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Generative AI as Cognitive Scaffolding: An Instructional Model for Project Management in IS Education

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ABSTRACT

This paper examines how generative artificial intelligence (AI) can be harnessed as a cognitive scaffold in information systems (IS) education, providing IS faculty with a replicable instructional model for project-based learning. An instructional intervention was implemented in five sections over three consecutive semesters in an undergraduate project management course (n = 177). Findings show that AI-assisted students produced higher-quality deliverables and developed competencies in project fluency, professional judgment, AI literacy, and professional readiness. Large effect sizes (Hedges' g > 1.0) indicate substantial educational impact. The study provides IS educators, particularly those in project management, with practical guidance on integrating AI responsibly into curricula to enhance student learning outcomes and prepare graduates for AI-augmented workplaces.

Keywords: Generative AI in teaching, Project-based learning, Scaffolding, IS education, AI literacy

1. INTRODUCTION

The information systems (IS) discipline faces mounting pressure to prepare graduates for workplaces transformed by artificial intelligence (AI). Project management—long recognized as a core IS competency (Leidig & Salmela, 2020)—is particularly affected, as AI tools increasingly automate documentation, scheduling, and stakeholder communication (Dwivedi et al., 2023; Holzmann et al., 2022). For IS educators, this presents both a challenge and an opportunity: how can AI be integrated into curricula in ways that enhance, rather than erode, professional judgment, digital fluency, and critical thinking? Recent advances in generative AI, such as large language models (LLMs), allow for the rapid production of structured deliverables central to IS practice, including project charters, stakeholder analyses, work breakdown structures, and agile sprint plans (Kasneci et al., 2023; Van Slyke et al., 2023).

While these capabilities promise efficiency gains, they also raise concerns. Passive reliance on AI can potentially undermine metacognitive engagement, obscure critical decision processes, and diminish competence development (Kirschner et al., 2006; Pavlik, 2023). Conversely, when structured effectively, AI can act as a cognitive scaffold, reducing unnecessary cognitive load (Sweller, 1988) and supporting students in tackling complex deliverables that exceed their current proficiency (Reiser, 2004; Vygotsky, 1978).

This study explores that balance through an instructional intervention embedded in undergraduate project management education. Drawing on design-based research principles, the intervention positioned ChatGPT as a "first draft partner" within a revise-and-review workflow. Students used AI to generate initial drafts, then critically refined them through structured reflection, instructor feedback, and rubric-guided

revision. The design aimed not only to improve project artifact quality but also to cultivate AI literacy—defined here as the ability to evaluate, adapt, and ethically use AI outputs in professional contexts (Luckin et al., 2022; Zawacki-Richter et al., 2024).

The contributions of this study are threefold:

- *IS Education Contribution:* Provides an empirically tested instructional design for integrating generative AI into project-based IS courses, directly addressing calls for curriculum innovation in response to AI disruption.
- *Theoretical Contribution:* Extends scaffolding theory into IS education by demonstrating how AI-human co-production workflows reduce cognitive load while fostering higher-order critical thinking.
- *Professional Contribution:* Positions AI literacy as a new IS competency, alongside project management, systems analysis, and database skills, offering guidance for educators and curriculum designers seeking to align IS programs with evolving industry expectations.

This paper contributes to the growing body of work in the *Journal of Information Systems Education* (JISE) that examines how emerging technologies reshape both IS practice and education. To guide this investigation, this study addresses the following three research questions:

- RQ1: How does the use of generative AI as a cognitive scaffold affect the quality of project management deliverables produced by undergraduate IS students?
- RQ2: To what extent does an AI-scaffolded intervention support the development of IS project management competencies and AI literacy?
- RQ3: How do students perceive the utility of generative AI in terms of cognitive support, critical thinking engagement, and professional readiness?

2. THEORETICAL BACKGROUND

2.1 Project Management and the IS Curriculum

Project management has long been recognized as a core competency within IS programs. The IS2020 Competency Model explicitly includes IS Project Management as one of the minimum required areas of competence (Leidig & Salmela, 2020). This recognition highlights the pivotal role that project management plays in empowering IS graduates to lead initiatives, coordinate stakeholders, and drive technology-enabled organizational change.

Importantly, IS2020 reframes curriculum development around competencies rather than prescriptive course lists, emphasizing both structure and adaptability: "The IS2020 report is the latest iteration of model curriculum work… [and] provides guidance regarding the core content of the curriculum… but also provides flexibility to customize curricula according to local institutional needs" (Leidig & Salmela, 2022, p. 471). This competency-based approach underscores the necessity for IS programs to adapt to emerging technologies. Just as earlier curriculum models (e.g., Gorgone et al., 2003) responded to shifts in systems development and global outsourcing, IS2020 explicitly allows for the embedding of new skill domains—such as AI literacy—into the IS core.

Despite these structural advances, IS educators face challenges in helping students translate theoretical project management knowledge into practice. Experiential learning has long been promoted as a solution in IS education (Alavi, 1994), enabling students to simulate real-world complexity. However, as Agarwal and Lucas (2005) argue, IS programs still face "the relevance challenge," where students struggle to bridge conceptual understanding and practical skill. Project deliverables such as charters, stakeholder analyses, and sprint plans are cognitively demanding and often overwhelm novices, underscoring the need for new forms of instructional support. Prior IS education studies have used simulations, role-play, and active learning to teach project management (Schmitz, 2018; Sharp & Lang, 2018), demonstrating the value of immersive pedagogy.

2.2 Cognitive Load and Scaffolding in IS Education

One persistent challenge in teaching project management—and IS education more broadly—is the cognitive load imposed by complex, multi-component deliverables. Students in formal project management classes must either navigate comprehensive encyclopedic project management texts (e.g., Kerzner, 2025) or integrate standards from guides such as Project Management Institute (PMI)'s *Process Groups: A Practice Guide* (2023) and the *Agile Practice Guide* (2017), either of which spans over 700 pages and dozens of subprocesses. For novice learners, this volume of information often results in overload, making it difficult to produce coherent deliverables (Kirschner et al., 2006; Sweller, 1988).

Instructional scaffolding provides one mechanism to address these challenges. Rooted in Vygotsky's (1978) concept of the *Zone of Proximal Development*, scaffolding posits that learners can achieve more with structured, temporary support than they can independently. In IS education, scaffolding often takes the form of templates, exemplars, instructor modeling, or structured peer review (Jonassen, 1999; Reiser, 2004). Prior JISE research has demonstrated the efficacy of scaffolding in technical domains; for example, Bunch (2009) used scaffolding to reduce cognitive load in database instruction, while McLoughlin and Alam (2014) utilized web-based tools to scaffold learning in social informatics. Such supports reduce extraneous cognitive load, enabling learners to focus on essential cognitive processes while developing independence in a progressive manner. Adaptive scaffolding frameworks, which fade as learners gain proficiency, are particularly effective in complex learning environments (Belland et al., 2017; Luckin et al., 2022).

