12-7-2022

Job ready or future-ready? The role of IS research in PG IS curriculum

Abdullah Alghamdi
Monash university, Abdullah.alghamdi@monash.edu

Henry Linger
Monash University, Henry.Linger@monash.edu

Job ready or future-ready? The role of IS research in PG IS curriculum

Full research paper

Abdullah Alghamdi
Department of Human Centred Computing
Faculty of Information Technology
Monash University
Melbourne, Australia
Email: Abdullah.alghamdi@monash.edu

Henry Linger
Department of Human Centred Computing
Faculty of Information Technology
Monash University
Melbourne, Australia
Email: henry.linger@monash.edu

Abstract

The paper proposes that an extension to the IS curriculum is needed to explicitly incorporate knowledge derived from IS research. Current research on, and models of, IS curriculum focus on competencies that are consistent with what ICT/IS employers' demand. Additionally, most scholarship on IS curriculum is focused on undergraduate studies, with little literature on post-graduate curriculum. There is a gap in the current curriculum models as they do not reflect the theoretical base of the IS discipline, as articulated in IS journals. The link between research and competencies is particularly relevant to post-graduate studies. To illustrate, we identified key subject terms in published papers in the IS basket of eight journals and mapped these with the IS competency realms proposed in the IS2020 curriculum model. We argue that the curriculum needs to combine practice and academic knowledge with practice skills to ensure graduates are professionally future ready.

Keywords: IS curriculum, Research themes, Professional Competencies

1 Introduction

Emergent issues in information systems (IS) are seen as one of the key challenges for the development of IS curricula (Leidig et al., 2019). Over a decade, academics have called for incorporating new trends in technologies in IS curriculums. At the time e-commerce and e-business emerged, Moshkovich et al. (2005) proposed guidelines to "infuse" e-commerce topics into undergraduate IS degrees to address skills gaps and industry requirements. Sendall et al. (2011) highlighted the importance of Green IT for businesses to ensure efficient sustainable IT practices. They believed that green IT knowledge and skills were in high demanded but most IS schools, at that time, lacked courses in Green IT. Jones and Liu (2017) argued that the success of tech companies in recent years is evident that IS degrees need to equip graduates with entrepreneurship skills. Their research called for adopting a software entrepreneurship methodology which is rooted in Agile Software Development.

The rapid changes in technologies and how it influences businesses might broaden the gaps between IS graduates' skillsets and demands for graduates. IS curriculum researchers attempted to provide a holistic view and unified models to support the development of information systems curriculum. Fichman et al. (2014) introduced a broad conceptualization of digital innovation as a lens to support the re-design of IS curriculum to keep up with new trends. They claim that digital innovation, as a vision in IS course development, offers flexibility as it can serve as a foundational concept and an organising principle for IS courses. Such flexibility is more likely to address the gaps in IS skills supply and demand (Van den Berg, 2018).

In practice, curriculum models were introduced to support the development of IS curriculum. The recent curriculum model (AIS/ACM IS 2010) was a revision of earlier curricula and its main objective was to broaden the scope of IS domains (Leidig et al., 2014).Studies that reviewed how IS curriculum models are used to develop IS degrees reported that, on the whole, the AIS/ACM IS 2010 guidelines have not been used explicitly (Lo & Cruz, 2014; Tehrani, 2015). This outcome is somewhat unexpected given that the model was designed to incorporate broader IS areas and allow a degree of flexibility in the IS curriculum (Leidig et al., 2019). Specifically, compared to the previous models, AIS/ACM IS 2010 reduced the number of core areas to encourage a wider selection of electives and specialisations based on career demand (Burstein et al.).

