature (Ezziane, 2007; Julien, Gross & Latham, 2018; Malafi, Liu & Goldstein, 2017; Pinto, 2012; Yevelson-Shorsher & Bronstein, 2018) pointed out disconnect among the various stakeholders: students, faculty, and library. All seem to realize and tout the importance of IL, but each had a different perspective on how IL should be addressed.

Research has shown that IL skills and rigorous practices are important for lifelong learning and career success (Cope, 2018; Hollis, 2018; Weiner, 2018, Conley & Gil, 2011; Bucher, 2010). Though, IL is closely associated with Library Science, there is a surge for IL skills in higher education in general (Owusu-Ansah, 2005; Wiener, 2012), and different disciplines like Medicine, Nursing, and Chemistry (Wahoush & Banfield, 2014). Weiner (2011) showed concern that IL was not receiving attention in the workplace as it was vetted mainly in educational contexts. She used multiple research sources (Goad, 2002; Klusek & Bornstein, 2006; Gardner, 2000; Cheuk, 2008; Lloyd, 2003; Perrault, 2007) to emphasize the need for information skills in the workplace because they are essential to solve problems and for creating organizational value.

Scott and Tanner (2015) underlined disconnect between the need of the workplace and what graduates academia provides. This issue has been a source of stress in academia. Sokoloff (2012) also highlighted a divide academic IL efforts and the role of IL in the workplace. He explained that because IL was confined to Library initiatives, academia's concept of IL differed from that of business organizations. Weiner (2012) shed some light on that disconnect. She explained that there was difficulty in institutionalizing IL because of the spread of different organizational and functional structures and process at colleges and universities. Expectations in the workplace have changed with more dependence on information, and consequently, organizations are attempting to adapt to these changes by seeking information-literate workforce. An information-literate workforce should benefit its respective organization and society. Rockman (2004) explains this importance:

"… (Information literacy) is the critical campus-wide issue for the twenty-first century, of keen importance to all educational stakeholders, including administrators, faculty, librarians, media and information technologists…" (p. 1)

Cheuk (2008) and Edmunds and Morris (2000) spoke of information overload as a current challenge in the workplace. They explained this overload as abundance of information that could not be used because it was not managed correctly. They argued that problems would be solved by an information-literate workforce. High-performing organizations promote an information-centric workplace (Avdjieva et al, 2004; Braun; 2004; Feast, 2003; Fiegen, Cherry, & Watson, 2002; O'Sullivan, 2002; Rockman, 2004). These organizations seek talented college graduates with IL proficiencies to advance organizational performance (Braun, 2004). Conley and Gil (2011) conducted a study that showed lack of IL awareness in the workplace. 72% of surveyed business professional in a career fair shared that they had not hear of IL. The researcher rationalized that IL was known because it was confined to the Library instead of all aspects of higher education.

U. S. colleges and universities are a major source of a prepared workforce (West, 2000). One can safely assume that universities and colleges believe that they produce a prepared workforce that is consistent with the marketplace's expectations. The workforce is expected to be prepared with the right proficiencies such as those of information literacy. Weiner (2011) claimed that research on IL's implications on the workplace was limited. Lloyd-Zantiotis (2010) investigated IL in relation to corporeality or organizational information. She shared that managing information effectively was essential to favorable work performance. Her work intended to encourage research on workplace IL because IL was mainly focused in educational settings. Limberg et al. (2012) noted IL as "…purposeful information practices in society…" (p. 93). Cope (2010) called for higher education institutions to embrace IL in their missions and to promote IL's role in developing engaged citizens, not just graduates with technical skills.

II RATIONALE

Zurkowski (1975) defined the information-literate individuals as those who are "…trained in the application of information resources to their work" (p. 6). IL should be seen as a lifelong wholesome learning process that helps an individual solve organizational problems (Badke, 2010). IL has been equated with problem-solving often (Makani-Lim, Agee, Wu and Easter, 2014; Macy & Coates, 2016; Timmers & Glas, 2010; Weiner, 2011). College students need IL to differentiate themselves in the workplace (Calloway et al., 2018; Whitesell & Helms, 2013). IL entails skills and knowledge

for all careers (Wolf, 2003). Generally, there are two ways to gain skills and knowledge: 1) through formal education like college, or 2) on-job training (Ezziane, 2007). Because IL is not usually discussed in human resource practices, it is important to investigate it in the formal education venue as the case for this study.

