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ARE THE CHALLENGES OF A NON-DIGITALIZED THESIS PROCESS TRANSCULTURAL?

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Abstract

According to the studies completed in Nordic universities (Finland and Sweden), the challenges of a non-digitalized thesis management process can be divided into those that are coordination-specific, supervision-specific and thesis writing-specific. Based on earlier studies, the coordination challenges primarily concern poor situational visibility, i.e., management and coordinators are not able to see if the theses are progressing or not and specifically which can produce problems. In addition, coordinators are also not typically able to follow the supervisors' circumstances, i.e., what is the real workload of each supervisor, how many students are lagging behind, which supervisors can take on more students, and to what extent and degree the supervisors are actively mentoring their students. Supervision challenges, in turn, are concerned mostly with communicating with the students: How well are supervisors providing quality feedback to their students, and to what extent are the supervisors tracking their students' progress and making sure they are following agreements and meeting deadlines? Thesis writing challenges are concerned mostly with the students being able to organize their thesis projects and communicating with their supervisors. If no centralized system is used, then communication is undertaken using several different media, such as emails, phone calls, LMSs, and instant messaging services. Later, it can be very difficult to track which media was used and where and when the latest communication and agreement occurred.

Digitalizing the thesis management process is one way to solve these known challenges. However, as thesis management is knowledge work conducted by experts, its digitalization is not as straightforward as the mechanical work. To support such expert-oriented digitalization, an EXOD (expert-oriented digitalization) model was developed and based on it, a thesis management process was digitalized at one Finnish university of applied sciences (UAS). During that digitalization, an information system (Wihi) was also developed and implemented to support the process.

In this study, we are applying a tool-based approach to thesis management process digitalization at the Ghana Institute of Journalism (GIJ). The hypothesis is that good practices developed during the thesis process of digitalization at the Finnish UAS can be transferred to another university in a different culture by adapting that already developed information system (Wihi). However, the first step of the research is to study whether we are solving the right problems, i.e., if the challenges of the GIJ thesis management process are similar to those that were found in the Nordic universities.

To identify the main challenges of the thesis management process in GIJ and the main differences between the challenges in the Ghana and Nordic universities, we interviewed one thesis coordinator and three supervisors in GIJ in the fall 2022. We applied data-driven content analysis that focused on an organizational point of view, i.e., how university staff perceives the situation from their own role perspectives. Their buy-in is vital for any thesis management process digitalization success, i.e., digitalization must solve their current and identified problems. This analysis indicated that the challenges of non-digitalized thesis management processes are quite similar in GIJ and the Nordic countries, and based on that knowledge, the utilization of the good practices developed for the earlier thesis management process digitalization in the Finnish UAS is also a meaningful approach for proceeding with such a system in GIJ.

Keywords: Non-digitalized thesis process, thesis process challenges, education digitalization, thesis management.

1 INTRODUCTION

Digitalization is an important tool whenever developing and improving an organization's efficiency and its ability to meet the new challenges of a changing world. Because of that focus, digitalization has a

remarkable role to play even in the business areas not traditionally considered as being IT oriented [1]. Digitalization can thus be a significant enhancement enabler in the education sector [2]; and as McGarr [3] pointed out, even in that venue, there has been a strong focus on increasing technology integration in schools, and perhaps too often placing technology in schools for its value alone, and the worst case deciding "to bring technology into schools without any detailed consideration of how it would be specifically used" [3]. Kauppinen et al [4] listed three main objectives of digitalization: 1) develop usable and useful digital tools for users; 2) generate data for decision-makers, and 3) improve processes [4]. It also seems that in many schools, only one or two of these objectives are being pursued; different kinds of technology tools are implemented, but process improvements are being neglected regularly. The risk is that separate tools do not generate easily utilized data [5], processes are not improved, and instead, the new tools merely introduce more complexity into the processes. Thus, the desired benefits of digitalization remain considerably small, or even at times produce negative outcomes [5], [6].

There are also other known challenges regarding education digitalization, especially in higher education institutions (HEIs). The work of the HEI lecturers can be considered as knowledge work, where process thinking is easily viewed with reluctance [7]. However, as Davenport [7] pointed out, in knowledge work it is also possible to have a process approach utilized, and there is huge potential even in knowledge work for intellectual automatization and AI-based solutions [8]. Although education digitalization often focuses only on tools [3], it is still possible to achieve the other objectives of education digitalization as well, namely, more usable data and improved processes [9].

