

THE PREPARATION TASK DOCUMENT:
THE EVOLUTION OF AN EFFORT JOURNAL

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Abstract: In many of the author's classes, students are asked to complete tasks that will be discussed during the next class period. There is no penalty for being wrong but students need to try. What started out as a paper artifact of an experiment in productive failure now takes the form of an editable Google document. In this paper, a brief history of students sharing their pre-class tries is presented, including valued pedagogy of the assignment, assessment and evaluation, insights, inspirations, trials, tribulations and future directions. Presentation attendees were invited to share their ideas by editing a shared Google document. That feedback is included at the end of this paper for those interested in this discussion. Using the same technology, those with the link to the shared folder in the author's Google drive can access this Google document, the Presentation Slides, and this proceedings paper.

Introduction, Impetus, and Original Adaptations

At St. John Fisher University, many faculty hope to develop students' growth mindset. As part of that process, students in the author's classes are asked to complete work that has yet to be discussed in class. The subsequent class will then start with a conversation about that work, in which students share their work and dialogue with each other about their solutions and the relevant ideas. There is no penalty for being wrong on the pre-class tries. The original version started from the author's involvement with the Teaching Inquiry Oriented Mathematics Establishing Supports (TIMES) project as a TIMES Fellow. In summer 2016, the NSF supported TIMES project began. The research project had several aims, one of which was to support faculty use of research based curricular materials that included task sequences, handouts, and problem banks. Instructor support materials included learning goals and their rationale, examples of student work, and implementation notes. The goal was for students to discover important mathematics concepts for themselves based on directed tasks and questioning. TIMES Fellows participated in a summer workshop (2016) and participated in online instructor workgroups during the span of the course. These workgroups were grouped by course and the author's group was the instructors preparing to teach Abstract Algebra, and thus using what was called the "Teaching Abstract Algebra for Understanding" (TAAFU) materials. Integral to the TAAFU materials were task sequences for the students to attempt prior to being discussed in class. Part of the learning philosophy was to utilize productive failure as an instructional tool. Students were asked to record their pre-class tries in a paper notebook that would be reviewed for completion during the exam periods. The work students completed for class would form the basis of the discussion for the next

class period. Directed questions were used to help foster student engagement and to support students working together in order to discover for themselves Abstract Algebra concepts like “groups”.

There are several desirable pedagogical features to this assignment and one is that there is no penalty for being wrong. Full credit was given if students had completed all or most of the tasks assigned for class. It creates incentive for students to complete pre-class work. Getting students to complete work in preparation for class has been a long time pedagogical objective and a long time struggle. This assignment creates that incentive and allows for students to be wrong without penalty. Requiring students to try a task prior to formally discussing the relevant ideas also generates a culture of trying which is a crucial component in the process of learning mathematics.

The first checkpoint was during the first exam, where students gave the instructor their portfolio task notebooks as well as their notes. Students were asked to keep a separate record of their tries (for easy assessment) but the practical reality is that when we take notes, it makes sense to take notes near the pre-class work completed for class. Many students’ pre-class times were embedded in their notes, making it a little more difficult to find everything in a short period of time like an exam period. The format of the second checkpoint was switched to using the Blackboard Assignment feature to have students submit picture files of their tries. Multiple submissions were allowed to accommodate tries for different days throughout the semester.

As an integral part of the Abstract Algebra course, the impetus to try again didn’t exist until it was time to teach Abstract Algebra again in fall 2017. The following spring, the assignment was brought into two sections of Calculus. The assignment collection was updated to take the form of two electronic submissions of a pdf file utilizing the Blackboard Assignment feature. The timing of the submissions corresponded to the midterm and the end of the term.

Lessons learned: The way in which student tries were submitted made it easy for students to procrastinate. Whether they were in a Junior level Abstract algebra class or a first year Calculus course. Not only did putting off entries create extra work for the student, but more importantly, it also defeated the purpose of the pre-class try. Both the quality of work and the reflections varied significantly. It was not unusual to get reflections in the form of, “I learned (insert learning task goal) “ without saying much of substance. It is a bit of a strange assignment, this whole “turn in your tries and it does not matter if you are correct or not” aspect seemed a little confusing to students. Maybe they were not used to being “wrong” as counting for credit. Certainly reflecting on the learning process is a novel request, so suggestions on improving reflections were given.

In addition, the next round was time for additional enhancements. In the fall, the assignment was used in Number Theory, a class for which most of the students were a strong reflective group. Spring brought two sections of calculus again and a good chance for a second look at how things were working at that level. In this iteration, the set up and structure of the assignment remained. Students were required to submit a pdf file of

their pre-class tries, including reflection, using the Blackboard assignment feature. Additional information and guidance was provided to help clarify the assignment. Assignment information and a rubric were posted and discussed on the first day. A dedicated section in Blackboard was created to organize the assessment information, the tasks themselves, and a place to upload assignment check-ins.