A particular feature of IS curriculum models is an emphasis on ICT. This has been a contested feature of IS research and practice as the IS discipline is grounded in a sociotechnical perspective (Hirschheim et al., 1996; Sarker et al., 2019; Sawyer & Jarrahi, 2014). This can be seen in the enduring domains that are addressed by IS in practice; information, people, organisation and technology (Hirschheim et al., 1996; Sidorova et al., 2008). In our digital world, these domains need to be unpacked and granulated to capture the subtleties that digital transformation and innovation have introduced as well as extending the purview of IS, beyond the organisational boundary, to account for its societal impact (Boell & Cecez-Kecmanov, 2012; Linger & Hasan, 2020; Walsham, 2012). This is consistent with recent calls by Lee et al. (2015) to shift the focus of the discipline from the IT artefact to the IS artefact and move away from a pre-occupation with technology as the centre of the IS discipline.

Research on, and models of, IS curriculum focus on how IS curriculum objectives are consistent with what ICT/IS employers' demand. Emerging IS trends, that impact how organisations utilize IT and how IS impacts society, are the motivation for research on updating IS curriculum. This focus on competency raises questions about the nature of IS knowledge that underpins that competency. This is exacerbated by the gap in the current literature that trending research issues, as articulated in IS journals, have not been explicitly linked to the development of IS curriculum. Consequently, how curriculum models reflect current IS research issues has not been explicitly investigated. We would argue that the link between research and curriculum is particularly relevant to post graduate studies.

Our paper aims to address these gaps by examining how current IS research are reflected in the recent AIS/ACM curriculum model and the implications of this mapping for IS curriculum.

The paper is structured as follows. Firstly, an overview and analysis of the IS curriculum literature are given, followed by the current research design. Next, the findings based on a summary of recent issues and trends published in IS journals and how they fit into the current curriculum models are presented. Finally, a discussion of findings followed by the conclusion is provided.

2 Background

2.1 Information Systems as a Discipline

A consensus on what information systems mean is arguably missing. Different scholars define information systems from different perspectives. IS as a discipline lacks the clear boundaries that define the IS field and this raises questions whether IS is a discipline although this is not uncommon is other field (Galliers (2003) Fields such as IS that are built on reference disciplines should be seen as a strength to be embraced, rather than a disadvantage, as it adds legitimacy to the discipline (Galliers, 2003). The lack of boundaries has been a theme in IS research for decades. A cornerstone of the IS discipline has been its sociotechnical perspective as the basis of the discipline's distinctiveness and cohesion, as well as its ability to expand its boundaries in response to a changing technological landscape (Sarker et al 2019).

The diversity of the IS discipline was well articulated by Banville and Landry (1989), who express their doubt about a common conceptual foundation of IS. They label IS as a "fragmented adhocracy" because there isn't a compelling case for consensus within the IS community as long as there is organisational or community support for the way problems are addressed, and the knowledge claims make a useful contribution. Hirschheim et al (1996) celebrate this fragmented adhocracy and propose a framework for IS that is theoretically grounded. Their contribution is to view IS through domains that are impacted by IS and the orientation of that change. The domains in the framework are; technology, language and organisation. Orientations are; instrumental, strategic, communicative and discursive. Significantly, the framework reinforces the foundational sociotechnical perspective of IS. While this framework has not been widely adopted, the basic premise of the domains that constitute IS remain invariant (Sidorova et al. 2008). Linger and Hasan (2020) have revised this framework to account for developments in technology and the digital infrastructure in the last 25-30 years. Their contribution was to granulate and re-focus the domains of change and repopulate the individual frames of the framework. But research, as well as practice, is driven by fads, particularly the everchanging technology and information infrastructure (Baskerville & Myers, 2009). The framework provides a theoretical mechanism to accommodate such fads.

A more recent contribution has been Lee et al. (2015) who argue for a pivot away from a focus in IS as an information technology artefact to an IS artefact that is in fact an ecosystem of different artefacts such as technology, information, social, etc. This again reinforces the sociotechnical perspective and the diversity of IS.

