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We're happy to have another great group of papers, along with a teaching case and a teaching exercise. The general theme of the issue is the broad topic of student skills – skills that our employers want, skills that our students are seeking, and skills that will serve as foundations for helping our students to become great IS practitioners, as well as great future educators. This focusing on skills for both Computer Science and Business courses, leveraging concepts from IS, assessing mobile learning and skill development, and learning design and development, robotic process automation, and Internet of Things. Never a dull moment in the IS community, and there's more to come!

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The journal acceptance review process involves a minimum of three double-blind peer reviews, where both the reviewer is not aware of the identities of the authors and the authors are not aware of the identities of the reviewers. The initial reviews happen before the ISCAP conference. All papers, whether award-winners or not, are invited to resubmit for journal consideration after applying feedback from the Conference presentation. Award winning papers are assured of a publication slot; however, all re-submitted papers including award winners are subjected to a second round of three blind peer reviews to improve quality and make final accept/reject decisions. Those papers that are deemed of sufficient quality are accepted for publication in the ISEDJ journal. Currently the target acceptance rate for the journal is under 36%.

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Enhancing Learning in Business Education Utilizing Project Management Practice and Skills

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Abstract

While industries compete to hire capable employees, it is essential that business education curriculum delivers graduates who can solve complex problems and implement multifaceted solutions. This approach to curriculum design focuses on developing project management skills to deliver an integrated, student-centered methodology across multiple disciplines. The development of undergraduate curriculum with a project management approach provides a framework centered on developing essential career skills in critical thinking, decision-making, and problem-solving.

Keywords: business education, project management, curriculum development, student-centered learning, project-based instruction

1. INTRODUCTION

As industry demands trained knowledge workers who can synthesize data, think critically, and develop solutions, undergraduate curriculum

must evolve (Rocca, 2010). A well-designed undergraduate curriculum within a dynamic and rapidly evolving industry supports student recruitment, program reputation, and prepares students for careers (Thai, De Wever, & Valcke,

2017). Coupled with employer expectations, current students demand higher levels of engagement and practical classroom experiences. Undergraduate curriculum founded on active student-centered learning can meet this need and deliver increased problem solving, stronger critical thinking, and more developed organizational skills (Rocca, 2010; Vandenhouten, Groessl & Levintova, 2017). Project management skills development can help support embedding industry tested methodology into curriculum. This can help to provide a set of principles to explain process and structure into course design assignments (Morrison, Ross, & Kemp, 2005). Implementing skills development and project management processes can help faculty develop interactive, and well-designed courses.

Curriculum development throughout undergraduate education has not done enough to leverage the innovation of project management practice and skills development across undergraduate curriculum. Our goal is to share an approach utilized effectively in our own curriculum redesign process. We believe that this advancement in the curriculum will better serve business students' needs and provide structure to project work across the curriculum. In our classroom, students can often struggle with basic introductory project management processes. While certain departments such as CIS and Management offer foundational project management-specific courses, we have surveyed students in introductory courses and capstone courses to determine the overall increase in their project management skill and application. We propose that integrating project management practice should be included across the core business curriculum. As evidenced by recent survey collections, it is imperative that we provide foundational project management skills development, earlier in our curriculum starting with first-year business core curriculum. Foundational applications of project management methodologies can be applied consistently throughout student course work and team projects. Information Systems and Management programs can be instrumental in helping to provide context and training by offering fundamentals of project management class options via general education requirements to benefit students across disciplines. The time has come to breakdown silos and expand curriculum access so students across majors can gain these critical skills that apply to all professions and industries.

Project management allocates setting goals and meeting due dates. Emerging time management practices can increase student efficiency and desired outcomes. In this ever-evolving workplace, enhancing communication skills would benefit students and employers. Communication within a project team is essential to project success. Iterative project management practices such as Agile are helping project managers provide benefits throughout the project's lifecycle. This trend is becoming relevant for students to understand and value as project management practice evolves. If faculty do not stay current with industry practices, we feel there is a disservice to our students' future applications.

