



Trend Analysis of Project Management Practices in Educational Technology Projects

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Abstract

The evolution of technology offers abundant opportunities and complexities of how the industry and organizations operate and evolve. Open and distance education has been made possible through the application of modern educational technology. However, educational technology projects are challenged with inadequate project management implementation, insufficient organizational and post-implementation support, and mistake in design and rollout technology. Instructional designers often spend a significant amount of time on instructional design tasks than project management. Whether an instructional designer subscribes to the ADDIE model, the Merrill's First Principles of Instruction or a model of their own making, these are just frameworks to deliver effective design solutions. Elements of the project management methodology can be embedded in instructional design models for creating engaging learning experiences. Motivated by this concern, this study aims to analyze the decadal trends in research on project management in educational technology projects by conducting a content analysis of peer reviewed journal articles. The number of publications on this topic has increased dramatically over the span of five decades. This study concludes by highlighting the need for instructional designers to possess sound project management skills, enabling them to complete educational products on time, within budget and in conformance with learner needs.

Keywords: Educational technology projects; instructional designer; instructional design; project management; project management skills.

1. Introduction

Project Management Institute (PMI) is a non-profit professional organization that is responsible for maintaining Project Management Body of Knowledge (PMBOK), an industry standard recognized by the American National Standards Institute (ANSI). PMBOK is the entire collection of processes, best practices, guidelines, and terminologies that are accepted within the project management industry. PMI is also responsible for administering the most globally respected Project Management Professional (PMP) certification. In order to achieve effective project management, PMI defines ten project knowledge areas: integration management, scope management, time management, cost management, quality management, human resource management, communications management, risk management, procurement management, and stakeholder management. These ten areas of project knowledge guide the project manager through the project's five stages, namely, initiating, planning, executing, monitoring and controlling, and closing [1]. Project management processes and procedures can be applied to all industries, regardless of the project types and sizes.

1.1 Project Management and Instructional Design

Project management is defined as the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements [1]. On the other hand, instructional design refers to the planning and creation of learning materials while

educational technology are tools or technologies used to aid learning. Thus, educational technology projects involve systematic guidance on specific phases to produce high quality instructions, in which technologies are used by the instructional designer to create the instruction. There are few differences between project management and instructional design. Project management has a predetermined time frame for each activity while instructional design is an ongoing process. Overall activities within a project rely on how effective the project manager communicates. In contrast, there are five basic stages of instructional design: analysis, design, development, implementation, and evaluation. The goal of the instructional design is to assist individual learning and systematically designed instruction that will result in human development.

Project management tools and techniques could help instructional designers deliver a predetermined deliverable within specified time, scope, cost, and quality standards [2]. Project management is also the perfect complement to the instructional design by providing a series of processes in order to manage and accomplish the task required for each stage of the instructional design. According to a study conducted in 1997 [3], project management plays a significant function in any successful instructional design. Another benefit of the project management approach in instructional design is the efficient allocation of scarce resources, for instance the production of courseware that are challenged by limited resources and quick turnaround times [4]. Interestingly, PMI offers a project management course to administrators and



teachers, so they can apply these skill sets to their schools and classrooms.

1.2 Research on Project Management Practices in Educational Technology Projects

Generally, the project management methodology is used in the field of information technology, software engineering, construction, architecture, and manufacturing as those complex projects require extensive financial and human resources [5]. However, there are some evidences of the use of project management practices in educational technology projects in the 2000s. The development of web-based instructional contents or known as eLearning Guild for instance involved professionals in different environments, such as education, government, and corporate [6]. This community of practice focused on the significance of project management best practices and skills according to the PMBOK Guide to improve efficiency and reduce risk in the courseware development project. Similarly, another study emphasized on the project management methodology and instructional design models in producing multimedia educational materials [7]. The author highlighted an important role of instructional designers play today is to act as a liaison between the project team and the stakeholders, including task allocation, project milestones, and deliverables to ensure objectives and deadlines are achieved [7]. In order for a project to remain within the agreed-upon budget and schedule, as well as meets user requirements, the author stressed the significance of planning, cooperation, and flexible work through the project life cycle [7]. There are a great number of reasons for educational technology project failure. Studies have suggested that the causes of educational project failure are due to the lack of alignment of projects to organizational strategy, mistake in the design and rollout technology, insufficient organizational and post-implementation support, poor stakeholder engagement, and inadequate project management implementation [5][6][7][8][9][10]. Instructional designers spent 47% of their time on instructional design tasks while only 15% time spent on project management [9]. Although the study is more than a decade ago, the practice is still happening today. In difficult economic times, the government funding for designing educational technology products has been reduced. Educational technology projects are also faced with limited staff and faster turnaround times.