2.2 Curriculum models for IS

The development of IS curriculum was influenced by the early attempts to provide guidelines for computer science courses. Three associations; ACM, the Association for Information Technology Professionals (AITP) and the Association for Information Systems (AIS), have taken the responsibility of developing curriculum guidelines for IS courses. The ACM first proposed the introduction of the guidelines in 1972 (Longenecker Jr et al., 2013). IS curriculum has been updated over time, and versions of the curriculum models were introduced in the 1980s, 1997, 2002 and 2010 and most recently 2020. The model curricula over the years have a common goal to provide consistent and standard guidelines for educational institutions to support the development of undergraduate and graduate IS courses (Föll & Thiesse, 2021).

The IS2010 model curriculum was an extension of previous models with an update on specific IS knowledge areas in high demand. The various domain knowledge areas were classified into two areas: core and elective knowledge areas (Topi et al., 2010). Core knowledge areas included fundamental subject areas relevant to computing in general (e.g. programming fundamental) and information systems knowledge (system analysis & design & IS project management). The elective knowledge areas covered more generic topics in IS such as organisational knowledge base and capabilities.

Vladiou et al. (2019) argued that IS 2010 models must be better correlated with the current IS job market. Based on a thorough empirical analysis of IS job requirements, the authors called for IS curriculum models that are aligned with the IS market. They claim that the skillsets and competencies emphasizes by employers are a useful guide for developing more effective IS curriculum models. The most recent IS curriculum model (IS2020) responded to these calls motivated by a competency-based approach does not focus on what graduates know but rather on what they can do (Leidig & Salmela, 2020). This approach considers competency as the intersection of knowledge areas and skills. The

model identifies competencies in IS foundations, the usual domains of IS covering data, technology, development and organisations, and integration to equips students with the ability to combine all competency areas to develop and implement an IS (Leidig & Salmela, 2020). The report acknowledges that these broad competency areas have remained unchanged since the earliest IS curriculum models.

2.3 IS Curriculum Research

Analysis of recent IS curriculum research indicates three key research themes: reviewing up-to-date IS skillsets in support of developing IS degrees; compatibility of IS degrees with IS curriculum models; and new approaches to IS curriculum development. The skillset theme analyses current IS industry job requirements and how IS courses are aligned with these requirements. The research in this area was driven by the observation that IS employment sector is growing at a fast pace, leading to an increased skill shortage. This is directed to bridging the gap between IS industry requirements and the skills required (Mardis et al., 2018). Nwokeji et al. (2019) reviewed job descriptions of 132 ICT employers. They proposed a theoretical framework classifying competencies into knowledge, skills and disposition to improve IS curriculum. However, this approach requires a regular review of IS job market to better prepare graduates with the right set of skills. Advanced tools using data mining of job postings can inform the curricula (Mohammad Akhriza et al., 2017).

In the alignment theme, Mills et al. (2012) classify IS schools in their use of IS 2010 model into four categories: adoptive, focused, flexible and independence. The first two indicate a better fit with the model whereas the other two indicates a lower degree of alignment. Clark's et al. (2017) review of 500 internationally accredited business schools in the United States showed that only 263 offer an undergraduate major in IS/IT-related fields. In the 263 IS majors, they found a lack of alignment between IS degrees and IS curriculum models. Such research highlights the need for a more sustainable process to adapt curriculum models to overcome the slow and indirect impact of models (Babb et al., 2021).

In the new approaches theme, studies contested the applicability of current curriculum models and introduced different approach or extension of existing models. Early work by Wagner et al. (2008) argued that IS curriculum models lacked strategies for measuring success. While the models provide insights into the key competencies an IS graduate needs, students' results varied widely in units designed to teach those competencies. Wagner et al. (2008) argue a learner centred approach is needed to map students' outcomes and learning objectives to course offerings and assessments. Rubleske and Cata (2017) state that the agility of IS skills development is difficulties for schools to adapt to IS curriculum models. They call for universities to inject a micro-credential program into IS degrees where students can complete clusters of short courses. While providing greater flexibility, it is more challenging in terms of formal recognition compared with IS degrees.

