A First Look at Faculty Workload on Advising Online Theses: A Case Study from an Online MS in GIScience Program

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Abstract: *Online courses have gained popularity and therefore demand in recent years. Courses are offered blended or fully online, parallel to their counterpart in-classroom courses. Degrees are also offered entirely online by a few institutions. As a degree program, there are other requirements other than coursework, such as the comp exam or thesis. Online faculty members are asked to do these non-coursework tasks in manners similar to the online format. The workload for these non-coursework tasks is often overlooked during the planning stage. To have a healthy online program, it is essential to recognize faculty workload associated with these non-coursework tasks. This study examines faculty workload associated with advising online GIScience theses and comp exams. Based on this case study, the average time to finish a thesis is four semesters. From the faculty viewpoint, it takes an average of 93 hours to advise an online GIScience thesis. It is approximately the same as three quarters of the time spent on teaching a traditional 3-credit on-campus course, but spread among four semesters.*

Keywords: *online graduate GIScience program, online GIScience thesis, faculty workload.*

1. INTRODUCTION

Modern technology, especially personal computers and the Internet, offers many opportunities, along with challenges, for educators to reach students in a wider catchment area and various personal and work situations [1, 2, 3, 4, 5]. Online education for GIScience (Geographic Information Science) can be traced back to 1991, as we witnessed the emergence of University of Colorado – Boulder's The Geographer's Craft [6]. This is arguably the first complete educational material (lectures and labs) in the field of GIScience designed to be delivered online. In the late 1990's, NCGIA (National Center for Geographic Information and Analysis) decided to move its original GIS core curriculum, published in 1990 as multi-volume books [7, 8, 9], and sequential GIScience core curriculum online [10, 11]. More recently in the late 2000's, we witnessed the emergence of Massive Open Online Course (MOOC), a collection of completely online and free courses of various length across various subjects [12].

Though online education received positive feedbacks [13, 14], there were negative feedbacks [15, 16]. Without a doubt, online education has attracted many non-traditional students' attention because of its flexibility and easy accessibility. Based on the success of online courses, universities established programs to be delivered online completely. The first online GIScience graduate program in the U.S. was offered by Northwest Missouri State University in 2003 [17], followed by a handful of other universities, such as Penn State University [18], University of Southern California [19], University of Denver [20], University of Colorado – Denver [21], University of Maryland [22], Johns Hopkins University [23], Delta State University [24], and others.

As popularity and demand on online courses and online programs grows, more and more faculty members are asked to teach online courses, or at least explore the possibility of converting current in-classroom courses to online courses [25, 26]. Most faculty members or administrators only set their eyes on workload associated with coursework [27]. Often overlooked is the workload associated with non-coursework tasks often found in a program, such as the research component or comp exam. As a graduate degree awarded from the universities identified above, student performance is partially measured by a research component, in the form of a thesis [19, 21, 28] or a capstone project [18, 29,

30]. Advising an online thesis or a capstone project is different from teaching an online course. There were reports on resources and time spend on teaching online courses [3, 4, 31, 32, 33, 34], and they could be used as quantitative measures on faculty workload when arranging online courses. On the other hand, there has been no report thus far on resources and time spent on advising online GIScience theses. To plan for a healthy online program, it is essential to carefully examine faculty workload associated with all major aspects of a program. Knowing overall workload, faculty members can request and administrators can allocate necessary resources. There are needs for such reports to serve as quantitative measures on faculty workload, as well as a reference for end of the year faculty evaluation, when arranging online thesis advisement.

The objective of this paper is to quantitatively examine the faculty workload on advising online GIScience thesis. Data was collected by two faculty members in an online Master of Science in GIScience program (hereafter referred to as "this online MS in GIScience program") offered by an accredited four-year public university (hereafter referred to as "this institution"), with 29 finished theses in eight-and-half years. This quantitative report can serve as an objective means for university administrations to measure and therefore provide necessary resources to faculty for thesis-related activities, in addition to teaching online courses.

2. ADVISING ONLINE THESIS RESEARCH

Data was collected by two faculty members (labeled as faculty A and faculty B) with 29 students. To protect identify, each student was labeled by his/her advisor (either faculty A or faculty B) and a sequential number. There are 15 students under faculty A's supervision, and 14 under faculty B. For example, student A08 is a student supervised by faculty A, while student B12 is another student supervised by faculty B. All of these 29 students are non-traditional online students. They are working professionals with a day-time job, away from campus. Most of them have a family with child(ren). In some informal discussions, students indicated that they were only able to do "serious work" (tasks requiring a good chuck of un-interrupted time, such as multiple hours) during nights or weekends. Data was collected by recording actual time (hours and minutes) spent on events associated with the thesis process (explained below). During the study period of eight and half years, it is inevitable to overlook recording time. In such cases, time is estimated based on similar tasks performed by same faculty/student combination.

