

Invited Paper
**Growth, Adaptability, and Relationships within
the Changing Landscape of IS Education**

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Growth, Adaptability, and Relationships within the Changing Landscape of IS Education

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ABSTRACT

In this article commemorating 30 years of the *Journal of Information Systems Education*, we reflect on our extraordinarily lucky careers together in the academic discipline of information systems. Both our careers and our field have seen continual growth, unrelenting change, and required adaptability. We credit our enduring and strong professional relationship and friendship with each other, the fun we've had with our collaborators (and especially our doctoral students), as well as our ability to adapt, as the keys to whatever positive outcomes we have enjoyed along the way. Given the rate of change in our field over the past 30 years, we are excited to think about what might transpire for us all over the next 30 years.

Keywords: Adaptability, Agile, Change, Relationships, Resources

1. INTRODUCTION

We are honored to collaborate and write an article to commemorate 30 years of the *Journal of Information Systems Education* (JISE). On the other hand, it is a daunting task to attempt to say something insightful and useful about the changing landscape of IS education. In any event, we decided to write a version of our collective, personal story, now spanning more than 30 years, and tightly interwoven with the growth and development of IS as an academic discipline. As the field grew, so did we, and if there is a constant, it would be continual growth and adaptability along the way. Without it, neither of us (or the field, for that matter) would likely have survived.

Below we describe how we first met and jumped into research together, diving into the deep end of a pool about which we knew very little. Key moments in our careers include working together at the same institutions and collaborating from different institutions. Some lessons we have learned we hope might be of use to others in the field, particularly in terms of how we think about and teach within the field of IS. Finally, we speculate about what the future may hold for us, although offered with the caveat that we do not know what the future will bring. At this point, our recollections hold a modest degree of

certainty and accuracy, while our future speculations likely hold little in that respect.

2. A FRIENDSHIP AND RESEARCH COLLABORATION BEGINS

We often tell the story of how we met and got started conducting research on group decision support systems. We were both new doctoral students at the University of Arizona, with Len arriving in 1985 and majoring in organizational behavior and management with a minor in IS. Joe arrived in 1986, majoring in IS and minoring in operations management / research.

Len came from northern California and had just finished an M.B.A. at Cal State-Chico. One of his departing tasks that spring and summer of 1985 was to help set up a personal computer lab complete with printers. He wished he had one of those new "local area networks" he had been reading about in order to better connect the computers together and with the local printers.

Joe had wrapped up his studies in computer science with an M.B.A. from the University of Montana and was working in Seattle prior to his arrival at the University of Arizona. During that time, Joe worked for a Fortune 500 firm, a startup he co-founded, and Seattle Computer Products (SCP). For those

vested with deep knowledge of the personal computer revolution, SCP was a legendary company, believing like others such as IBM with its PC product, that the money in this emerging market was in hardware, not software. Long story short, SCP sold its prototype “disk operating system,” DOS, for next to nothing to a slightly older and larger start-up in town named Microsoft... and the rest is history.

Upon arriving at the University of Arizona, both of us were excited about what lay ahead. In the style of Gladwell (2008), we were lucky outliers at the right place, at the right time, of the right age, and with just the right background. We had just enough knowledge of technology and an abundance of desire to learn, enabling us to take advantage of all the University of Arizona had to offer. Attending the University of Arizona was a tremendous opportunity with its outstanding faculty, “big science” mentality, ample resources, and access to cutting-edge technologies – being at the very beginning of the next wave in computing that was coming.

Upon arriving in 1986, Joe put his technical skills to good use as part of a team that was coding early versions of GroupSystems, collaboration software for proximate and/or dispersed teams across a network of personal computers. Len was in his second year, searching for a fun and interesting minor.

Len had heard about the stellar reputation of the IS department within the business school at the University of Arizona (the College of Business and Public Administration, later becoming the Eller College of Management), and was intrigued by stories of a professor named Jay Nunamaker. Nunamaker’s team developed a lab with networked personal computers and was creating various types of collaboration software.