2.3 Generative AI as Cognitive Scaffolding

Recent advances in generative artificial intelligence (AI), particularly large language models (LLMs) such as ChatGPT, Gemini, and Copilot, introduce a new modality of scaffolding in IS education (Dwivedi et al., 2023; Kasneci et al., 2023). These tools can generate structured drafts of project charters, stakeholder analyses, work breakdown structures, and sprint plans in seconds—precisely the artifacts that IS students often find most daunting. By lowering barriers to initiation, generative AI has the potential to reduce extraneous cognitive load (Sweller, 1988) and accelerate the development of applied IS competencies.

Yet risks remain. Generative AI outputs can be hallucinated, generic, or misaligned with project context (Kasneci et al., 2023; Pavlik, 2023). Over-reliance risks undermining critical thinking and professional judgment if students accept outputs uncritically (Kasneci et al., 2023). Similar concerns have been raised regarding heuristics and biases in IS project management decision-making (Purvis et al., 2004). These risks are particularly salient in IS education, where graduates are expected not merely to use technology, but to evaluate, adapt, and apply it ethically in organizational contexts (Leidig & Salmela, 2020).

Responding to these challenges, Van Slyke et al. (2023) argued: "Our goal… is to develop a better understanding of the range of possible impacts of ChatGPT on IS education and to describe how IS educators might respond" (p. 2). Their call highlights the importance of moving beyond conceptual speculation toward tested instructional designs. This study evaluates a co-production model in which AI is positioned as a "first draft partner" rather than a decision-maker. Students generate AI drafts, then critically review, tailor, and revise outputs, with instructor feedback guiding higher-order engagement. In this way, AI's limitations become catalysts for deeper learning, aligning with productive struggle theory (Reiser, 2004).

2.4 Gaps and Study Contribution

Despite growing interest in AI's role in IS education (Ratten & Jones, 2023; Van Slyke et al., 2023), empirical studies remain limited. Most contributions are conceptual, speculating about AI's potential to disrupt IS education, but they offer few tested pedagogical models. There is a pressing need for research that not only demonstrates how AI can be responsibly integrated into IS curricula but also evaluates its impact on both the quality of deliverables and the development of competencies. However, unlike prior JISE work focused on agile role-play and classroom exercises, this study empirically evaluates AI as a new form of cognitive scaffolding in IS education.

This study addresses that gap by empirically testing a design-based instructional intervention in undergraduate project management courses. Specifically, it investigates how generative AI can serve as cognitive scaffolding to support the production of complex project deliverables, while also fostering AI literacy as a transferable IS competency. By extending scaffolding theory into IS curriculum design and offering a replicable human–AI co-production model, this study makes theoretical and practical contributions to the evolution of IS education.

3. INSTRUCTIONAL DESIGN AND EVALUATION

This study employs a design-based research (DBR) approach (McKenney & Reeves, 2018; Wang & Hannafin, 2005), adapted for IS education. DBR is well-suited to contexts where educators seek to simultaneously address theoretical questions and practical design problems in authentic learning environments. In the IS discipline, DBR aligns closely with the design science research tradition (Gregor & Hevner, 2013; Hevner et al., 2004), which advances knowledge through the creation, evaluation, and refinement of artifacts (Schlimbach et al., 2024).

Here, the instructional design itself serves as the artifact: a modular framework for integrating generative AI into project-based IS coursework. The DBR process was iterative, spanning five sections of the same course in project management over three consecutive semesters. The initial design was implemented in the AI-assisted cohort, evaluated, and refined based on student outcomes and instructor observations. This iterative cycle reflects DBR principles of rapid prototyping, situated experimentation, and theory-informed design, while grounding the research in the IS2020 competency model's emphasis on project management as a required skill (Leidig & Salmela, 2020).

3.1 Context and Participants

The intervention was implemented in a U.S. undergraduate IS program where project management serves as a required competency-building course. The course is designed to simulate professional delivery environments, integrating both predictive and agile methodologies. Students work on a semester-long case—the COVID-Friendly ATM System—that requires them to produce project charters, stakeholder analyses, predictive work plans, and agile sprint plans. This case was deliberately chosen because it represents a realistic, multi-stakeholder IS problem, demanding structured planning and adaptive decision-making.

Two cohorts participated:

- AI-Assisted Cohort (n = 92): Students used ChatGPT to generate structured drafts of deliverables, which they then revised and refined through structured reflection and instructor feedback.
- Non-AI Cohort (n = 85): A historical comparison group who completed the same project sequence in a prior semester, under the same instructor, but without AI support.

This quasi-experimental design enabled comparison of learning outcomes across conditions, while maintaining authenticity in the instructional context.

3.2 Instructional Intervention

At the heart of the intervention was a human–AI co-production workflow (Figure 1). Rather than treating ChatGPT as a decision-maker, the design positioned it as a cognitive scaffold: a first-draft partner that students must evaluate, tailor, and improve. For each deliverable, students followed a structured cycle:

- *Prompt Development:* Students were introduced to principles of prompt engineering (Project Management Institute, 2024), with guidance on framing project-specific queries.
- *AI Drafting:* Students submitted prompts to ChatGPT, generating initial drafts of project charters, stakeholder analyses, predictive work breakdown structures, and agile sprint plans.
- *Critical Review and Revision:* Students evaluated AI outputs for accuracy, contextual fit, and stakeholder alignment, explicitly identifying hallucinations, omissions, and generic content.

- *Instructor Feedback:* Revised drafts were submitted for formative assessment using structured rubrics, with an emphasis on technical completeness and evidence of critical engagement with AI outputs.
- *Iterative Refinement:* Students incorporated instructor feedback to produce final deliverables. This scaffolded workflow was deliberately modular, enabling adaptation across other IS courses that require structured deliverables (e.g., systems analysis, database design, enterprise architecture). The design embedded AI literacy as a learning outcome alongside traditional project management competencies by making students responsible for tailoring and justifying their revisions.

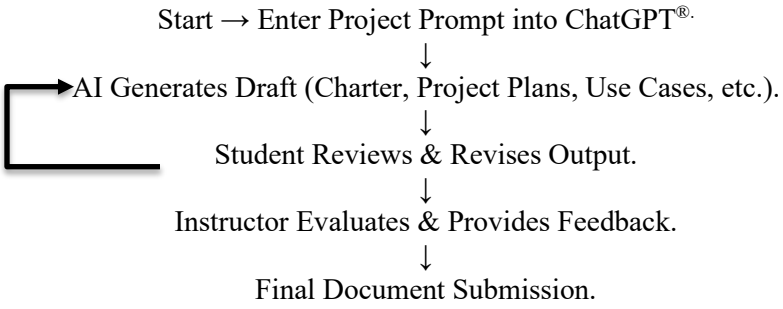


Figure 1. AI-Assisted Project Management Workflow as a "First Draft Partner"

3.3 Deliverables Evaluated

To ground the intervention in applied project practice, students produced four core deliverables using either predictive or agile frameworks:

- *Project Charter:* Students were given a customized project charter template to tailor a project deliverable needed for a different project. This also demonstrated the flexibility of generative AI for the second cohort.
- *Stakeholder Analysis:* Students analyzed stakeholders for the project, requiring the use of Power-Interest grid classifications and stakeholder strategies for classified stakeholders.
- *Predictive Project Management Plan:* Students were required to develop a structured, linear approach that enables the project to progress through defined phases in a fixed sequence. It emphasizes detailed upfront planning and a clear scope, schedule, and budget baseline. Students completed the project management plan using MS Project.
- *User Stories and Agile Sprint Plans:* Students were also required to develop core components of agile development methodologies. First, students developed user stories focusing on what the user wants to achieve and why (note: while this is taught within the systems analysis class, some students do not take that class; user stories are covered in a focused format for project management). Second, agile sprint plans were developed for time-boxed iterations in which a team works on a subset of user stories to deliver a potentially usable product increment.

