Integration of faith and learning (IFL) at Biola university

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1. Introduction

During Spring 2012 and Spring 2013 several groups of students in my statistics classes (Math 208 and Math 213) surveyed the population of Biola undergraduates, under my direction, for their unreported projects. The topic was integration of faith and learning (IFL) at Biola. IFL was defined as “what the Christian faith means to academic learning.” The Christian faith includes Scripture, theology, your personal experience with Jesus, and so on. Academic learning relates the subject matter in your Biola University classes. This subject matter is both theoretical (understanding the theory behind the discipline) and experiential (gaining experience practicing fundamental aspects of the discipline). The occasion for the study was a Biola Faculty Development Group book (Academically Adrift: 1) that I had participated in during Spring 2012.

The primary hypotheses were as follows:

H1: The longer a student has been at Biola, the more IFL they will have.

H2: The longer a student is at Biola, the more their IFL will increase.

H3: The variability inherent in an indirect assessment of IFL can be measured and controlled, thereby enabling the discovery of differences in IFL levels.

Additional research questions were

• How does IFL vary by gender?
• How does IFL vary by race?
• Does IFL vary by major?

In the figures and tables which address these research hypotheses, the hypothesis number is listed in colored brackets, e.g. [H1].

2. Methods

Twelve students volunteered during Spring 2012 to collect data. The student volunteers surveyed 10-18 class majors each. Respondents were selected using any random means available to the students. Interviews were completed online using the volunteer’s laptop. In addition, I surveyed all students in my courses, which were 94% science majors (all science departments). In total, 260 surveys were completed in Spring 2012. During Spring 2013, approximately ten students from my classes volunteered to collect the follow-up data. 106 surveys were completed, 6 of which were invalid resulting in a sample of 100. 94 students reported that they had graduated, I did not want to complete the follow-up to a non-representative sample.

The response rate was therefore (106-94)/106 = 17.9%, which is considered a good response rate for medium surveys (A-PAPR, 2006).

The inventory consisted of seven items (see Appendix). Demographics of gender, race, year attending, major group, and academic division were collected. Survey quality depends on survey representativeness. While the design of the survey was paired, in that each student responded to the same set of items, the sampling methods attempted to be random, representativeness was compared to the student body demographics. Surveys were scored 1 (strong agreement) to 10 (strong disagreement) with the results weighted to reflect the population, thereby amending unreported results.

The design of the survey was paired, in that each student responded to the same set of items, the sampling methods attempted to be random, representativeness was compared to the student body demographics. 


3. Results

Does the sample reflect the population?

A table compares the sample of students to the population of Biola students.

<table>
<thead>
<tr>
<th>Item</th>
<th>Sample</th>
<th>Population</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>51</td>
<td>53.55%</td>
<td>1</td>
<td>0.10</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>46.45%</td>
<td>1</td>
<td>0.10</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>10</td>
<td>24%</td>
<td>1</td>
<td>0.75</td>
</tr>
<tr>
<td>White</td>
<td>86</td>
<td>72%</td>
<td>1</td>
<td>0.06</td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>6%</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17</td>
<td>19%</td>
<td>1</td>
<td>0.06</td>
</tr>
<tr>
<td>Other</td>
<td>46</td>
<td>51%</td>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>Attended</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comm</td>
<td>6</td>
<td>2%</td>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td>Soc</td>
<td>42</td>
<td>16%</td>
<td>1</td>
<td>0.63</td>
</tr>
<tr>
<td>Comm</td>
<td>10</td>
<td>6%</td>
<td>1</td>
<td>0.63</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The linear model is given by

\[ y = \beta_0 + \beta_1 y + \beta_2 x + \epsilon \]

This means that the basic integration level is 7.5, and students add an average of 0.2 points per year. The p-value for the slope is 0.035, which is in the Biostatistician’s imagination (i.e., 0.01) and therefore significant. The second research hypothesis [H1] is supported.

The model assumptions are met, meaning that the model is valid. The p-value for the Shapiro-Wilk test of normality is 0.28 (null hypothesis: data are normal). The plot of the residuals vs. fitted values is very flat (not shown). I am supporting the common variance assumption.

Conclusions

Survey quality. The design was panel, which permits one to infer changes in the respondents’ IFL levels over the factor (Biola education). Correlation gender and race/ethnicity match the known Biola population; major group and year were weighted to match the official Biola enrollment figures. Therefore, since the factors in the data match the Biola parameters, the sample should represent the population in other ways as well, namely about IFL.

Good news. Biola is doing well to produce highly measurable IFL in its students as reported here. In addition, there are no meaningful differences between gender ([H1], race/ethnicity [H5], or major group [H6]). The one feature that characterizes the integration level is that the higher the levels of IFL, the more their IFL will increase.

Appendix: Inventory items

The 7 items were responded to for “Before” Biola and “After” Biola. The difference was the change in the mean of the reported responses on IFL for the respondent. The items were scored on a 1-10 scale where 1 = “I didn’t do it”, 5 = a “moderate attempt”, and 10 = “a very great attempt.”

4. Discussion


Biola experienced a very high level of integration by the mid-Spring of their Freshman year (average 1.7 points), the increase was much smaller in subsequent years (average 0.2 points/year). Why is this? Can post-graduation IFL levels be further increased? Also, this research did not rule out differences between individual majors. Do some departments achieve greater levels of IFL then others?

Literature cited

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For further information

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