

# gPortfolios: a pragmatic approach to online asynchronous assignments

gPortfolios

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## Abstract

**Purpose** – The purpose of this paper is sharing out basic guidelines and examples from an extended collaboration to move educators move online while avoiding synchronous meetings. “gPortfolios” are public (to the class) pages where students write responses to carefully constructed engagement routines. Students then discuss their work with instructors and peers in threaded comments. gPortfolios usually include engagement reflections, formative self-assessments and automated quizzes. These assessments support and document learning while avoiding instructor “burnout” from grading. gPortfolios can be implemented using Google Docs and Forms or any learning management system.

**Design/methodology/approach** – The authors report practical insights gained from design-based implementation research. This research explored the late Randi Engle’s principles for productive disciplinary engagement and expansive framing. Engle used current theories of learning to foster student discussions that were both authentic to the academic discipline at hand and productive for learning. This research also used new approaches to assessment to support Engle’s principles. This resulted in a comprehensive approach to online instruction and assessment that is effective and efficient for both students and teachers.

**Findings** – The approach “frames” (i.e. contextualizes) online engagement using each learners’ own experiences, perspectives and goals. Writing this revealed how this was different in different courses. Secondary biology students framed each assignment independently. Secondary English and history students framed assignments as elements of a personalized capstone presentation; the history students further used a self-selected “historical theme.” Graduate students framed each assignment in an educational assessment course using a real or imagined curricular aim and context.

**Originality/value** – Engle’s ideas have yet to be widely taken up in online education.

**Keywords** Online learning, Google Docs, Coronavirus, Emergency remote teaching, COVID 19, Expansive framing, Productive disciplinary engagement, Situated cognition, Social learning, Learning management systems

**Paper type** Research paper

In responding to the 2020 coronavirus pandemic, educators encountered numerous challenges moving to remote teaching. Many students lacked sufficient internet access or devices for “synchronous” video conferencing. Many discovered how tedious discussion forums could be. And creating engaging “asynchronous” assignments proved to be difficult. In response, we offer *gPortfolios*.



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gPortfolios are public (to the class) online pages where students post written responses to carefully crafted assignments. The instructor and students then discuss posts in threaded comments. The only requirements are editable pages that allow threaded comments and an online quiz tool. gPortfolios can be implemented easily using Google *Docs* and *Forms* (hence the name) or any learning management system [1]. gPortfolios work with print or online textbooks and are ideal for open educational resources (OERs, including online videos and articles and Wikipedia). gPortfolios can support productive social engagement while allowing the flexibility of self-pacing. While gPortfolios work in fully self-paced courses, students will interact more when completing them at their own pace against a common deadline.

### Background

gPortfolios emerged across a decade of practical research of online learning and assessment. This research used the theory of *situated cognition*. This theory looks carefully at the social and cultural settings where learning takes place *as well as* the social and cultural settings where that learning might later be used or “transferred.” These transfer settings include other courses, workplaces, personal lives, course assessments and achievement tests. This research has adapted the educational design principles that emerged in the work of Randi Engle (1967-2012) and colleagues. gPortfolios have been used successfully in a range of courses. Because they require writing, gPortfolios are probably not suited for primary grades. While they have yet to be used in upper elementary or middle grades, we will illustrate some accommodations we have for English language learners and developing writers that might work with those grades.

### Productive disciplinary engagement and expansive framing

Randi Engle and Faith Conant introduced productive disciplinary engagement (PDE) in 2002 to explain compelling discussions that had been recorded in a science classroom. From this perspective, *engagement* means that students are making substantive contributions to discussions, coordinating their contributions with others, attending to others, demonstrating passion or emotion, staying engaged for long periods, and spontaneously re-engaging, all within the academic discipline at hand. Disciplinary engagement is *productive* when students make disciplinary claims and arguments that become more sophisticated over time, raise new questions, recognize confusion, make new connections, satisfy goals, etc.

Engle and Conant (2002), advanced four guiding principles for fostering PDE: *problematize content*, *give students authority*, *hold students accountable to others and to disciplinary norms* and *provide relevant resources*. Educators are encouraged to provide instruction and resources that help students “problematize” disciplinary knowledge from their own perspectives, resolve the disciplinary problems or questions that result and hold themselves and each other accountable for appropriately using the language and ideas of the discipline.

Add to this the concept of *expansive framing* (Engle *et al.*, 2012) to help teachers “position” students as authors (rather than consumers) of disciplinary knowledge. Expansive framing does so by insistently pushing each student to make connections with people, places, topics and times beyond the boundaries of the assignment and/or course, and to see themselves as participants in a broader intellectual conversation that extends over time. While these theories are complex, the core idea is simple: If you want your students to later use the ideas they are learning (“transfer”), make sure your students discuss doing so while they are engaging with those ideas.