3 Mapping Research to Competencies

In this section we discuss critically the competency realms as presented in the IS2020 curriculum and what relevant research addresses the realm. Our intention is to highlight the disparity between the knowledge that underpins the competency and the knowledge claims in research.

To determine the knowledge areas addressed in academic IS research we conducted a large-scale literature review covering all empirical and conceptual articles published between 2017 and 2021 in the basket of eight journals. Articles that are addressed as debate and perspective, issues and opinions, editorial, epilogue and special issues introductions were excluded. A total of 1572 articles were selected with the journal breakdown as shown in Table 1.

Journal	Number of articles	Journal	Number of articles
European Journal of Information Systems	159	Journal of Management Information Systems	190
Information System Journal	177	Journal of Strategic Information Systems	100
Information Systems Research	313	Journal of the Association for Information Systems	248
Journal of Information Technology	82	MIS Quarterly	303

Table 1:Number of selected articles from journals

For each article, we included the journal name, volume and issue number, the title, keywords, subject terms and the abstract. Articles from 6 journals were retrieved from Business Source Complete which included subject terms assigned by the journal. Articles from the EJIS and JSIS were retrieved from other databases. We relied on keywords as the journals did not provide subject terms. We ran a frequency analysis of the subject terms and keywords to determine the focus of IS research in the past 5 years. A total of 3865 distinct terms were found.

We coded the terms into 16 themes. We then mapped the themes against the four competency realms identified in the IS2020 curriculum model representing IS knowledge and skills. Table 2 shows whether the research themes address the IS competency realms. This mapping is based on our analysis of the combination of subject terms/keywords and abstract of the articles to assess if the paper addresses any of the curriculum IS competency realms.

	IS competency realms			
Knowledge Themes	Data	Technology	Development	Organisation
Information System Security	X	X	X	X
Social Media		X	X	X
Technological Innovations			X	X
Digital Technology			X	X
Consumer Behaviour				
Electronic Commerce			X	X
Information management	X	X	X	X
Decision Making	X		X	X
Data management	X			
Crowd				
Cloud Computing		X	X	X
Knowledge Management	X			X
Performance	X			X
Mobile Technology			X	X
Project Management				X
Software Development			X	X
AI		X		X

Table 2: Research themes and competency realms

Our analysis of the mapping explores the competency realms and how research themes address (or do not address) those realms. We conduct this from the perspective of competencies and do not necessarily reference every research theme. Our focus is to highlight the gap between realms and themes.

3.1 Data

The competency realm concentrates on key semi-technical skills. The IS curriculum model listed key requirements to meet the demand in this area including skills in visualization, data mining and business intelligence. A postgraduate degree in IS can go beyond the basics and have a broader understanding of data and information management. Skills on creating dashboard and visualising data is indeed useful but more importantly it is necessary to understand decision makers and behavioural decision within organisational context, a knowledge area that has been researched thoroughly in IS. Performance management is another knowledge area in research that impacts on data management realm. Research is focused on deriving insights from performance data and the organisational impact of those insights This realm lacks the people and organisations focus that is addressed in research.

3.2 Technology

Technology and security realm as listed in IS2020 emphasize the importance of gaining skills in IT infrastructure, secure computing and emerging technologies such as blockchain. This emphasises the technological focus of IS that is increasingly being challenged in the research literature. There is no question that an IS graduate need knowledge of this realm but not necessarily the technical skills to develop an application of the technology. This is particularly true of PG graduates who predominantly move into analyst type positions. Rather than a technology focus, research can contribute a greater understanding of IS security. A wide range of published IS papers highlighted aspects of IS security development within organisations. These papers emphasis organisational and individual readiness, awareness and training required for implementing IS security and policies. This knowledge raises awareness of processes and products enabling organisations and individuals to adopt such security practices informed by IS research

3.3 Development

Development is a realm that is conceptualized around software development methods and technology development including web development, mobile development and user interface design. Again, this emphasises the technological focus of IS and narrowly addresses IT artefacts. IS research is focused on innovation and broader organisational development processes as well as human-centered development. Moreover, research also addresses the broader social and organisational aspects of technological innovation, the management of such processes and their impacts. There is bigger agenda in the research that addresses the infrastructure and platforms to support IT systems. This is consistent with Lee's et al. (2015) notion of IS as an eco-system of artefact such as information, social, communication etc. as well as the technology artefact. A comprehensive knowledge of "development" as presented in the research literature provides a necessary, complementary knowledge area and related skillset. This would also boost IS graduates confidence in managing the development processes in an organisational context.