Calloway et al. (2018) stressed the information workers need research skills to understand communication from clients and "…evaluate new technologies and computing methods… and must have the ability to evaluate the quality and credibility of web information…" (p. 30). They need to use research plans to find information and materials to analyze problems, plan and design solution.

This research project argues that IL should be a second nature for business majors to embed in their careers. There is not worthy research that explores IL practices in the business school as there is no IL culture in most disciplines (Johnston & Webber, 2006). IL practices are missing from most disciplines because IL is mentioned mostly in association with the library sciences. Badke (2011) explains that IL "…is invisible to academia because it is misunderstood, academic administrators have not put it on their institutions' agendas, the literature of information literacy remains in the library silo…there is a false assumption that technological ability is the same as information literacy, faculty culture makes information literacy less significant than other educational pursuits.." (p. 129). Such gap calls for this study, especially because IS majors are projected/aspiring to be information workers in their careers. This research project seeks to explore the IL-preparedness of business majors.

III. LITERATURE REVIEW

This section aims to share a survey of literature on information literacy in the business school and the unified theory of acceptance and use of technology (UTAUT). For each of the three items, there will be an overview. It will be helpful here to share the history of IL and the theoretical contribution of UTAUT. The review will make a case for conducting this research project.

Information Literacy (IL)

The construct "information literacy" has existed in the literature since the 1970s. Zurkowski (1975) introduced the term in the context of his work on the effort of the National Commission on Libraries and Information Science (NCLIS)'s initiative to create a national program for information literacy. The construct started gaining emphasis in the early 2000s with the ubiquity of the Internet and its technologies (Špiranec & Zorica, 2010; Eisenberg, 2008). A large portion of literature associates IL to library sciences and discusses the construct with respect to seeking, locating, and evaluating information (Huvila, 2011). Owusu-Ansah (2005) argued that IL could be better served if adopted and spread by and to different disciplines. Tuominen et al. (2005) emphasized that IL should be not be thought of as information skill only. They spoke of IL inter of sociotechnical practices in wide array of domains (school, workplace, and society). Eisenberg and Berkowitz (1990) associated IL with problem-solving that can be applied in different disciplines, not just in the context for seeking and finding information.

Multiple IL initiatives introduced frameworks with standards and competencies. For example, the Association of College and Research Libraries (ACRL, 2000) generated the IL framework that included five standards and twenty-five performance indicators for IL in Science & Engineering/Technology. The performance indicators, in turn, included outcomes for assessment. Figure 1 shares the five standards.

Standard
1. The information literate student determines the nature and extent of the information needed.

2.	The information literate student acquires needed information effectively and efficiently.
3.	The information literate student critically evaluates the procured information and its sources, and as a result, decides whether to modify the initial query and/or seek additional sources and whether to develop a new research process.
4.	The information literate student understands the economic, ethical, legal, and social issues surrounding the use of information and its technologies and either as an individual or as a member of a group, uses information effectively, ethically, and legally to accomplish a specific purpose.
5.	The information literate student understands that information literacy is an ongoing process and an important component of lifelong learning and recognizes the need to keep current regarding new developments in his or her field.

Figure 1 – ACRL IL standards

Changes in the information sciences and the articulation of an educational paradigm have helped the IL concept (Špiranec & Zorica, 2010). Bruce (1999) stressed the importance of IL in the workplace. She reasoned that today's information-centric organizations need information-literate employees to manage information, corporate memory, and research and development. Ottonicar, Valentim and Mosconi (2018) emphasized the criticality of IL in these information-laden times. They designated this as the "digital age" (p.56), and further, the "4th industrial revolution" (p. 55). Hollis (2018) went as far as hailing IL as a human right. He pondered whether IL was "… a singular or a plural construct…" (p. 77). He argued for IL to be a plural construct because otherwise would limit its context to education instead of the workplace, and more importantly, society.

