

Predicting Assessment Outcomes: The Effect of Full-Time and Part-Time Faculty

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ABSTRACT

Assessments have risen in prominence in colleges of business, in response to requirements of accrediting agencies. Among the forms of assessment are embedded exams within courses, often in the form of multiple-choice tests near the end of the semester. These tests can be stand-alone comprehensive exercises, or comprise a small portion of a larger exam. Performing well on exit exams such as the ETS is highly dependent on how well students did in their foundational courses. This study examines outcomes assessment scores in 11 sections of the Principles of Marketing, Management, and Business Law courses at a southwestern university. These courses were taught by a variety of full-time and part-time faculty. Models were constructed based on demographic variables as well as native ability, effort, and type of instructor. The results indicate that part-time instructors in these courses had exam scores 15% lower than those of students in courses taught by full-time professors. Furthermore, it was observed that students with adequate native ability (as measured by their ACT score) and effort (as measured by their cumulative GPA), could overcome the effects of poor instruction by part-time faculty.

Keywords: assessment, full-time, part-time, accreditation, embedded exams.

INTRODUCTION

Increasingly, academic programs look to assessment as an important vehicle in determining the overall veracity of a program. It is a means by which the deliverer (instructor) of an academic program can determine if the goals and objectives of the program have been achieved by the recipients (students). Institutional effectiveness is concerned with the extent to which intended outcomes are being achieved (Black & Duhon, 2003). There are two (2) fundamental schemas of assessment delivery. The first employs an instrument developed externally and is standardized across a multitude of dimensions, like the Educational Testing Service's (ETS) exam in business. The second approach employs an embedded, internally developed, instrument that explicitly measures the specific outcomes associated with a program or course.

While much research has been done on the ETS and its predictors of student performance, little has been done to assess the impact of the type of instructor. Furthermore, most assessment-related research has focused on the capstone course in the program, rather than the earlier foundational courses. The purpose of this paper is to examine the impact of using full-time and part-time instructors on student performance on assessment exams in three foundational courses (Marketing Management, and Business Law). Assessments were administered to 11 sections of students of these three courses at a College of Business at a public university located in the Southwestern part of the United States. The institution is mid-sized with a total enrollment of approximately 7,500 total students, 1,000 undergraduate business students, 350 graduate business students.

This manuscript is organized as follows: First, a literature review is provided. The second section of the manuscript describes the data method, model, and results. This includes detailed examination and analysis of the differences observed. The final section offers conclusions, implications, and directions for future research.

LITERATURE REVIEW

Research abounds on the subject of program assessment, but not on type of instructor. Assessment is a "systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development" (Palomba & Banta, 1999). Collegiate business programs are increasingly tasked with the need for ongoing assessment of student performance in their programs (Adams, et al, 2000; Bagamery, et al, 2005; Martell & Calderon, 2005; Terry, et al, 2008; Trapnell, 2005). Increasingly, since the mid-1980s, there has been a shift towards student-centered and learning-oriented assessments and accreditation (Lubinescu, et al, 2001). In fact, the AACSB imposes standards for program learning goals upon collegiate business programs aspiring to attain or maintain AACSB accreditation. These programs utilize direct measures in order to demonstrate student achievement of the stipulated goals (Martell, 2007; Pringle & Michel, 2007).

As assessment increases to build momentum, it is important to identify the internal and external audiences who will utilize the results in shaping and refining the assessment process. A comprehensive assessment process provides an institution with information that can be both shared and utilized to satisfy the needs of internal and external constituents. The internal

audience (faculty, students, assessment committees, administrators and alumni) benefits by helping to define successful ongoing programs, implementing similar programs, and for improving less successful programs. Externally, the assessment data are used to demonstrate to accreditation organizations, government officials, government boards and other constituents the institution's effectiveness and accountability (Aloi, et al, 2003).

There are two principle types of assessment tests, standardized and local. Of the two, local tests require more faculty effort and other resources for test development, scoring, reporting, and improving. However, the advantage to the local instrument is that it can be tailored to a specific course or program so that the actual scores more accurately reflect the extent to which specific learning objectives are being met (Black & Duhon, 2003), along with impact of local and specific influences or drivers.

The Educational Testing Service's (ETS) exam in business has become, to many, the de facto standard of standardized assessment instruments in collegiate business programs. The literature reveals an almost universal agreement as to the principle variables examined as predictors of student performance on the ETS exam. These variables include: grade point average (GPA), standardized test scores (ACT/SAT) and gender. In addition to these variables, Mirchandani, et al, (2001) include transfer GPA and student grades in quantitative courses.

It is possible to extrapolate and utilize the same variables when examining the results on a local instrument. Terry, et al, (2008) developed a model based upon a production view of student learning to examine the determinants of performance on the business major field achievement ETS exam. Their model controlled for grade point average (GPA), standardized test scores (SAT/ACT), junior college transfer students, gender. Their findings were consistent with much of the previous research in this area, that academic ability as measured by grade point average (GPA) and scores on standardized tests (SAT/ACT) are the primary determinants of student performance on the ETS exam.