Although education digitalization does have its challenges, there are of course also challenges with non-digitalized education processes, in this case, the thesis management process [9], [10]. When thesis management processes are digitalized, both types of challenges can be resolved-- those related to knowledge work digitalization as well as those related to the non-digitalized thesis process.

Based on the studies done in Nordic countries (Sweden and Finland), the non-digitalized thesis management process challenges relate to thesis process coordination, thesis supervision, and thesis writing [9], [10]. The coordination challenges primarily concern poor situational visibility, as management and the coordinators are not able to recognize the general and specific situations of the theses are namely, if they are progressing or not, and which of do have problems. In addition, it is typical that coordinators are not able to follow the situations of supervisors either, i.e., to analyse what the real workload of each supervisor is, identify whether any students are lagging from earlier semesters, select supervisors who can on take more students to mentor, and assess how actively and successfully the supervisors are supervising their students' work.

Supervision challenges, in turn, are concerned mostly with student communication, how supervisors keep track of the situation of all their different students and the status of their thesis projects, and how well they know about the previous agreements with each student and their latest activities. Thesis writing challenges are concerned mostly the organizing the actual thesis writing project and the communication with the thesis supervisor. If no centralized system is used, the communication is accomplished using several media-- emails, phone calls, LMSs, and instant messaging services. The problem with this process is that later on, it becomes very difficult to track which media was used and where the latest communication is recorded and archived [9], [10].

To cope with both of these education digitalization challenges and also the non-digitalized thesis management process challenges, an EXOD (expert-oriented digitalization) model was developed. Based on it, a thesis management process was digitalized at one Finnish university of applied sciences (UAS) [9]. During that digitalization process, an information system (called Wihi) was developed and implemented to support the digitalized process. In follow-up research, digitalization has proved to be successful, and Wihi is a useful tool to use to support data gathering and process improvement [6], [9].

Digitalization does not automatically mean new information system development. It can also mean that ready-made information systems can be applied. Thus, one part of this process digitalization is to find out if supporting information systems should be developed during the digitalisation (bespoke development) or if a ready-made information system suitable for the process already exists [11]. Given this kind of standard, off-the-shelf software has several advantages over bespoke development. Delivery time is shorter, costs are lower, and quality is normally better (the main bugs are already fixed) [11]. However, the fit of off-the-shelf software for the business (in this case education) needs is not automatically optimised [11]. Therefore, if off-the-shelf software is used in such digitalization, it is really important that it identifies and solves the right problems and challenges and fulfils the three objectives of digitalization (a useful tool, handling data for decision-making and improved processes [4]. If the uniqueness of the business process is low and the complexity of the needed IS is high, off-the-shelf

software is a good solution [11] provided it does meet the needs of the identified process. Presumably, the thesis management process is more or less similar to all universities, and because of that continuity, it can be assumed that an information system developed for one thesis process digitalization effort can be used at another university as an off-the-shelf solution. If this consistency is really the case, then a tool-based digitalization approach can be an effective way to proceed in the thesis management process digitalization.

The idea of tool-based digitalization offered here is that the good practices already developed in one digitalization project are transferrable to another case, using the support of the information system developed in the earlier project. Even in a tool-based approach, digitalization is much more than just the implementation of an information system. When using digitalization, the processes must still be changed, and the users' buy-in is needed; thus, change management is an essential part of the wholeness. Therefore, the main research problem becomes how best to organize the change in process and that change management if a tool-based approach is used.

However, before the tool-based approach can be applied to the thesis management process digitalization in a new university, the first step is to study whether the existing problems in this new university (in this case, the Ghana Institute of Journalism) are similar to the ones solved earlier with the information system. Will the previously developed solution solve the right problems in the new context?

To evaluate the tool-based digitalization applicability in this new case, we formulated the following research question:

RQ1: What kind of non-digitalized thesis process challenges are there at the Ghana Institute of Journalism?

To answer this question, we conducted interviews with a thesis coordinator and three supervisors of GIJ in the fall of 2022 and collected the main challenges they had experienced when using a non-digitalized thesis process.

2 METHODOLOGY

This study was conducted at the Ghana Institute of Journalism (GIJ), which is participating in the Education Transformation (Eduditra) project that is aimed at exploring and implementing digitalization of the thesis process. In the project, Wihi piloting was executed with one coordinator, four supervisors, and 40 students. After ensuring the stakeholders' voluntary participation and data security proceeded according to the EU's General Data Protection Regulation (GDPR 2016/679), the participants received online training (five hours of workshop and independent learning) on how to use Wihi in their respective roles as students, supervisors, and coordinators. During this pilot phase, four participants were interviewed one thesis coordinator and three thesis supervisors, who were reported as being skilled technology users.