We met in Nunamaker’s off-campus lab, and several important things happened. As former collegiate athletes from the Pacific Northwest, we had a lot in common and immediately hit-it-off. We were also both incredibly hard working, wanted to make a difference, and were very much open to learning and growing. Perhaps most important, we were both enamored with that lab. We suspect that we felt much like Steve Jobs must have felt when he travelled across town to Xerox PARC to see the new technologies they were working on that became cornerstones of the Apple legacy (Isaacson, 2011).

In our case, we both saw for the first time the power of a local area network connecting personal computers and utilizing a new genre of software that could be developed to harness all of that technology, as well as the possibility of interconnecting those networks. We knew that something special and profound was happening in that lab that would soon emerge across the country in similar labs. We also realized that we needed to work together to better understand the technology and help develop and implement it... and there was a rush to be first.

Len minored in IS and applied the knowledge from doctoral seminars that focused on theory-driven, social-psychological, laboratory experimentation. Joe contributed his technical expertise and his access to the lab.

We were clearly at the right place and time, now with a combination of unique skillsets that would enable us to learn why and how people would adopt this technology. We also discovered how specific features and configurations of the software would influence the use and perception of the technology by the groups using it. Our goal was to understand

the “why” underlying the technology. Up to that point in time, the focus had been on building great software based on assumptions of usefulness, gleaned from hunches and anecdotal evidence from groups that had been brought in opportunistically to use the technology. Our approach was to study the technology scientifically and methodically, with controlled user experiments – a classic empirical approach to answer the classic research question, “what are the effects of A on B?” For example, what effect were specific features of the technology, such as anonymity, having on the processes and outcomes of groups who used it.

We conducted many experiments together, and some separately, in that research stream. Publications in top-tier journals began while we were doctoral students and continued for many years after. We launched a research monograph together (Jessup and Valacich, 2003), while still doctoral students, that included many well-known scholars – e.g., Karl Weick, Joe McGrath, Terry Connolly, Jay Nunamaker, Gerry DeSanctis, M. Scott Poole, and Paul Gray, to name a few – from a variety of disciplines.

Joe went far deeper into this research stream and published a number of seminal pieces on his own and with co-authors, and it all began back in that off-campus lab. We were, in the Gladwell sense, very lucky outliers in terms of our experience at that point in time, and drawing from Kuhn’s *Structure of Scientific Revolutions* (Kuhn, 1996), we were there at the beginnings of a wave in research and development in networked software solutions for personal computers that enabled people to collaborate. We were lucky to be on our surfboards as the wave started, and we were fortunate to stand up and ride that wave. We encouraged and assisted each other through road blocks and setbacks, believing that our foundations in social science theory, research, and methodologies were a tailwind that helped us gain speed on that wave.

Our preparation was timed perfectly with an incredible opportunity. According to Kuhn, our early arrival in the research field enabled us to get away with some initial sloppy procedures. We were pioneers in that, initially, there were few others doing the work we were doing in the way we were doing it and with access to technology that we had. Over time, others joined the research stream, and top-level publications in this area became more plentiful and more difficult to achieve. You now had to conduct studies and write them up with much more precision, and you often had to combine multiple experiments into one publication. Being early had its benefits.

3. CONTINUING TO BE AGILE AND ADAPTIVE

As mentioned above, we sometimes worked together at the same universities, and we sometimes worked apart. We continued to collaborate and never lost our agility and adaptability. We are not referring to agile software development per se (Valacich and George, 2019); rather, we simply mean being nimble and having the ability to move quickly and easily. We refer to being adaptive in the biological sense (i.e., adaptation), meaning the ability of an organism or species to become better suited to its environment.