Black & Duhon's (2003) study of ETS scores conducted during three (3) semesters in 1996-1997 included an examination of an incentive as a driver in student performance. In that study, students scoring at the national 50th percentile, or better, were given an extra-point bonus, which was used in the calculation of the student's final course grade. The exclusion of this, or some other, form of incentive is not used; some students may not take the test seriously and by extension, the results may be misleading (Allen & Bycio, 1997). Terry (2007) included the impact of course formats, traditional campus courses, online courses and the newer hybrid courses on ETS scores.

While studies on ETS outcomes are abundant, there is a paucity of research examining the effects of the type of instructors used in business courses. Furthermore, the majority of assessment-related research focuses exclusively on outcomes and student traits, and not on the employment status of their instructors. Part-time instructors are frequently used to fill gaps in the delivery capacity of institutions. While these instructors are normally professionally qualified in the discipline themselves, they often lack the training and pedagogical background found in a full-time faculty member. Depending on the institution, full-time faculty members may teach up to three or four courses per term, while part-time faculty may teach only one or two (while often balancing other employment obligations).

Although prior research has shown that a student's ETS score can be predicted in large part by traits such as ACT/SAT score, GPA, gender, and the like, what is lacking is understanding the drivers in a student's performance in foundational course assessments.

METHODOLOGY, MODELS AND RESULTS

Embedded multiple-choice assessment exams were administered in the Spring 2008 semester at a four-year public university with 7500 students in the southern US. In all cases the respective exams included 20 questions, each worth 5 points. Courses included in this study and the mean scores are: Principles of Marketing (3 section; mean = 73.38), Principles of Management (4 sections; mean = 66.14), and Business Law (4 sections; mean = 74.61). All three courses are at the Junior level, and are offered within the same academic department.

Demographic data were collected from the Registrar's office, including gender, nationality, transfer status, GPA (effort), and ACT (native ability). The first three variables were coded as (0) or (1) binary variables, while GPA ranged from 0.00 to 4.00, and act ranged from 1 to 36. ACT scores were only available for a subset of the overall sample, because this test score is not required for matriculating transfer at this institution. A final (0) or (1) binary variable was created signifying whether the course instructor was full-time or part-time.

The first round of modeling is the Full Model, which included 350 course-students and their exam scores. Data from all 11 sections were aggregated without regard to course or section. There were four course sections taught by part-time instructors (112 course-students), and seven courses taught by full-time professors (238 course-students). This group contained students both with and without an ACT score; the ACT score was not factored into this first model. The overall mean assessment score across the entire sample was 71.0.

A linear regression model was then calculated with Comp (score on the comprehensive assessment exam) serving as the dependent variable, which is a function of the following:

$$\text{Comp} = f(\text{Demographics} + \text{Effort} + \text{Professor})$$

Specifically, the model is as follows:

$$\text{COMP}(i) = B(0) + B(1)\text{GENDER}(i) + B(2)\text{TRANSFER}(i) + B(3)\text{NATIONALITY}(i) + B(4)\text{GPA}(i) + B(5)\text{PROF}(i) + e(i)$$

Results from this model appear in Table 1. With an R^2 of 0.26, the GPA and PROF variables were significant at the $p = 0.05$ level. Thus, the student's cumulative GPA and type of instructor serve as strong predictors of student scores on their assessment exams.

A t-test for independent means was then calculated using COMP as the dependent variable and PROF as the predictor. The mean score for students taught by a part-time instructor was 60.9, while the mean score for those taught by a full-time instructor was 75.9 ($t=-9.168$; $p = 0.000$).

A second model was then built among the subset of students with a reported ACT score. The average test score among these 153 students was 69.87. This model was conceptualized and specified as:

$$\text{Comp} = f(\text{Demographics} + \text{Effort} + \text{Native Ability} + \text{Professor})$$

$$\text{COMP}(i) = B(0) + B(1)\text{GENDER}(i) + B(2)\text{TRANSFER}(i) + B(3)\text{NATIONALITY}(i) + B(4)\text{GPA}(i) + B(5)\text{ACT}(i) + B(6)\text{PROF}(i) + e(i)$$

Results from this model appear in Table 2. With an R^2 of 0.305, the ACT and PROF variables were significant at the $p = 0.05$ level, while GPA was significant at $p = 0.06$. It can be concluded that, while PROF is a major predictor of student outcomes, both ACT and GPA play an important role in student scores, with ACT being the strongest predictor. More importantly, it suggests that native ability (ACT) and effort (GPA) are sufficient to overcome a weak part-time instructor's teaching performance.

A t-test for independent means was calculated for the ACT subset using COMP as the dependent variable and PROF as the predictor. The results were similar to those for the full data set; the mean score for students taught by a part-time instructor was 58.6, while the mean score for those taught by a full-time instructor was 74.9 ($t = -6.563$; $p = 0.000$).

Next, correlations were calculated among the five independent variables as a test for multicollinearity. The highest correlation was .295, indicating there was no multicollinearity among these variables.

