

IDE 632 Final Exam

Product Design Specifications

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Introduction

For this project, the client has requested that we develop and implement a model for helping their collegiate sciences department switch to a *Flipped Classroom Model* in their instruction. To do this, we have selected to use the Gerlach & Ely Instructional Development Model with tasks in the specification of objectives, front-end analysis, interactive implementation, and evaluation of performance. This product design specifications document will overview each of these steps and the materials and resources that we propose as the best solutions for achieving a flipped-classroom model for the client.

Client

The client is the department chair of the Physics Department at a small university local to Syracuse, NY. After ‘reading a few articles’ and speaking to several colleagues about the *Flipped Classroom Model* for instruction, he came to us with the hopes of implementing it within their department (fewer than 10 professors). While none of the staff (including the client) have been trained or experienced in using the *Flipped Classroom Model* (FCM) and despite a lack of explicit compensatory incentives for this implementation, the client remains confident that his physics professors are both willing and able to make the switch in their instruction.

When asked about the department’s primary motivation regarding the FCM, the client stated that he was interested in achieving “inquiry-based thinking and learning” that he believed would help students maintain “higher-order thinking and engagement in the classroom.” With regard to measurable metrics, the client cited attendance, test scores, and professional competency (hiring rate) among students in their courses.

The client agreed to allow our team to interview the faculty throughout and after the transitory process to follow-up on evaluating our initial objectives.

Audience

The product discussed in this document is instruction (both online and in the classroom) as provided by the Physics department to its students. As a result, the audience is made up of the students that enroll in these courses.

Interestingly, the client stated that the switch to the FCM was not to improve student evaluation responses of the physics department’s classes. “The student response surveys haven’t alerted us

to any problems,” he said, “because they seem to think it is fine. However, we believe that they are not as engaged in class as they should be.”

This product design specifications document seeks to achieve the client’s objectives with regard to this group of students.

Project Goal and Objectives

In summary of our interview with the client, we can state their primary goal as follows:

To increase the depth of thinking of engagement of students across all physics courses.

In order to define some of the enigmatic terms in this goal (such as “depth,” “thinking,” and “engagement”), the following list of measurable objectives were established:

- ❖ Increase classroom attendance of students
 - As measured by regular attendance record-keeping
- ❖ Increase classroom participation in the form of students asking relevant questions
 - As measured by a question-recording system professors will implement
- ❖ Increase student performance on quizzes and exams
 - As measured by regular grading systems
- ❖ Increase demonstrated depth of thought in student interactions and work
 - As measured indirectly through professor interviews

For more information on evaluation metrics, please refer to the appropriate section in our model below.

Means

Since this project involves training professors on effectively using a new framework for instruction and student engagement, the means of producing great professional development for those instructors will require several tasks.

We intend on using in-service training sessions, developing a handbook for professors resources, and training instructors on utilizing an online learning management software (i.e. Blackboard) in order to leverage their student interactions.

Refer to the project plan details for more information on each of these items.

Project Plan Details

The following outlines both the methods and tasks for helping achieve the prescribed outcomes. All items are subject to review and revision by the client based on constraints or other variable factors.

Project Tasks

For an instructional development model that fits with this specific project, we have selected the Gerlach and Ely Model to select our tasks and organize our resources. To understand our rationale for choosing this model, it may be best to first look at the steps that it recommends when producing new instruction:

