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APPROACHING AN AXIOM: TESTING A GROUNDED THEORY DEVELOPED FOR ONLINE STUDENT TEAM PROJECTS ON CAMPUS

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ABSTRACT

This study tests a grounded theory that provides a pedagogical framework for instructors interested in facilitating student team project delivery. Since the theoretical model was developed with observations from the lived experience of virtual student teams delivering projects in an online course, this study advances previous findings by testing the model with feedback from a comparable on-campus course. The new findings affirm the model also applies for campus-based courses. In addition, findings about students' application of online collaboration tools, the role of culture and language in team productivity and the effectiveness of student peer evaluations in fostering accountability are also discussed. Finally, survey revisions for improved insights about team crises and team trust are suggested for a planned second study.

Keywords: Project Management, Pedagogy, Grounded Theory, Qualitative Research, Information and Communication Technology, Online, Virtual Teams.

INTRODUCTION

While teaching an online project management course that included a team project, Lohle observed that successful and unsuccessful virtual student teams exhibited several key traits. Lohle and Terrell (2016) then analyzed online discussions captured during this course over several semesters and published a theoretical model (Fig. 1) designed to assist other online instructors interested in delivering virtual student team projects.

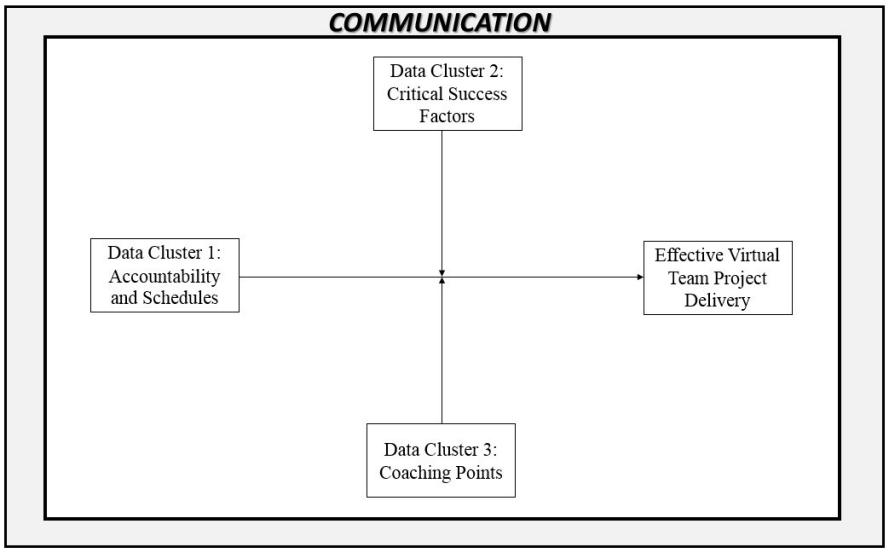

Figure 1. A Grounded Theoretical Model for Effective Student Project Delivery on Virtual Teams

Communication. Student concerns about the risks of insufficient or miscommunication outstripped all other concerns by a wide margin.

Accountability. After communication students were most concerned about holding their teammates accountable for successful project delivery.

Schedules. After communication and accountability students were most concerned with managing and aligning their schedules to ensure they could come together to deliver.

Critical Success Factors and Coaching Points. While student concerns about communication, accountability and schedules dominated their feedback, their additional concerns were grouped into these two categories.