Correlations were then run among two independent variables (GPA and ACT) with the dependent COMP variable, first for the ACT subset (Table 4), and then for a further refined subset of ACT students taught by part-time instructors (Table 5). In the first case, both GPA and ACT correlated significantly with COMP, verifying the conclusion of the regression equation. In the second case, ACT correlated with COMP at the $p = 0.01$ level, with GPA correlating at $p = 0.07$. These results reinforce the conclusion above the native ability (ACT) and effort (GPA) are sufficient for overcoming a poor classroom experience, with native ability being the foremost predictor.

CONCLUSIONS AND FUTURE RESEARCH

This study is limited in that it was conducted in only one semester, at one institution, and among only a portion of course offerings in the College of Business. Thus, findings may not be generalizable across time, place, and subject. Still, the findings suggest that Colleges of Business must exercise prudence in the hiring of part-time faculty who probably have other means of employment, and thus may treat their course(s) as of secondary importance. This is not to say that all part-time faculty are of inferior quality or that full-time faculty are of superior quality; rather, it signifies that caution must be used in hiring decisions. Furthermore, part-time faculty by definition do not necessarily have the mission of the college or university at heart; it is likely they are gainfully employed elsewhere, and thus teaching one or two courses as a source of supplemental income.

Future research should examine a broader spectrum of course offerings in the College of Business, and, if possible, beyond principles-level courses. It would also be of great interest to track the 350 students in this study as they complete their education to see how they score on assessments in the capstone senior-level course. It is possible that a poor foundation will lead to poor scores later in their academic careers. One implication of these results is that part-time faculty should be used for elective courses rather than foundational courses, wherever possible.

Finally, it should be noted that, while students with high ability and effort in this study managed to overcome the effects of a poor instructor, care should be taken at administrative levels to not expect learning to occur in spite of who teaches the course.

Table 1: The Full Model**Coefficients(a)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	42.811	3.855		11.106	.000
	Gender	-.496	1.491	-.016	-.332	.740
	Transfer	2.466	2.124	.056	1.161	.246
	GPA	5.713	1.079	.248	5.293	.000
	Nat	1.574	3.613	.021	.436	.663
	Prof	13.962	1.609	.410	8.677	.000

(a) Dependent Variable: Comp

Table 2: The Partial Model**Coefficients(a)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	23.876	10.366		2.303	.023
	Gender	-1.461	2.301	-.045	-.635	.527
	Transfer	2.978	2.902	.074	1.026	.307
	GPA	3.893	2.039	.144	1.909	.058
	Nat	4.514	6.070	.055	.744	.458
	ACT	.996	.338	.213	2.943	.004
	Prof	13.904	2.502	.403	5.557	.000

(a) Dependent Variable: Comp

Table 3: Correlations Among Partial Model Independent Variables**Correlations**

		Gender	Transfer	GPA	Nat	ACT	Prof
Gender	Pearson Correlation	1	.042	-.162(*)	-.167(*)	-.129	.001
	Sig. (2-tailed)		.608	.046	.039	.112	.991
	N	153	153	153	153	153	153
Transfer	Pearson Correlation	.042	1	.118	-.239(**)	.154	-.008
	Sig. (2-tailed)	.608		.147	.003	.057	.925
	N	153	153	153	153	153	153
GPA	Pearson Correlation	-.162(*)	.118	1	.149	.183(*)	.295(**)
	Sig. (2-tailed)	.046	.147		.067	.023	.000
	N	153	153	153	153	153	153
Nat	Pearson Correlation	-.167(*)	-.239(**)	.149	1	-.150	.062
	Sig. (2-tailed)	.039	.003	.067		.064	.450
	N	153	153	153	153	153	153
ACT	Pearson Correlation	-.129	.154	.183(*)	-.150	1	.105
	Sig. (2-tailed)	.112	.057	.023	.064		.197
	N	153	153	153	153	153	153
Prof	Pearson Correlation	.001	-.008	.295(**)	.062	.105	1
	Sig. (2-tailed)	.991	.925	.000	.450	.197	
	N	153	153	153	153	153	153

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 4: Correlations Among Partial Model Selected Variables

		GPA	ACT	Comp
GPA	Pearson Correlation	1	.183(*)	.312(**)
	Sig. (2-tailed)		.023	.000
	N	153	153	153
ACT	Pearson Correlation	.183(*)	1	.280(**)
	Sig. (2-tailed)	.023		.000
	N	153	153	153
Comp	Pearson Correlation	.312(**)	.280(**)	1
	Sig. (2-tailed)	.000	.000	
	N	153	153	153

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

**Table 5: Correlations Among Partial Model Selected Variables:
The Case of the Part-Time Instructor****Correlations**

		GPA	ACT	Comp
GPA	Pearson Correlation	1	.162	.267
	Sig. (2-tailed)		.278	.070
	N	47	47	47
ACT	Pearson Correlation	.162	1	.379(**)
	Sig. (2-tailed)	.278		.009
	N	47	47	47
Comp	Pearson Correlation	.267	.379(**)	1
	Sig. (2-tailed)	.070	.009	
	N	47	47	47

** Correlation is significant at the 0.01 level (2-tailed).

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