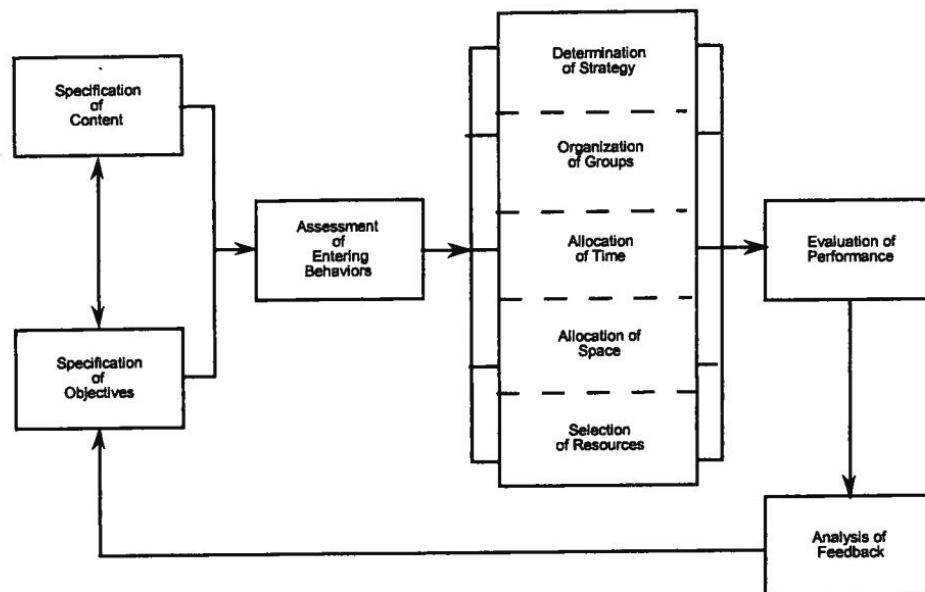


Figure 7. The Gerlach and Ely model. *Note.* From *Teaching and Media: A Systematic Approach*, Second Edition, by V. S. Gerlach & D. P. Ely, 1980, Boston, MA: Allyn and Bacon. Copyright 1980 by Pearson Education. Reprinted by permission of the publisher.

The Gerlach and Ely Model (G&E Model) is advantageous for the following reasons:

- A. First, It recognizes that for many instructors, the *Specification of Content* and *Specification of Objectives* happen simultaneously. While it would be ideal for objectives to be determined first, many professors do not have that luxury. This model recognizes that.

- B. Second, it focuses on both the *Allocation of Time* and *Allocation of Space* when designing instruction. A Flipped-Classroom Model has the unique problem of warranting a strategic use of both (due to the use of online resources), making these steps critical.
- C. Finally, the model makes all five “interactive tasks” simultaneous, which is useful when considering how this project will be implemented. Professors will have the summer to prepare their instruction for the fall, so all of these can be adjusted at once.

List of Project Tasks

With respect to the list created by the G&E Model, we can fill in the prompts for our environment and arrive at the following list:

1. Specifications

- 1.1. Specification of Content
 - 1.1.1. Review existing syllabi and learning materials
 - 1.1.2. Determine content
 - 1.1.3. Ensure compliance and programmatic alignment
- 1.2. Specification of Objectives
 - 1.2.1. Establish measurable objectives
 - 1.2.2. Establish evaluation methods
 - 1.2.3. Select thresholds defining success (“the need”)

2. Front-End Analysis

- 2.1. Assessment of Entering Behaviors
 - 2.1.1. Collect data on all relevant objectives
 - 2.1.1.1. Attendance
 - 2.1.1.2. Quiz & Test Scores
 - 2.1.1.3. Classroom Participation (if any data)
 - 2.1.1.4. Hiring Rates (if any data)
 - 2.1.1.5. Student Response Surveys
 - 2.1.2. Analyze data and abstract themes
 - 2.1.3. Produce report on benchmarked objectives

3. Interactive Steps

- 3.1. Determination of Strategy
 - 3.1.1. Design approach to disseminating content
 - 3.1.2. Design student assessment system (quizzes, grade incentives)
 - 3.1.3. Design interactive approach to inquiry-based learning
- 3.2. Organization of Groups
 - 3.2.1. Determine group structures for students to optimize interactive strategy
- 3.3. Allocation of Time
 - 3.3.1. Determine logistics for at-home (online) content and activities
 - 3.3.2. Determine logistics for in-class content and activities
- 3.4. Allocation of Space
 - 3.4.1. Determine how to maximize online experience via LMS

- 3.4.2. Determine how to maximize classroom experience by leveraging at-home experience
 - 3.5. Selection of Resources
 - 3.5.1. Select at-home resources (websites, multimedia, textbook)
 - 3.5.2. Select in-class resources (presentations, activity guides, equipment)
- 4. **Evaluation**
 - 4.1. Evaluation of Performance
- 5. **Analysis**
 - 5.1. Analysis of Feedback

Resources

As indicated above, this project requires the client to make great use of both digital and analog materials in order to achieve their outcomes. Since it is the instructional designer's responsibility to help them equip their professors for this end, we have selected all of resources that both (a) the professors will need to master or utilize and (b) the client and instructional designer will need to utilize in order to reach the objective.

→ **For Professors To Use**

- ◆ Blackboard LMS
 - Handbook on Blackboard FCM Fundamentals
 - Youtube playlist on how to perform essential Blackboard tasks
 - Training on how to use Blackboard effectively for *FCM*
- ◆ Collaborative Digital Workspaces (Google Docs, Slides, and Sheets)
 - Training via Google Suite Modules
 - Review & Assessment via Trained Instructor
- ◆ Flipped-Classroom Activities
 - Guidebook on creating in-class activities for *FCM*
 - Links to Youtube videos on creating in-class activities

→ **For Client and ID To Use**

- ◆ For Training
 - Google-Certified Trainer
 - Workspace for Training Workshops
- ◆ For Resources
 - Word Processor (for Handbook and Guidebook, if not purchased)
 - Cloud Storage (for materials and professor-created templates)
 - Data Collection Software (for benchmarking and analyzing environments)

Product Specifications

This section will provide more specific details about items that were listed above but require further explanation.