A critical component of using ChatGPT is validating the output produced by the AI. Each AI-generated deliverable was required to be manually reviewed and revised by students, emphasizing the development of planning fluency and contextual judgment.

3.4 How Each Deliverable Was Developed by Students (Step-by-Step)

To ensure consistency and opportunities for critical thinking, the development of each deliverable followed a specific sequence emphasizing human–AI co-production.

3.4.1 Project Charter and Stakeholder Analysis. Students began by reviewing the COVID-Friendly ATM case study and a custom Project Charter template (Appendix A). Following an in-class demonstration

of the project concepts, students in the AI cohort issued a specific prompt (Appendix B) to generate an initial draft of the charter. Students were required to review the output, as well as iterations of the assignment, using the Required Validation of AI Output (Appendix A), identifying specific areas of concern, such as hallucinations, gaps, or misalignments. They utilized the "AI Output Evaluation Log" (Appendix A) to document these errors. The final submission required the revised charter, along with "Tailoring Notes" that explained the revisions, ensuring the student remained the final decision-maker.

3.4.2 Predictive Project Management Plan. For the predictive work plan, students utilized the case study and the Project Team Profiles (Appendix A). Using the prompt detailed in Appendix B, students generated a Work Breakdown Structure (WBS) and initial resource allocations. As specified in the Project Charter, the Required Validation of AI Output (Appendix A) was required for areas of concern involving AI. This AI output was then imported into MS Project. At this stage, students were required to manually adjust dependencies, insert buffers, and resolve resource overallocations, as the AI draft often lacked the nuanced logic necessary for a valid schedule. Students then assessed the AI output for estimation logic, dependency integrity, and other relevant factors, documenting their corrections in the Assumptions Log and Tailoring Notes before submitting the final version.

3.4.3 Agile User Stories and Sprint Plan. Using the same case materials, students shifted to agile methodologies. They employed the prompt in Appendix B to generate user stories and an initial sprint plan. The students then selected specific stories for the sprint, moving the remainder to the backlog. The critical review process focused on validating the acceptance criteria and ensuring the sprint plan was realistic, given the team velocity. As with previous deliverables, the final submission included the "AI Output Evaluation Log," requiring students to justify where and why they modified the AI-generated stories or sprint logistics.

3.5 Data Collection

To evaluate the intervention, I employed a mixed-methods design (Creswell & Plano Clark, 2018). Three forms of data were collected:

- *Quantitative Deliverable Performance:* All project deliverables were graded using structured rubrics (Appendix C) aligned with PMI standards. Scores (on a 0–100 scale) reflected completeness, contextual relevance, stakeholder alignment, and evidence of revision. Deliverables were evaluated by the course instructor and a doctoral student who attended the class and had project management experience, with randomization to reduce bias.
- *Qualitative Reflections and Observations:* Students in the AI-assisted cohort submitted written reflections after each major deliverable, describing their experiences, perceived benefits, and challenges of using AI. Instructor observation logs were also maintained, documenting revision patterns, engagement behaviors, and common issues in AI use.
- *Post-Intervention Survey:* A structured survey (Appendix D; n = 40 respondents, final semester of AI-assisted cohort) captured student perceptions of cognitive support, critical engagement, confidence gains, and future AI use intentions. Items were adapted from prior AI-in-education studies (Kasneci et al., 2023; Luckin et al., 2022; Zhai, 2022).

3.6 Data Analysis

To compare cohort performance across the four project deliverables, I used Welch's independent-samples t-tests. To mitigate family-wise error inflation, I applied a Holm correction across the four tests; all effects remained statistically significant at $p < .01$. Assumptions were examined: Welch's test is robust to variance heterogeneity; visual inspection of residuals suggested approximate normality within groups.

Inter-rater reliability was assessed on a 30% random subsample of deliverables graded independently by the instructor and a doctoral student. The rubric total scores showed strong agreement, with an ICC(2,k) of 0.82 and a 95% CI of [0.74, 0.88]. Any discrepancies were reconciled via consensus.

For the survey data (n = 40; response rate = 92%), internal consistency of the five domains was assessed with Cronbach's α: Cognitive Support α = .84; Critical Thinking α = .80; AI Limitations α = .76;

Confidence α = .82; Future Intentions α = .88. No significant differences were observed between respondents and nonrespondents on available demographic variables (e.g., gender, major).

3.7 Ethical Considerations

The University's Institutional Review Board exempted the study. Participation in data collection was voluntary and did not affect grades. All reflections and survey data were anonymized. Deliverables were graded as part of regular coursework, with a process-focused evaluation (including prompt logs and tailoring notes) that reduced the risks of plagiarism or AI over-reliance.

4. RESULTS

The mixed-methods design enabled a comparison of learning outcomes across the AI-assisted and non-AI cohorts, as well as an exploration of student perceptions and behaviors. The findings demonstrate that generative AI, when framed as a cognitive scaffold, enhanced traditional IS project management competencies and emergent AI literacy skills.

4.1 Quantitative Performance: Enhanced Project Management Fluency

Across deliverables, AI-assisted students outperformed the non-AI cohort (see Table 1). For the project charter, the mean difference was 7.50 points, $t(162.1) = 8.52$, $p < .001$, 95% CI [5.76, 9.24], Hedges' $g = 1.29$. Stakeholder analysis revealed a mean difference of 8.60 points, $t(157.5) = 8.17$, $p < .001$, 95% CI [6.52, 10.68], $g = 1.24$. Predictive planning results showed a mean difference of 7.90 points, $t(158.1) = 8.23$, $p < .001$, 95% CI [6.00, 9.80], $g = 1.24$. For the Agile sprint plan, the mean difference was 8.90 points, $t(159.2) = 10.08$, $p < .001$, 95% CI [7.16, 10.64], $g = 1.52$. All effects remained statistically significant following Holm adjustment.

Higher charter and stakeholder analysis scores suggest stronger stakeholder engagement and alignment competencies—key outcomes emphasized in IS2020. Improvements in predictive WBS and agile sprint planning indicate enhanced dual-method fluency, reflecting the ability to apply both structured and adaptive project approaches. Large effect sizes ($g > 1.0$) indicate not only statistical significance but also substantial practical gains in IS project deliverable quality.

