Applying Agile Principles in Teaching Undergraduate Information Technology Project Management

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ABSTRACT

This article describes how the traditional teaching and learning activities over the years have been challenged to be agile - easily adaptable to changing classroom conditions. Despite this new phenomenon, there is a perceived paucity of agile-in-teaching research. Available studies neither focus on the use of agile principles beyond delivering software developmental courses. Research in this area has not provided longitudinal insights into the evolution of agile implementation in teaching and learning. Further, they lack a comprehensive evaluation of teaching and learning activities using agile principles. This article responds using an account of how agile principles guided the delivery of an IT Project Management course to three different student cohorts over three academic years. An evaluation of these activities demonstrates skillful adaptation of the principles to achieve learning outcomes. Implications of agile-in-the-classroom research are discussed.

KEYWORDS

Agile, Ghana, IT Project Management, Learning Outcomes, Teaching

INTRODUCTION

Traditional teaching and learning activities over the years have been challenged with innovative pedagogy, and technology-enhanced learning environments. One’s adaptability to these changing conditions suggests the extent of agility, similar to what is happening to employee work processes in organisations (Pathak, 2017). This flexible characteristic is akin to the flexibility inherent in agile software development processes as compared with the rigidity of the traditional waterfall software development process. This implies that agile teaching manifests when teaching and learning activities is largely learner-focused and modifiable to achieve equally dynamic learning outcomes. Despite the introduction of such principles into teaching and learning, academic research seems to be lagging in terms of exploring, understanding, and explaining the decisions, processes, adjustments and outcomes related to agility in teaching and learning. This lag reflects in the paucity of articles around the issue. The scanty literature available have also been quite limited in the issues covered. For instance, such studies report the results of introducing agile coaching in a software engineering course (Rodríguez, Soria, & Campo, 2016), using agility in teaching software development (Guercio & Sharif, 2012;
McAvoy, 2005), and teaching programming (Sahli & Romney, 2010). Quite generally, others have also developed a conceptual model for achieving agility in business school education (Gupta & Bharadwaj, 2013). These studies although providing valuable insights, leave several gaps that deserve to be researched and filled.

First, extant research is focused on the use of agile principles in delivering software development courses. Agility is already a topic or an aspect of such courses, thus delivering them with agile principles seems natural. We believe that more insights could be gained from teaching other courses, be it IT-related or not, especially with respect to replicability and contextual issues. Second, they do not provide longitudinal insights into the evolution of agile implementation in teaching and learning those courses. Third, the use of agile principles in delivering courses is not comprehensively evaluated to show how all the agile principles have been followed. The purpose of this paper is to explore the use of agile teaching methods in the classroom. This research would also suggest the benefits of an agile classroom for teachers and learners, and how the principles and practices of agile can be used to enhance teaching and learning.

This paper has five sections. The second section is an overview of agile practices in the classroom and gaps in existing agile research in the classroom; and the purpose of this paper. It also discusses the concept of agile and its implications for teaching and learning. The third section presents an account of agile principles in the delivery of an IT Project Management course to three different student cohorts over three academic years. In the fourth section, the teaching and learning activities are evaluated against the agile manifesto’s principles. This is followed by the fifth section which presents a discussion of implications of agile for teaching and learning with specific reference to course planning and delivery, collection and use of feedback, course assessment, learner satisfaction, and achieving quality of teaching and learning by applying agile principles. This paper is important for academics who want to stay up to date with the state of agile-in-the-classroom research, as well as for researchers who want to survey and understand specific teaching and learning activities that could be do towards the goal of being agile.

AGILE: OVERVIEW AND PRINCIPLES

Overview

Software development processes could follow either a traditional approach, or a non-traditional approach. In the former, there is need for extensive planning, codified processes, and rigorous reuse with the aim of making development efficient and predictable (Boehm, 2002). However, this method has been criticised for not being customer-centric, and time-consuming. Hence, increasingly, there is some shift preference for the latter which has been captioned as agile software development – a response to the challenges with plan-based traditional software development methods (Dybå, 2000; Nerur, Mahapatra, & Mangalaraj, 2005). Agile processes rely more on “people and their creativity rather than on processes” (Dybå, 2000; Nerur et al., 2005).

In other words, agility is to strip away as much of the heaviness, commonly associated with the traditional software-development methodologies as possible to promote quick response to changing environments, changes in user requirements, and accelerated project deadlines (Erickson, Lyttinen, & Siau, 2005). Table 1 presents a comprehensive list of differences between the two approaches.

Principles of Agile and Implications for Teaching and Learning

The agile concept is founded on four core principles as enshrined in the Agile Manifesto (Agile Alliance, 2001). The first principle is that there should be a preference of individuals and interactions over processes and tools. The second concerns a preference for working software over comprehensive documentation. The third encourages customer collaboration over contract negotiation, whilst the fourth advocates responding to change over following a plan. Other proposed elements of the agile
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