3.4 Organisation

The key competencies under the organisational domain realm include ethics and societal implications of IS, IS management and strategy, digital innovation and business process management. This is clearly a mix of key graduate attributes and the management of the IT function in organisations. These competencies require a theoretical understanding of issues rather than a grounding in practices, that are often superficial or shallow. As an example, IS graduates need knowledge of key theories and processes in ethics in order to understand and appropriately and responsibly adopt artificial intelligence (AI) within an IS. This knowledge is necessary so that the IS not only benefits the organisation but also does not harm the public, directly or indirectly. Such theories and issues are well-researched and discussed extensively in the IS literature. A deep understanding of IS impact, adoption, strategies and benefits is fundamental for graduates to be able to manage and adapt IS in a constantly changing social and technological context.

4 Discussion and conclusion

IS curriculum models provided IS schools with guidelines on the structure and content of IS courses. The models emphasize the importance of competencies and skillsets for graduates to be work-ready. One limitation is that the models are generally directed at undergraduate IS degrees. However, for IS postgraduate degrees, there are other imperatives that place more emphasis on acquiring knowledge of current IS issues but at a more conceptual or even theoretical level rather than just competency in that area. Such a shift is required to meet accreditation standards required for postgraduate courses, particularly at the Masters level. An IS postgraduate should demonstrate a higher level of understanding of the IS domain.

The current IS2020 report (Leidig & Salmela, 2020) builds on the competency orientation of previous models, particularly the IS2010 model, and is explicitly a model for undergraduate courses. This orientation is grounded in competencies required for ICT jobs that focus on technical and business skills but also reference the SFIA framework. (SFIA 2020). One aspect of IS202 is that the skill level of each competency is predominantly at Bloom's cognitive level of "understand" or "apply". This is consistent with the report's understanding of competency as the intersection of knowledge and skill. What is significant is that knowledge is limited to "know how". Our contention is that graduates of postgraduate course need knowledge as well as ways of knowing (Cook & Brown, 1999) to inform their "know how".

We argue that research themes we have identified can guides postgraduate IS degrees by increasing the depth of their knowledge ways of knowing the IS discipline. We believe this would equip graduates with a greater confidence and creativity in their professional career.

To this end, at our institute, we are embarking on redesign and redevelopment of the faculty's flagship Masters course in IS. This endeavour is informed by conceptualisation of the IS discipline through the lens of the IS artefact as an ecosystem of artefacts without privileging the technology artefact (Lee et al., 2015). The early work on the design of the course is focussed on the domains of changes Hirshheim et al. 1996; Linger & Hasan 2020) but the content is grounded in the theories that inform those domains. Our approach to pedagogy is to combine conceptual and theoretical knowledge with practice in different ways. This culminates in a capstone project where students are expected to demonstrate their "engaged scholarship" (Van de Ven, 2007); display their professional competencies and skills and reflect on their academic knowledge. The starting point for this endeavour was a greenfields approach with no external constraints. As we progress, institutional, professional and local constraints emerge and are externally imposed. At this stage we are unsure how successful we will be delivering an IS degree that balances academic knowledge and professional competencies.