Lessons learned: Humans do human things and students do student things. The Number Theory students were better about staying on top of the assigned tasks than the Calculus students but it is easy for any student to get behind. We expect that this was exacerbated by the pandemic generally, and specifically during the shutdowns in March 2020 and again in October 2020.

Each entry was to include 1) date due, 2) brief description of task, 3) snapshot of attempt, and 4) post-class reflection. Entries were to be presented in chronological order. Some students left out one or more of the requirements, so the assignment information and rubric both made note of common troublespots. Another thing that was hard for students was making sure they have the complete assignment. Sometimes it may be to wrap up a small example that we ran out of class time to complete. Other times it was a pre-posted activity designed to elucidate some big idea or reinforce old concepts. Occasionally it might be a combination of the two. In the beginning, the goal was for students to have ownership of and responsibility for keeping track of the assignment information. Some students submitted a link to a Google doc instead of a pdf file. At this time, the assignment was for a pdf, so the desired form was emphasized in the next iteration.

The rubric reflects the quantity of student tries. Right or wrong; all tries count, as long as they are submitted before class starts. In this model, the instructor relies on the Honor system whether or not students are doing the work before the class to be discussed. Some students tried to get away with posting notes from class as their pre-class tries. Other students posted a peer's work as their tries. The rubric was updated to avoid these issues. Reflections varied and full credit was given with completion of the task and some attempt at a reflection.

Google documents: The first big upgrade and the Pandemic

Perhaps inspired by students who had previously submitted links to Google documents (instead of the pdf file) the next big inspiration was to have students use Google docs to share their pre-class tries. Students shared a link to a Google document with the instructor that the student then updated as the course progressed. This link gave the instructor access to a student's document, including a time stamped history of the edits, and the ability to comment - as long as permissions are set to editor. The fact that Google documents are editable and come with a time stamp for each version of the file, making this form of technology a great fit for this assessment. Because there is no penalty for being wrong, assessment was as straightforward as counting entries submitted on time.

Depending on the semester, entries were due the night before or at another time prior to the onset of class. While not always possible, it was a nice feature to make the deadline

so that it allowed enough time to review for student understanding. Even a spot check of a handful of students is good feedback for the instructor to see which ideas students are getting and which they are struggling with. Over time, the beginning of class deadline was the best fit, making it more difficult to get a representative sample of how the students understood a particular task or concept.

To organize student work, the instructor created a private folder in their Google drive for each class for the shortcuts to students' documents. The next step is to create a shortcut from the links that students send. The final step is to cross-check with the roster to make sure that all the students have sent a link. If the sharing email is lost or misplaced, the instructor can search by the student's name to see if there is anything in the Google drive that the student has shared.

The Pandemic hit in spring 2020 and, like most schools, Fisher shut down. Some faculty and students were remote in fall 2020 and spring 2021. At Fisher, the general pandemic experience was complicated by the need to shut down again in fall 2020. What the pandemic has taught many faculty is that we cannot be clear enough or repeat ourselves often enough. For this assignment, that included the assignment requirements (and known troublespots) as well as the details of the task of the day. In some cases, tasks were straight-forward and quick - finishing up an activity that was started in class. Other times, the task was more complex, so we would wrap up class with a discussion of the task, including a Q & A session. We kept the dedicated section in Blackboard, and even maintained a list of suggested tasks that was updated periodically. The Google doc feature to the assessment created the added challenge of a hard deadline for every task. Submitting work before the deadline was hard for a surprising number of students. Another glitch was that some students created a new Google document for each entry instead of updating the same document.

Assignment and rubric information highlighting common trouble spots were discussed in class on the first day. After clarifying the components of the assignment and addressing questions, students also completed and submitted their first entry - allowing them to get technological support if they needed it. The dedicated section in Blackboard included a list of suggested tasks that was updated periodically. Unsurprisingly, student work varied - both in quality of attempts and reflections and in the number of pre-class tries submitted on time. This is a hard assignment. The hardest part for many students was submitting a single Google document and updating before the beginning of class.

All in

The pandemic encouraged many faculty to reset their expectations and this allowed us to reimagine the next iteration. In fall 2021, this assessment became a feature of all the author's courses. Requiring this assessment in every course necessitated a few updates. With this version, the reflective piece was dropped and the assignment and rubric were cleaned up to reflect the updates and to emphasize the requirements. To be fair, allowing for the reflective piece was always a complication, in that students needed time to follow up and submit the reflection for each entry. Agreement on how to make that work would

take place in the first day class conversation where we agreed upon a time - usually at the end of day on the day the task was discussed. This adjustment simplified the process, making the assignment a potential fit for any level of course. Moreover this change thereby created a space for students to value trying at a variety of levels.