Though, IL is grounded mainly in higher education, the main noble goal of IL framework is teaching college students problem-solving that will benefit society and business alike (Pinto, 2012). A large part of the literature seems to look at IL in educational settings with minimal attention for the workplace (Badke, 2011; Monge & Frisicaro-Pawlowski, 2014; Sokoloff, 2012). That, in turn, limits the great potential of IL's effect on society (including business) outside the academy.

More literature has portrayed IL in human and social light. Ottonicar et al. (2018) also highlighted IL as "…fundamental to citizens and to their social integration…" (p. 56). Julien, Gross and Latham (2018) highlight IL as "…a critical foundation for success in daily life, the workplace, and in civic engagement…" (p. 191). Huvila (2011) associated IL with membership in information-centric public and declared it a "…societal issue..." (p. 238).

IV. THEORETICAL FRAMEWORK

This study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) for its theoretical framework. UTAUT was introduced as an improvement of other technology acceptance models (Boakye, 2015; Abukhzam & Lee, 2010). Venkatesh et al. (2003) developed this theory with four constructs: Performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). UTAUT is used mainly in technology acceptance contexts. It is considered the main reference model in information systems (Kiwanuka, 2015).

UTAUT's constructs are highly performance-centered (Taiwo & Downe, 2013). The model has been widely used in various research contexts (mobile banking, e-government service use, learning, etc.). Marchewka, Liu, and Kostiwa (2007) used UTAUT to assess student perceptions about using a Web-based application for course-delivery (course management software). While the study shared results, it ended inquiring the fit if UTAUT in organizational settings. Oye et al. (2012) used UTAUT in a study of university staff to adopt Information and Communication Technology (ICT). The findings suggested that the four constructs had significant positive effect on the staff's behavior. Thomas et al. (2013) used UTAUT as a framework to study mobile learning of college

and university students. Mandal and McQueen (2012) adopted UTAUT for their study on use of social media in small business.

UTAUT is not without detractors. Kiwanuka (2015) claimed that UTAUT did address the actual process of adoption. He acknowledge the position and importance of UTAUT to IS research. Earlier, Benbasat and Barki (2007) shared many theoretical concerns with UTAUT's predecessor. They listed diversion of researchers' from a system's perceived usefulness, "illusion of cumulative tradition" (p. 213), focus on a single behavior, and exclusion of subjective norms and perceived behavioral control. Furthermore, UTAUT was similar to Theory of Planned Behavior (TPB). Brevik (2005) noted that UTAUT and other similar models did not describe IS success in implementation and performance. This and similar criticism might not be appropriate considering that the Model did not intend to investigate the process or the outcomes. Venkatesh et al. (2003) noted the intention of their model as it only focused on the behaviorist aspect of adoption. They hoped for their model to help future IT research and workplace explorations into "…productivity, job satisfaction, organizational commitment, and other performance-oriented constructs…" (p. 470). This study is interested in productivity of business majors in organizational settings. UTAUT makes for a robust fit for this study because its four constructs coincide with IL's five standards (Figure 1) in terms of effort, performance, influence, and conditions. The nature of IL standards underlines a strong performance tone.

V. RESEARCH QUESTIONS AND HYPOTHESES

Research questions

Information Literacy is the core interest of this study. The researchers will investigate the level of IL practices in Business majors. Drucker (1957), the father of modern management, presented the concept of knowledge worker in the context of management theory and practice. He theorized that organizational productivity would depend on informed workforce. Some of his writings pointed to the evolvement of information society. Because the business school aims to be responsive to the needs of the marketplace (Alshare et al., 2011), it is imperative to continuously assess the business curricula.

Sim and Wright (2002) underlined the importance of offering a curriculum that prepares students to solve problems and make decisions, especially emphasizing the nature of information work. In a comparison study of IS and CS student's problem solving, the researchers underscored the importance of the learning experience. They wanted faculty to "…develop instructional strategies that will both acquaint students with the challenges they will face and help them meet those challenges…" (p. 34).

Baxter et al. (2011) concurred that higher education should prepare their students with information skills. Their study examined predictors of success in a college computer science course. They claimed that new college students might have computer application experience. Consequently, they recommended that business schools should develop these students' skills further with less emphasis on theory.