These principles have been validated and refined in dozens of peer-reviewed studies. For a detailed account of how they were translated into a comprehensive framework for online instruction and assessment, please refer to [Hickey \*et al.\* \(2020\)](#), particularly Table 1). For vignettes illustrating how this approach was implemented at Indiana University High School, please refer to [Itow \(2020\)](#), this issue). To see how these principles were used at scale with hundreds of open learners, see [Hickey \*et al.\* \(2015\)](#) and [Hickey and Uttamchandani \(2017\)](#).

### Creating a gPortfolio assignment

The steps below include real-life examples from each of our online courses. These include some of the authors' efforts: Shelby's non-credit information technology courses; Daniel's graduate course on educational assessment; and secondary courses in English, world history and biology from Courtney, Chris and Jody. These steps distinguish between disciplinary *knowledge* and disciplinary *practices*. Disciplinary knowledge is what experts "know" independent of setting; disciplinary practices are what experts "do" in disciplinary settings (where their expertise is most obvious).

These steps will be new to many educators. gPortfolios do not present disciplinary knowledge in isolation (to be framed later) or frame learning from an expert's perspective. Instead, these assignments use each learners' *developing* disciplinary practices to frame disciplinary knowledge. As [Meyer \(2014\)](#) demonstrated, students should re-frame across assignments. They should define increasing expert disciplinary practices as their disciplinary knowledge expands:

- (1) *Define the disciplinary ideas for the assignment.* While disciplinary ideas may be conventional educational objectives or standards, think of them as disciplinary *tools*. They gain most of their meaning from the ways they are used in *specific* disciplinary practices. When students treat disciplinary ideas as tools, small differences in disciplinary practices will reveal important things about those ideas that will help students learn in ways that support transfer. Most textbooks chunk content into chapters that are about right for one gPortfolio and include objectives, summaries and assessments you might use. In our examples:
  - An assignment on cybersecurity threats in one of Shelby's IT course was organized around the six most common threats (e.g., insider threats, cybercriminals, etc.).
  - An assignment on creating effective essay items in Daniel's assessment course was organized around guidelines in a textbook chapter.
  - All assignments in Chris' history courses and Courtney's English courses were organized around a handful of related state standards.
  - Most of the assignments in Jody's biology courses were organized around the topics in five to ten pages of a multimedia textbook.

After you draft an introduction to the assignment, introduce the ideas in a way that reminds students they will be discussing how the ideas are used in different ways in different settings. For more on thinking about disciplinary ideas as "tools," refer to [Barab \*et al.\* \(2007\)](#).

- (2) *Identify your disciplinary resources.* These, along with your guidance in using them, are the resources in the fourth PDE principle. In some cases, you may create written, audio or video resources. But for most school content, there are already

plenty of OERs to (carefully) curate. If you do create new resources, avoid creating “content” resources. Rather create resources that model the PDE discussions and expansive framing expected of your students:

- Each of Shelby’s assignments include a short podcast where she asks two different experts about how they used the ideas in their networks. Each assignment also includes links to five to ten OERs.
- Each of Daniel’s assignments include a video where he contrasts using the ideas in the educational assessment course with his other courses. While a few OERs are included, most assignments are organized around a textbook chapter.
- All assignments in Courtney’s English classes use OERs; the literature courses also include a paperback collection of fiction.
- All assignments in Chris’ history classes use OERs.
- Most of the assignments in Jody’s biology class are organized around pages from an online textbook, an interactive multimedia “lab” from the publisher, and supplemental OERs (especially animations).

It works well if you add the resources to your assignment pages using hyperlinked images. Just be sure to include the title of the resource and a short description to help orient.

- (3) *Create a framing activity.* This generates the “space” where students problematize content in the first PDE principle. Your first student activity should help your students introduce themselves “expansively” and create such a space. You can usually have students describe their *past experiences*, *current interests* and *future goals* that are most relevant to the assignment, module or course. This should result in the “framing context” where students will practice using the ideas. For example:
- Shelby’s IT courses first ask students to describe an IT network that they have used, are using, or hope to work on in the future.
  - Daniel’s assessment course first asks students to describe a personally relevant curricular aim that they have taught, are teaching or might teach towards and an educational setting where that might occur.
  - Jody’s biology assignments open with a contextualization activity where students write about their relevant experience, interests and goals, and describe how the topics relate to other topics in the class and how they might use what they learn in the future.
  - Courtney’s English courses frame each assignment as a potential element of a capstone multi-media project called This I Believe. Students draft an initial capstone topic statement in the first assignment and then revise that statement across assignments.
  - Chris’s history classes also frame each assignment as a potential capstone element. But they also select one of six different historical themes (e.g. technology, politics, etc.) that they found most relevant/interesting, justify that selection and use that theme to frame each assignment.