For example, Len had to run some experiments using a specific configuration of the software and didn’t have access to the lab. He was forced to use separate computers in a decision behavior lab run by his advisor, Terry Connolly, and as such he

had to do all the coding himself – in BASIC – not an easy task for the guy with the social science bent. Similarly, he was asked to teach a database design course in his first, formal tenure-track position, having little or no formal preparation. The course needed to be taught, and he had to teach it. He dove in, got up to speed quickly, and taught the course using an available database management system.

Joe graduated and took his first tenure track job at Indiana University. There he evolved into an accomplished social scientist, taking advantage of an existing social psychological experimentation lab and modifying it to suit his purposes. This became the basis of a prolific and enviable stream of top-tier journal publications. Next, Joe was hired to build an IS program at Washington State University. When he didn't have an adequate, dedicated classroom for his program, he cut through university red tape, found a partner in Microsoft, and acquired funding to build, what was thought to be at the time, the most expensive state-of-the-art computer aided classroom in the country... a true showcase.

Over the course of our teaching careers, we've both also had the opportunity to combine entrepreneurship with IS. This teaching has been among the most rewarding we've done, either together or separate. Helping teams of entrepreneurial students has been an incredible experience, helping them to envision marketable uses of new technologies and/or the digital transformation of business, write business plans for their ideas, use lean start up concepts to test and launch their ideas, and for some, helping them secure funding to start their companies. Doing this kind of teaching wasn't something we were trained to do, but we adapted and overcame obstacles to do it, and it has paid off for us and many of our students.

We've noticed as well that the way the discipline thinks about pedagogical research has shifted. For example, when we were doctoral students in the mid to late 1980s, there was rarely anything pedagogical published in the field's journals. In fact, JISE did not exist – it was launched as we were finishing up our doctoral program. Further, we believe that what was published on pedagogy was comparatively not very rigorous at the time and was more about curriculum and/or accreditation implications. Now we find that pedagogical research is much more sophisticated, rigorous, frequent, accepted, and rewarded. Much has changed.

We believe that this type of research was infrequent back then because there were limited outlets for it, but also because the discipline was so new that its founding faculty at the time were spending more of their time trying to establish themselves on campuses around the country as a legitimate, distinct, worthy academic research discipline. Now, the field is much more mature, research methods are more established, much is happening in technology-enabled teaching and learning, and outlets for this type of work are much more plentiful. So much more of this work is being published, and it is much better now than it was decades ago.

For example, Joe is working on a grant application that takes assessment of human behavior on computers (and related intentions) to an entirely new and extraordinary level. Based on his research in capturing our tell-tale signature behaviors as we keyboard and mouse, taken into context with other behaviors and environmental characteristics, this work reveals an unprecedented granularity into how and why we think, act, and react in our ubiquitous computer interactions. This work

provides an unprecedented level of assessment that is now possible and extends to teaching and learning as well as into many other contexts. Similarly, Len is helping to design and implement an advanced learning environment at Claremont Graduate University with the help of several technology companies and donors, the third such lab in his career. Methods for technology enabled teaching and learning, and their assessment, continue to explode with possibilities as more and more of what we do ports over into online environments.

We also feel that doctoral education is about change and adaptation, and for many reasons we both strongly agree that one of the best and most rewarding features of a career in academe is being able to work with great doctoral students. As faculty, given the rapid, inherent rate of change in our discipline, we are forced to continually evolve or we become extinct intellectually. Our doctoral students have continually helped both of us to stay relevant, and we've learned so much from them over the years. For example, Joe credits his students at the University of Arizona with pulling him into keyboard and mouse tracking, which now dominates his research. Similarly, Len credits his work with his students at Washington State University with pulling him into research on the role of patents in technology transfer and commercialization. They've kept us young, not only in terms of being much better in touch with new technologies, but also with fresh insights and with renewed energy.