Like many other universities, the thesis component in this online program requires students to demonstrate their ability to conduct a research project from the beginning to the end. The thesis process is similar to most on-campus programs, with minor deviations to suit online communications. It begins with the student choosing his/her thesis advisor and writing the one-page thesis concept summary (a.k.a. thesis pitch). In the meantime, the student will discuss with his/her advisor on potential committee members. After the thesis pitch is approved by his/her advisor, the student may approach potential thesis committee members with the thesis pitch and submit committee request form. Once the committee is formed, the student may begin writing his/her thesis proposal and go through the proposal review/comment/revision process. There is no proposal presentation. The committee will approve the thesis proposal solely based on the written proposal. Once the proposal is approved by the committee, the student may begin conducting his/her actual thesis research and, optionally, write periodical progress reports. Having accumulated sufficient results, the student may begin the thesis writing, and go through the thesis review/comment/revision process. When the thesis is at a stage that the committee is satisfied, the student has to decide the format of the thesis defense, either on-campus defense or online defense. Online defense requires some testing to make sure that audio and video transmission over the Internet works at both ends. Most students will have conditional pass, meaning some editing or modifications after the defense. When the committee is satisfied with the post-defense editing or modifications, the thesis will be sent to the graduate office for the graduate dean's review. With the graduate dean's approval, the thesis is finally finished.

As one may see during the thesis process, there are many interactions between the advisor and the student. In an online program, such interactions could be done through various online media, such as e-mail, threaded discussion, teleconference, video conference, phone, or even personal visit. It is personal preference and availability on which media to utilize for interactions. In this case study, authors utilized e-mails for most communications. There are some interactions through skype, phone, and personal visits, but very rare due to time restrictions. With very few occurrences, little time spent, and missing data for skype, phone, and personal visits, only time spent on e-mails are recorded and

reported here. The following section details on time spent on e-mails, followed by another section on reading and providing comments on proposals and theses, followed by sections to summarize time spent on online theses.

2.1. Hours Spent on E-mails

From this case study, most of the communications in the thesis process are through e-mails, even with brainstorming early in the thesis process. More often than not from our experience, e-mail communications take more time than oral communications [35], this is especially true for cases where students were asking technical questions. An oral conversation may take only five minutes. However, it may take up to 30 minutes to type an e-mail. The time spent on e-mails is not only on typing, but also on the thinking/processing, finding the references, and composing the documents. Many times in the same e-mail, we have to move back to an earlier paragraph to edit what we just typed minutes ago in order to make a comprehensive response. Other times, words in an e-mail are just not enough; we have to compose a separate document containing pictures to explain the concept.

Though e-mail communication may take much more time than oral communication, there are some benefits with e-mail communications. Oral communication is a one-time event, while e-mails can be saved and reviewed later when needed. One student told us that he had asked us a question early in his thesis process by e-mail. It was a very technical-oriented question. We replied with a lengthy e-mail, explaining the solution in great detail with reference to textbooks. The student understood our e-mail, and moved on to continue his thesis process. Months later, he encountered a related technical problem. He went back to re-read our reply for his first question. This time, he had a different understanding of our e-mail reply. This different understanding solved his second technical problem. The e-mail was the same, but the student had a different understanding because of his experience and knowledge. While doing his thesis research, the student accumulated more and more skills and experience. These skills and experience became his own knowledge. With his knowledge expanding, he can absorb more advanced materials. In addition, he can relate or integrate different situations to analyze and solve the problem on his own.

To understand the time spent on e-mails, we are taking student B05 as an example, as shown in table 1. Each e-mail between student B05 and his advisor, faculty B, was recorded and counted. Words in each e-mail were also counted, as well as attached documents. Words inside the attached document were counted toward the words in the e-mail. In table 1, time for student is time faculty members spent on reading student's e-mails (it took 8.4 hours in total to read and comprehend all 193 e-mails from the student), while time for advisor is time faculty members spent on processing, researching, composing, and responding (it took 27.1 hours in total to compose all 194 e-mails sent to student). Faculty B spent 35.5 hours in total on student B05 in terms of e-mails. From our records, we found that for shorter e-mails, writing/composing time is mostly on typing only. Most of these shorter e-mails are asking simple questions, not technical related, such as where to submit documents, reasons for delays on submissions, etc. However, for lengthier e-mails, writing/composing time also includes time on thinking, searching for references, and finding solutions. Many of these lengthier e-mails are asking technical questions, such as why did I get results like this, where did I go wrong, is this result normal, what should I do next, is this a valid way of doing things, etc. For answering these technical questions, a simple yes or no does not suffice. Often times, we have to repeatedly read the question, process the question to make sure we truly understand the nature of the question, and then search for references to support our statements, and finally compose the respond e-mail.