The sampling decision process was based on relevance sampling in which the informants were chosen for representing active participants in the trial who used Wihi for managing their current thesis projects [12, p. 123]. As the aim was to explore the challenges of the digitalization process, semi-structured interviews were selected as the relevant data collection method for this study [13]. These semi-structured interviews were conducted in September of 2022 on the GIJ premises, where participants were given a calm and safe room in which to speak openly. The interview protocols were designed based on the previous literature, see e.g. , [5], [9] that related to the challenges of education digitalization. The interviews were accomplished, and their audio was recorded at the GIJ. Afterwards, these recordings were transcribed for clear data analysis. The sample was collected by interviewing these informants. It is rich and offers a deep view of the phenomenon.

The qualitative data from these interviews were data-driven coded by one author using the software, Atlas.ti v9. 19 subcodes were found in the first round of coding. Coding was implemented using categorial distinctions [12, p. 109]. After this data-analysis, the other author generated four codes based on more detailed first-round subcodes (see Table 1 in Results). These four codes were generated relative to the previous literature. Therefore, a data-driven analysis was combined with a theory comparison. In that analysis, a total of 62 analytical units resulted in 4 codes used to express the findings.

3 RESULTS

As a result of the data analysis, four main categories of challenges in the non-digitalized phase (previous to digitalizing) were revealed. In Table 1, the categories are presented with the data unit frequencies for each participant group (coordinators and supervisors) and their definitions with examples. The categories that were determined are emotional and cognitive challenges (n=20), task-specific challenges (n=8), process-related challenges (n=26) and technical capability (n=8). With one exception, each of these categories applies to all informant categories that refer to coordination (coordinators), supervision (supervisors) and thesis writing (students). The exception was the category of task-specific challenges, which does not apply to thesis writing.

Table 1. Codes, Frequencies, Code Descriptions, and Examples.

Categories	*Frequency*			*Identified in the text corpus when participants referred to...*	*Examples*
	Coordination	*Supervision*	*Thesis writing*		
Emotional and Cognitive Challenges, n=20	n=2	n=11	n=7	- Emotions, such as frustration and complaining. - Number of tasks, i.e., workload. - Too many (digital) tools used in the non-digitalized process. - Questions to answer the issues related to the non-digitalized process.	*..., I was looking forward to a system where the process would be smooth. It would reduce stress...; ...we´ve not had so much of complaints and issues we had previously.* *As you can see our workload is extremely demanding.* *... I use Excel, and then I use Microsoft Word to do the corrections on the documents. Sometimes I use Google Documents.* *So, if they have any issues, they come back to me.*
Task-specific Challenges, n=8	n=4	n=4		- Issues related to allocating human resources. - Challenging find documents related to communication or documentation. - Comments that indicate there is no access to the needed system. - Lots of physical archiving. - Unclear process objectives.	*Realise that because [??] allocation, some supervisors have more than others, although they are in the same category.* *99% use their own email. And you know, this is the reason why sometimes we can't even find the email.* *No, I don't have direct access to the system. It's academic affairs. They have to generate the registered students' list for me.* *I don't want to have papers in my office anymore…* *We also communicated the same information to the students. So, now students knew what was expected of them.*
Process-related Challenges, n=26	n=17	n=8	n=1	- Process actions which indicate that there are irregularities that cause problems. - Creating or using process supporting documents for non-digitalized processes. - Communication related to changes in the process. - Timing issues in the non-digitalized process. - Monitoring the progress of the process. - Process guidelines, which are not integrated into the IT-system. - Manual work in general.	*... I now have a supervisor. But when we have a new [??] of students registering, when you request for their list, my name may find its way into that list again.* *I create all of them [templates for Excel] by myself... I use different colours... The research department provides a template...* *Not all of them came, but two- thirds of them attended. So, we communicated the new changes to them.* *Another task is in the past; we use to have challenges, the deadline.* *So, if you give your word to me. and I said I didn't receive it, nobody knows if I received it or not.* *Currently we have a guidelines for project work. It was even made available to the lecturers and students...* *A lot of work is manual. And yes, I do the allocation, even though I mentioned that I use Excel, it's still manual...* *The challenges are enormous. The first is that it's so time consuming.*
Technical Capability, n=8	n=1	n=2	n=5	- Organizational IT support. - IT skills.	*So, I rely on YouTube videos to sometimes get support on help that I need.* *I've noticed that most of them don't know how to run their work through the majority of the software.*

4 DISCUSSION

It is observable from Table 1 that the challenges of non-digitalized thesis processes found at GIJ are similar to Nordic universities. These issues could further be sub-divided into emotional and cognitive challenges, task-specific challenges, process related challenges, and technical capabilities.