This version of the assignment invited an organic rebranding opportunity as it was no longer “reflective” and more of a documentation of their preparation work. The rationale being that in attempting to complete the tasks, students were prepared to participate in class. Enter the Preparation Task Document. Even if a student struggles with a task, the engagement is important, as is the re-engagement during the classroom conversation. Issues can be sorted out or understanding can be deepened depending on each student’s needs. Students shared a Google document with the instructor that they updated through the term. The instructor created a Google doc for the expected “daily” tasks that was updated as these tasks were assigned. This served as a record for students and the professor as to what was expected on which day. On the first day of class not only do we discuss the assignment, students complete and submit the first entry and send a sharing email to the professor. Depending on the class a brief content-based task might also be assigned for the next period. The first entry is a short series of questions designed to get-to-know the student and give the instructor a heads up on important student information and academic accommodations, or other necessary student support. This starter entry also opens the door to student-instructor communication by starting a conversation about the student and their academic needs and personal interests.

One technological piece that notably impacts the learning experiences is the iFisher: Next Generation Learning Initiative. Through this program, St. John Fisher has invested resources to have a 1-1 iPad program. This means that all faculty and students currently have an iPad for their use, as well as an Apple Pencil. St. John Fisher University has made using technology relatively easy to use in the classroom. All of the classrooms have computer projection systems, AppleTV systems (so students and faculty can quickly connect their iPads to the projectors), and document cameras which can display documents as well as capture nearby audio.

Students use their technology of choice. Due to the Fisher iPad initiative, most students use their iPads but some students use a tablet or laptop and use their iPad like a textbook. Furthermore, students are at varying levels of proficiency with the iPad. Some students have been using an iPad since middle school and others are brand new to the device. This first day “get to know you” entry not only provides the instructor with valuable information about the students, it is also a great way for students to get a handle on the assignment, and, as needed, get technological support getting the Google doc set up and shared with the professor. The instructor can leave their email application out to easily check to see if a particular student’s sharing email came through. Another advantage of the students having iPads is that it’s easy to remind them before class for the first few weeks (until they get into the routine) to update their Prep doc if they haven’t already. This is another way to communicate the message that entries only “count” if they are posted before class starts and an easy way to help students establish class routines.

Private Google drive folders were again created for each class to organize shortcuts to students' preparation task (Google) documents. Assessment for each student was simply counting the number of on-time entries and using the rubric to assign a numerical value. The categories on the 0 to 4 point scale approximately corresponded to a score based on the ratio of on-time entries to total expected entries. So if a student had submitted approximately 75% of the expected entries on time, they could expect to earn approximately a 3 on the 4 point scale. The author counts this assignment as 10% of the student grade, but the weight associated with this assessment is up to the instructor and another versatile feature. Like all student work, the quality and quantity of work submitted on time varied. As one might expect, students who stayed on top of the daily work and sought help when needed, tended to be successful in the course, irrespective of the level.

Insights, inspirations, trials and tribulations, and what's next

In facilitating learning and fostering understanding, it is important that instructors create spaces for learners in which trying is valued and that it is okay to be wrong. The author tries to apply this same philosophy in classroom conversations where (based on the instructor's reaction) students may not be able to tell if a student's answer is correct. Instead, the instructor tries to guide students in a conversation so that they decide for themselves what is correct as a means to make sense of the ideas. Another technique the author uses when students have questions is to wrap up the question-related discussion by asking if the response answers the question and if there are other questions - related or unrelated. We want them to feel comfortable asking questions. It seems as if students' anxiety and concerns over being wrong have become more pronounced, perhaps exacerbated by the pandemic, so these pedagogical features become even more paramount.

Whether it was class related or shared interests, this assignment created another way for the instructor and students to communicate and connect over course content or other subjects of interest. Pedagogy and assessment are intertwined. The way we think about pedagogy drives our assessment and the way we assess drives our pedagogy. For example, we believe that productive failure and productive struggle supports meaningful learning. The value of productive failure (and productive struggle) is a popular instructional theory that supports learning and the development of students' growth mindset, and the notion that they can do it. We want students to be willing to engage in the struggle. The belief is that students who engage in tasks that require them to struggle, even when they fail to succeed immediately, these engagements improve their long term success.