Cannon et al. (2004) believed that business students were not prepared to approach and solve authentic problems because the business school's curriculum was limited by its delivery methods. They explained "…business organizations are facing a rapidly increasing dynamism in their environment; business schools have been slow to reorient their curricula to industry needs…" (p. 93). They listed many reasons for that slow response. These included faculty resistance, faculty reward systems, teaching load, resource issues, faculty effort and faculty members' understanding of other disciplines, the strong influence of individual disciplines, and the general difficulty of implementing change in higher education institutions.

Aasheim and Williams (2009) investigated whether perceptions of entry-level skills for information workers were different between academia and industry. They survey 350 IT managers and 78 faculty members. The found that there were agreements and disconnects between academia and industry on skills a graduate should possess.

Particularly, this study is interested in exploring the reach of IL in student preparation.

The following research questions will guide this study: 1) Does IL impact an individual to complete a task successfully? and 2) What factors impact IL?

Hypotheses

The UTAUT framework includes four key factors: performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh, Thong, & Xu, 2016). The model was designed to assess intention and attitudes toward technology use. It has been widely applied in technology adoption and attitude studies in various disciplines. Hamzat and Mabawonku (2018), Khechine et al. (2013), Taiwo and Downe (2013), Thomas et al. (2013), Oye et al. (2012), Pardamean and Susanto (2012) and Zhang et al. (2012) used UTAUT for different studies with college students. Performance expectancy and similar self-reporting factors include effort expectancy can be problematic for different reasons (Hollis, 2018). In some cases, participants may not have accurate perceptions. Another reason may be that they think of accomplishments without accounting for struggles (Tourangeau, 2009). Another reason is that because participants may not have benchmarks or baselines by which to self-assess (Kruger & Dunning, 1999).

Thomas et al. (2013) investigated the relationship among UTAUT's four factors. They used supporting and opposing literature to relay a fair look into the matter. For example, the study highlighted that Venkatesh et al. (2003) claimed that UTAUT rationalized about 70% of user behavior while others (Wang & Shih 2009; Al-Gahtani, Hubona, & Wang 2007; Teo 2011) used smaller percentages. There was agreement on the reliability and validity of the model but not on the strength of the relationship.

Similarly, Taiwo and Downe (2013) conducted a meta-analysis study of a large sample (n=96) of studies that adopted UTAUT. They sought to analyze the empirical findings of these studies in investigation of the validity of UTAUT. They reasoned that such an approach "…fosters examination of relationship between the dimensions of a model as a whole. Thus, analyzing relationships between the constructs of UTAUT with a larger sample of subjects…" (p. 49). With a large number of studies that were conducted in different contexts, the results were diverse. These studies took place in various contexts (technology adoption, knowledge sharing, interface robot/assistant agent, motivation, etc.)

This current study adopts UTAUT's four factors to develop its hypotheses to assess IL abilities of Business Majors. The mixed the nature of the findings from Dwivedi et al. (2019), Thomas et al. (2013), Pardaman and Susanto (2012) and the rich literature these studies shared underscored the complexity of UTAUT and its four constructs' effects. Courtesy of the nature of UTAUT, such categorization is important to provide a more effective theoretical framework that will serve the research project (Hamzat & Mabawonku, 2018). Similar to Dwivedi et al. (2019), this chose to categorize factors into two groups: Internal (PE and EE) and external (SS and FC). Based on the various studies shared in the previous sections, the authors believed the categorizations is justified as social influence and facilitating conditions are focused on perceptions of external elements – current or past, whereas the expectancies are regarding future task.

External factors (SI, FC)

There is a rich literature that explores the relationships among UTAUT's four factors. Thomas et al. (2013) listed a large list of references in their study that relayed opposing findings and views.

They claimed that some relationships were "…hypothesized to not exist…are also investigated by researchers and the findings are sometimes in conflict with the expectations…" (p. 74).