As a practice-based discipline, the IS curriculum needs to reflect the imperatives of practice as well as knowledge that underpins the discipline. However, there is a fundamental difference between the bodies of knowledge (BoK) of IS practice and the IS academic discipline (Van de Ven, 2007). Van de Ven's notion of engaged scholarship provides opportunities for practice and academic research to contribute to each other's knowledge claims. Such an interactionalist approach offers an opportunity to address the enduring debates in IS about rigour verses relevance and contribute significantly to our understanding of the IS discipline (Mathiassen & Nielsen, 2008, Lyytinen 1999). But most importantly, encapsulating both practice and academic knowledge, combined with practice skills, ensures graduates are professionally future ready.

References

Babb, J., Gardner, L., Leidig, P. M., Salmela, H., Muthupoltotage, U. P., & Qutab, S. (2021). Towards a Continuous Process for Using and Sustaining IS Curriculum Guidelines.

Baskerville, R. L., & Myers, M. D. (2009). Fashion waves in information systems research and practice. *MIS quarterly*, 647-662.

Boell, S., & Cecez-Kecmanov, D. (2012). Conceptualizing Information Systems: From'Input-Processing-Output'Devices to Sociomaterial Apparatuses.

Burstein, F., Richardson, J., & McGovern, J. A Study of Australian Undergraduate IS Programs and Curriculum.

Cook, S. D., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. Organization Science, 10(4), 381–400.

Fichman, R. G., Dos Santos, B. L., & Zheng, Z. (2014). Digital innovation as a fundamental and powerful concept in the information systems curriculum. *MIS quarterly*, *38*(2), 329-A315.

Föll, P., & Thiesse, F. (2021). Exploring Information Systems Curricula. *Business & Information Systems Engineering*, *63*(6), 711-732.

Galliers, R. D. (2003). Change as crisis or growth? Toward a trans-disciplinary view of information systems as a field of study: A response to Benbasat and Zmud's call for returning to the IT artifact. *Journal of the Association for Information Systems*, *4*(1), 13.

Hirschheim, R., Klein, H. K., & Lyytinen, K. (1996). Exploring the intellectual structures of information systems development: a social action theoretic analysis. *Accounting, Management and Information Technologies*, *6*(1-2), 1-64.

Jones, C. G., & Liu, D. (2017). Approaches to incorporating it entrepreneurship into the information systems curriculum. *Journal of Information Systems Education*, *28*(1), 43-58.

Leidig, J., Leidig, P., & Ferguson, R. (2014). University Responses to the IS 2010 Model Curriculum: A Pre and Post Comparison. Proceedings of the Information Systems Educators Conference ISSN,

Leidig, P., & Salmela, H. (2020). IS2020 A Competency Model for Undergraduate Programs in Information Systems: The Joint ACM/AIS IS2020 Task Force.

Leidig, P. M., Ferguson, R. C., & Reynolds, J. H. (2019). IS2010: A Retrospective Review and Recommendation. *Journal of Information Systems Education*, *30*(4), 298-302.

Linger, H., & Hasan, H. M. (2020). Making IS relevant in a connected world: Revisiting the intellectual structures framework.

Lo, A., & Cruz, A. (2014). The implementation of the AIS/ACM IS 2010 curriculum by top US universities: an analysis of catalogs and college websites.

Longenecker Jr, H. E., Feinstein, D., & Clark, J. D. (2013). Information Systems Curricula: A Fifty Year Journey. *Information Systems Education Journal*, *11*(6), 71-95.

Lyytinen, K. (1999). Empirical research in information systems: On the relevance of practice in thinking of IS research. *MIS quarterly*, 25-27.

Mardis, M. A., Ma, J., Jones, F. R., Ambavarapu, C. R., Kelleher, H. M., Spears, L. I., & McClure, C. R. (2018). Assessing alignment between information technology educational opportunities, professional requirements, and industry demands. *Education and Information Technologies*, *23*(4), 1547-1584.

Mathiassen, L., & Nielsen, P. A. (2008). Engaged scholarship in IS research. *Scandinavian Journal of Information Systems*, *20*(2), 1.