The fourth industrial revolution is changing the way people learn, work and think. Delivering a successful educational technology product depends on more than just following an instructional design model or having an extremely creative instructional solution. Proper planning, direction, and execution of the educational technology projects are indeed important. Instructional designers as project managers must be responsible for the triple constraint – cost, schedule, and scope of the educational technology project. The triple constraint is illustrated as a triangle with scope, time, and cost as the sides of the triangle that must be balanced in any project. Instructional designers then should able to manage the scope, time, and cost, as well as human resources associated with their projects. Additionally, evaluating risks or success factors of the project and managing changes throughout the project that may threaten the project's success are also significant.

1.3 Significance of the Study

In order to conduct a systematic analysis of the evolution of project management in educational technology projects, this study focuses on the decadal trends in research publications. The purpose of this study is to understand the direction of evolution towards applying project management methodologies in the

educational technology projects. Instead of reporting the number of publications in each decade, a trend analysis also provides a background information on the focus of researchers towards time specific project management in educational technology projects. This study is conducted to examine the research question: What has been the trends in research on project management in educational technology projects over the decades? The research is significant for the current and future researchers as they will get the overall scenario of research on project management in educational technology projects, its current status and research trends which will give them future research directions.

2. Methodology

This exploratory study was designed to analyze the decadal trends in research on the project management practices in educational technology projects. Conceptual content analysis [11] was employed to examine the trends. An electronic database search of ProQuest ERIC was conducted using the following keyword search terms: “project management AND educational technology projects.” Only peer reviewed and English language research articles were included in the analysis. Figure 1 shows the database search returned 608 results.

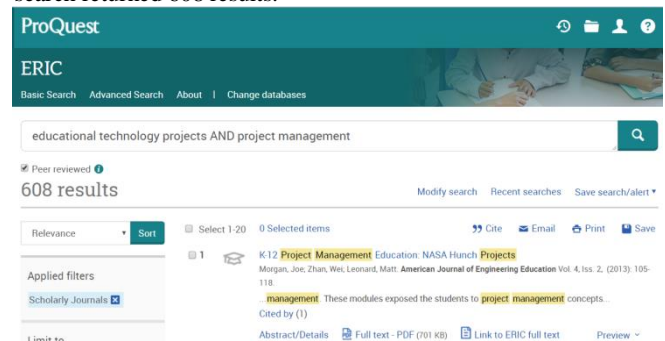


Fig. 1: ProQuest ERIC results page returned after submitting the request

A priori codebook [12] was developed using relevant descriptors on the ProQuest results page. In this study, the codebook was structured using six components: publication date, publication title, subject, authors, abstract, and preview. In order to ensure interrater reliability, educational technology experts were invited to review the codebook and analyzed 20 results via content analysis [11]. To ensure the interrater agreement was maintained, independent analysis of the search results was conducted with periodic check-ins. Based on the information available from the ProQuest results page, a priori coding of the categories was established. Relevant themes related to the study were identified after completing the coding.

3. Findings

1970s saw the first ever research on the project management practices in an educational setting. The management information system was developed to support the information and data management needs for two educational projects. Interestingly, the new system supports the old curriculum and becomes more complex as required.

1980s studies drew attention towards the failure of educational technology projects in various countries. This era focused on the use of microcomputers in school and higher education for effective teaching and classroom management. Feedback and evaluation of school administrators, teachers, students, and parents were conducted towards educational microcomputer software and computerized programs.

1990s publications reflected the growing trend of educational project management, a global approach to facilitate teachers'

work by assisting them integrate new technologies. Student learning was expected to be improved via technology use in education.

2000s witnessed numerous advancements in the area of educational technology, researchers seeking cross-disciplinary approaches to instructional design process. Incorporating project management concepts, processes, and procedures into educational technology projects adds a dimension that exposes instructional designers to the realities of effective learning design.

2010 to present day mark the contemporary situation that emphasizes the knowledge of project management based on the PMI standard. Project management courses are offered to undergraduate and graduate students in preparing them for project management activities in the real world. Figure 2 illustrates the trends in project management and educational technology projects by conducting a content analysis of peer reviewed journal articles over the decades.