We've also worked closely with so many information systems doctoral students over the years that we consider them like family members, not only working long hours in labs with them but, in some cases, launching companies with them. Our fatherly advice has, of course, changed over the years. Initially, we both advised our doctoral students to take the "best" job they could get, meaning the faculty job with the most high-profile "research" institution, and we now see that in some cases that just wasn't good advice for the student. As we've grown and gotten smarter, we now advise doctoral students to take the job that is the "best fit" for them and their lives, families, goals, skillsets, etc., recognizing that might not necessarily be in the academy. Some of our doctoral students really want to publish papers, while others want to chase grants, or spin out technologies, or launch and run companies, or teach, or consult, or work in government, or teach in executive education, or move into administration, or write books, and so on. We're supportive of their diverse paths and their multitude of choices, and we wish them all well and urge them to check in with their old advisors more frequently.

We could give many more examples across many universities but we hope the reader understands the point. We were and are nimble, moving quickly with the changes in technology, never letting barriers get in the way, taking advantage of what little we had, and if we didn't have what we needed, we went out and found it or a reasonable alternative. Over the years, we gained funding for, and access to, some incredible state-of-the-art technologies to use in our teaching and in our research. Our resourcefulness enabled us to be successful when we really shouldn't have been by most accounts.

4. CONTINUAL LEARNING EVEN TODAY

We worked together at the University of Arizona, with Joe as a full professor in a named professorship and Len as Dean. It was an honor to be together at our alma mater. We're at separate institutions now, but we'd have to say that despite getting (much) older, we pride ourselves on having the mindset that we continue to learn every day.

Joe has shifted from a singular focus on publishing empirical research in top-rated journals. While he is still active in the academic publishing game, he evolved and adapted to the grant-getting, design science, tech transfer culture at the University of Arizona. His work also shifted more toward deception detection and cybersecurity, and he continues to attract great students. In fact, and in keeping with the culture at the university, he and one of his former students, Jeff Jenkins, launched a start-up based on their work that is doing quite well. It is literally disrupting the online lending industry using previously unattainable data related to how people interact with application forms. Their patented approach captures fine-grained human-computer interaction data that is converted into hundreds of metrics that are used to train machine learning algorithms on important outcomes of these firms. This novel approach is not limited to online lending but is capable of improving decision models in countless use cases, including insurance applications and claims, employment applications, and numerous governmental processes. Joe is always adapting, always open to what is new, always peering around the corner for what is coming, and always finding ways to add value.

Len has shifted from Dean to university President, now in his second position, this time at Claremont Graduate University. He now looks for entrepreneurial faculty and program heads like we both were in our early days, and he finds ways to remove barriers for them and provide them with the fuel they need to bring their ideas to life. Len is finding that successful IS programs are ones where the faculty work together as a team, where they continually find ways to provide a great experience and outcomes for their students, where the purpose of their research is to have a positive impact on others, and where they continually evolve both their teaching and their research. Len's days teaching IS courses are probably over, unless he had a lot of retooling and massive amounts of coffee, but he has the opportunity to see IS from a perspective that few in the field are allowed to enjoy.

5. LESSONS LEARNED FROM A CAREER TOGETHER IN IS

Our point in this article is not to try to predict the future for what we should be teaching in IS programs. We clearly see, and are excited about, developments in areas such as cloud computing, mobility, big data and analytics, agile systems development, the Internet of Things, social networks, cybersecurity, artificial intelligence, augmented reality, and so on. It wouldn't be useful for us to try to pontificate on these or other trends, and, quite frankly, we'd probably miss the mark.

Instead, we think we can glean some lessons learned from our experiences together that might be useful to those who will be building and teaching IS courses and programs. You can probably guess the "take-aways" from this essay thus far, but below are some that we captured.

While we weren't necessarily able to see around corners, we were **constantly on the lookout for new technologies and how we could exploit them**. We did this by reading a lot, mostly in the popular press, and by talking with people working in industry to find out what they were doing and what was likely to come down-the-pike next. **We consider ourselves to be constantly learning.**

We were agile and adaptive, making changes on a moment's notice to shift our work, evolve our teaching, renovate a lab, find a new research partner or funding source, etc.