After its initial publication the researchers tested this theoretical model. Charmaz (2006) confirmed "theoretical sampling" helps researchers finalize theoretical models using assessments that determine whether they truly fit the data. Likewise, Eisenhardt (1989) stated theoretical sampling employs case studies to assess whether a theoretical model constitutes good theory. The researchers analyzed two sets of case studies using data captured over several semesters from the online project management course used to derive the theoretical model. One set of case studies focused on teams that failed (Lohle & Terrell, 2017b) while one set focused on teams that succeeded (Lohle & Terrell, 2017a). The case studies' findings reinforced the theoretical model's validity and the researchers also observed teams that did not respond well to challenges were more concerned with accountability than teams that were resilient. This demonstrated the phenomenon of "swift trust" introduced by Jarvenpaa, Knoll and Leidner (1998; 1999) and later by Jarvenpaa, Shaw and Staples (2004). Swift trust occurs when virtual teammates do not meet before their project begins and they expect their peers to possess the skills portrayed in their professional profiles. Virtual teams tend to emphasize delivery over benevolence early until team members are sure they can rely upon each other to succeed. Swift trust tends to erode quickly when teams fail to deliver while benevolence and deeper trust results if they are successful. In these case studies the successful teams achieved benevolence while those that failed never did. In addition, all teams exhibited a phenomenon known as "The Punctuated Equilibrium Theory" first described by paleontologists Eldrege and Gould (1972). Citing the fossil record, they refuted the prevailing assumption that evolution follows a smooth, linear progression. Instead, species tend to experience periods of stability punctuated by intense revolutions, followed by more stability. Gersick (1988, 1989, 1991) later confirmed The Punctuated Equilibrium Theory also applies in business settings after noticing project teams tend to experience stability after starting to work together, then experience challenges around midpoint at which time they either come together to succeed or they fail. Each team studied experienced a crisis at midpoint and then either rallied or failed. This prompted the researchers to strongly advise instructors to prepare their students to cope with inevitable project challenges at midpoint.

Recommendations from these studies were later implemented in an on-campus project management course delivered at University of Bridgeport. In this course, student teams were formed and asked to deliver a mid-term project where they came together to write a research paper and a final project where the same teams were asked to choose hypothetical projects, develop project plans for them using Microsoft Project software and deliver in class presentations about them. Acknowledging potential objections from Apple Macintosh users a "bring your own device" approach was not supported. Instead, Microsoft Project was confirmed as the course's standard tool, students were required to use it and were afforded the opportunity to access it on campus in computer labs. At their discretion several students also procured Microsoft Project trial downloads. These protocols preempted complaints and all students proceeded without incident. Peer evaluations were also implemented that required students to hold their teammates accountable through documented evaluations of their contributions. These were not "blind" evaluations, the syllabus documented a data capture and evaluation process where the instructor actively considered team member feedback in determining students' project scores. Anonymous peer feedback was also shared with each student team with a recommendation to leverage it for continuous improvement. Finally, the online project management tool Basecamp was implemented and students were accountable for collaborating with it via graded instructor reviews. Students were required to use the tool's instant messaging, message board, scheduler, to-do lists, status questions and document and file storage for daily task management. The instructor also had access to Basecamp, monitored student team communication and progress and interjected coaching points and feedback as required. Students exhibited no confusion while using Microsoft Project to facilitate the delivery of their final project's detailed planning, GANTT and other reporting and time tracking requirements while also using Basecamp

for overall project coordination because Basecamp's features did not overlap extensively with Microsoft Project's features.

METHODOLOGY

This is the first of two studies focused on the lived experience of student teams delivering projects during a campus-based project management course. Having devised a useful theoretical model and tested it extensively via a longitudinal study focused on online course delivery, these studies advance knowledge in the field by testing this proven model in a traditional, on-campus classroom setting. Students were asked to fill out an online survey during the fourteenth week of this fifteen week course delivered during the fall semester, 2018. The survey contained four open-ended questions:

> *Which of these factors, communication, accountability or scheduling, was most important for your team's success? Why? Which was least important? Why? Did other factors contribute to team success?*
>
> *What was the biggest challenge your team encountered while working on your mid-term and final projects and their related project charters and homework assignments? How did you deal with it?*
>
> *Do you think your team trusted each other? Why? How did this impact team success?*
>
> *Was the peer review process effective? Why? Did Basecamp increase your team's collaboration? How?*

This study was approved by University of Bridgeport's Institutional Review Board (IRB). The SurveyMonkey Internet application was used to develop an anonymous survey administered during class time. The instructor read the IRB's guidelines for online social sciences research to the class and while these guidelines affirmed students could refrain from participation all thirty-six students responded, a large sample for a qualitative study. Open code analysis via margin notes was then conducted and the findings were compiled. This process entailed the researchers' review of participant feedback, writing notes in the margins with their observations about that feedback, analyzing and summarizing those notes into common themes known as "open codes," grouping those open codes with "axial codes" used to describe those groups, then assessing which of the codes were most prevalent. (Creswell, 2007; Glaser & Strauss, 1967). Since the data set was not large, Microsoft Excel was used.