Deliverable	Mean Diff (AI–Non)	t(df)	p (two-sided)	Holm-adjusted p	95% CI	Hedges' g
Project Charter	7.50	8.52 (162.1)	$p < .001$	$p < .001$	[5.76, 9.24]	1.29
Stakeholder Analysis	8.60	8.17 (157.5)	$p < .001$	$p < .001$	[6.52, 10.68]	1.24
Predictive Work Plan (WBS)	7.90	8.23 (158.1)	$p < .001$	$p < .001$	[6.00, 9.80]	1.24
Agile Sprint Plan	8.90	10.08 (159.2)	$p < .001$	$p < .001$	[7.16, 10.64]	1.52

Table 1. Deliverable Comparisons With Exact p-Values and 95% CIs

4.2 Qualitative Findings: Competency Development Through Human–AI Co-Production

Thematic analysis across reflections, surveys, and instructor observations yielded four dominant themes, each linked to key IS educational competencies.

4.2.1 Theme 1: Overcoming Cognitive Barriers → Project Fluency. Students consistently described AI as helping them overcome "blank page" anxiety. One student noted, "The AI broke the overwhelming parts into something more manageable," while another stated, "Having a first draft gave me confidence to get

started." By reducing initial cognitive barriers, students engaged more quickly in structuring project artifacts, indicating enhanced planning fluency—a core IS project skill.

4.2.2 Theme 2: Active Revision → Critical Thinking and Professional Judgment. Rather than accepting outputs uncritically, students actively revised AI drafts. Students commented, "Some parts were good, but ChatGPT missed major stakeholders. I had to go back and add the regulatory bodies," and "Spotting its mistakes made me learn the material better." These revisions reflect critical evaluation and professional judgment—competencies identified in IS2020 as essential for project work under uncertainty.

4.2.3 Theme 3: Recognizing AI Limitations → AI Literacy. Students demonstrated awareness of AI's shortcomings, identifying hallucinations and generic outputs. Comments included, "It made up some compliance risks that did not even apply," and "Sometimes it just sounded too generic." This critical stance toward technology use is evidence of AI literacy, a transferable IS competency that parallels traditional digital fluency but emphasizes critical engagement with AI tools (Van Slyke et al., 2023).

4.2.4 Theme 4: Confidence and Motivation → Professional Readiness. Students reported increased confidence in their ability to produce project deliverables. One student remarked, "Way better than staring at a blank Word document," while another said, "I feel more capable that I could do this in a real job." Such gains in self-efficacy and professional readiness align with IS program objectives to prepare graduates for practice in AI-augmented workplaces.

4.3 Post-Intervention Survey: Endorsement of AI as Scaffolding

Survey results (n = 40 from the last AI cohort) reinforced the themes above (using a 5-point scale; see Table 2). Over 90% of students expressed intentions to use AI in future coursework or professional settings, reinforcing the argument that AI literacy should be explicitly incorporated into IS curricula as a core outcome.

Domain	Sample Item	Mean (SD)	IS Competency Link
Cognitive Support	"ChatGPT helped me structure project documents."	4.62 (0.54)	Planning Fluency
Critical Thinking	"I critically evaluated AI outputs."	4.40 (0.58)	Professional Judgment
Recognizing AI Limitations	"I worried about AI-generated inaccuracies."	3.95 (0.79)	AI Literacy
Confidence & Motivation	"I feel more capable in project documentation."	4.35 (0.61)	Professional Readiness
Future Intentions	"I intend to use AI tools for future work."	4.70 (0.49)	Transferable IS Competency

Table 2. Post-Intervention Survey Results

4.4 Integrated Competency Outcomes

Taken together, the results show that the AI-assisted intervention enhanced four competency areas central to IS education:

- *Project Fluency:* Faster, more structured creation of deliverables (charters, plans).
- *Critical Thinking & Professional Judgment:* Active revision and contextual tailoring of outputs.
- *AI Literacy:* Recognition of AI's limitations and ability to adapt outputs responsibly.
- *Professional Readiness:* Increased confidence and motivation to apply skills in real-world contexts.

These findings extend scaffolding theory into IS curriculum design and empirically demonstrate that AI can be integrated into IS project education in ways that strengthen, rather than weaken, student agency and professional capability.

5. DISCUSSION AND CONTRIBUTIONS

This study set out to investigate how generative AI can be integrated into IS project management education as a form of cognitive scaffolding. By embedding a design-based instructional intervention within undergraduate coursework, I found that AI-assisted students produced higher-quality project deliverables and developed transferable competencies in AI literacy, project fluency, critical evaluation, and professional readiness. Beyond these empirical results, the study offers several contributions to the IS discipline.

5.1 Contributions to IS Education

First, the study provides an empirically validated instructional design for integrating generative AI into IS curricula. While prior work has speculated on the impacts of AI in IS education (Van Slyke et al., 2023), few studies have moved beyond conceptual discussion. By demonstrating a replicable co-production workflow, this research answers recent calls for actionable guidance.

Second, the findings highlight that AI literacy is itself a core IS competency. IS2020 identifies digital fluency as required (Leidig & Salmela, 2020), but the emergence of AI tools reshapes what fluency entails. Third, the study offers practical benefits for IS faculty. Educators can utilize AI to scaffold initial drafts, thereby reclaiming class time for advanced topics. This contribution aligns with prior *JISE* work emphasizing project-based pedagogy and experiential exercises (Pollard, 2012; Schmitz, 2018; St. John & St. John, 2024). Additionally, process-focused grading—requiring students to submit prompt logs and tailoring notes—provides a mechanism to uphold academic integrity in the AI era, discouraging passive reliance and encouraging reflective engagement.

5.2 Contributions to IS Pedagogy and Theory

Our design-based research approach is closely aligned with the broader IS design science tradition. In line with Gregor and Hevner (2013), I treat instructional workflows as IS artifacts—designed, tested, and iteratively refined. By positioning the AI scaffolding workflow as a design artifact, this study highlights how IS researchers can construct and validate pedagogical innovations. This reinforces the role of *JISE* as a venue for bridging design-oriented theory with actionable practice in IS education. Recent contributions (e.g., Schlimbach et al., 2024) demonstrate how design principles for AI-enabled learning tools can emerge from iterative cycles of evaluation and refinement. The intervention aligns with IS design science traditions by treating the instructional framework as an artifact subject to iterative refinement.

5.3 Contributions to IS Practice

For IS educators, this reinforces the point that AI can complement traditional teaching methods such as role-play or simulation (Schmitz, 2018; Sharp & Lang, 2018). Ultimately, the study has implications for the development of professional capabilities and industry practice.

- *Accelerated onboarding of junior IS professionals:* Organizations may adopt similar AI scaffolding workflows to reduce ramp-up time for new hires, providing structured drafts that must be critically evaluated and tailored to organizational contexts.
- *Upskilling the workforce in AI literacy:* As IS professionals increasingly encounter AI-driven planning, reporting, and analysis tools, the ability to evaluate, adapt, and ethically integrate AI outputs will become a critical professional competency.
- *Maintaining human judgment in AI-augmented work:* By demonstrating that AI scaffolding supports rather than substitutes for human reasoning, this study reinforces a co-production model of work, in which AI tools enhance efficiency while decision authority remains with professionals.