We were resourceful. Sometimes that meant using baling wire and duct tape to make technology work in our research or our teaching. Other times it meant begging our Dean, Provost, or President for funding and showing them the return on investment they would get, or in some cases getting creative and finding external partners with deep pockets to fund an idea we had.

We strove to add value for our students. We wanted to knock their socks off every time we taught, worked to always teach them the latest technologies and techniques, and helped them realize great outcomes both in the classroom and in their careers.

We never hesitated to be "all in," often diving into projects head first and with gusto. **We worked hard and we always had a lot of fun**, both in our research and in our teaching, and we think that was infectious and attracted students and faculty (and donors).

We learned that relationships matter, a lot. Our friendship continued to grow and evolve over the years, and while at times we got sore at each other over this issue or that, we were always, and still are, close and have each other's backs. Further, as we learned in our research results on group decision support, we could go farther and faster with each other than we could on our own.

6. EPILOGUE

Think back 30 years ago when this journal first began and remember the state of the technology at the time and the state of teaching in IS. Personal computers were finally becoming affordable, networking was really just beginning and reaching the masses, the Internet was in its infancy and we were dreaming about electronic commerce, there were no cell phones as we currently think of them, and in the classroom we relied a lot on lecturing and some of us were still writing our lecture notes on plastic sheets on an overhead projector.

Now imagine what the next 30 years will bring for the IS field in terms of how we will teach and learn. If the next 30 years progress at the same rate as the prior 30 years did, we're certainly in for a wild ride on some more gnarly waves of change.

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AUTHOR BIOGRAPHIES

Leonard M. Jessup is President at Claremont Graduate University and was most recently President of the University of Nevada-Las Vegas (UNLV). He previously served as the Dean of the Eller College of Management at the University of Arizona and before that as Dean of the business school and later as Vice



President of university development and president of the Washington State University Foundation. Jessup is a professor and scholar of management information systems. His many publications include co-authoring the third edition of *Information Systems Today: Managing in the Digital World* and “On the Future of the MIS Discipline: MIS as a Critical Strategic Driver,” published in the journal *Database*. In addition to his academic achievements, he has received numerous awards, including the 2018 CEO Award from the Council for Advancement and Support of Education (CASE) District VII. The first in his family to graduate from college, Jessup was born and raised in Northern California. He holds a doctorate in management and organizational behavior from the University of Arizona with a minor in management information systems. He also holds an M.B.A. and a Bachelor’s degree in information and communication studies, both from California State University-Chico.

Joseph (Joe) S. Valacich is the Eller Professor of MIS within the Eller College of Management at the University of Arizona, a Fellow of the Association for Information Systems (2009), and a co-founder, Chairman, and Chief Science Officer (CSO) of Neuro-ID, Inc. His



primary research interests include deception detection, human-computer interaction, data visualization, cyber security, and e-business. Valacich is a prolific scholar, publishing more than 200 scholarly articles in numerous journals and conferences, including: *Academy of Management Journal*, *Communications of the ACM*, *Decision Sciences*, *Information Systems Research*, *Journal of Applied Psychology*, *Journal of the Association for Information Systems*, *Journal of MIS*, *MIS Quarterly*, *Management Science*, *Organizational Behavior and Human Decision Processes*, and many others. His scholarly work has had a tremendous impact not only on the IS field, but also on several other disciplines, including computer science, cognitive and social psychology, marketing, and management. In June 2019, Google Scholar lists his citation counts at more than 25,000, with an H-index of 71. He was the general conference co-chair for the 2003 International Conference on Information Systems (ICIS) and the 2012 Americas Conference on Information Systems (AMCIS); both were held in Seattle, Washington. He is the Honorary Chair for the 2021 ICIS conference to be held in Austin, Texas.



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