Project management practice often encompasses recognizing and addressing real-world problems. Project management includes working with a team of various subject matter experts to complete a common goal. Students can advance skills to understand several aspects of project work such as managing deadlines, allocation of specific resources, the value of time, and the impact on budgets and cost.

Overall, improvement of project management skills in undergraduate curriculum, across multiple disciplines (not just computer information systems or business) can support students in both academic and professional growth. They can also develop valuable and marketable skills that will be useful in their future careers (Karanja & Grant, 2020).

Additionally, recent project management trends indicate we should continue to focus on education related to developing interpersonal skills essential to project management practice. Creating curriculum that includes team-based leadership exercises can help develop these skills. Experiential learning project-based assignments should be integrated consistently across the entire undergraduate degree program to improve curriculum and to more effectively train students to adapt and thrive amidst common business disruptions. Karanja and Grant (2020) also stressed the importance of real-world project management assessments.

2. LITERATURE REVIEW

As research has identified, pedagogy must align with employer expectations of graduate skills (Daniel, 2012). There is a growing demand for project management courses that prepare graduates with skills in professional communication, critical thinking, collaborative problem-solving, and critical reflection (Gharaie &

Wingrove, 2020). Business classrooms allow students to engage in an applied approach to active learning both online and in-person (Martin & Bolliger, 2018) which can further increase knowledge through application, engagement, and problem-based learning. Students must explore challenges using data to find the root cause analysis, generate ideas, allocate resources, and provide innovative solutions while understanding project management practices (Eckhardt, 2018). Utilizing project management fundamentals can help them do this.

These skills are particularly important in a business school, where assessment and accreditation factors measure course learning outcomes and course design (Currie, 2017). Using project management methodology in curriculum can increase strategic and critical analysis skills. Students learn and apply knowledge to gain an appreciation for the proposed gap between theory and overall application and include critical thinking and strategy into their mindset (Dirksen, 2015). Reducing cognitive load can assist in knowledge and skill retention and application (Doyle & Zakrajsek, 2018).

The use of evidence-based pedagogies to inform practical business application in the classroom enhances engagement and relevance (Mitchell, 2016), while leveraging the expertise of faculty and providing structure and support to students (Dirksen, 2015). Project management skill development and the use of appropriate tools provides an opportunity to enhance structure and application of methodologies that are empirically supported practices in industry. The integration of industry skills and problem-based pedagogy prepares graduates to successfully transition from the rigor of the academic environment to the modern expectations of the business world (Ewing & Ewing, 2017). Linking course learning outcomes to industry requirements is essential and should be ongoing in course design (Dirksen, 2015). However, curriculum must continuously evolve, and this link should be revisited regularly to address ongoing organizational changes and industry disruptions while providing an efficient, cohesive, and holistic structure (Nisula & Pekkola, 2018).

While hands-on, business focused problem solving that transfers into real world scenarios is commonplace and expected in the classroom (Eckhardt & Wetherbe, 2016; Ewing & Ewing, 2017), a project-based pedagogy supports academic rigor in the business curriculum and provides students with a platform to apply their

program learning as they prepare for the workplace (McNamara, 2009; Vieregger & Bryant, 2019). Rosenbaum, Otolara, and Ramirez (2015) suggest that addressing challenges to learning can be complex and, "although practitioners want to hire new employees with the ability to solve real-world problems, a pertinent question to address is the best method for heeding their request" (p. 183). Through thoughtfully designed real-world projects, students can demonstrate critical thinking and adaptability in evaluating business problems and determining the most feasible solutions (Seow et al., 2019).

To develop a curriculum that increases higher-order thinking, students must be exposed to the application of how to investigate organizations, apply knowledge to problem-solving, establish ideas, and produce creative solutions to problems identified (Pellegrino & Hilton, 2012). In addition, encouraging students to organize team projects using project management methodologies provides them with the experience to increase critical thinking and problem-solving skills while fully investing in learning the course material beyond just memorization (Kuh, 2008). They must also have opportunities to reflect on actions with their team members, which affirms the skills developed during the learning process and provides opportunities for critical personal reflection and enhanced self-awareness (Perusso et al., 2020). These reflective practices lay the groundwork for the self-efficacy and change-making skills necessary for business professionals (Perusso et al., 2020).