Table1. *Time spend on e-mails with student B05. Avg. Words is the average number of words of all e-mails from the student or from the advisor. Attachment is the count of all attachments from the student or from the advisor. Time for student's e-mails is spent on reading, while time on advisor's e-mails is spent on processing/composing.*

	Count	Avg. Words	Attachment	Time (hours)
student	193	130	9	8.4
advisor	194	116	10	27.1
Total	387	246	19	35.5

2.2. Hours Spent on Reading and Commenting on Proposals and Theses

In most on-campus graduate programs, when advisors comment on proposals, they have a chance to orally express and explain their comments to students with face-to-face interactions, or some online but real-time interactions, such as Skype or GoToMeeting, in addition to written comments in digital or hand-writing form. In this case study, such face-to-face or real-time interactions are rarely possible. Instead, all comments are typed up and saved digitally embedded in the proposal document. This commented proposal is then returned back to students. Students are then asked to respond to these comments by either revising their proposals or discussing it with their advisor (through various communication methods mentioned previously). There may be several rounds of reviews/revisions. The same issue with e-mail communications could be found here. A face-to-face talk may take only five minutes, but it may take 30 minutes to type these comments.

During such review processes, time is spent on reading, reviewing, commenting, and typing, which is a similar process to reading and replying to e-mails. Every comment (includes insertion, deletion, comment, and sometimes formatting) is recorded and counted. Table 2 shows the recorded time spent on commenting on student B02's proposals. Student B02 went through four rounds of review/revision process, with approved proposal in round 5. In his first round of review, the proposal itself is of 3443 words in length, the advisor provided 30 insertions, 36 deletions, and 11 comments, all typed up and embedded in the proposal document. The time spend on the first round of review is 2.9 hours. In total, faculty B spent 11.8 hours on student B02's proposal.

Table2. *Time spend on commenting Student B02's proposal. Numbers under comments are counts for word/insertion/deletion/comment.*

Review	Comments	Time (hours)
Round 1	3443 / 30 / 36 / 11	2.9
Round 2	2609 / 21 / 24 / 27	2.5
Round 3	2880 / 36 / 28 / 21	2.8
Round 4	2998 / 21 / 25 / 3	2.2
Round 5	2975 / 0 / 0 / 0	1.4
Total		11.8

Commenting on these is in the same fashion as commenting on proposals. There may have been several rounds of reviews/revisions. There are insertions, deletions, comments, and sometimes formatting on each round. Table 3 shows the recorded time spent on commenting on student A01's theses.

Different students make differing rates of progress during their thesis processes, and therefore spend different amounts of time to finish their theses. Based on our records, Table 4 summarizes the time spent on communication regarding e-mails, commenting on proposals, and commenting on theses. Also listed in this table is the semesters that students registered for thesis hours.

Table3. *Time spend on commenting Student A01's thesis. Numbers under comments are counts for word/insert/delete/comment.*

Review	Comments	Time (hours)
Round 1	9068 / 68 / 114 / 10	6.2
Round 2	8320 / 266 / 445 / 16	12.8
Round 3	9950 / 114 / 111 / 12	7.2
Round 4	10320 / 31 / 18 / 23	5.2
Round 5	10683 / 99 / 80 / 3	6.8
Round 6	11267 / 0 / 0 / 0	4.7
Total		42.9

Table4. *Time for students on various stages of their thesis process. Numbers for semester is count of semester the student has registered for thesis hour. Time is in hour.*