Mills, R. J., Velasquez, N. F., Fadel, K. J., & Bell, C. C. (2012). Examining IS curriculum profiles and the IS 2010 model curriculum guidelines in AACSB-accredited schools. *Journal of Information Systems Education*, *23*(4), 417-428.

Mohammad Akhriza, T., Ma, Y., & Li, J. (2017). Revealing the gap between skills of students and the evolving skills required by the industry of information and communication technology. *International Journal of Software Engineering and Knowledge Engineering*, *27*(05), 675-698.

Moshkovich, H., Mechitov, A., & Olson, D. (2005). Infusion of electronic commerce into the information systems curriculum. *Journal of Computer Information Systems*, *46*(1), 1-8.

Nwokeji, J. C., Stachel, R., Holmes, T., & Orji, R. O. (2019). Competencies required for developing computer and information systems curriculum. 2019 IEEE Frontiers in Education Conference (FIE),

Rubleske, J., & Cata, T. (2017). University micro-credentials and the need for agile IS skill development programs. Proceedings of the EDSIG Conference ISSN,

Sarker, S., Chatterjee, S., Xiao, X., & Elbanna, A. (2019). The sociotechnical axis of cohesion for the IS discipline: Its historical legacy and its continued relevance. *MIS quarterly*, *43*(3), 695-720.

Sawyer, S., & Jarrahi, M. H. (2014). Sociotechnical approaches to the study of information systems. In *Computing handbook, third edition: Information systems and information technology* (pp. 5-1-5-27). CRC Press.

Sendall, P., Shannon, L.-J. Y., Peslak, A., & Saulnier, B. (2011). The greening of the information systems curriculum. *Information Systems Education Journal*, *9*(5), 27.

SFIA (2020) SFIA, the global skills and competency framework for a digital world, https://sfiaonline.org/en.

Sidorova, A., Evangelopoulos, N., Valacich, J. S., & Ramakrishnan, T. (2008). Uncovering the intellectual core of the information systems discipline. *MIS quarterly*, 467-482.

Tehrani, M. S. (2015). Towards a Consistency of Information Systems Curriculum. *Issues in Information Systems*, *16*(2).

Topi, H., Valacich, J. S., Wright, R. T., Kaiser, K. M., J.F. Nunamaker, J., Sipior, J. C., & Vreede, G. J. d. (2010). *IS 2010 Curriculum Guidlines for Undergraduate Degree Programs in Information Systems*.

Van den Berg, C. (2018). Enriching the information systems curriculum to enable digital innovation capacity. *South African Journal of Higher Education*, *32*(6), 215-233.

Vladiou, M., Constantinescu, Z., & Danciulescu, D. (2019). Career Tracks and Job Requirements in Information Systems vs. ACM/AIS IS 2010 Curriculum Guidelines: An Empirical Study.

Wagner, T. A., Longenecker Jr, H. E., Landry, J. P., & Lusk, C. S. (2008). A methodology to assist faculty in developing successful approaches for achieving learner centered information systems curriculum outcomes: Team based methods. *Journal of Information Systems Education*, *19*(2), 181.

Walsham, G. (2012). Are we making a better world with ICTs? Reflections on a future agenda for the IS field. *Journal of Information Technology*, *27*(2), 87-93.

Acknowledgements

The research reported in this paper was partially funded through an internal Faculty of Information Technology grant

This document was adapted from the Instructions for Authors from ICIS2007 (which in turn was adapted from the AMCIS templates), PACIS 2007, ACIS 2011, ACIS 2010, ACIS 2008, ACIS2007, ACIS 2006, and the ACIS 2005 Instructions, which were an extension of the ACIS 2004 instructions, much of which was adapted from the ACIS 2003 and ACIS 2002 Instructions, which were based on the ACIS'98 Instructions (which was adopted from ACIS'97 Instructions). These in turn were adapted from an "Instructions for Authors" written by Roger Clarke. The new format, use of the Creative Commons license and support for DOIs was added by John Lamp in 2015.

Copyright