Students that improve project management skills can identify and address problems as they arise instead of finding errors at the end. Learning these skills in an undergraduate business curriculum will help individuals to become more proactive and better at decision-making. Understanding scope management, along with project management process will help students with future workplace application (Salapatas, 2000). In addition, communication skills and enhancement of team dynamics will increase workplace efficiencies.

Our curriculum integrates consistent project management tools integrated into each course project, supporting literature that underscores the importance of real-world alignment between course projects and industry standards. For example, successful project managers seek support from the Project Management Institute (PMI) for fundamental, foundational tools and resources to aid in the execution of projects. PMI is an international project management

organization that delivers guidelines, resources, networking opportunities and best practices for the project management field. Our faculty are actively engaged in working with PMI to support the development of experiential learning activities, exposure to industry speakers, and providing guidance on careers in the project management field. In addition, the Project Management Book of Knowledge (PMBOK) is a valuable resource that explains the value of project management structure, guidelines, and practices. This guide is valuable for faculty to utilize when enhancing the curriculum and introducing students to industry standards.

To complement the tools that they are exposed to while engaging in course projects, we encourage students to seek professional certifications in project management, such as the Certified Associate Project Management (CAPM), and Project Management Professional (PMP) certifications offered by PMI. These certifications tie industry standards to the overall learning experience. While PMP certifications require extensive project experience, understanding the competency requirements can help students to build project experience and track hours for future certification testing requirements.

3. PROJECT MANAGEMENT PROCESS

Our aim is to enhance project management-based learning and curriculum development across our school. For the project deliverables, students demonstrate proficiency and the ability to use credible research to solve ongoing challenges. We propose that the integration of project management skill integration, fueled by innovation and critical strategic analysis, can lead to an increase in problem-solving capabilities for students. We monitor learning outcomes within projects related to problem definition, the innovation of ideas and challenges, and problem-solving in business and consulting using an applied approach.

This paper outlines a structure to integrate project management processes into course design. Project management applications in pedagogical design can further increase effective collaborations and relationships with industry leaders and support cross-functional, interdisciplinary curriculum. Our approach addresses the needs of employers and the relevance for graduate application and future employability.

4. METHODOLOGY

Student Feedback Survey

To determine the level of project management awareness and skill development present in undergraduate business students, we collected online survey data regarding project management experience and skills from 185 undergraduate students at a medium-sized private university. No identifying data was collected, and participation was voluntary. Students were invited to participate in the survey via email and recruited from two business core classes and one senior-level course and included various majors (e.g., international business, finance, supply chain, human resources, accounting, marketing, business analytics, management, entrepreneurship, CIS, and business minors with majors from across the university). Survey items can be found in the Appendix. 30.3% were first years, 27.6% were sophomores, 21.1% were juniors, and 21.1% were seniors. Sixty percent of respondents had never taken courses or workshops regarding time management, resource allocation, budgeting, or project management. Of those who did, 21.8% had taken only a general introduction. 50.3% reported wanting to see more project management content in their courses. When asked if they were implementing project management skills such as time management, scope organization, milestone schedules, risk management, etc., 55.7% reported they were in their class projects; 20% said they were in their student organizations; 10.3% reported they were in their internships; and 15.7% reported they were in their jobs. On a Likert scale from 1 (none) - 6 (expert), 73% of respondents rated a 3 or 4. When it came to utilizing a project management charter or contract in their classes, 48.9% had never used one whereas 75.1% reported using a project schedule or plan; 76.2% had never used a project schedule software or tool; and 79.9% had never used a project scope statement.