FINDINGS

As occurred with the online student teams, successful on-campus teams emphasized communication and scheduling while unsuccessful teams emphasized accountability. Likewise, most student concerns again focused on communication while several students said all three dimensions were required for project success, reinforcing the theoretical model's underlying construct. Feedback about communication, scheduling and accountability is explored below. It should be noted that, throughout this report, participant feedback is not edited to preserve each participant's unique voice.

Communication

Students confirmed communication was critical for team success.

> *Communication was the main factor driving our team's success.*
>
> *Personally I've seen that the most important factor for our team's success is communication face-to-face like meetings…*
>
> *Communication was most important because it was a "team" project. Every task completed needed to be communicated to know the status of the project.*

> *The biggest challenge we encountered was communication because there were many instances when my teammates did not inform me about the challenges they are facing and did not provide me any suggestions or feedback before the…[mid-term]… peer evaluation thus it made [it] very difficult for me to improve the areas where I…lagged behind.*
>
> *The biggest challenge was communication because we had a different vision of cooperation and perceived ethics in a different way. We met and talked about it.*

Although these were on-campus student teams, most used information and communication technology (ICT) to address their communication challenges. While ICT tends to be leveraged by virtual teams to foster collaboration (Hislop, 2013; Project Management Institute, 2017), these campus-based students did not hesitate to use it. For instance, while some students initially exhibited hesitation toward using Basecamp they quickly warmed to its ease of use and integration with Google Docs. Once they perceived how having all project related communication and documentation accessible via a single application enhanced their performance, they quickly became avid Basecamp users. These observations align well with previous findings about the role of performance expectation in technology adoption (Venkatesh, Morris, Davis, & Davis, 2003; Kimball, 2015). Team members also actively used Zoom and WhatApp for communication alongside Basecamp. Finally, students also appreciated the instructor's ability to view and provide feedback about what they were doing using the tool.

> *Communication was least important as the team members were well connected on several platforms.*
>
> *I think the most important factor is communication. We can engage each team member to the project by using Basecamp and Zoom, so each team members could be involved and give response anytime without the limitation of location.*
>
> *…we conducted virtual team meetings and in-person meetings.*
>
> *We were able to set aside particular times after class to work on projects and scheduled Zoom meetings to allow for successful meetings to be held in order to complete the work at hand.*
>
> *…it was nice to get work done because of virtual features.*
>
> *Basecamp and Whatsapp played the biggest role in communication and we were able to complete everything.*
>
> *The biggest challenge we endured was having transportation issues, and trying to meet in person, our team was very wide-spread in terms of physical locations. We were able to set particular times after class to work on projects, and had scheduled Zoom meetings to allow for successful meetings to be held in order to complete the work at hand.*
>
> *Being limited to only meet on Friday's. We scheduled Zoom meetings on other days to make up for it.*
>
> *Basecamp was also great because it allowed us to keep our project in one place and have a space where we could collaborate and see what was going on. Especially if we were out of the loop, missed a meeting, or forgot what we talked about last meeting.*
>
> *Basecamp definitely increased team collaboration as it was a common ground for all flow of communication good or bad.*
>
> *Basecamp was a very effective tool to use, and allowed us to stay in constant communication and keep on one another when we had certain parts of the projects assigned to us individually.*
>
> *…Basecamp increased our team's collaboration because we were able to openly communicate on one platform with full transparency.*

> *…I'm happy that the Prof[essor] was able to see everything that was going on so that he knows who's doing what.*
>
> *Basecamp…[enabled the receipt of]…quick feedback from our Professor.*
>
> *Basecamp…helped keep the communication less invasive as everybody can read. It keeps the conversations professional.*

The University of Bridgeport has a large international student cohort. While courses are conducted in English, it is often not the students' native language. This led to some communication challenges.