Interestingly, Thomas et al. (2013) found in their study that "…performance expectancy, social factors, and facilitating conditions on behavioral intention are significant and positive. On the other hand, effort expectancy does not predict behavioral intention when the facilitating conditions are controlled. With attitude included, effort expectancy continues to have no net effect on behavioral intention..." (p. 84). Dwivedi et al.'s (2019) main finding was that facilitating conditions and social influence have effect on an individual's attitude toward performance. They thought that was not "…not completely surprising—facilitating conditions such as training programs and help desks may be instrumental in enabling individuals to form positive attitudes…" (p. 728). The reasoned that the two constructs were "contextual", and thus, will always play a role in attitude and behavior.

Human behavior varies according to self-perceptions (Kurbanoglu et al., 2006). While employee abilities and skills are important to effective organizational participation, it become vital to assess such abilities and skills accurately within the organizational context. Oye et al. (2012) emphasized the importance of staff development for organizational success. They recommended that organization invest resources in staff ICT training internally and externally. Alshare et al. (2011) also underlined the importance of graduate communication skills to the employer organization. They believed that employers would invest in staff training as they are important to achieving the managerial goals. Moreover, they noted disconnect between the employee's job competencies and actual job performance.

Brevik (2005) used a study to evaluate UTAUT's usefulness to explain success of information systems implementation. The findings suggested that the model was useful in assessing success and acceptance. But this study stated the concern that "…the interaction between the measures in a process view is not explained and a lack of correspondence is evident. Thus, it fails partly in explaining all the success dimensions of user acceptance in IS implementation…" (p. 174).

Dwivedi et al. (2019) looked at UTUAT-centered studies (162). They used 1600 observations to code 21 relationships of the various factors of the model. They aimed for their work to be a critical meta-analysis study of the model. The most interesting thing about their discussion was that they clustered the four constructs into two groups. They explained "The four exogenous constructs in the UTAUT model may be viewed as representing technology attributes (i.e., performance expectancy and effort expectancy) and contextual factors (i.e., facilitating conditions and social influence) even when they may be viewed as perceptions held by individuals…" (p. 721). As this study aims to contribute to discipline and practice alike, external factors such as social influence and facilitating condition should be assessed. Thus, we posit:

H1: Supportive external influences and conditions influence a Business Major's IL abilities positively.

Internal factors (PE, EE)

Venkatesh et al.'s (2003) model noted PE as a person's belief in his/her ability of good performance in some context. The model noted EE as that individual's ease of completing tasks in that respective context. That context could be using some artifact (software application or designing a bridge). For this study, the individual's context is IL abilities. PE had its origins in self-efficacy theories (Kurbanoglu, 2003). It has been an essential element of Social Learning Theory (Bandura, 1977). It encompasses self-confidence to complete a task. Zimmerman (2002) spoke of it in terms of certainty measure. Furthermore, it breeds motivation for respective behavior.

Dwivedi et al. (2019) expectedly discussed the effects of performance expectancy and effort expectancy on behavioral intention. They thought that "….the four exogenous constructs had stronger direct effects on attitude than on behavioral intention (e.g., the effect on performance

expectancy on behavioral intention…" (p. 721). Hollis (2013) showed concern that individuals with low IL skills maybe misled by their self-conception and thus, consider themselves to possess better skills. Julien and Hoffman (2008) suggested that it is better if self-centered factors (ex. Perceptions, assessments, etc.) are separated from other factors in research.

Avdic and Eklund (2010) conducted an IL study that investigated college students' use of reference database for research. The study uses the UTAUT model to survey these students and their teachers. One of the highlighted finding was that effort expectancy differed between the students' understanding and that of their teachers. The study argued that in general, college students believed that their IL skills were better than they were able to demonstrate in behavior (conducting library research). In addition, the researchers pointed out the teachers' pessimism of the students' information research abilities.

Yevelson-Short and Bronstein's (2018) interviewed students, faculty, and librarians for s a study of their perceptions of IL. The study highlighted a huge disconnect among the three groups. The students felt that their IL skills were lacking, the faculty thought that the students would pick their school during their studies, and the library was aware of the students' IL deficiencies and introduced initiative to tread the problem. But these initiatives were hard to implement in the current curriculum because of logistics. The findings suggested that it was important for the faculty, library and students to collaborate on any IL initiatives. Furthermore, while the study was limited to one school, it is noteworthy that the students realized their limitations, and hence, acknowledged the need for help from faculty and the library.