In short, the findings underscore that the responsible integration of AI in IS education prepares graduates for academic success and professional effectiveness in AI-augmented project environments.

5.4 Summary of Contributions

To summarize, this study contributes to the IS discipline in three interrelated ways:

- *IS Education:* Provides a replicable instructional design for integrating generative AI into IS curricula, empirically demonstrating how scaffolding workflows improve deliverable quality and cultivate AI literacy.
- *IS Theory:* Extends scaffolding theory into IS contexts, bridges DBR and design science traditions, and reconceptualizes IS competencies to include AI-critical evaluation.
- *IS Practice:* Offers actionable insights for organizations on embedding AI scaffolding in professional training, accelerating onboarding, and maintaining human oversight in AI-augmented environments.

6. IMPLICATIONS FOR IS EDUCATORS AND PROGRAMS

The findings from this study carry significant implications for the design and delivery of IS curricula. As generative AI tools become commonplace in organizational practice, IS programs must teach students how to use these tools and critically evaluate, adapt, and manage them within project contexts. Below, I outline five implications for IS educators and program leaders.

6.1 Embed AI Literacy as a Core IS Competency

As IS2020 codified project management, systems analysis, and database management as required competencies (Leidig & Salmela, 2020), future curriculum updates should consider AI literacy as a core graduate outcome. This study shows that students who critically revised AI outputs developed transferable skills in identifying hallucinations, contextual misalignments, and ethical risks. Programs should explicitly frame these skills as part of the IS graduate profile, ensuring alignment with industry expectations for AI-augmented work.

6.2 Position AI as a Scaffold, Not a Substitute

The instructional design tested here demonstrates the value of framing AI as a "first draft partner." By requiring students to revise, justify, and tailor outputs, educators can maintain rigor while leveraging AI to reduce cognitive barriers. IS faculty should explicitly communicate that AI tools are support, not solutions. This reframing prevents shallow learning and encourages students to exercise professional judgment—skills that employers consistently demand of IS graduates.

6.3 Design Assessments Around Process, Not Just Product

Traditional deliverable-based grading in IS courses risks incentivizing passive use of AI. In contrast, this study's requirement for prompt logs, tailoring notes, and process-focused rubrics shifted assessment toward student judgment and critical engagement. IS educators can adopt similar approaches to ensure academic integrity while encouraging reflective learning. This strategy also aligns with professional practice, where project documentation is evaluated not only for its content but also for its traceability and justification.

6.4 Scale Across IS Domains

Although this intervention focused on project management, the design is modular and transferable, allowing for flexibility and adaptability. Similar workflows could be implemented in:

- Systems Analysis (e.g., AI-generated use cases or ER diagrams refined by students).
- Database Design (e.g., AI-generated schemas checked for normalization and integrity).
- Enterprise Architecture (e.g., AI-drafted capability maps adapted to organizational contexts).

By scaling across domains, IS programs can cultivate a consistent model of AI-augmented learning, ensuring graduates build both technical fluency and critical evaluation skills across multiple competencies.

6.5 Faculty Development and Support

Finally, integrating AI scaffolding requires faculty readiness. Instructors must be equipped not only to use AI tools but also to guide students in critically engaging with them. Institutions may consider faculty development programs that:

- Provide training in AI prompt engineering and oversight.
- Share case studies of AI integration in IS curricula.
- Create communities of practice for IS educators experimenting with AI-enabled pedagogy.

Such initiatives will help ensure that IS programs respond proactively to AI disruption rather than reactively.

6.6 Summary of Implications

Collectively, these practices provide IS programs with a pragmatic roadmap for AI integration. In sum, the results of this study suggest a strategic path forward for IS educators:

- Treat AI literacy as a core IS competency.
- Position AI as a scaffold, not a substitute for student reasoning.
- Redesign assessments to emphasize process and judgment.
- Scale modular workflows across IS domains.
- Invest in faculty development to build capacity for AI-integrated teaching.

By adopting these practices, IS programs can prepare graduates who are not only fluent in traditional IS competencies but also capable of navigating AI-augmented workplaces responsibly.

7. LIMITATIONS AND FUTURE RESEARCH

As with any design-based study, several limitations should be acknowledged. These limitations also provide directions for future research in IS education.

7.1 Context and Generalizability

This study was conducted in a single undergraduate IS program at one U.S. institution. While the project management course is representative of IS2020's competency model, caution should be exercised in generalizing findings to all IS programs or contexts. Institutional resources, student demographics, and faculty readiness may influence the effectiveness of AI-assisted scaffolding. Future research should replicate this design across multiple universities and curricular settings, including graduate and executive education, to test broader generalizability.

7.2 Cohort Design and Causality

The comparison relied on non-random cohorts from consecutive semesters taught by the same instructor. While this quasi-experimental design provides meaningful contrasts, it cannot entirely eliminate potential confounds such as cohort effects. Randomized controlled trials, in which students are assigned to AI-assisted and non-AI conditions within the same semester, would strengthen causal inferences regarding the effects of AI scaffolding in IS education. In addition, although conservative multiple-comparison corrections (Holm–Bonferroni; Holm, 1979) were used to mitigate family-wise error, the quasi-experimental cohort structure and moderate survey sample size warrant cautious interpretation. Future randomized controlled designs with larger survey samples would enable stronger causal inference.

7.3 Longitudinal Outcomes

The intervention demonstrated short-term improvements in deliverable quality and competency development; however, its long-term impacts remain untested. Do students retain AI literacy and project fluency beyond the course? Does early exposure to AI scaffolding translate into improved workplace readiness? Future longitudinal studies should examine whether competencies developed through AI-assisted workflows persist and transfer into professional IS practice.

7.4 Cross-Cultural and Cross-Domain Variability

IS education is inherently global, and cultural context shapes both technology adoption and classroom practices. The structured critique of AI outputs observed in this study may vary in settings where students are less comfortable challenging technology or authority. Cross-cultural studies could explore how AI literacy manifests across regions and educational traditions. In addition, the framework should be tested across other IS domains, such as systems analysis, database design, and enterprise architecture, to assess its scalability beyond project management.

7.5 Technological Evolution

This study focused on one generative AI tool (ChatGPT) available during the intervention period. As AI models evolve rapidly, future tools may alter the nature of scaffolding and the balance between human and AI contributions. Comparative studies across platforms (e.g., domain-specific AI tutors, multimodal models) are needed to understand whether and how findings generalize across technological ecosystems.

7.6 Ethical and Integrity Considerations

Finally, although this design emphasized process-focused grading and critical engagement, broader questions remain about academic integrity and equity in AI-enabled learning. Future work should investigate how different assessment strategies, institutional policies, and access models influence fairness and responsible AI use in IS programs. Specifically, issues of equity and access warrant attention. While this study demonstrates the benefits of AI scaffolding, it assumes that students have equal opportunity to engage with generative AI tools. In practice, institutional policies, course-level restrictions, or varying degrees of digital literacy may create disparities. Future research should investigate how to scaffold learning for students who lack access to or are uncomfortable with AI, as well as how universities can ensure inclusive AI literacy development across diverse educational contexts.

