Analyzing Research Activity Duration and Uncertainty in Business Doctorate Degrees

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ABSTRACT

This study explains how to apply the Program Evaluation and Review Technique (PERT) from the project management discipline to quantify uncertainty for the research phase in a Doctor of Business Administration (DBA) degree. Doctorate programs are expensive and time consuming yet unfortunately they have high attrition rates (failure to complete). Although course work is very structured, the unpredictable nature, complexity and variability of research activities make a DBA program risky for students, supervisors, funding sources, and the university (due to high expectations and accreditation criteria). As the US Navy successfully applied PERT on their complex Fleet Ballistic Missile and Polaris Submarine Weapon projects, it is argued that this methodology could help quantify uncertainty and reduce risk in the doctorate research phase. Statistical techniques are utilized to test the hypothesis that PERT is a reliable task duration estimation and planning method for DBA research (based on a sample).

Keywords: Beta Distribution, Contingency, Doctor of Business Degree Program, Doctorate Supervision, PhD, Project Review Evaluation Technique (PERT), Uncertainty

INTRODUCTION

Doctorate degrees are valuable because they give competitive advantage to employers (Bair & Haworth, 2004; Pfeffer, 2007; Recotillet, 2007; Thune, 2009) and they facilitate accreditation at universities (Golde, 2006; Lovitts, 2001). Doctorates promote knowledge creation and they provide opportunities for self-actualization (Cumming, 2010; Horn et al., 2007; Zuber-Skerritt & Roche, 2004).

The doctorate, considered the epitome of an academic education, relies on two or three examiners to judge the quality of three or four years of work, and to agree or not that the candidate has earned the right to be called ‘doctor’, an internationally recognised award (Kiley, 2009, p. 889).

However, doctoral degrees (including the DBA) are an expensive investment, ranging from $35,000 to over $70,000 while it generally takes 3-6 years to finish (Sowell, 2008) and sometimes up to 10 years (Gravois, 2007). The latter makes a DBA program risky with respect...
to the monetary and time investment, or at the worst extreme: failure to get the dissertation approved (Zibit, 2005).

Given the uncertainty associated with the completion of a mandatory research dissertation in a DBA (while considering the investment cost), it is argued that students could create a project management plan (PMP) to reduce the risk of failure. Although there is generally only a single full-time-equivalent (FTE) human resource to allocate (the student), it is asserted that optimistic effort durations need to be balanced with pessimistic estimates (as a contingency to account for the uncertainty), assuming 1 FTE. Program Review and Evaluation Technique (PERT) was developed by the US Navy (staffed with consultants from Booz Allen Hamilton as well as Lockheed) for planning the nuclear-powered Fleet Ballistic Missile and Polaris Submarine Weapon System projects (Clark, 1962). In the project management discipline, PERT is a recommended best-practice for two knowledge areas: estimating activity durations in time management and quantifying uncertainty in risk management (PMI, 2008, standards 6.4.2.4 & 11.4.2.1).

Project management theories have already been applied to plan doctoral research, by students (Strang, 2006, 2009a), and by their supervisors (Lee, 2008; Strang, 2009b, 2010a). One researcher reviewed the literature and reflected on her experience, then concluded that “the supervisor’s task becomes one of directing and project management” (Lee, 2008, p. 271).

To that end this manuscript applies PERT to estimate duration and uncertainty in the research phase of a DBA. The goals are to utilize PERT to quantify risk in DBA research tasks, to determine the probability of successful completion of the intended schedule, based on an a priori benchmark from a small sample of successful doctorate program completion data. The researchers intend to test the hypothesis that PERT is reliable method for planning the DBA research phase duration, as compared to a benchmark mean.

LITERATURE REVIEW

Business Problem

DBA degrees are an expensive investment. While the literature reports DBA price tags range from $36,000 to over $90,000 in the USA (Ayoun & Palakurthi, 2008; Bair & Haworth, 2004; Ehrenberg, Zuckerman, Groen, & Brucker, 2009; Horn et al., 2007), non-USA DBA’s can cost much more (EUA, 2007). It generally takes 3-6 years to finish a doctoral degree but sometimes up to 10 years (Gravois, 2007; Sowell, 2008). “There is also a psychological cost to consider - ‘the most important reason to be concerned about graduate student attrition is that it can ruin individuals’ lives’ (Lovitts, 2001, p. 6). These characteristics make the DBA degree a risky endeavor when considering the monetary and time investment, plus the uncertainty of getting the dissertation approved (or considering the numerous external factors that can derail good students).

Sowell (2008, pp. 2-17) analyzed the Council of Graduate Schools completion and attrition program longitudinal data from 49,000 PhD and doctorate students at US-based higher education institutions over 12 years during 1992-2004. He found the mean cumulative attrition rate was 31% across 330 degree programs over the 12 years (during 1992-2004). He also found the attrition rates ranged from 43% (at year 6) up to 64% (at year 10) across all disciplines (business doctorates were not isolated in the data). He tracked student enrollment data throughout this timeframe so they were counted as a successful completion even if they took 12 years (as long as the institution allowed the student to remain active or readmit). The average research doctorate completion time in this longitudinal data was 2.4 years duration.

Other researchers reported much larger and dispersed doctoral program attrition rates ranging from 11% to 77% (Bair & Haworth, 2004; Gardner, 2008; Lovitts, 2001). Gardner found high attrition rates for math, engineering and English doctoral students in her study of 60 candidates at a well-known research
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