The non-digitalized thesis process at GIJ is cumbersome and bureaucratic, giving room to frustrations at the workload. In the GIJ system, the supervisors and the coordinator reported a huge workload especially because student allocation to supervisors is done manually and every other process within the thesis supervision and coordination is also manual. The quotes "*The challenges are enormous. The first is that it's so time consuming* (Supervisor)" and "*In allocating students to supervisors, I create all of them [templates for Excel] by myself...* (Coordinator)" are just a few examples of how the manual work of tasks and process management become time consuming and challenging.

In the process of allocating students to supervisors, the coordinator does not have access to the students' records and has to rely on the Academic Affairs Directorate. This circumstance often leads to multiple allocations or disparities in allocation to supervisors of the same rank. This finding is supported by the following extracts from the interviews: "*I realise that because student allocation is done manually, some supervisors have more supervisees than others, though they are in the same category* (Coordinator)" and "*I don't have direct access to the system. It's academic affairs. They have to generate the registered students' list for me* (Coordinator)."

The process in GIJ is such that there is no system there to coordinate and monitor what happens between a supervisor and the supervisees until there is complaining from any of them. Communication is often between the supervisor and supervisee on the blind side of the coordinator. When supervisors find it difficult to trace previously sent emails, it sometimes delays the feedback to students. This situation is evident in the following extract: "*99% use their own email. And you know, this is the reason why sometimes we can't even find the email* (Supervisor)" and "*So if you give your word to me and I said I didn't receive it, nobody knows if I received it or not* (Supervisor)".

In terms of the processes, the Directorate of Research, Innovation and Development (DRID), which is the office that coordinates research and project work at GIJ, often organises seminars for students and supervisors on the do's and don'ts of project work in GIJ, however, often not all the students and supervisors attend the seminars, so the challenges are often not resolved. The Directorate has also developed policies and guidelines to make the thesis process smooth, but those are yet to materialize, as confirmed by the extract below:

> *"We organised seminars for students and supervisors, but not all of them came, but two thirds of them attended. So, we communicated the new changes to them. Because some people did not attend, you get them repeating the same old mistakes, but if we had a system which was robust enough and encompassing, we could have all the information in one place for them to access."*

Finally, the archiving and retrieval of documents were also reported on by the participants as task-specific and process-related challenges. Because the system is manual, students still submit hard-bound projects. Given the limited space to store these documents, it is also difficult to retrieve them when there is a need. There have been efforts made to digitalize the submission process, where students submit soft copies of their project work via e-mail. That process is yet not fully digitalized to help with archiving and retrieval. Supervisors and the coordinator often depend on every available software to help alleviate the burdensome processes, and they do not have the needed technical support to be able to address issues that come up and are in the way. This issue is evident in the extracts: "*So I rely on YouTube videos to sometimes get support on help that I need.*" and "*I've noticed that most of them don't know how to run their work through the majority of the software, but it is still a learning process*."

5 CONCLUSIONS

Similar to the Nordic cases, non-digitalized these processes, as shown in the GIJ case, are transcultural, as the issues that arise in one situation apply to other contexts as well. One possible reason is that thesis objectives and requirements are universally not very different and do require similar processes for successful completion and delivery.

This being the case, it can be assumed that the practices that have been shown to be good in one Finnish university will also be useful in the Ghanaian university (GIJ) under study. In this case, it makes sense to try to solve the identified problems using a tool-based approach, which aims to utilize the good

practices already built into the existing information system (Wihi) in the new environment. Even so, a tool cannot dictate new practices and processes, it is important that during the thesis management process development that change management is done carefully, different user groups are included in that change process and the wishes and concerns of the user group are taken into full account during the change project.

In this study, we concentrated mainly on the thesis coordinator and the thesis supervisor's point of view. However, before any thesis process digitalization project is started, it is important to study the students' objectives and challenges that relate to their successful thesis writing process.

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