Pardamean and Susanto (2012) used Blog technology as a context for assessing business majors. The rationale behind the study was to motivate the students to be active participants in their learning by use new technologies. The study used UTAUT's four factors for its hypotheses. The findings were mixed: PE (internal) and SI (external) had significant effect on the students' behavioral intentions but EE (internal) and FC (external) but did not. They acknowledged that previous studies realized the positive relationship between behavior and adoption, but their study did not. They stressed that their study had depended on self-reported data than objective assessment. Kurbanoglu et al. (2006) stressed that an individual's feeling of competence and confidence is essential to a successful completion of tasks. They explained "…The higher the sense of efficacy, the greater the effort, persistence, and resilience…which are two factors crucial for information problem solving, self-regulated learning, and lifelong-learning…" (p. 73). Thus, our current study posits that

H2: Internal expectancies influence Business Major's IL abilities positively.

VI. RESEARCH METHOD

Research Design: Data for the study was collected using web-based survey design. Survey design enables a generalizable quantitative description of the targeted population's attitudes (Creswell 2014). Online surveys provide several advantages, such as economy, speed of return, error checking, a computer assisted instrument, time to provide thoughtful answers, anonymity, and a far reaching geographical distribution (Fowler Jr 2013). Web-based surveys have been previously used in similar research to enable data collection from students (Gupta and Bostrom 2013; Kale et al. 2009). The survey is cross-sectional, with the data collected at one point of time.

Sample: A key requirement for a high quality sample is representativeness of the population of interest (Hair et al. 2010). The survey was sent out students from three undergraduate IS class during the summer semester. The demographics of the sample is presented in Appendix 1 and 2.

Measures: Contemporary research advocates the use of existing instruments to measure psychological constructs (Straub 1989). UTAUT measures were used (rewrite this part). However, no instrument exists to measure information literacy. The authors thus, went through a structured process for developing the instrument. First, the nature of the construct was examined. Information literacy, as explained earlier, is represented by five interlocking ideas. Thus, it was conceptualized

as a higher order, reflective-reflective construct (Hair Jr et al. 2018). Second, each of the learning dimensions, consistent with their definitions, was conceptualized as independent constructs.

Data Analysis

Table 1 – CFA - Factor Loadings

Item	EE	IL1	IL2	IL3	IL4	IL5	PE	SF	FC
ARCH_1		0.912							
IL1_3.0		0.853							
ARCH_2			0.864						
IL2_2.0			0.813						
ARCH_3				0.905					
IL3_3				0.814					
IL4_2					0.78				
IL4_3.0					0.916				
ARCH_5						0.897			
IL5_2						0.756			
EE_1	0.959								
EE_2	0.93								
EE_3	0.943								
FC_1									0.859
FC_2									0.747
FC_3									0.862
PE_2							0.976		
PE_3							0.987		
SF_1								0.909	
SF_2								0.853	
SF_3								0.908	

All items significant at $p<0.05$

The measurement and the structural components of the entire model was tested using SEM technique. SEM is an appropriate statistical approach to examine the relationships of the entire theoretical model (Hair et al. 2010). While SEM is a general term encompassing a variety of statistical models, this study used partial least squares structural equation modeling (PLS-SEM). The PLS-SEM is the preferred method when the objective is prediction of structural relationships (Hair et al. 2011). PLS-SEM is increasingly applied approach to examine structural equation (Hair et al. 2012). The use of PLS-SEM is an appropriate approach as it has the ability to handle sample size issues better. It also can handle complex theoretical models, such as the proposed model in this study and provide accurate estimates. Smart-PLS V3 software package was used for the data analysis.

Measurement Model: The first step is to test for test for construct validity using convergent and discriminant validity tests. To do this, the entire research model was run in one pass. Bootstrapping was used to see the significance. All items in the table show loadings of above 0.7, thus, presenting good factor loadings.