	Semester	E-mail		Proposal		Thesis		Total
		count	time	review	time	review	time	
Stu. A01	3	265	25.1	4	9.3	6	42.9	77.3
Stu. A02	2	134	15.1	2	22.9	2	25.5	63.5
Stu. A03	6	221	28.8	4	9.3	12	60.4	98.5
Stu. A04	4	208	27.6	3	8.4	8	30.1	66.1
Stu. A05	3	365	43.5	4	8.6	10	67.4	119.5
Stu. A06	3	233	33.6	8	31.8	10	44.0	109.4
Stu. A07	5	206	25.1	5	26.4	6	27.2	78.7
Stu. A08	8	219	29.6	5	12.0	3	19.0	60.6
Stu. A09	3	188	24.9	5	15.4	4	28.2	68.5
Stu. A10	8	178	27.6	3	9.0	11	51.8	88.4
Stu. A11	3	259	35.2	7	15.5	10	49.0	99.7
Stu. A12	4	367	47.0	9	27.5	6	35.3	109.8
Stu. A13	4	200	27.0	3	11.7	4	22.5	61.2
Stu. A14	2	223	31.5	6	15.8	3	18.3	65.6
Stu. A15	2	240	33.7	5	13.5	8	50.0	97.2
Stu. B01	5	310	21.4	3	11.6	8	29.3	62.3
Stu. B02	4	567	146.9	5	11.8	4	12.4	171.1
Stu. B03	3	194	18.3	5	18.1	4	26.2	62.6
Stu. B04	12	295	30.5	3	9.4	6	32.5	72.4
Stu. B05	2	387	35.5	4	13.1	2	13.0	61.6
Stu. B06	7	530	38.6	9	22.0	11	69.5	130.1
Stu. B07	4	281	23.5	5	9.8	5	25.5	58.8
Stu. B08	3	210	20.5	2	7.2	3	28.7	56.4
Stu. B09	4	409	48.5	7	24.0	5	33.8	106.3
Stu. B10	5	329	47.0	4	9.7	10	87.1	143.8
Stu. B11	4	261	30.5	3	11.7	6	64.2	106.4
Stu. B12	5	298	29.0	4	13.3	6	27.2	69.5
Stu. B13	3	246	24.8	5	16.5	6	36.4	77.7
Stu. B14	3	171	11.2	6	12.6	8	31.3	55.1
Average	4.28	275.66	33.85	4.76	14.76	6.45	37.54	86.14

2.3. Other Time for Thesis Advisor

In addition to time spent on communications mentioned above, there is time spent on thesis defense and associated work. For an online thesis defense, it is necessary to have a test run to make sure that audio and video work for both ends through the Internet. It is estimated that the test run for online defense on average takes one hour. For on-campus defense, there is time for pre-defense greet and meet (likely this is the student's first time actually being on campus), sometimes even breakfast or lunch. There is also time for post-defense chatting and wrapping up, sometimes with lunch or dinner. It is estimated that the pre- and post-defense activities for on-campus defense on average takes one hour. For both defense formats, there is time for the actual defense and a post-defense committee meeting to evaluate the performance of the defense and thesis. For the thesis defense, both online defense and on-campus defense, it is estimated to take 1.5 hours on average. The post-defense committee meeting is estimated to take 0.5 hour. There is also time on various forms, such as the committee request form, thesis signature pages, the library release form, the research component form, etc. It is estimated to take one hour for all of these forms including typing, copying, delivering, and organizing. In summary, it is estimated that defense and associated work takes an average of four hours.

The time estimated above included all activities related to thesis research, but not the coursework and comprehensive exam, which are the other two required components for graduation from this online MS in GIScience program. Coursework is between the student and individual course instructors, not the thesis advisor. Though it is a separate process from the thesis process, comprehensive exam is coordinated by the thesis advisor and administered by the committee as a whole. The thesis advisor's duty on coordinating the comprehensive exam includes, but is not limited to, review coursework,

create comprehensive exam website, write questions, grade questions, review grades, and report the results. Giving a rough estimate, the whole comprehensive exam process takes three hours.

2.4. Average Time on Advising a Thesis

With all of the activities mentioned and explained above, Table 5 summarizes the average total time, including communication (e-mails, commenting proposals, commenting theses), defense, and comprehensive exam, to successfully advise an online thesis. The average time to finish an online GIScience thesis is 93 hours. This is close to a rough estimate on the average time to finish a geography thesis in a traditional on-campus setting: 100 hours [36], which include regular weekly meeting, proposal review and defense, and thesis review and defense.

Table5. *Average total time spent on successfully advising and finishing a thesis.*

	Time (hours)
Communication	86
Defense	4
Comp Exam	3
Total	93

It should be noted that it is very likely this study underestimates the time on finishing a thesis. Most time is actually recorded time, but there are some missing records, for which estimates were made based on recorded time for similar tasks. Time was recorded only when authors were working in office. There were times that we were away from our offices (such as talking to other faculty members, reviewing/commenting on proposals/theses while in waiting, replying to e-mails while on leave or conference, etc.), under such situations time was not recorded, and therefore not counted in this study. With our best knowledge, it is estimated that there is a 10% - 15% amount of time not accounted for.