Remind students that you will be providing public (to the class) feedback. Tell them that they might find this challenging, should look at peer work for guidance

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and inspiration but *not* content to “borrow,” and should refine their frame within and across assignments as they learn. For more on framing and a complete example in a graduate education course, see [Hickey \(2015a\)](#).

- (4) *Define engagement routines.* These routines give students the authority to solve the problems they uncover, consistent with the second PDE principle. Most of your assignments should consist of routines that help students expansively frame their engagement with the disciplinary ideas and resources. Many of our assignments start with an introductory routine that prepares students for more complex routines; most use variations of “relevance ranking.” This is where students summarize, extend or identify the “big ideas” in resources; reorder those summaries in order of relevance/importance to the framing context; and provide a personal (i.e. not general) rationale for the selection and/or ranking. For example:
- Shelby’s *threat actor* assignment has students summarize and rank the six most relevant threats to their real or imagined network.
  - Daniel’s assignment for essay items has students use the textbook guidelines to create an item for their curricular aim, then summarize and rank those guidelines in order of impact on that exercise.
  - Most of Courtney’s and Chris’ assignments have students socially annotate a handful of text OERs using Docs or *Perusall* [2]; privately summarize the three or five most relevant ideas in those resources [3]; and publicly (to the class) apply those ideas to an artifact (e.g., a recorded speech or essay) that they might include in their capstone.
  - Most of Jody’s assignments have students read/review textbook pages; rank the relevance of a handful of OERs, privately complete the publisher’s interactive lab activity; write a paragraph for a metaphoric *literature across the curriculum* activity; and write a paragraph *considering the consequences* of the ideas in a real world setting.

Your routines and feedback should support engagement whereby students can learn from each other but cannot directly copy. Reserve “known answer” questions (which kill discussion) for the assessments (below). Keep in mind that you are trying to help learners discuss how the things they are learning connect with relevant settings in their past, relevant current settings outside of the course and relevant settings in their future (as described in [Engle et al., 2012](#)).

- (5) *Define social engagement routines and guidelines.* Your guidelines and routines accomplish the accountability in the third PDE principle. Nearly all interaction should occur in threaded comments directly on gPortfolios. Your comments should maximize PDE in artifacts and interactions; “position” students as authors who are the expert in their setting; and hold students and peers accountable for their participation. Minimize inefficient private instructor–student interactions via emails, messages and/or gradebook comments, and encourage PDE in student comments as much as possible. For example:
- Shelby’s assignments encourage students to look at peer work and post questions. But the courses are fully self-paced and instructor-free, so the interaction has been limited mostly to looking at peer gPortfolios for ideas.
  - Each of Daniel’s assignments require students to post at least one question; students are instructed (but not required) to examine and comment on peer

work. Daniel gives every student extensive feedback on the first two assignments. After that, he gives extensive feedback to the students who post well before the weekly deadline and posts a hyperlinked announcement to the “early posts.” Then he contributes to threads that emerge.

- Jody, Chris and Courtney give a mix of public and private feedback to students. Because their students are working at different paces, most of the peer interaction outside of the social annotations involves looking at the earlier public posts and instructor comments.

Your guidelines should tell students to turn on “notifications” but should not require students to interact when they do not have anything interesting to say. Relative to discussion forums (which are often abstract and tedious), students are usually enthusiastic when discussing their own work.

- (6) *Create formative self-assessments (optional).* Formative assessments can help ensure mastery. But giving private feedback to individual student can overwhelm instructors and take time away from more efficient public feedback. As elaborated in [Hickey, Chartrand, and Andrews \(2020\)](#) and [Hickey \(2015b\)](#), we suggest you consider “instructor free” *formative self-assessments*. These can motivate prior engagement; formatively enhance achievement; and avoid inefficient private instructor feedback. Design short-answer items and instructions so that students try to answer from memory before searching resources for additional information, and then comparing their answer with a more complete “expert” answer. Items should be different enough from the engagement routines to require transfer.
- (7) *Create engagement reflections.* Most of our assignments conclude by asking students to reflect on their prior engagement. Most use versions of the following three prompts:
  - *Contextual engagement:* How useful was your [framing context] for applying the ideas in the assignment? Did any of your peers have a [framing context] that seemed more suited to this assignment than yours?
  - *Collaborative engagement:* What did you learn from your peers and what did your peers learn from you? Which exchanges did you find particularly productive?
  - *Consequential engagement:* What will you do differently in the future because of what you learned in this assignment?