The *Handbook on Blackboard FCM Fundamentals* will be either be purchased by the department or authored by an expert in the *FCM* as sponsored by the department. It should provide a step-by-step guide for how to leverage Blackboard in order to successfully manage a *FCM* class, including instruction on how to facilitate online discussion, gauge student engagement, and organize resources for classroom use.

The *Collaborative Digital Workspaces* provide key opportunities for the professors to engage with students in collaborative activities both in-and-out of the classroom. We've selected the G-Suite (including Google Docs, Slides, and Sheets) for this. While it is possible the client could request their instructors to become *Google Certified* at the lowest level for this, we believe that this much time is not necessary. Instead, the client can select certain modules on Google's free training site to assign to instructors, and can review and assess their abilities without the certification exam itself.

Data Collection Software will be determined based on how the client's colleagues approach the step (1.1.2) - "Establish Evaluation Methods." For example, the client may determine that measuring student engagement in the classroom is important enough to install a software that instructors can use to record each question that students may ask during class sessions. This would fall under this particular resource. Of course, each of these data collection methods would require universal training among instructors to ensure that data is collected in a consistent and reliable manner.

Evaluation

The client has requested that the department make the shift to the *FCM* with enough time to be prepared for the beginning of the fall semester in September. As a result, the evaluation of these changes will begin in the fall and take into account each of the measurable objectives listed above.

The objectives of *increased attendance* and *increased test scores* are straightforward, as there is already a system for measuring each of these things. The objective *increase demonstrated depth of thought* will rely on a more qualitative approach, so we recommend that the client establish a system in which professor document their reflections of their students' general thinking on a bi-weekly basis. Then the client should interview the professors to observe any changes from their perspective.

The final objective of *increase meaningful engagement in class* can arguably be measured by the asking of relevant questions. One way we can evaluate this is by instituting a simple system for tallying or recording the questions that students ask. For example, instructors could have students submit their questions through an online form before class begins and tally those submissions.

Evaluation will take place throughout the semester, but the data analysis and report will occur at the end of December after the final test scores have been calculated.

Reflection

Describe any limitations or constraints for completing the project. This could be limitations such as technology, time, learning competencies, and conditions.

As a general statement, I am hesitant about helping a client implement a new model of instruction (warranting dramatic changes, at that) that they are not personally experienced with using themselves. Making this instructional model sustainable for the Physics department would mean ensuring that the client himself fully understands how to assess whether or not it is being implemented by his instructors effectively. "Reading a few articles" does indicate this level of expertise on the subject.

Cost is a clear constraint, but is technically mitigated if the department's professors are truly bought-in to the implementation. This is because most of the resources for this project are either completely free (Youtube, Google Suite, Google Online Modules) or have already been purchased (Blackboard). That said, paying for traditional on-campus training from both the Google Trainer and a FCM Instructional Designer is likely expensive.

As mentioned above, another constraint is professor motivation. While it is not necessarily a better strategy to both mandate and compensate instructors for switching to the *FCM*, it could be difficult to get professors to fully engage with their training if there are no explicit incentives for their participation.

Finally, we are assuming that the professors will be competent with online technologies if they are trained to use it. This may not be the case, and would become a big part of the professional development (or hiring) process for the department.

What more did you feel you would need to know to be able to complete this?

It would help to know the professors' experience with the *FCM* or facilitating any degree of online instruction. If one or more of the relevant instructors had this experience, it could be leveraged into a more streamlined plan for training and implementation.

Also, it would be useful to have specific data on several items, including student attendance, student survey responses, and test scores when compared between different professors. Although all of this should come about during (2.1) - "Assessment of Entering Behaviors," it could help to draft a clearer plan of attack.

Finally, it is a safe measure to always check on existing resources (whether human or material) that the client already possesses. For example, if the university at-large possesses a staffed

instructional designer, then we could reduce costs and increase efficiency thanks to the familiarity of their work.

What questions did you wish you or someone else had asked during the client interview?

Aside from the responses given to the previous question, I wished that someone had asked about whether the client was willing to become rigorously trained on implementing the model himself. Department chairs typically operate on a “lead by example” system, meaning that it could prove useful to have them go through the training first. It could also highlight at an earlier stage whether the client believes the implementation is worth the costs it would create.

In addition, I wished someone had asked how long the client expected to keep their current position at the university. The sustainability of such a project demands the committed work and leadership of the advocate, so it would be worth considering the long-term effects of a client that has unclear plans about their distant future.

Work Cited

Romiszowski, A. J. *Designing Instructional Systems: Decision Making in Course Planning and Curriculum Design*. Kogan Page, 1999.