7.7 Directions for Future Research

Building on the limitations identified above, several avenues for future research emerge. First, longitudinal studies tracking IS graduates beyond the classroom would help determine whether AI literacy and project management competencies developed through AI-scaffolded instruction persist and transfer into professional roles. Such work would provide insight into the durability of these competencies and their relevance to workplace performance in AI-augmented environments.

Second, cross-institutional replications are needed to assess the generalizability of the co-production model across diverse IS programs, institutional contexts, and student populations. Replication across universities with varying curricular structures and resource constraints would strengthen confidence in the instructional design's robustness and scalability.

Third, cross-cultural investigations would extend understanding of how cultural norms shape students' willingness to question AI outputs, engage in critical revision, and develop AI literacy. Because IS education operates within global and culturally heterogeneous contexts, such studies would illuminate whether and how AI-scaffolded learning differs across educational traditions and regions.

Fourth, future research should explore the application of AI scaffolding beyond project management to other core IS domains, including systems analysis, database design, and enterprise architecture. Examining whether similar gains in fluency, judgment, and professional readiness occur across domains would help establish AI scaffolding as a generalizable pedagogical approach within IS education.

Fifth, adaptive scaffolding models warrant investigation. Rather than providing uniform AI support, future designs could dynamically adjust the level of AI assistance based on learner expertise, task complexity, or demonstrated performance, enabling more personalized and developmentally appropriate learning experiences.

Ultimately, comparative studies across various generative AI platforms and modalities are necessary. As AI tools evolve rapidly, examining whether learning outcomes differ across models, interfaces, or domain-specific systems would help educators make informed choices about tool adoption and instructional design.

In sum, while this study demonstrates the promise of AI scaffolding in IS education, its scope is necessarily bounded. By extending research across various contexts, cultures, domains, and technologies, future studies can deepen understanding of how generative AI influences the development of IS competencies and informs the ongoing design of IS curricula.

8. CONCLUSION

The rapid emergence of generative artificial intelligence has ignited new debates in the IS discipline. For educators, the central challenge is not whether students will use AI tools, but how such tools can be harnessed to develop, rather than diminish, professional competencies. This study contributes to that discussion by empirically demonstrating that when integrated through a structured co-production workflow, generative AI can act as a cognitive scaffold that enhances both the quality of project management deliverables and the development of transferable IS competencies.

The intervention yielded four key competency outcomes:

- *Project Fluency:* Students produced higher-quality project charters, stakeholder analyses, predictive work plans, and agile sprint plans, reflecting improved ability to structure complex IS deliverables.
- *Critical Thinking and Professional Judgment:* Active revision of AI outputs cultivated evaluative skills essential for IS professionals facing uncertain and dynamic environments.
- *AI Literacy:* Students learned to critique, adapt, and responsibly integrate AI outputs, positioning AI literacy as a new core competency that complements the IS2020 framework.
- *Professional Readiness:* Gains in confidence and motivation suggest that AI-assisted scaffolding better prepares students for real-world IS project work.

Theoretically, the study extends scaffolding theory into IS curriculum design, illustrating how AI-human co-production workflows reduce cognitive load while preserving higher-order engagement. Methodologically, it demonstrates the value of design-based research as a complement to IS design science, where instructional frameworks are treated as artifacts subject to iterative refinement and evaluation. Practically, the findings provide IS educators with a replicable model for responsibly integrating AI into project-based learning, with implications for scaling this approach across other IS domains, such as systems analysis, database design, and enterprise architecture.

Looking forward, the implications for IS programs are clear. AI literacy should be explicitly embedded alongside project management, systems analysis, and database management as a core IS competency. By positioning AI as a scaffold rather than a substitute, educators can prepare graduates who are not only fluent in emerging technologies but also capable of exercising judgment, creativity, and ethical responsibility in AI-augmented workplaces. In short, thoughtfully integrated AI can strengthen IS education, equipping the next generation of professionals to navigate and shape the evolving digital landscape.

9. AI USE DISCLOSURE

The author confirms that this manuscript was conceived, designed, and written by the author. Generative AI tools (e.g., ChatGPT, Grammarly) were not used to generate original content for the manuscript. Limited

use of AI-based tools was made solely for editing, grammar checking, and language polishing during manuscript preparation. All substantive ideas, analyses, and interpretations are the work of the author.

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APPENDICES

Appendix A. Instructional Inputs to the AI-Scaffolded Workflow

Purpose: Defines the core instructional materials provided to students prior to AI use. These inputs establish context, constraints, and evaluation criteria necessary for meaningful AI–human co-production.

1. Project Case Study

Derived from https://bootcamp.uxdesign.cc/case-study-designing-a-better-and-covid-friendly-atm-experience-16f9087cfd77

COVID-Friendly ATM

COVID-19 is still around and has profoundly impacted our daily lives, compelling us to adopt a fresh perspective on various aspects. One significant change that has emerged is our approach to handling cash. The risk of transmitting the virus through physical currency, which passes through the hands of numerous individuals, has prompted a growing inclination toward digital payments. Although digital transactions have experienced a continuous surge, cash transactions remain an integral part of our everyday routines. ATMs fulfill this essential service by providing physical currency. However, they also present a heightened risk of contamination, as they are among the most heavily affected surfaces in public spaces and can potentially carry the coronavirus. *Problem:* With the daily influx of numerous individuals at ATMs, these locations can become breeding grounds for virus transmission through human interaction. According to the World Health Organization (WHO), the virus can remain viable on various surfaces, including plastics, for 3 to 4 days. Additionally, ATMs were designed to serve multiple functions beyond simple cash withdrawals, as illustrated below.

The goal of the project is to establish the solution's objective through careful examination of the issues and user demographics, informed by research. The primary aim is to create a contactless and cardless ATM experience, offering a streamlined and straightforward process that eliminates any confusion or frustration. This entails designing a system with minimal steps, facilitating rapid withdrawals, and enhancing overall user-friendliness in the product.

2. Custom Project Charter Template

Situation Summary: This section includes the project's background and a reference to the situation analysis (Is this a problem, opportunity, or business requirement?). It outlines the procedure used to determine the recommendations presented.

Current State ("As Is"): The current state refers to how things are currently done within the project scope. If this is a large, multi-faceted project, the current state includes processes, behaviors, tools, technologies, organizational structure, roles, inputs, outputs, guides, enablers, flow, and management. The current state identifies gaps that must be documented in the future state requirements and design. Gaps indicate areas of the current state process that are missing. If these gaps are not identified and documented, they will persist in the future. The main advantage of "as-is" process analysis is creating a solid foundation in an organization's processes. An as-is analysis enables a business to assess its current processes and identify opportunities for improvement. Without this fundamental information, managing and improving processes is not easy. In other words, if you do not know where you are starting from, you will have difficulty getting to where you want to be.

