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Honors Thesis Preparation: Evidence of the Benefits of Structured Curricula

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A recent study of honors curricula across the nation indicates that 75.6% of honors programs and colleges at four-year institutions have thesis or capstone requirements (Savage and Cognard-Black). In addition to institutions with thesis requirements, many more also have the option for students to complete theses. For example, an earlier study found that 94.3% of honors colleges offered the opportunity to complete an honors thesis (Sederberg). As Anderson, Lyons, and Weiner indicate, the origins of the honors movement in the United States included an emphasis on the completion of an honors thesis. While discipline-based modes of research and creative scholarship are the most common, alternatives to the traditional thesis rooted in experiential education have also been encouraged (Gustafson and Cureton). In short, the honors thesis in its several forms is an established element of honors education. Despite the centrality and prevalence of the honors thesis requirement, however, little research has been conducted to understand the preparation that students should have in order to write a thesis.

Expectations for honors theses are generally high and often approximate the level of rigor one expects from masters-level students. Unfortunately, many students complete these projects without specific coursework to prepare them for projects at this level of rigor. A growing number of scholars have advocated for courses and curricula to provide students support as they develop honors theses (Anderson, Lyons, and Weiner; Coey and Haynes; Levinson and Mandel). While the arguments for these courses are strong and some report positive evaluations of these courses, there is scant empirical evidence for the success of such courses. This study draws on data from nearly four hundred students over a six-year period to demonstrate the effectiveness of curricular models in supporting students' completion of honors theses.

CONTEXT

Starting in 2007, the Georgia Southern University Honors Program began developing seminars for students in their final semesters to provide them support as they developed their thesis projects. All honors students must complete a thesis project that includes a written component. The course content has been designed to help students through steps such as developing a topic, identifying a mentor, understanding previous research, identifying an appropriate methodology, collecting data, and presenting findings in both a written thesis and an oral presentation. The content in these courses is similar to that covered in other thesis courses discussed in the literature (Anderson, Lyons, and Weiner; Coey and Haynes; Levinson and Mandel). Unlike some institutions, however, GSU has designed courses rooted in departments or colleges. In other words, they are not generic preparations for the thesis but are instead taught by professors in the students' major disciplines, thus allowing for more specificity in the course content and more discipline-specific guidance in building a substantial research project.

Because these seminars were designed to be discipline-specific (or at least specific to a cluster of majors within a college), a question arose whether it would be desirable and feasible to develop such courses for all majors, and some disciplines opted out. In the natural sciences, for instance, engaging undergraduate students in substantial research projects has been a standard practice for some time, typically involving a research mentor who guides the student through the steps of carrying out and presenting research. This norm renders a fair amount of the content of thesis seminars redundant. Consequently, the decision was made not to develop the seminar sequences in the natural sciences, except for one department that developed a pre-research

methodology sequence in which students earned directed research credits for the work they did with their mentors

During the timeframe for this study, the majority of honors students completed theses in in the natural sciences or in disciplines where seminars were developed. Nevertheless, a consequential number carried out their thesis projects without curricular structures designed to support thesis work. This situation occurred for two reasons. First, some departments have very few honors students and find it difficult to justify offering a discipline-based thesis seminar. Second, some degree programs are so structured and full of required courses that it is impossible to add additional credits into the course of study. In these cases, students are permitted to contract courses for honors credit—typically nine credits are required at the upper-division level—and are encouraged to use these contracts to build toward a thesis. There is not, however, a requirement to make the contract work be incorporated in the thesis. Consequently, the contract work, while allowing students to dig deeper into a subject in their major, does not always have relevance to the honors thesis.

While it would have been ideal to offer the students in all these majors structured curricular support to develop and complete honors theses, the actual situation presented an opportunity to compare the outcomes for students completing honors theses in one of three distinct curricular models. First, a cadre of students—mainly in the social sciences and humanities—carried out their thesis research in the context of a disciplinary thesis seminar. From 2010 through 2015, 40% of honors graduates participated in these courses. Hereafter, students in this group will be designated as falling into the "seminar group." Second, students in the natural sciences carried out their work in a lab or field environment (typically as part of a team) to complete their thesis projects. Between 2010 and 2015, 35% of those who completed honors theses fell into this category, and following Zimbardi and Myatt, we label them the "apprenticeship group." Finally, the third group, which includes those who completed theses without structured support, represents 25% of students who completed theses between 2010 and 2015 and are labeled the "unstructured group."

