

PDIG Final Report 2021-2022

Development of Topic-Specific Diagnostic Tools
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Project Description

Describe/show to what degree the project was carried out as planned. Include what went well and what proved to be a challenge.

Include a synthesis of your journal entries.

Our goal was to create a new set of diagnostic tools that teachers can use that are topic-based. Currently, most school boards have diagnostic tools that are grade-level based. The purpose behind this project was to create something that teachers could use to diagnose a student's ability with one assessment rather than use a bunch to narrow it down.

We were able to create the following tools:

- Algebra
- Analytic Geometry
- Arithmetic
- Geometry
- Statistics/Probability

Each diagnostic tool has two versions: a concise version that a student can complete in less than a class period, and a comprehensive version that provides more questions that allows for greater precision.

One of the teachers was not able to take part in most of the meetings due to time constraints. The two active members initially disagreed as to what the focus of the tools should be. One teacher wanted a heavier focus on word problems while the other teacher preferred to have shorter, direct questions, but a higher quantity. A compromise was met when it was agreed that we would make two versions of the diagnostic tool that would offer something quick and easy to use, as well as something that was thorough and detailed.

Our December meeting was cancelled due to schools being closed for the final week before the holidays. It was impossible to schedule anything until after March Break as the teachers on the team found it difficult to leave their classrooms during this time and to ensure that they were able to finalize and prepare their report cards for the end of the first term.

One of the intentions of the project was to offer abstract questions that would allow for students to offer their interpretation of a possible answer that would be indicative of their grade-level. There was a lack of agreement as to what that should look like and how to implement it within the diagnostic tools. These abstract questions are included in the

comprehensive versions of each tool as an optional component teachers can choose to use.

However, two teachers that remained part of the project were very committed to seeing the project through. We were able to do some field testing of a few of the projects and they were met with success with the students.

Journal Reports and Class Demo Sessions

Meeting #1 – October 13, 2021

Members Present: James Gore, Noura Helal, Maria Sorokina

In our initial meeting, we discussed what the diagnostic tools would look like. Immediately, there was a difference of opinion as to whether these tools should have as many straight-forward questions as possible so that it would allow for highly detailed analysis or whether the tools should focus more on word and complex problems that would also determine a student's problem-solving ability. After discussing it for most of the morning, it was resolved that we won't agree in the short term and that we should probably focus on the task of creating questions and that we'll continue our debate next meeting.

Meeting #2 – November 19, 2021

Members Present: James Gore, Noura Helal, Maria Sorokina

Before we continued our work on the questions for the tools, we came to a compromise on how we would go ahead with our final product. As both teachers gave their points-of-view, it became clear that there may be a need for both types of diagnostic tools that both teachers were championing. We decided it was best to create two types of tools: a concise version and a comprehensive version for each topic. The bank of questions that were being developed would be for the comprehensive tools while the concise tools would be a condensed version of the former.

During this meeting, both teachers completed work on the algebra section while I completed work on the probability portion.

Meeting #3 – March 18, 2022

Members Present: James Gore, Noura Helal, Maria Sorokina

Work continued on the project. I started work on the statistics portion while Noura worked on analytic geometry and Maria worked on geometry.

Meeting #4 – March 23, 2022

Members Present: James Gore, Noura Helal (PM), Maria Sorokina (AM)

Due to scheduling conflicts, the two teachers involved were not able to meet at the same time. I met with Maria in the morning and she completed her work on statistics while Noura met with me in the afternoon and completed her work on geometry.

Meeting #5 – May 16, 2022

Members Present: James Gore, Vicki Krawczyk

Vicki joined me to review the work the team had done over the year. We validated the answers for the questions that everyone had written. After some discussion, some of the questions were determined to be inappropriate for the final project and are excluded from the tools (for example, a question on division point in Sec. 4 CST/Sec. 5 SN is not necessary as it is one of the last concepts a student would learn in analytic geometry).

Project Goals

- *Describe/show to what degree the goals of the approved project were met.*
- *If the goals were only partially met or not met at all, describe the reasons for this.*

The main objective of creating topic-based diagnostic tools was met. Each tool, whether the concise or comprehensive version is used, allows teachers to determine what grade-level the student is able to perform, similar to a DRA score for English Language Arts.

It's important to note that this tool does not replace the tools that many school boards are using which are grade-level based. However, we anticipate that teachers may prefer to use these tools since the grade-level tools are based on a pass-fail system and if a student "fails" a diagnostic test, they will need to write one that's a lower level to determine their actual score. This can be tedious as teachers have reported that they had to give more than one diagnostic to get a proper image of where their students stand.

Due to disagreement about how to integrate the questions properly, one goal that was partially missed was the implementation of abstract questions into the diagnostic tool. The inclusion of these types of questions was to allow for students of any level to try them without feeling frustrated or confused by something they hadn't seen before. Their purpose was to gain an understanding of what the students know based on how they attempted the question.

For example, for a question where a student would have to determine the area of a circle located inside a larger rectangle without any measurements, a student in cycle 1 may make an estimate based on a percentage of the total area of the circle compared to the total area of the rectangle. However, a cycle 2 student may attempt to solve the question using algebra based on the relative measurements of the circle and rectangle in respect to each other (for example the diameter of the circle being half that of length

of the rectangle). Students would need to explain the reasoning behind their response which would give the teacher an idea as to the level of student thinking appropriate to their grade level.

While this was supposed to be a major feature of the diagnostic tool, it was felt that since there wasn't a consensus regarding its implementation, it should not be the focus of the diagnostic tools. However, since the project was supposed to include these types of questions, each comprehensive version of the tool has one of these types of questions. These questions are optional and will allow teachers to use them (or not) as they wish.

Project Outcomes

- Describe/show the gains that the participating teachers achieved through this project.

Unfortunately, there wasn't much in terms of gains for this project. The teachers involved developed content that was similar to that of what they've done in the past. Because of concerns about how other teachers would use this tool and also how different the tool might look compared to what has been traditionally used, the more innovative aspects of the diagnostic tool were dropped; or at least not made a major part of this project.

Reinvestment

- Clearly describe how the resources created and/or the learning achieved by the participants can be of benefit to the educational community at large.

- If applicable, comment on whether or not this project should be carried out by other teams and if so, how it could be improved.

This project can be of great benefit to all teachers as it gives them a new tool to help them determine the level of their students prior to the instruction of new content and concepts. Since it is topic based instead of grade-level based, teachers can use these tools at any point of the year. Additionally, it gives more detail about what a student's ability since it provides feedback about specific topics rather than lump everything within a grade-level. The issue with the grade-level diagnostics is that it may say a student is at level but doesn't give a clear indication that a student is struggling with a particular concept which may affect them later on.

Depending on how the optional abstract questions are used and the feedback its use receives, it would be beneficial to continue this project to build upon those types of questions. One downside of any diagnostic if questions look too intimidating or difficult, students may not try them, regardless of their ability. The abstract questions are designed to probe student thinking, regardless of level and supply better quality feedback to teachers.