In addition to advising thesis as an advisor, faculty members may also serve as committee members on other thesis committees which he/she does not chair. As a committee member, faculty members are obligated to read and comment on proposals and theses, participate in the thesis defense, grade the comprehensive exam, and other paperwork. The time serving as committee members was not recorded nor reported in this study.

3. FACULTY EXPERIENCE ON ONLINE GISCIENCE THESIS ADVISEMENT

Some factors had been reported relevant or irrelevant in faculty participation in online education [37]. In this study, informal discussions were held to ask students' opinions and feedback on factors that drive students to ask a certain faculty member to be their online thesis advisor. Major factors include, but were not limited to, timely and quality responses, subject expertise, experience on student advisement, attention to details, patience with students, welcoming attitude, broad research interests, and overall interactions with students.

In addition to positive factors when deciding on a thesis advisor, there were also negative factors that push students away from forming the online student/advisor relationship with a certain faculty member. Major negative factors include, but are not limited to, cold attitude, lack of technical skills, difficult to communicate with, difficult to reach, long response time, responses do not solve the problem, and lack of experience on thesis advisement.

In the history of this online program, there are seven faculty members involved in teaching online courses. However, only five are involved in student advisement, especially chairing a thesis committee. Table 6 summarizes faculty's experience on successful thesis advisement. Among these five faculty members, faculty A and B have been teaching online courses for this online program for eight and half years. Faculty C has been teaching online courses for nine years and in the leadership position for this program. Faculty D was involved in teaching online courses for seven years. Currently faculty D is in a full-time administrative position, but still participates in student advisement without teaching any online courses. Faculty E has been teaching online courses for seven years. Each faculty member has the same access to online students, and similarly teaches both required and elective courses.

Table6. *Summary of faculty members' experience on thesis advisement, as of summer 2012.*

	Faculty A	Faculty B	Faculty C	Faculty D	Faculty E
Years	8.5	8.5	9	7	7
Finished	15	14	11	5	2

4. IMPLICATIONS AND DISCUSSION

Advising a thesis is not a task of just one week or one month. It is a lengthy process spanning across several semesters, on average four (4) semesters (Table 4) or 93 hours (Table 5). The thesis process could be as short as five (5) months in two (2) semesters, or as long as five (5) academic years in 12 semesters, according to our records. A general rule of thumb commonly accepted in this university for time on teaching (also including preparing, grading, and other course activities) an on-campus course is three times the actual class meeting time [38]. A regular 3-credit on-campus course meets 2.5 hours per week, which leads to around 40 hours per semester [39], which in turns leads to a total of 120 hours associated with preparing and teaching a 3-credit on-campus course in a semester.

From the faculty viewpoint, finishing a thesis takes around three quarters (3/4) of the time for teaching a 3-credit on-campus course, only it is spread among four (4) semesters. For weekly scheduling purpose, it takes an average of 1.5 hours (93 hours divided by four (4) semesters, then divided by 16 weeks) per week to advise a thesis. Considering multiple students working on their theses simultaneously, the time and workload can add up quickly. For example in the spring 2012 semester, Faculty A had 13 registered thesis advisees (which results in an estimated 19.5 hours per week working on theses), while Faculty B had 15 registered thesis advisees (which results in estimated 22.5 hours per week). Considering the time for preparing a 3-credit on-campus course is 7.5 hours per week (3 times the 2.5 hours of meeting time), in this particular semester for both faculty, the workload for all of thesis activities is somewhat similar to teaching three (3) 3-credit courses. For reference purposes, the normal teaching workload for both faculty is four (4) courses per semester.

From the administration viewpoint, most ranked faculty members are required to advise students in various aspects of students' academic activities. Thesis advisement can fall into this category of duty. Advising five (5) theses in the same semester takes about 7.5 hours per week (5 times 1.5 hours per thesis), about the same time to teach a 3-credit on-campus course. From a different viewpoint, it takes about 23 hours per semester (93 hours divided by 4 semesters) to advise a thesis. Discussing with other geography faculty members in this institute, it takes an average of 1.5 hours per semester per undergraduate student on curriculum advisement (including password assignment, overall coursework arrangement, degree audit, or pre-registration discussion, excluding chatting, daily/friendly conversation, or course content related questions). In a given semester, advising a thesis is about the time advising 15 undergraduate curriculum advisees.