Desired Future State ("To Be"): The future state is defined as the future state of a business process or solution. The future state is ultimately defined as an excellent vision for the project's results. It is where the stakeholders want to be, their long-term goal regarding desired results, and how that applies to your business. Without a definitive future state, a company will often find itself lacking direction, making it

harder to make pivotal decisions, causing misalignment amongst executives, and hindering the progression and growth of a company's mission. One of the most important aspects of defining the current and future state is prioritization. When undertaking this work, it is essential to prioritize goals and actions that will have the most significant impact on the business. This involves setting both short-term and long-term goals, while focusing on the most critical areas for improvement.

Pains and Gains: This defines why you are doing the project. Pains – the negative costs, experiences, emotions, and risks that the stakeholders may experience and need to be removed. Gains – the benefits the stakeholders expect and need, and the benefits that may increase the likelihood of completing a project.

Project Constraints & Assumptions: Any project factor considered true, accurate, or specific without empirical proof or demonstration. Realistically, planning a project is only possible by making assumptions (constraints): any restriction that defines a project's limitations. For example, a project's scope refers to the limits of what the project is expected to accomplish. Time, cost, and scope are the three most significant constraints in project planning and management.

Background and Other Information: Background information refers to the details that identify and describe the significance and historical value of a selected project, as well as references to supporting literature on the topic. It is vital because it provides relevant information about a specific project.

Project Manager Authority Dimensions: Identify the 3-4 most important dimensions of this project manager's authority. Assume a balanced matrix structure.

1) Focal position – a single point of contact
2) Relationship among project manager, functional managers, work package owners, general managers, sponsors, steering committee, and others
3) Cross-functional initiatives
4) Participation in technical and management decision-making
5) Involvement in staffing and selection
6) Allocation, budgeting, and expenditure of funds
7) Selection of subcontractors
8) Conflict resolution
9) Project team continuity and integrity
10) Coordination of organizational resources
11) Information gathering
12) Information dissemination
13) Leadership role in operational requirements, specifications, and selection
14) Customer liaison
15) Technology coordination
16) Project organization
17) Performance review of key personnel
18) Allocation and control of funds.

3. Project Team Profiles

Name	Position	Cost/Hour	Overtime Cost/Hour
Susan Goodman	**Business Analyst**	**35**	**52.5**
Education:	B.S. Systems Engineering, XXXX (2019), MBA YYYY (2023)		
Skills:	She is detail-oriented but keeps sight of the big picture		
Interpersonal Skills:	She is well-known and highly regarded within the company, known for her witty sense of humor.		
Intangibles:	She is familiar with the internal power structure and can utilize it when necessary.		

Tina Schmot	**Technical Specialist**	**42.5**	**53.75**
Education:	B.S. Computer Science, XXXX Tech (2015), Certified MCSE		
Skills:	Very skilled in all technical aspects, including programming, database, telecommunications and hardware configurations.		
Interpersonal Skills:	Find most people and their habits tiring. She feels that I will give her the work, and I will finish it; let us save time together if necessary.		
Intangibles:	She is an efficient worker, but has little extra time due to her extreme family commitments. She is only available 50% of the time. We are not sure when she will be available to work.		
Pat Reardon Jr.	**Business Analyst**	**30**	**45**
Education:	B.S. Management, XXXX (2024)		
Skills:	Has no experience and little potential. He is the nephew of the Senior Vice President of Human Resources, or he would most likely not have been hired.		
Interpersonal Skills:	Embarrassingly cocky, considering his lack of skills. He has a minimal attention span.		
Intangibles:	He has been on the job for less than three months and has already called in sick for four days. He has not worked in a team environment until this opportunity.		
Juanita Perez Sr.	**Systems Analyst**	**47.5**	**71.25**
Education:	B.S. MIS, XXXX (2011)		
Skills:	She has nearly 14 years of experience, starting as a programmer for four years and then transitioning to a ten-year career as an analyst.		
Interpersonal Skills:	She is recognized as a "team player" and has been credited as a key factor in the success or failure of a project.		
Intangibles:	In some ways, success has gone to her head. She often does what she feels is best, even if it conflicts with the PM or her boss. So far, it has worked out, but this has the potential to be a problem.		
Bhat Patel	**Project Manager**	**50**	**75**
Education:	B.S. MIS, XXXX (2010), MBA YYYY (2016)		
Skills:	This is his first time as a PM, and he has no experience.		
Interpersonal Skills:	Previous workers feel that he is sometimes abrupt, "strong-headed," and inflexible when offered alternatives.		
Intangibles:	He is an efficient worker with a strong work ethic, having completed two projects as an analyst. He has a good reputation within the functional area that wants the system.		
Gui Sisuan	**Systems Analyst**	**35**	**52.5**
Education:	B.S. Information Systems, XXXX (2021)		
Skills:	She possesses exceptional knowledge in defining requirements and gathering information.		
Interpersonal Skills:	She is gregarious, outgoing, and extremely nice. She has a terrific disposition and works well with clients.		
Intangibles:	Although she has only been with the company for one year, her five years of consulting experience provide a unique perspective.		

4. Required Validation of AI Output

AI-driven tools are transforming project management by generating reports, risk assessments, timelines, and other deliverables. However, AI outputs are not infallible—they require human oversight to ensure accuracy, alignment with project objectives, and the needs of stakeholders. This module explores how

students and professionals can add value by tailoring AI-generated deliverables rather than accepting them at face value.

At the end of this module, students will be able to:

1) Understand AI limitations such as hallucinations, biases, and a lack of contextual awareness.
2) Identify key areas where AI-generated deliverables require tailoring.
3) Apply a structured approach to refining AI outputs for project-specific needs.
4) Demonstrate value-added decision-making when integrating AI deliverables into project workflows.

Why AI-Generated Deliverables Require Tailoring

1. Addressing AI Hallucinations & Errors

AI models can fabricate data, misinterpret inputs, or generate incorrect outputs. Blind acceptance of AI-generated content can compromise decision-making and project outcomes. For example, an AI tool generates a risk assessment report but incorrectly categorizes a high-risk vendor as low risk due to missing data. The project manager must validate and correct the classification before making procurement decisions.

2. Contextual Adaptation to the Project's Unique Needs

AI operates based on patterns and training data, but each project has unique requirements. Tailoring ensures alignment with the project's industry, organizational culture, and goals. For example, AI generates a project plan for a new CRM system but does not account for existing IT infrastructure constraints. The student must adjust the timelines and resource allocations accordingly.

3. Ethical & Compliance Considerations

AI models may lack awareness of regulatory, legal, or ethical constraints. Human oversight is necessary to ensure compliance with FERPA, GDPR, HIPAA, and other industry-specific regulations. For example, AI drafts a performance assessment framework, but it unintentionally introduces biased evaluation criteria based on historical hiring data. The student must audit and revise these criteria to ensure fairness and accuracy.

4. Improving Readability & Stakeholder Alignment

AI outputs are often generic, overly technical, or misaligned with stakeholder priorities. Tailoring ensures that deliverables are clear, actionable, and relevant to different audiences. For example, AI generates a project status report, but it is filled with unnecessary jargon. The student refines the language, adds key business insights, and restructures the format to make it effective for executive leadership.

