International Journal of Quality Assurance in Engineering and Technology Education
Volume 6 • Issue 2 • July-December 2017

Portfolio Assessment in Engineering:
Student Perspectives on Effective Implementation

Benjamin Taylor, Central Queensland University, Rockhampton, Australia
Lois R. Harris, Central Queensland University, Rockhampton, Australia
Joanne Dargusch, Central Queensland University, Rockhampton, Australia

ABSTRACT

Learning professional skills through exposure to real-world contexts demands sophisticated assessment practices. However, complex and often novel genres can be daunting for undergraduate students. This study examined student perspectives as they engaged in Portfolio assessment for the first time within a core undergraduate engineering unit. 42 students were surveyed (27%) with 11 participating in a follow-up telephone interview. Students rated content derived from their contributions to team projects as the most valuable component of their portfolio in terms of demonstrating the unit learning outcomes and developing the skills and dispositions needed in professional practice. The team structure of many learning opportunities encouraged students to collaborate and to draw on each other as instructional resources. The data indicated it is highly worthwhile for instructors to develop static resources that reduce students' need to contact instructors with trivial questions, though lecturer contact was deemed essential and effective for comprehending more complex tasks.

KEYWORDS

Engineer, Higher Education, Portfolio Assessment, Project-Based Learning, Student Perspectives

1. INTRODUCTION

Student portfolios can be used within higher education to assess complex professional skills (Flores, Veiga Simao, Barros & Pereira, 2015; Franco et al., 2017; Jaeger & Adair, 2015). Portfolios are said to be learner-centred, promote reflective practice, and help students better understand and achieve complex learning outcomes (Davis, Ponnamperuma & Jer, 2009; Flores et al., 2015; McDonald, 2012). Boud and Soler (2016) identify portfolios as a potentially sustainable approach to assessment as this genre can help students develop skills needed to meet their own future learning

DOI: 10.4018/IJQAETE.2017070101

needs. It is for these reasons that a growing number of engineering programs are utilising this assessment genre to evaluate student competency in relation to complex graduate attributes, often in conjunction with project-based or problem-based learning (e.g., Jaeger & Adair, 2015; De los Ríos-Carmenado, Lopez, & Garcia, 2015). When implemented well, reports of first experiences with project- or problem-based learning are usually encouraging (Duda & Ross, 2012) and research suggests that such approaches can potentially reduce student attrition, increase student satisfaction, and improve students' success rate (Nedic, Nafalski & Machotka, 2010).

However, there are ongoing challenges associated with using portfolio assessment, particularly when implementing it with new undergraduate students. For many students, portfolio assessment is a novel assessment genre, and different to the more traditional exams, essays, and assignments they may be expecting (Flores et al., 2015). In their review of student perceptions of novel forms of assessment, Struyven and Devesa (2016) identify that students may resist tasks using unfamiliar genres, perceiving such tasks as increasing their workload (i.e., they must learn the genre as well as the content), alongside concerns that strategies which brought them success in the past may not apply equally to the new task. In relation to portfolio assessment itself, studies examining student perceptions of their assessment experiences within diverse discipline areas (physiotherapy, teacher education, engineering and English foreign language) found that students were concerned about the amount of time needed to create portfolios (Aydin, 2010; Bevitt, 2015, Jaeger & Adair, 2015, Kuisma, 2007; Struyven, Blieck, Roeck, 2014). Students may find initial portfolio compilation stressful (Vaughan, Florentine & Carter 2014), with some reporting that the process can actually negatively impact on other aspects of their learning (Davis et al., 2009). How portfolios are actually implemented clearly matters and can influence student approaches to learning, as well as their learning outcomes (Segers, Gijbels, and Thurlings, 2008). Hence, it is important to understand not only how lecturers communicate assessment expectations and scaffold student engagement with portfolio assessment tasks (Dargusch, Harris, Reid-Searl, & Taylor, 2017), but also how students understand and bring these resources together to support their own learning.

In addition to student-level challenges, portfolio assessment may also have implications for staff workload. While feedback is vital, particularly during initial experiences of portfolio assessment (Segers et al., 2008), substantial lecturer time is required to provide formative feedback and/or summative evaluation in relation to potentially lengthy portfolios. Additionally, within engineering contexts, portfolios often include evidence gained via collaborative learning experiences (e.g., team projects). Hence, there is also instructor workload associated with setting up and managing collaborative learning groups, in addition to time spent guiding students about how to evidence outcomes from these collaborative projects within their portfolios (Howard & Eliot, 2012; Ribeiro, 2011). Demands on instructors are likely to be highest during students' first encounters with portfolio assessment as they may need additional support to understand requirements and develop the reflective and self-regulated learning habits this genre requires.