Convergent validity is assessed using Cronbach's alpha, Composite validity and Average Variance Extracted (AVE). For lower order factors i.e. each of the learning dimensions, had good compositive validity and AVE. This is shown in Table XX. The table shows that IL2 and IL5 have Cronbach's Alpha of less than <0.6. However, given that other convergent validity criteria are met, we believe that lower order constructs of Information literature show sufficient convergent validity. The able also shows that inter-construct correlations as well as the square root of AVE on the diagonal. These constructs do not show sufficient discriminant validity. This supports the assertion that IL concepts, while separate, are interlocked i.e. are correlated with each other. Additionally, as shown later, these lower order constructs also load well on the higher order information literacy construct showing good factor loadings.

Table 2 – Convergent reliability and Fornell-Lacker criteria – discriminant validity (IL)

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	IL1	IL2	IL3	IL4	IL5
IL1	0.72	0.88	0.78	0.88				
IL2	0.58	0.83	0.70	0.84	0.84			
IL3	0.66	0.85	0.74	0.84	0.79	0.86		
IL4	0.63	0.84	0.72	0.62	0.65	0.73	0.85	
IL5	0.56	0.81	0.69	0.61	0.72	0.60	0.61	0.83

Convergent and discriminant validity for the rest of the constructs and higher order Information literacy are shown in Table XX. The table shows good convergent reliability measures for all the constructs except IL. The AVE for IL is below 0.6. However, we accept this because a) IL is a HOC and b) the other two measures of convergent reliability are sufficient. The table also shows sufficient discriminant validity, with the lowest of sq. root of AVE being higher than any of the inter construct correlations (Fornell-Lacker criteria). Overall, we believe that the constructs have sufficient construct validity.

Table 3 – Convergent reliability and Fornell-Lacker criteria – discriminant validity – Measurement Model

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	EE	IL	PE	SF	FC
EE	0.939	0.961	0.892	0.944				
IL	0.904	0.922	0.551	0.538	0.742			
PE	0.963	0.981	0.964	0.376	0.174	0.982		
SF	0.873	0.92	0.793	0.736	0.568	0.28	0.89	

FC	0.771	0.864	0.68	0.638	0.598	0.224	0.723	0.824

Structural Model

Figure 2 shows the structural model. The model shows a strong and significant effect of both the external conditions on Information Literacy. The effect size for both the exogenous variables is medium. The model also shows that information literacy has a strong and significant impact on information literacy. The effect size is high. No impact is found on performance expectations. The model also shows that facilitation conditions and social factors explain significant portion of the variance in information literacy. They also have high predictive relevance. Finally, the model shows that information literacy is a key construct that can explain and predict Effort Expectations. Such was not the case for performance expectations.