5. Filling in AI's Gaps with Critical Thinking & Judgment

AI lacks intuition, creativity, and deep contextual awareness. Tailoring involves asking more profound questions, anticipating risks, and integrating qualitative insights. For example, AI drafts a change management strategy, but it does not consider employee resistance due to past failed initiatives. The project manager adjusts the strategy to include trust-building measures.

Framework for Tailoring AI-Generated Deliverables

Conclusion: AI should currently be used as a co-pilot, not an autonomous decision-maker. AI is a powerful tool for enhancing efficiency in project management, but students and professionals must add value by critically evaluating and refining its outputs. This grading rubric provides a structured approach to assessing student application of AI tailoring principles.

AI Output Evaluation Log (Tailoring Notes) *Instructions to Students:* For each AI-generated deliverable, you must complete this log to document gaps and revisions.

- **Gap Type:** E.g., Hallucination, Context Mismatch, Generic/Vague
- **AI Output:** Copy the specific text from ChatGPT
- **Student Revision:** How you fixed it
- **Justification:** Why this change was necessary for the client

Appendix B. AI Prompt Templates Used in the Intervention

Purpose: Documents the standardized prompts used to generate initial AI drafts, enabling replication of the instructional design across IS courses.

1. Project Charter Initial Prompt
Step 1: Enter ChatGPT
Step 2: Use the + under the prompt to attach the two files
Case Study: COVID-Friendly ATM
Custom Project Management Project Charter Template
Prompt: Develop a project charter for the attached case study. Use the custom project management template to format the deliverable.

2. Predictive Work Plan Initial Prompt
Step 1: Enter ChatGPT
Step 2: Use the + under the prompt to attach the two files
Case Study: COVID-Friendly ATM
PM Team Profiles
Step 3A: Prompt: Develop a project work plan for the requirements definition. Use the attached information to develop this plan. Assign the best resources and estimate work, duration and costs for the tasks created for each assigned resource. Develop robust task definitions for each task. Include positive and negative risks and strategies for the tasks. Identify quality checks for the tasks. Include any assumptions and constraints for each task. Make sure there are:

- No over-allocated resources,
- Task descriptions for each task,
- Basis of estimates for each task,
- Assumptions and constraints for each task,
- Completion criteria for each task and
- Buffer at the phase level
- Task dependencies
- Resource assignments, etc.

Step 3B: Second, separate prompt: Format this for easy input into MS Project.
Step 4: Complete Tailoring Project Management Deliverables on any outputs.
Step 5: Review the results and improve. Continue this until you are satisfied.

3. Agile User Stories Initial Prompt
Develop user stories for "A COVID-Friendly ATM".

4. Agile Sprint Planning Initial Prompt
Step 1: Enter ChatGPT
Step 2: Use the + under the prompt to attach the two files
Case Study: COVID-Friendly ATM
PM Team Profiles
Step 3A: Develop an agile project management plan using the above material. Assign the best resources and offer robust task definitions for each task. Estimate work, duration and costs for the tasks above for each assigned resource. Identify positive and negative risks and strategies for the tasks. Identify quality checks for the tasks. I want sprints broken into user stories. Complete only the first two user stories. The rest should be placed in the backlog. Make sure there are:

- No over-allocated resources,
- Task descriptions for each task,
- Basis of estimates for each task,

- Assumptions and constraints for each task,
- Completion criteria for each task and
- Buffer at the phase level
- Task dependencies
- Resource assignments, etc.

Step 3B: Second, separate prompt: Format this for easy input into MS Project.
Step 4: Complete Tailoring Project Management Deliverables on any outputs.
Step 5: Review the results and improve. Continue this until you are satisfied.

Appendix C. Assessment Rubrics

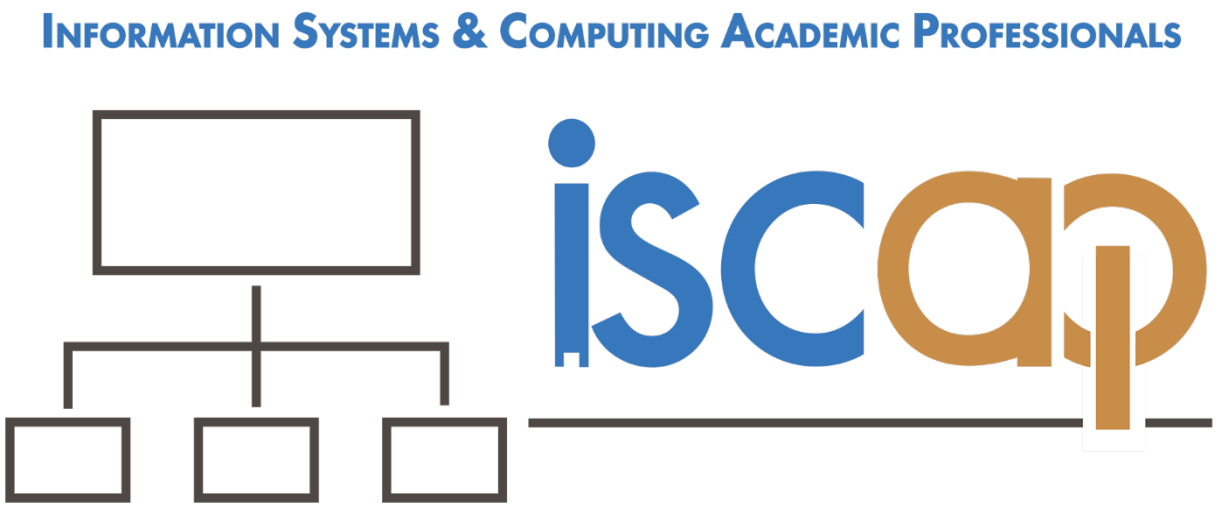
Purpose: Describes the rubric criteria used to evaluate AI-enabled deliverables, emphasizing validation, contextual adaptation, and human judgment.

Criteria	Excellent (10 pts)	Proficient (7–9)	Needs Improvement (4–6)	Unsatisfactory (0–3)
Validation & Accuracy	Errors fully corrected	Minor errors remain	Major errors remain	Little/no validation
Contextual Adaptation	Fully tailored to project context	Mostly adapted	Somewhat adapted	Not adapted
Stakeholder Relevance	Effectively adjusted to stakeholders	Some adjustments	Few adjustments	No effort made
Human Judgment	Creative/insightful refinement	Some oversight	Minimal oversight	None evident
Presentation & Clarity	Clear, professional	Mostly clear	Some issues	Poorly structured

Appendix D. Post-Intervention Survey Instrument

Purpose: Lists survey sample items used to measure student perceptions of cognitive support, critical thinking, AI limitations, confidence and future intentions.

- *Cognitive Support*: "ChatGPT helped me structure project documents."
- *Critical Thinking*: "I critically evaluated AI outputs."
- *AI Limitations*: "I worried about AI-generated inaccuracies."
- *Confidence*: "I feel more capable in project documentation."
- *Future Intentions*: "I intend to use AI tools for future work."



STATEMENT OF PEER REVIEW INTEGRITY

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