Course Design

Our course design methodology is based on the convincing argument that academia must look at education from a different mindset, one that can implement practical applications across multiple disciplines. Not only do we need to implement project management consistently throughout our curriculum, but we must help other disciplines to see the value. Our unique contribution is to utilize a consistent experiential approach based on project work to deliver curriculum consistently across an entire program. In our approach, we first identified ways to enhance our courses by applying project management principles within

course design. Second, our project approach provides an opportunity to implement the project management process into undergraduate education. Third, by recognizing the importance of skill applicability, there could be an increase in employability factors relevant for our graduates. Fourth, we find that project management skill development provides a realistic, structured approach to in-class problem-solving that helps to make solutions real-world feasible.

When building course projects, students should understand expectations, have clear project learning goals, and be able to retain foundational project management skills for future application. Project planning requirements include developing an understanding of the scope of work to be completed. This consists of students understanding the role that project management plays in using structure to increase efficiency and outcomes. To this end, we utilize project-based assignments that mimic industry workloads and ask student teams to work with clients preparing written deliverables and client presentations. Teams learn the value of documentation of lessons learned and reflect upon the importance of understanding team dynamics and execution of work.

Project Assignment Details

In this section, we provide sample project descriptions used in our courses to train project management skills, allowing students to apply that knowledge in practice.

Project Management Methods

The goals and outcomes of the student's project work include:

Creating the project team and establishing a team charter. The team charter identifies rules, norms, and expectations. The team charter aligns the project goals with a clear understanding of roles and points of contact. Best practices could include insight into the value of the change control process, use of status reports, or analyzing risk mitigation plans to keep projects on track.

There is an opportunity to use project management techniques to create a project plan and to schedule project activities with deliverables and due dates. Often scheduling software can assist with tracking deliverables and may be covered throughout multiple courses.

Defining the project scope and boundaries becomes a critical component of the project plan. While this is not a new practice, understanding

the parameters necessary to keep the scope from changing will help students value scope management practice. While our students have been exposed to the topic of scope management, many did not appear to retain the introductory content that was introduced in some of the core classes.

Students could benefit from analyzing the work involved in the project plan and integration of a work breakdown structure (WBS). The WBS can help students by breaking down tasks associated with the work and breaking it down into smaller, more manageable parts of work activities. When leading projects, using a WBS could help facilitate a more organized approach to fulfilling the tasks.

Once the project is completed, it is recommended to review the results and close the project. Documentation of lessons learned throughout the project will help with overall project execution in the future. This data can be stored in a repository for future project use. We have encouraged our students to learn from each project experience to enhance their project leadership potential.

Project Examples: Introductory Management Project Based Work

Students participate in management consulting teams. The teams review assigned businesses experiencing challenges. Students are evaluated on their ability to demonstrate knowledge and evaluation of management philosophies as they relate to quality indicators such as identifying a problem or challenge, research of balanced scorecard, understanding competitors including benchmarking, and financial statistics outlined in an executive summary. Framing the problem is the foundation of the course project and is part of the project management scope statement. In the introductory management course, students review specific company research and metrics by benchmarking against industry competition. Students identify the top challenges and outline research-supported plans to overcome those challenges.

Operations and Supply Chain Project Based Work

The project analysis piece in coursework focuses on identifying and analyzing the supply chain operations of a particular company. Students then use data and research to provide managerial insights. They then apply concepts developed in class to evaluate and make recommendations. Students are held accountable using the project management planning and scheduling tools outlined above to improve team tasks and

processes. The transferrable skills that are developed provide a solid foundation for success in the future.

Senior Seminar Project-Based Work

While students are asked to think critically about several businesses, they apply their management program learning outcomes. As students engage in project-based work, support and direction are provided by instructors through the course structure and design, alignment to program learning outcomes, and the creation of a student-centered environment for problem-based learning. The project work uses several smaller assignments where students recall their learning to show subject understanding in preparation for a final real-world project.

Students are given the chance to present their learning in a presentation requiring student teams to organize and communicate on a specific management curriculum subject area. These areas include forecasting, data analysis for production demand or inventory control, quality standard and defect analysis, bottlenecks and process improvements, product and team performance issues, ethics compliance, employee retention, staffing, sourcing, recruitment, selection, and human resources documentation.