These are “summative” assessments of engagement, so you can use them to award points for completing the gPortfolio. But the reflections also “formatively” shape students’ future engagement (because they anticipate them) and their understanding of disciplinary knowledge *and* practices (because they must revisit both). For more on this way of thinking about engagement, refer to [Gresalfi et al. \(2009\)](#) and [Hickey \(2015b\)](#).

Daniel recently added two additional reflections that have proven helpful. One for *conceptual engagement* is related to the formative self-assessments: *How well were you prepared for the formative assessments? Did you struggle with any of the concepts?* The other is *cultural engagement*: *How did your race, ethnicity, gender, orientation, SES and (dis)ability impact your engagement?* This responds to a critique of PDE by [Agarwal and Sengupta-Irving \(2019\)](#). They argued that without explicit instructor attention to power and privilege, under-represented minority students were likely to be



- marginalized in discussions. The cultural reflection and instructor comments can readily “reposition” the engagement of minoritized students (Hickey and Quick, 2020).
- (8) *Create a summative quiz.* We recommend using summative quizzes to motivate engagement, document mastery and estimate transfer. Ideally you will create a quiz for “modules” of several related assignments. As elaborated in Hickey *et al.* (2020), we suggest “proctor-free” tests that use multiple-choice items that are scored automatically; only give students overall scores (for test security); are time limited (e.g. perhaps two minutes per question); include *some* “best answer” items that can’t possibly be Googled; have *no* items that can be Googled easily; and use items that are different enough from any resources or formative assessments that they provide evidence of transfer.
  - (9) *Create your grading scheme.* One efficient scheme is giving full engagement points if all required gPortfolio elements are completed, then using quizzes for remediation and/or final grades. In most cases, you can save a lot of time by not grading gPortfolio content.
  - (10) *Add supplemental resources and accommodations.* You must accommodate any special needs that your students might be overcoming. While YouTube can automatically add captions, they usually need to be corrected. Your school system likely can help ensure that assignments and work with screen readers for students with visual impairments.  
Consider including *supplemental routines* with background OERs on entry-level topics for underprepared students. For younger students and/or developing writers, consider making engagement routines easier. Rather than selecting and/or summarizing all disciplinary ideas, provide shorter summaries that students can extend before ranking. Or provide four summaries and have students add one or two more before ranking. Easier still, provide complete summaries and just have students reorder and justify. With elementary students, you might just ask “which video helped you the most and why?”
  - (11) *Create other necessary elements.* As you create hyperlinked home pages, instructions, etc., use language that expansively positions students as authors contributing to an ongoing conversation by drawing on their past to ensure they can use what they learn in the future. If you are using standalone Google Docs, you will have to decide how “public” students’ work will be and designate sharing settings; youth work likely should only be viewable to class members and possibly parents. In some cases, you may find that some parts of some assignments may need to be viewable only by the instructor.

## Final suggestions

Modules consisting of several assignments lets you *and* your students use what you learn in the initial assignments to foster PDE in later assignments. You can also include more complex later assignments that build on the ideas and artifacts in early assignments. For example, Daniel’s students engage with the complex principles of *reliability*, *validity* and *bias* by ranking the relevance of aspects of each principle for the example assessments created in their earlier assignments. Also, note that you can make changes to the instructions or routines while students are still working on them. When coupled with instructor explanations, such changes can help students recognize PDE.

We hope that our examples and experiences can help educators and students make a smooth transition to online learning. In particular, we hope that those who choose to (or are

forced to) use asynchronous formats can use gPortfolios to keep students connected with their teachers and each other while avoiding student isolation and instructor “burnout.”

### Notes

1. Because we originally used wikis, we call these “wikifolios” when completed on pages in a learning management system (LMS). Note that the *Canvas* LMS does not allow threaded comments on student-generated pages. A simple workaround has students generate a new discussion forum for each wikifolio and post work in the forum “header”.
2. An external app that lets students to collectively read and “mark-up” documents and provides a summary of student activity. An alternative is *Hypothesis*. For more on online social annotation, see [Kalir \(2020\)](#).
3. This was private because it was too easy for students to plagiarize.

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### Appendix. Sample gPortfolio assignment on cell growth and division. From Duncan (2020)

#### Section 5.1: The cell cycle

- Read pages 130-133 in your textbook.