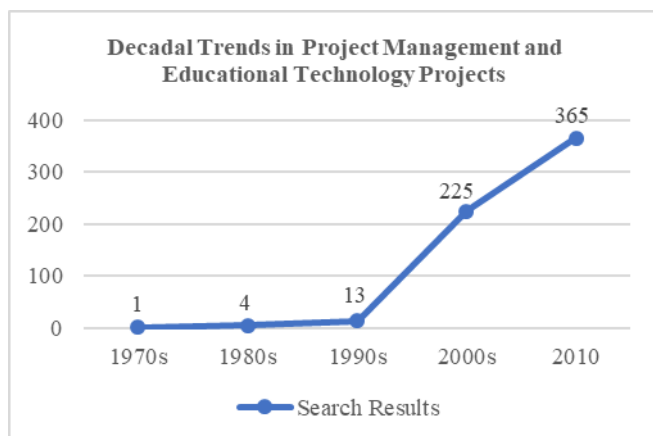


Fig. 2: Trend analysis of project management in educational technology projects

4. Discussion

Previously, a great deal of emphasis has been placed on designing, developing, and delivering of courses to learners [8]. However, the focus recently has moved to the end-to-end management of educational technology projects from planning to closure. Instead of having a sound instructional design knowledge, instructional designers must also have project management skills that enable them to lead their project team, estimate project requirements, complete educational projects on time, on budget, and in accordance with client expectations, processes, and standards. In other words, the roles of an instructional designer in educational technology projects are very diverse, requiring competencies in leadership, both management and technical [4]. However, there are challenges associated with performing both responsibilities, as an instructional designer and a project manager by one individual since each role requires a different skill set [4]. Indeed, the career paths and education backgrounds exhibit considerable variation. The decade's analysis indicates that the beginning of research publications focused on the management information system scenario, but the more contemporary research emphasizes on the project management courses scenario. The focus has gradually shifted from developing systems to support educational projects to providing formal project management education. The recent effort is seen as a way of preparing future instructional designers, especially for those who want to better understand the processes, tools, and techniques of project management.

However, project management courses are often not available within the educational technology program. In Malaysia for instance, most of courses in project management are offered by the computer science and information technology department at the public and private universities. This scenario creates a gap

between the theory and real world experience. GradSchools.com [13], a graduate school directory in the United States, lists 58 doctorates and 269 masters programs in educational technology and online learning that prepare professionals in the instructional design field. Unfortunately, most of the educational technology curriculum does not include project management courses in their program. Project management courses are usually offered as standalone programs or aggregated together into subject matter courses. A search-by-subject on GradSchools.com [13] shows graduate programs in project management are offered in the curriculum for business, engineering, and technology.

5. Conclusion

Recent studies claim that instructional designers tend to get stuck in the details of a design. Thus, a systematic approach can assist them to stay focused. In order for instructional designers to be successful, they should be equipped with project management skills to manage each stage in the design process. Instructional designers can discover the advantages of a systematic approach by identifying the relationship between project management and instructional design. However, it is significant that instructional designers adopt the project management practices without altering the process of instructional design [3]. For instance, audience analysis is one of the important stages in instructional design and if it is missing, resulting in poor training material. Also, project management can assist designers to combine some of the stages of instructional design that do not require the intense attention. In fact, the whole instructional design teams should support the use of project management methodology, define project management framework, processes, and tools in compliance with the PMI standards, as well as the related skill sets as outlined in the PMBOK Guide.

Furthermore, instructional designers can also consider the principles of project management applied in software engineering, for instance creating a course development workflow, project planning frameworks, and course design checklists in designing and developing educational technology products [8]. Knowledge and skills in project management could help instructional designers to manage the instructional design process and stay away from shortcuts aimed to save cost and time, which usually resulting in poorly designed learning experiences with costly revisions [4].

The trend analysis in this study shows growth interest in research towards integrating project management practices in educational technology projects. Instead of providing a deeper sense about the project management practices in educational technology projects, this study also lays down the foundation for present and future initiatives. By compiling the research publications over five decades and presenting the evolving trends, researchers could look over the time spans and add to the limited research available. Besides, most of the studies on project management in educational technology projects were conducted from the developed country perspectives, therefore future researchers should conduct more studies from the developing country perspectives.

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