> *The biggest challenge to me is language barrier. When we review my writing, native [English speaking] team members have the different express way, so the team review the whole content together for keeping consistence.*
>
> *Personally, I encountered problems with the working culture here in USA. This was the first time working on a project with different background which made it real tough sometimes. Now I know how to tackle with the projects. I hope next semester would be easy going.*
>
> *Cultural differences and lack of understanding of the material was the biggest challenge. We dealt with it by trying to be understanding a gracious with each other on the material.*
>
> *Biggest challenge was the language barrier. Though we all know English, expressing a complex idea or thought was really difficult.*
>
> *…Understanding the differences between international and domestic students' knowledge. I ended up doing more of the work to get it done properly.*

Scheduling

Course enrollment consisted of a mix of working and non-working students and this triggered scheduling concerns:

> *Scheduling was most important in my team, as few members were full time employees and it was difficult to schedule meeting according to everyone's requirement.*
>
> *…scheduling [challenged us] just because we all have different schedules, however we planned accordingly and everything worked out just fine.*
>
> *The biggest challenge was scheduling, as individual availability would change through the week sometimes and this made team meetings difficult.*
>
> *People always has different scheduling to meet to discussing. So we have to re-schedule.*
>
> *…With mixed team having working professionals and students, it was tough to bring everyone at the same place.*

Accountability

Students' shared positive and negative feedback about team member accountability. Positive feedback confirmed successful teams tend to be comprised of accountable team members.

> *Most important: Accountability, we worked together and checked each other's work to facilitate the project.*
>
> *Perhaps the least important was accountability. Each individual was cognizant of their responsibilities and there was never any situation where we were concerned that members were not pulling their weight or doing what they were supposed to be doing.*
>
> *We were all on board for holding each other accountable…We all bought in from the start which was contributing to our teams' success, and allowed for us to evaluate on a week by week basis how to make this project successful.*

Accountability was least important…[because] Our contribution helps us to be success[ful].

…splitting tasks between members and fixing deadlines to share it, so each member feel accountable.

There weren't major big challenges because for most of the time everyone came to meetings and was organized. After the midterm, we analyzed what went well and what did not go well. From this analysis, we made changes to do better on our final.

Negative feedback about accountability focused on the adverse impacts on other team members when one or more teammates failed to deliver.

…It was holding ourselves accountable and responsible for the work we were doing. Some team member were not ready to take responsibilities and they thought what they did was right. They were not ready to listen to other's opinions or what they had to say. Dealing was a bit of a problem as the remaining team members had to do extra work.

Our biggest challenge was staying on top of our assignments. A lot of the time we all got side tracked with other things…What we did was work on part individually and then met once a week to put it together. I believe it wasn't the best way of approaching the assignment because someone was always left finalizing everything.

Some of the team members were not responsible enough for the work which was assigned to them. Even backing out last moment was a consistent problem. Rest of the team members had to [do] extra work, that is how we dealt with the problem.

Biggest challenge was to get everyone to contribute and frankly however how we have tried, all team members did not contribute.

The biggest challenge was dealing with people who do not contribute anything to the project. The way I dealt with [this] is to 'avoid' and pretend they do not exist and still have them get a grade that you worked for. Avoiding helps not direct your energies toward someone who isn't going to step up in spite of holding them accountable.

The biggest challenge was dealing with peers who did not provide their 100% or were least bother[ed] as to what was happening around [them]. This made us reschedule and redelegate tasks amongst ourselves. Hence [an] increase in workload. Well, I tried talking it through but in the end thought it were best if I make sure I do it all correctly as I did not want to lose any marks because of someone else.