The primary research question in this study concerns the learning benefits of these various curricular approaches. Based on the existing research, we should assume that a structured approach would yield better results than an unstructured approach. While offering support to students seems intuitively to be better than not offering support, none of the existing studies

demonstrates the value of structured curricula to support honors students. Given the lack of data, some might persuasively argue that honors students do not need this type of support: they are supposed to be bright and hard-working, and if they can't complete a thesis on their own, perhaps they are not cut out for honors. Determining the efficacy of curricular structures is thus important, especially since these structures take time, effort, and financial resources to implement.

METHODOLOGY

As the call for greater undergraduate research opportunities has become more frequent, a good body of scholarship has emerged on the effectiveness of undergraduate research experiences. One of the most extensive efforts in this area of research has been led by David Lopatto, who in 2004 developed the Survey of Undergraduate Research Experiences (SURE) that has been administered thousands of times over the past ten to fifteen years. The survey is constructed with dozens of items listed as statements, and respondents are asked to rate their learning gains on a five-point Likert scale. The chief goal of SURE has been to provide quantitative evidence of the benefits of undergraduate research experiences. Lopatto further grounded his work in a qualitative study carried out by Seymour et al., which identified a variety of benefits in categories such as personal/professional, thinking and working like a scientist, skills, and clarification of career goals. Based on the work of Seymour et al., Lopatto conducted factor analysis on the individual items of the SURE, and they clustered into similar categories (*Science in Solution*).

The author obtained permission from Lopatto to adapt SURE to examine learning gains among students who completed honors theses. Starting in May 2010, each student graduating from the Georgia Southern University Honors Program completed a senior exit survey that included items from the SURE instrument. Since Lopatto's work was focused on students in the sciences, the SURE items were adapted to make them relevant for a broader variety of disciplines. The final version for this study included twenty-two items which, based on Lopatto's work, cluster into six distinct areas of growth (see Table 1). The priming instructions for students reporting on this section of the survey were the following:

> Students may gain from their undergraduate research experience in a variety of intellectual, attitudinal, and social ways. The following section is designed to measure what you consider to be the gains (the

benefits) you derived from your research experience. Remember to mark N/A if any proposed gains do not apply to your experience. The following responses apply to the entirety of your experience in completing your Honors Thesis or Capstone Project. From your research experience, how much of a gain occurred in [the items listed in Table 1]?

Table 1: Honors Thesis Survey Items and Categories of Learning Dimensions Adapted from the SURE

Individual Items	Category
Learning a topic in depth	Knowledge Synthesis
Ability to read and understand primary literature	Information Literacy Skills
Ability to see connections to your college coursework	
Ability to collaborate with other researchers	Interaction and Communication Skills
Your skill in oral communication	
Your skill in written communication	
Learning to work independently	
Becoming part of a learning community	
Understanding of the research process in your field	Professional Development
Understanding of how professionals work on real problems	
Understanding of professional behavior in your discipline	
Sense of contributing to a body of knowledge	Professional Advancement
Developing a continuing relationship with a faculty member	
Enhancement of your professional or academic credentials	
Readiness for more demanding research	
Shows pride in academic work; maintains a consistent effort	Personal Development
Sense of accomplishment	
Tolerance for obstacles faced in research process	
Interest in a discipline	
Clarification of a career path	
Self-confidence (in general)	
Learning to persevere at a task	

A one-way analysis of variance (ANOVA) was conducted, with curriculum type (seminar, apprenticeship, and unstructured) treated as a between-subjects factor to determine the effect on student learning gains within each of these six categories (knowledge synthesis, information literacy skills, interaction and communication skills, professional development, professional advancement, and personal development). In total, there were 392 students who completed the survey over the period 2010–2015 with no changes to the wording of the items. Since the thesis seminars were implemented at different times in different majors, students were categorized into the different curricular models based on the offerings for their major at the time they participated in honors.

FINDINGS

Overall, the students in structured curriculum models reported larger learning gains than those in unstructured settings, but not uniformly in all areas. The means and standard deviations for each of the learning gains, broken down by curriculum model, are presented in Table 2.

Two of the six dimensions of growth (information literacy skills and personal development) indicated no significant differences in reported learning gains across the curriculum models. The finding regarding personal development can be explained by the fact that, regardless of one's major or curricular structure, completing an honors thesis is a result of perseverance and leads

Table 2: Means and Standard Deviations for Learning Gains in the Different Curricular Models

	Seminar		Apprenticeship		Unstructured	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Knowledge Synthesis	4.44	0.72	4.38	0.79	4.22	0.78
Information Literacy Skills	4.12	0.85	4.13	0.75	3.94	0.84
Interaction and Communication Skills	3.75	0.87	4.02	0.75	3.78	0.82
Professional Development	4.02	0.73	4.29	0.66	3.87	0.75
Professional Advancement	4.15	0.76	4.32	0.68	3.90	0.78
Personal Development	4.08	0.75	4.16	0.72	4.03	0.74

to a sense of accomplishment and other personal dimensions of growth. Accordingly, one would expect students who persist through completion to have roughly similar reported learning gains of personal growth across curriculum models.