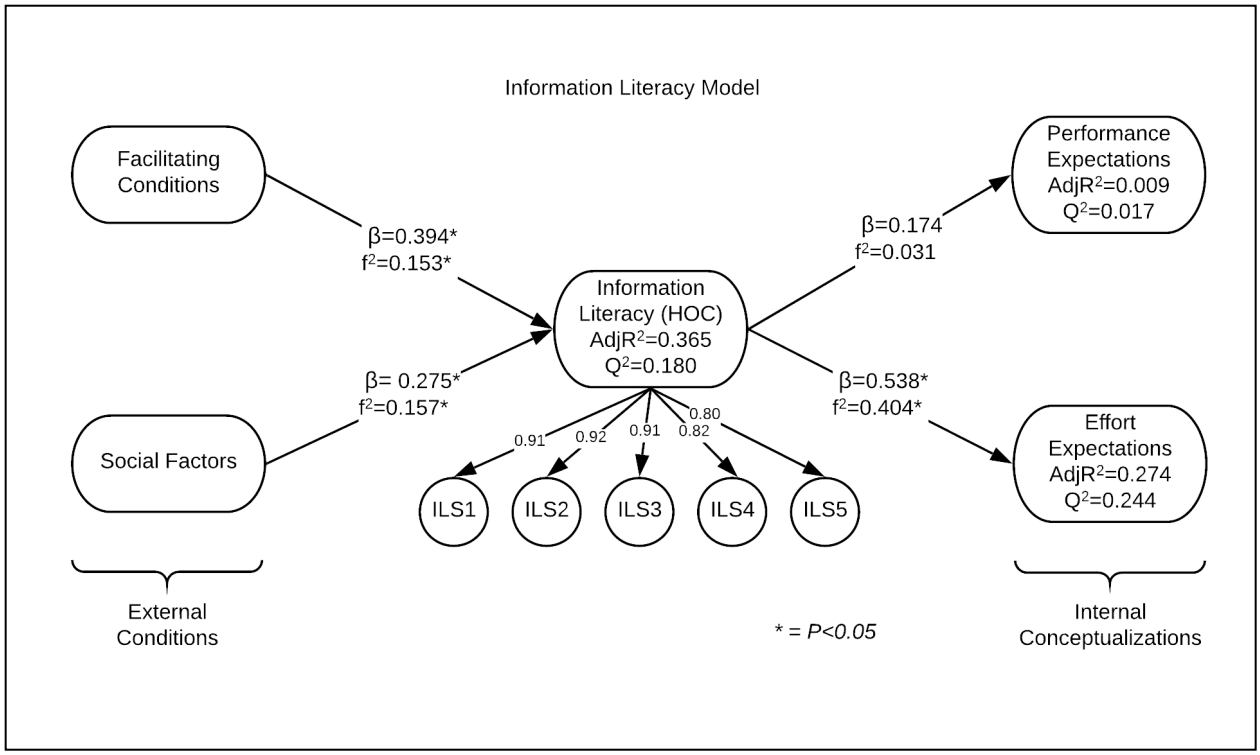

Figure 2 – Structural Model

VII. DISCUSSION AND IMPLICATIONS

The study has two key areas of discussion and implications. The first one deals with the construct definition and measurement development. This is the first study that we know of that developed a clear measure for Information Literacy as a second order construct based on the five underling (but interdependent) dimensions. As can be seen from the analysis presented in Figure 1, the dimensions are almost equally distributed. This implies that each of the dimensions in IL is important. Additionally, not only does this confirm the underlying initial conceptualization of IL in the literature, it also helps researchers in the future use the construct in different settings.

The second key area of discussion and implication is the development of the nomological network for information literacy. In this regard, we drew on the UTAUT constructs. We argued that the four key constructs (social factors, facilitating conditions, performance expectations and effort expectations) can be broadly categorized into two areas. We argued that information literacy is the

key construct that explains the relationship between these two buckets. The nomological network presented shows that the perceptions of external conditions (social factors and facilitation conditions) have a significant positive impact on information literacy.

This implies that external conditions can be structured so that people do become better at influencing their information literacy. Examples of such actions can be seen in the literature. Yevelson-Shorsher and Bronstein (2018) recommended that IL be viewed as more than a process. They stressed that IL initiatives should be collaboration for academic stakeholders (students, faculty, and libraries). They insisted that faculty and librarians should join forces to develop proper training for their students. Tuominen et al. (2005) argues that literacies could not be separated from sociotechnical contexts and that IL, in particular, was more effective as group or community activity. They advised that IL implementation must be supported by useful surrounding conditions and artifacts such organization of documents, tools, organizational procedures, work practices and economic forces.

In terms the impact of information literacy, the empirical analysis shows that an individual's perception of their information literacy has a direct and significant impact on effort expectancy. This implies that individuals are well aware of the importance of information literacy, and that they have a fair understanding that their ability on information literacy determines the level of effort needed during problem-solving / decision making. There was no impact on performance expectancy. This can be explained by looking at the fact that the performance of an task is future based, while effort is present based when looking at a task. Overall though, it also shows that if conditions exist for better information literacy, individuals will perceive a less arduous effort in problem solving because of enhanced level of information literacy.

Finally, the study also contributes to UTAUT literature by investigating the relationship between the four major constructs. The study implies that eventual behavioral intention regarding any task is dependent on past (external conditions), present (effort) and future (performance). We hope that this wider conceptualization is used by researchers in more studies.

VIII. CONCLUTION AND CONTRIBUTION

The main contribution of this study is its originality of the research subject matter. IL is an important lifelong learning process that has not spread wide enough with the exception of a small number of disciplines (Library, Medicine, Nursing and Chemistry). This study aimed to make a case for IL in its most relevant discipline, IS. The significance of this study can be enhanced if it becomes a conversation starter toward an IS curriculum that can benefit academia, IS graduates and businesses equally.

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X. APPENDICES

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