Though these numbers makes online thesis look costly from an administrative and financial viewpoint, the quality of these online theses should not be overlooked. This online program, to the date the manuscript was prepared, is one of very few online GIScience graduate programs requiring a thesis. Other online GIScience graduate programs require either a report or a project, such as a capstone project in Johns Hopkins University's online MS-GIS program [29], a capstone project in Penn State University's online MGIS program [40], a capstone project in University of Denver's online MSGISc program [30], an advanced applications project or Master's report (thesis is optional) in University of Colorado – Denver's online M.Eng-GIS program [21] or online MS-GIS program [41], a professional project in University of Maryland's online/on-campus MPS in GIS [42], or a capstone project in Delta State University's online MAS-GIT [43]. Even with the same term "thesis", different universities may have different requirements, and different procedures, not to mention the different standards, requirements, procedures between "thesis" and "capstone project". There is practically no basis for comparison in terms of quality of online GIScience thesis. Even so, the authors are grateful to work with brilliant students on their thesis research, many of which are noteworthy. To give some examples, five theses were published as peer-reviewed journal papers [44, 45, 46, 47, 48]. A thesis was awarded an honorable mention in a regional thesis competition, which was open to all disciplines awarding Master's degrees from 14 states in the Midwest region [49]. A thesis was awarded the First Place in a student paper competition hosted by a national/international professional society [50].

This study is based on 29 online students from two faculty members within the same university. The size of the sample may not be large enough to derive a finding that could be universally accepted. However, it did provide a way to quantitatively examine faculty workload associated with non-coursework tasks commonly found in a graduate program, such as thesis and comp exam. As a pilot study, it is our hope that many studies will follow to raise the awareness of faculty workload in

various aspects of online programs. There are several directions for further research, such as collaborating with other universities to include diverse online thesis/project settings and increase sample size, comparing GIS online theses/projects to online theses/projects from other disciplines, such as history, philosophy, etc., or comparing online theses to on-campus theses.

At the time the manuscript was written, this online MS in GIScience program requires a thesis to fulfill the research component required for the graduate degree. Other programs may require differently to fulfill the research component, such as capstone project. Different programs may have their own approach to conduct the research component. For example, Northwest Missouri State University requires a thesis defense to wrap up the research activity, while Penn State University accepts a conference presentation to wrap up the research activity. Though approach varies, the proposed methodology may still be used to track time spent on online thesis advisement.

It is well known among faculty members that progress of a thesis varies from student to student. There is no such rule of thumb to say how long this student will take to finish his/her thesis. Each thesis research is unique with its own time table. Even with a small sample size within only one online program such as this study, one can see major differences on time to finish a thesis. In Table 4, student B02 takes a large amount of time on e-mails (146.9 hours), with a much smaller amount of time on thesis (12.4 hours). On the other hand, student B10 takes a large amount of time on thesis (87.1 hours), but a smaller amount of time on e-mails (47.0 hours). The time to finish a thesis varies widely, from as long as 171.1 hours for student B02 to as short as 55.1 hours for student B14. The duration also varies widely, from 12 semesters for student B04 to 2 semesters for student A02. Recognizing this diversity, we can only say that our findings are averaged numbers, meant to be decision-making tools for administrators and faculty members to plan and manage workload in online programs.

5. CONCLUSION

This study presented an average time of 93 hours, spanning through 4 semesters, for advising online GIScience theses by recording and estimating time spent on e-mails, commenting on proposals, commenting on these, defense, and comp exam. This average time leads to an estimated 23 hours per semester or 1.5 hours per week for advising an online thesis. Compared to the total time required to teach on-campus courses, it is estimated that finishing a thesis takes about three quarters (3/4) of the time to prepare and teach a 3-credit on-campus course. On the other hand, it is also estimated that in a given semester, advising a thesis takes the same amount of time to advise 15 undergraduate on-campus curriculum advisees. Advising five (5) theses in one semester takes the same amount of time to teach a 3-credit on-campus course. The methodology and results presented in this study is an objective means for university administrators to measure faculty workload, as well as for faculty members to manage their time on various forms of teaching or research.

It should be noted that numbers presented in this paper are based on only eight and half years of data from only two faculty members with 29 students. It is noted that different faculty have different approaches on advising Master's thesis. This is only a preliminary finding on the topic. Further research should be conducted to involve more faculty members, collect more data, as well as survey students and find out the top influencing factors on students' successful completion of their thesis research.

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