On the topic of information literacy skills, all students completing a thesis are immersed in a thorough process of reading and analyzing primary literature in the discipline and often making connections across their coursework. They should not be able to complete a project without these skills, leading them to report similar learning gains in information literacy skills across the curriculum models.

The remaining four learning dimensions did demonstrate significant differences, however. The curriculum model had a significant impact on knowledge synthesis, $F(2,387)=2.35$, $p=0.097$. There was a significant difference in knowledge synthesis between students in a seminar ($M=4.44$, $SD=0.72$) and those in an unstructured program ($M=4.22$, $SD=0.78$), with the former reporting higher knowledge synthesis. There was no significant difference between seminars and apprenticeship ($M=4.38$, $SD=0.79$) nor between apprenticeship and unstructured curricula, indicating that the seminars did help students gain greater depth of knowledge than those in unstructured settings.

For interaction and communication skills, the curriculum model had a significant impact, $F(2,347)=4.26$, $p<0.05$. There was a significant difference in interaction and communication skills among students in an apprenticeship ($M=4.02$, $SD=0.75$) and those in seminars ($M=3.75$, $SD=0.87$) and those with unstructured curricula ($M=3.78$, $SD=0.82$) such that those in an apprenticeship reported higher gains in interaction and communication skills. There was no significant difference between those in seminars and those without a structured curriculum.

Student reports of professional development were also significantly correlated with the curriculum model, $F(2,378)=9.80$, $p<0.01$. There was a significant difference in professional development between students in an apprenticeship ($M=4.29$, $SD=0.66$) and both those in seminars ($M=4.02$, $SD=0.73$) and those with unstructured curricula ($M=3.87$, $SD=0.75$). In other words, those in an apprenticeship model indicated stronger learning gains than those in the other two curriculum models. There was no significant difference between those in seminars and those without a structured curriculum.

Finally, the curriculum model had a significant impact on the students' sense of professional advancement, $F(2,381)=8.37$, $p<0.01$. There was a

significant difference between professional advancement reports between those without structures (M=3.90, SD=0.78) and those in seminars (M=4.15, SD=0.76) as well as between those in unstructured majors and in an apprenticeship model (M=4.32, SD=.68). Students without curriculum structures reported significantly lower gains in professional advancement than students in seminars or apprenticeship.

CONCLUSION

In sum, structured curricula led students to report stronger learning gains than did students in unstructured settings without coursework to support them in writing an honors thesis. On none of the six learning dimensions did students in unstructured settings have statistically significant higher learning gains than the two structured models. It is noteworthy that the apprenticeship model, common in the natural sciences, yielded stronger results than the seminar model. The apprenticeship model led students to stronger gains over the other two models on three dimensions: interaction and communication skills, professional development, and professional advancement. Seminars led to stronger results over the other two models on only one dimension: knowledge synthesis. For professional advancement, while lower than apprenticeship, seminars led to statistically significant results that were higher than the unstructured model. These results provide evidence that the careful mentorship of students does make a difference in how they see their experience in completing an honors thesis.

While important, this study has some limitations. This study examined only those students who completed theses. The study also did not include consideration of potentially positive effects of structured curricula in areas such as persistence and retention; future research should examine the effects of different curriculum models on retention and graduation rates. Future research should also examine the effect of curriculum models on objective measures of thesis quality, a characteristic this study did not examine. In addition, this survey instrument was administered shortly after the completion of the thesis project when students are happy to be done. Of the 392 respondents, 83% rated their overall research experience as a four or five on a five-point scale; since most of them felt they had had a positive experience in writing a thesis, the responses fell into in a more limited band of variation and made it harder to discern the differing effects of the curriculum models. This limitation nevertheless highlights the fact that, despite the limited variation

among respondents, there were statistically significant variations among the different curriculum models. Finally, the SURE instrument was developed for students completing research projects in natural science fields. An effort was made to delete science-specific items and adapt others to all disciplines, but the stronger results of the apprenticeship model raise the question whether the instrument had some effect on the results.

Despite these limitations, the present study provides quantitative evidence for the benefits of curriculum structures designed to help students complete honors theses. The apprenticeship approach that has developed in the natural sciences provides obvious benefits for students, and in social science and humanities disciplines the seminar curriculum model leads to positive effects for students. Leaving students to their own devices to negotiate the process of writing a thesis leads to less meaningful learning experiences. Honors programs and honors colleges exist not just to challenge students but also to support them. Since the honors thesis is a central component of the honors experience, we should do more to provide structured support for students who take on this challenge.

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