#### Section 5.2: Mitosis and cytokinesis

- Read pages 134-138 in your textbook.

#### Learning objectives:

- Describe the stages of the cell cycle.
- Compare rates of division in different cell types.
- Identify factors that limit cell size.
- Describe the structure of a chromosome.
- Follow chromosomes through the processes of mitosis and cytokinesis.

#### Main ideas:

- The cell cycle has four main stages.
- Cells divide at different rates.
- Cell size is limited.
- Chromosomes condense at the start of mitosis.
- Mitosis and cytokinesis produce two genetically identical daughter cells.

#### Familiarize and contextualize:

Living things must grow and develop. At times they suffer injuries or damage, or cells simply wear out. New cells must be formed for the organism to survive. What process must occur to make a new, properly functioning cell? Watch this video to learn more – *Cell Division and the Cell Cycle*.

Complete the following activities in your Wikifolio, then submit the corresponding URL link to the Ch 5 Lesson 7 Collaboration page.

- (1) *Activity 1: Contextualization*  
At the top of your wiki, say a few things about your previous experiences, current interests and future goals as they relate to learning these main ideas and objectives. For example: *Did you ever learn about mitosis before? How does cell division relate to other things you learned or will learn in this class? How might you use this knowledge about the cell cycle in the future?* It is ok to say you do not have any idea, but you should probably be able to come up with something in your past, present and future to relate this to. Even if you do not, thinking hard about this will help you make sense of your classmates' relevant experiences. Look at the posts of your classmates if you need examples and inspiration.
- (2) *Activity 2: Rank the following Resources:*  
Below you will find four resources that review the main ideas in this lesson. Arrange these resources in order from most-relevant to least-relevant, following each with a sentence about their relative relevance and/or importance to you.
  - Cell cycle and mitosis
  - Cell cycle animation
  - Mitosis animation
  - Mitosis and cytokinesis
- (3) *Activity 3 Virtual Lab:*  
This Activity should be completed as a separate lab assignment, found in the "Labs" section of the Assignments page or in Module 2 of the Modules page. *Do not submit it as part of your e-portfolio (wiki).* Look at the lab *Phases of Mitosis*.  
Directions: Click the link above or select *Student Premium-Multimedia Labs and Activities-Virtual Investigations-Chapter 5 Phases of Mitosis* from the online textbook and follow all instructions. Answer all the questions posted in the Lab assignment in a Word file, be sure to include your name in the document, then rename the file to append your own last name and finally upload the file to be graded.
- (4) *Activity 4: Literature Across the Curriculum*  
An old piece of poetry says, "to everything there is a season [. . .] a time to be born, a time to die." For cells, the line might say "a time to divide and a time to grow." In multicellular organisms, different types of cells have different roles and need to complete specific tasks. For example, a cell that is not large enough is not useful for storing nutrients for later, but a cell that is too large will not be useful for transportation through a tiny capillary. In your wiki, think of an analogy related to how the size of a cell affects its ability to function properly.
- (5) *Activity 5: Considering the Consequences*  
If a starfish sustains damage to a limb, it often grows a new one. If a human adult sustains damage to his or her spinal cord, mobility is often impaired. If a gecko loses its tail, it may grow a new one. In your wiki answer the following questions:
  - Which type of cell is less likely to go through the cell cycle after being damaged- starfish limb, human spinal cord or gecko tail? Support your answer.
  - Occasionally cells stop dividing and enter another phase called GO. If you damage your liver, new liver cells can be produced to replace up to 75% of the liver. However, if you sustain brain damage, your body does not produce new brain cells. *Explain this observation using what you have learned about the cell cycle.*

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(6) *Activity 6: Pose a Question*

Pose a question to your peers in the comment section of this wiki that came up while you were completing this lesson. Then answer three other people's questions and respond to the people who respond to you. If you do not have a question about something that confused you, come up with a question related to what you learned to ask your peers.

(7) *Activity 7: Reflections*

This is your chance to look back and reflect on the whole lesson. Write a few sentences for each question below and reflect on how you engaged with the ideas in this activity and with your peers.

- *Critical engagement:* How did your own experience, interests and goals shape the way you engaged with the ideas in this activity? What is unique or special about you that helped you connect to some of these ideas? Give an example of how another student's different perspective helped or changed their (or your) understanding of an idea.
- *Collaborative engagement:* Whose examples or suggestions were most helpful in making sense of the ideas in this activity? Name at least two other students and explain how their examples or suggestions were helpful to you.
- *Consequential engagement:* What are some of the larger consequences of this lesson for you? What might you do differently going forward?

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