Peer Evaluations

Since peer evaluations provide a mechanism for students to hold each other accountable, feedback about this process was pertinent. Most students actively supported peer evaluations and observed positive results.

…a team member whom I marked low on peer evaluation really came out strong in the second half of the semester. They actually did a lot of work and without "that person" completing the final project could not have been possible.

…a few team member whom I graded less on the peer evaluation, came out really strong in the second half of the semester. And I was so delighted to see that holding them responsible and more accountable for the work they were doing [had a positive impact].

The peer review…was effective because it allowed for us to have discussions and bring us together as a team, and create more of a cohesive environment all together. It allowed us to have a conversation about how to improve for the second half of the project, and move forward with our contributions.

I think it was effective. There was an increase in performance levels in the final project that brought the person who was singled out to perform better in the second half.

Peer review pushes each member of the group to feel accountable.

As you know all members are not concerned so if there is anything that will evaluate your performance in the team that will be great.

…It just made the team members more accountable and we could clearly see the difference in the final project vs. the mid-term project.

The peer review process was very effective because it actually allowed everyone to really see what we thought and felt about each other and team member.

Peer review process was effective as compared to the Mid-terms. Team members who did not work properly during the Mid-term certainly made efforts, not 100% but decent efforts.

Unfortunately, while most students appreciated the peer evaluation process, some teams did not act on it. Worse, some students either inflated their scores or analyzed which students provided what feedback. Several students also recommended process improvements.

The peer review process I believe was not effective because some of my teammates wanted to just give everyone the highest score to not get penalized in the grading process.

Yes, the peer review was helpful, but nothing came of it. If there is a peer review prof[essor] should confront that student if the review is very bad. [Author's Note: The instructor did so privately.]

Peer review was not effective for me personally, because more than involvement with the project, it seemed a bit biased with how close team members are. Peer evaluation shouldn't effect grades, but at the same time, it's understandable the accountability part.

Peer review revealed the low contribution by some team members, but no impact on further contribution, unfortunately.

Not effective. I don't think the Mid-term evaluation changed the individual's performance.

I don't think they were noticed my team gave everyone all 4s. [Author's note: a score of 4 was the highest score for each dimension on the peer evaluation for a total contribution to the final grade of 20 points.] I know they were not honest because they complained about the people they gave 4s to. I think we should be required to write why we gave a team member a certain score and also include in the evaluation what each team member is doing well and what they could work on. If [a] team member sees they have all 4s they might think that they're doing everything write [sp.] and that they don't need to improve on anything.

I think it is ineffective in this setting…One team member figured out line-by-line who provided the point grade.

Team Trust

Unfortunately, this study did not generate any insight about whether The Punctuated Equilibrium Theory applied. It was also difficult to ascertain whether swift trust occurred. Instead, most responses about team trust confirmed the instructor had assigned the teams and students were therefore forced to work together to succeed. Insufficient additional data was captured to achieve deeper understanding about these topics.

CONCLUSION

Considering qualitative feedback from thirty-six students, Lohle and Terrell's theoretical model appears as valid for on-campus student team projects as it is for online student team projects. Likewise, on-campus students are as concerned about communication as their online counterparts and challenged teams continued to emphasize

accountability more than their less challenged counterparts. In addition to this positive reinforcement, this study added several pedagogical observations:

- Though a course may be campus based, students will actively leverage ICT to collaborate on team projects.
- Cultural diversity and language proficiency exacerbates communication challenges.
- Students appreciate the opportunity for peer evaluation. Most study participants observed improved delivery after sharing their mid-term peer evaluations.

RECOMMENDATIONS FOR FUTURE RESEARCH

As mentioned earlier, this is the first of two related studies. It is anticipated that additional data will be collected at the end of the fall semester, 2018. Considering these conclusions, the researchers will adjust the survey to provide more insight into navigating crises and team trust while keeping it short enough to foster active student engagement. Since this study's strong, positive feedback about the peer evaluation process and Basecamp use was unambiguous, the question pertaining to these items will be replaced by questions about team trust and navigating crises.

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