Outcomes

Students are encouraged to think strategically and critically. Students present their research and findings to the class including a panel assigned to be the acting Board of Directors. The research and application across business disciplines allow for valuable experiences for students. Alumni have returned to our classrooms and have shared evidence that the hands-on curriculum and project management skills development in our curriculum helped them to further their career advancement quickly. Alumni have entered the workforce prepared to identify challenges, opportunities for change, and were prepared for execution.

As supported in the literature, consistency in project deliverables can assist students in the retention of the knowledge, skills, and motivation we are trying to develop. Holding team members accountable using project management planning tools and schedules helped to structure team success and improve team task and interpersonal processes. Students who engaged with a program with this practice often demonstrated these valuable skills. This consistent approach served as a model for interactions and expectations in team interactions.

5. DISCUSSION

As evidenced in our survey, not all project management skills were present in the undergraduate student population. In fact, the students that took multiple courses with a specific project management focus could articulate the application of the skills and competencies. We believe that threading project management throughout multiple courses and majors will further strengthen this critical skill development and application.

Survey results suggest that while students are exposed to project management processes and techniques, they are not proficient in implementing standard business practices. The data demonstrates the value of the integration of project management practice throughout undergraduate courses across disciplines. We cannot fully implement project management practice and reinforcement without it being threaded throughout several courses.

Integrating project management tools and techniques allows students to grow both academically and professionally in their skill application. Programs can address the demand for project management skills, the consistent use of project management tools and processes in their pedagogical design of team projects across courses. When students see that project management methodologies are used consistently across courses, they can continuously hone these skills and improve team process effectiveness and deliverable outcomes. When asked to analyze challenges, students must understand the practical application of problem-solving, project management techniques and the consequences of team decisions.

The driver behind our effort has been ongoing feedback from stakeholders that guide the process improvement of learning outcomes such as the demand for graduates with project management skills. Our applied projects allow students to link education to increased business knowledge, improved team dynamics and communication, critical thinking, and time management. While we have made progress in updating the project management curriculum, we concur that we have not yet fully integrated project management skill development across the business curriculum. Our intent is to share the ideas and thought processes behind the course design to help others in the development of an updated project-centric curriculum. While project

management is not a new skill, we feel that it is highly underutilized and undervalued in the business education curriculum. We understand that project management practice continues to evolve, and educators must continue to enhance curriculum along this continuum.

Practical Application

We have designed our course assignments and experiences to be more applicable and meaningful for our students and their future employers. A strong body of evidence proposes integrating feedback from stakeholders and research theory into each curriculum discussion. While it is common to offer a project management curriculum in business schools, integration should continue to be a thread throughout various majors. The important development of project management skills cannot be fully executed in one or two programs to be successful across the curriculum. Faculty and practitioners should continue to stay current with industry trends to support the development of curriculum and student outcomes.

Incorporating experiential project-based learning opportunities, such as student internships and ongoing project work, should continue to be included in the curriculum. These experiences will allow students to apply their project management skills in an academic and professional setting. In addition, one of the most effective ways to learn project management skills is ongoing exposure and experience participating and leading projects. By offering more project-based learning experiences in the undergraduate business curriculum, you are enhancing the experiences and applications for your students. In addition, it would be beneficial across the business curriculum to identify the pathway to professional certifications in project management such as CAPM, while students are completing undergraduate credits.

Student assessment measures should evaluate not only the project deliverables but also evaluate the team process and project management skills. In each class outlined above, students are held accountable using project management planning and scheduling tools to facilitate efficient and effective team tasks and interpersonal processes. Team debriefs are also a critical component in each of our classes to reinforce lessons learned and continuously improve team processes and outcomes. Free online tools like ITP Metrics (<https://www.itpmetrics.com/assessment.info>) can help faculty measure team processes and facilitate team debriefs. Projects should be experiential in nature and include the application

of key metrics critical for their future success in the business environment. The project management tools described outline a multidisciplinary approach that can be integrated across business schools and utilized as a platform to develop an interest in lifelong learning for our graduates.