This is a hard assignment. Students want an A for effort and we want to see the students try and submit those tries on time. The primary student pitfalls that remain are submitting tries on time (before class starts) and updating the same Google doc throughout the span of the term. The beginning of the class deadline was difficult for some students to meet. Every term, there were a handful of students who misunderstood this detail, despite providing a rubric and spending time clarifying in class during the first day. That said,

students deal with a lot of information on the first day of classes so perhaps they are overwhelmed or distracted. More recently, due to the iPad 1-1 initiative, students have been using iPads and for those new to the device, so they may be trying to manage how to work the device (from getting files, making a copy, editing, and sharing with the instructor) and miss crucial details of the class discussion. Some students are checking email or otherwise not fully engaged with the class discussion. Other students were quite savvy and very good at helping their classmates which is a real asset in class to help support the technological needs of a diverse population. Moreover, getting students to meaningfully reflect is really hard.

Different types of feedback were given - both in putting together the document (keep up with the assignment on the regular and document your thoughts) and in the actual reflection process. For example, the hardest part tends to be the reflection stage, so in looking for more reflection, please consider a few questions. What insight do you gain from trying, struggling (or not as the case may be), and discussing in class – with peers or as a group? What insight do you gain from discussing your work with others and hearing other people’s perspectives? Both at your table and in the whole class setting? Is there anything you learned by putting the document together? Another way to reflect would be mathematically by, say making a connection or making a generalized observation or generalizing a result, or ...

From an instructional standpoint, we prefer more time on student work and less time on “counting tries”. It was also disappointing that it took so long to get to this nice version, and more generally jump on the Google doc bandwagon as it really is tailor made for this assignment and so many other ways of sharing within the educational community.

The author remains all in. In fall 2023, the preparation task document will be a feature in all of their courses, with a few adaptations as follows. The iPad 1-1 initiative at Fisher creates new opportunities and challenges. Historically, the screencast series, produced and supported by Grand Valley State University, used in our Discrete Structures (bridge to proof) course has been very popular with students. Their tasks often involve taking notes on relevant screen casts, then we use class time to clarify (as needed) and build on these ideas. Sometimes math tasks will be assigned as a companion to watching a screen cast, giving us data that we can use to make conjectures about the relevant ideas. Assigning screen casts to watch (and take notes on) before class is a great way for students to “preview” the ideas and review and build on them during class, thereby deepening their mathematical understanding.

One consequence of the iPad is that it is easy to take a screen grab of salient definitions or theorems and insert that image into a Google document and call it “taking notes”. While this is a tidy way to present the information, it does not require the same level of engagement as taking notes “by hand” - whether that occurs on paper or electronically using an app like Notability. Students who post screencaps as “notes” struggled in the course and their grades suffered compared to those who hand wrote their notes. So screencaps of screencasts will not count for “notes”. It will be required that notes be hand-written.

Another factor that needs consideration is student workload. Our students are busy. They are juggling a full load of coursework with a part-time job, sports, or other activities. So we intend to be mindful of their workload. The author recently dropped this component in a Calculus II course due to concerns about students' time. Instead, optional video screencasts were provided and tasks for class were suggested. Many students completed these tasks. Without the incentive of a grade, perhaps some students were less inclined to complete the pre-class tries. This created an unnecessary inequity in the classroom that can easily be solved. It creates incentive to do the pre-class work and best practices suggest that it is best to give credit to the students who are doing the work.

We are excited to try this assignment again. The pedagogy is sound and supports students' mathematical thinking through the learning process. Part of the power is the adaptability and the process - whether the instructor chooses to include a reflection component or not. At the end of the talk, feedback was solicited from the audience on a series of questions. Audience participants eagerly scanned the QR code that linked the user to a shared Google document with editing privileges. Because teamwork makes the dream work, participant feedback is included below. Questions posed are followed by participant responses.

Questions for the audience:

Question 1: How do I improve the quality of my students' reflections? (without it becoming too burdensome)

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- Show good examples of what you are hoping to see.
- Include a collaborative group polish to the assignment. With individual roles in the group,(grapher, solver, presenter...) You can also have students create videos verbally discussing the tasks.
- Mathematical tasks are created for use of multiple representations and multiple methods. Low entry fun and high ceiling options
- Have you thought about using an RSS feed reader to organize student responses?
- I'm learning in the OneNote classroom and think that I can incorporate this journal within each student's individual work space.

Question 2: How do I create more student buy-in and less student confusion about the nature of the assignment?

- Is it possible to create a substitute assignment/second option for this activity?
- Show some sample progressions from a course they can follow.
- Value their prework by incorporating it directly, and obviously into your next lecture
- Connect the prompts from the assignment to class
- Do the students get to read one another's submissions? Seeing good submissions can help them get an idea of what you expect and also what they will get out of it.

- Incorporate interesting correct/incorrect/creative student responses directly into your lecture

Question 3: What suggestions for improvement do you have?

- Incorporate reflection before or after exams to bring in study skills, opportunities for intervention
- Give the students reflection prompts. In other words teach them how to reflect

Question 4: What questions do you think I should be asking?

- How long does it take to grade this?
- Ask them what do you notice, what do you wonder?