Future Consideration

The field of project management is ever-changing and will continue to evolve. It is important for educators to stay up to date on the latest best practices and techniques to ensure that the curriculum continues to have merit. Partnering with professional organizations locally such as PMI (Project Management Institute) can help ensure this goal will be achieved. Identifying trends and updating curriculum to address industry standards and practices will continue to provide students with lifelong learning opportunities.

Indeed, exposing students to experiential project management components has increased knowledge of factors that are often uncertain, complex, and unpredictable. Classroom practice of these factors has better prepared our alumni for employability as evidenced by our job placement rates. We continue to monitor insight from career placement statistics and execute assignments that allow for practical application. The outcome of our work is that our students can walk into an interview with a portfolio of project deliverables that highlights not just what they know, but what they can do.

Limitations

We evaluated the course curriculum redesign within one university. While we believe our project process is unique in delivering an updated curriculum, we highlight data from our introductory management and capstone course that supports the claim that undergraduate course curriculum would benefit from enhancement of project management skills focus. It would be beneficial to identify best practices in course design, project management process, and skill development for future course design discussions across multiple departments and various schools, outside of the School of Business.

6. CONCLUSION

The inclusion of project management tools and application can increase efficiency in course design (Echardt & Wetherbe, 2016). This pedagogy aligns with AACSB's Impact of Research Task Force report that argues, "By

bringing together practitioners and academics on focused topics, education holds enormous potential to strengthen the linkage between research and practice" (p. 37). Positioning graduates with lifelong skills that go well beyond the traditional classroom setting (Dirksen, 2015). Experiences using project management techniques and skills development provide students with opportunities to enter the workforce with hands-on experience managing projects, working with a team, analyzing data, and applying experiential knowledge (Eckhardt & Wetherbe, 2016), skill sets relevant to on-the-job requirements. This prescribed method has not always been a practice present. Project management tools can be consistently implemented across the curriculum to improve project-based student learning outcomes and workforce readiness.

7. APPENDIX: STUDENT SURVEY

1. Have you ever taken project management courses or workshops? If yes, which methodologies?
 - a. General introduction
 - b. Adaptive
 - c. Agile
 - d. Kanban
 - e. Lean
 - f. PMBOK (Project Management Book of Knowledge)
 - g. Prince2
 - h. Scrum
 - i. Waterfall/Traditional PM
 - j. None
 - k. Other (please specify)
2. Do you have access to project management professional development opportunities or training materials?
 - a. Yes
 - b. No
 - c. Unsure
3. Are you familiar with project management methodologies? If so, select the ones you are most familiar with:
 - a. Adaptive
 - b. Agile
 - c. Kanban
 - d. Lean
 - e. PMBOK
 - f. Prince2
 - g. Scrum
 - h. Waterfall/Traditional PM
 - i. None
 - j. Other (please specify)
4. Are you currently implementing any project management skills, such as time management, scope organization, milestone schedules, risk management, etc.? (Select all that apply)
 - a. No
 - b. Yes, in my class projects.
 - c. Yes, in my student organization.
 - d. Yes, in my internship.
 - e. Yes, in my job.
5. If you answered yes, which project management methodologies are you currently using?
 - a. Adaptive
 - b. Agile
 - c. Kanban
 - d. Lean
 - e. PMBOK
 - f. Prince2
 - g. Scrum
 - h. Waterfall/Traditional PM
 - i. None
 - j. Other (please specify)
6. What level of project management skills do you feel you possess?
 - a. Likert scale: 1 = none; 6 = expert
7. How confident do you feel managing a project?
 - a. Likert scale: 1 = not at all; 6 = extremely
8. How many class projects have you participated in during your time as an undergraduate student?
9. In those class projects:
 - a. Did you utilize a project management charter or contract?
 - i. Yes
 - ii. No
 - b. Did you utilize a project schedule?
 - i. Yes
 - ii. No
 - c. Did you utilize a project schedule software or tool?
 - i. Yes
 - ii. No
 - d. did you complete a scope statement?
 - i. Yes
 - ii. No
10. Do you consider any of the following communications, risk, resource, or quality management at any level when working on your class projects?
 - a. Yes
 - b. No

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