

Dynamic Instructional Design (DID) Model

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Introduction

Designing high quality, technology-infused instruction is important to student learning. The Dynamic Instructional Design (DID) model is used in the design phase of the Design-Plan-Act (D-P-A) system for developing comprehensive, quality instruction. The focus of this paper is on the steps that make up the DID model: 1) Know the learner, 2) Articulate Standards-Align objectives, 3) Identify teaching and learning strategies, 4) Select support technologies, and 5) Assess and revise. These steps are a guide to simplify the design process and to make sure the developer does not miss a step while developing content.

Know the learner

The learners that I will use as a part of the DID model are enrolled in the department of computing sciences (CSCI) at Coastal Carolina University (CCU). The students are primarily working towards a degree in information technology or information systems; however, computer science students may also take the course as an elective. On the surface, there are two types of students in the course, degree-earning and degree-earning with honors. The honors students are enrolled in the university honors college and must meet a higher set of standards, such as earning a 'B' in the course, and completing additional research-based assignments during the course.

Delving deeper into the class makeup, there may also be students who are given special accommodations from the office of disability and accessibility. These student's accommodations can range from longer time periods to take exams to having a note taker in the classroom during class. Included could also be students who require accessibility devices, such as screen readers. Students do not have to identify unless they need accommodations. I ask for general feedback on

course needs during the first week of the course for all students. The survey is located in the Moodle learning management system (LMS) and is a simple, open-ended essay question.

The students complete three personality tests as a part of the course. The tests are similar to the Myers Briggs test (MBTI): 1) Human Metrics Jung Typology test, 2) Personality Type assessment, and 3) Keirsey Temperament test. The students reflect on their personality types and compare them with other members of their project group (See Appendix A for information on the personality tests). I use the personality scores and the reflections to determine whether to assign groups randomly or to allow students to form their own group. I also use the scores to develop scenarios that will cause changes in the project scheduling, to change the project management suddenly, to remove a member for a period, for example. These scenarios will force teams to think of contingency plans when initially planning their project and how they will work together as a team. Communication feedback helps me determine the best time to form groups before a project begins (the first week of class or in the days just before the project begins) for the next class rotation. During the timeframe between the fall face-to-face course and the summer online course, I used the MBTI reflection and the end-of-project group survey to make changes to the structure of the course due to the shortened length of the summer I session.

All results of the personality tests and reflection are uploaded into the course LMS and students are required to post their findings in a discussion forum. Once they post their own results, they are required to reply to other peer posts. This discussion allows students to see who has similar characteristics as well as how they are interacting in their project groups. Most often students mention procrastination, being an introvert, and communication, as their own characteristic or someone else on the team. If the students believe they are an introvert, they want to work with an extrovert. Since we are no longer in a paper world, the students want to work

with another student who is a self-starter because most of the content is stored in a digital portfolio and it requires someone to set it up early for the team to work on documents in a timely manner.

After teaching this course in Fall 2018, I realized a valuable component of project management was missing...the actual project. This semester was the first time students would be exposed to planning, designing, implementing, and presenting a project. So because I did not have previous assignments or objectives for this type of assignment, I did not form groups until the fourth week of class. The students who were procrastinators (or not self-starters) did not begin communication in their group until the sixth week or later, even though they were completing activities during class that focused on deciding on a project, writing a communication plan, and writing a project charter. When students completed the end of project survey, these early activities were mentioned as a failure point for their project and why they could not complete the planned implementations. Given this knowledge, I moved group formation, e-portfolio setup, and communications contracts to the first week of class.

I have not had to modify my course to address students who need accessibility accommodations. However, the course is built to satisfy accessibility requirements and standards for the university in Moodle. All information for the course is electronic and in plain text so if there is a need for screen readers, students should not have an issue with the reader software. I plan to have any video material redone with closed caption. I added more project-related resources that have accompanying tutorials, so students do not rely solely on me to provide setup instructions. The honor students in the course are required to complete additional assignments that require research. For example, honor students may research cost-benefit analysis in large companies versus small startups.

Articulate and align standards

The standards set for the project management course are governed by the department's ABET accreditation body. The standards are as follows:

1. Discuss issues using project management terminology consistent with that found in PMI's Project Management Body of Knowledge (PMBOK)
2. Understand and develop scope statements, work breakdown structures, software project cost estimations, CPM and PERT
3. Demonstrate understanding of risk management, resource scheduling and Earned Value Analysis
4. Use project selection techniques to compare potential projects
5. Demonstrate technical writing skills through the development of PM artifacts
6. Discuss issues related to management and leadership with team projects

The performance objectives for this lesson will align with number 6 of the standards. Students will form a group to plan, design, and implement a project within the triple constraint defined by the project management body of knowledge (PMBOK).

Performance Objectives and Lesson

- A. Students will be able to choose leadership roles to support a project team.
- B. Students will be able to identify e-portfolio software to store project documents.
- C. Students will be able to define a communication contract that will govern team expectations.
- D. Students will be able to prepare a project charter that explains their project scope, time constraint, and quality criteria.

The lesson is loosely based on the 5-step lesson plan. Since I do not believe implementing a project is similar to teaching math to a 5th grader or explain social studies concepts to a 7th grader, it is difficult for me to follow any plan that lays out task for a single day. Most activities in project management will need completion over several days. Table 1 shows the steps for the lesson as it applies to performance objective D.

Table 1. Project Charter lesson

<p>Pre-Planning:</p> <p>Objective: Students will be able to prepare a project chart that explains their project scope, time constraint, and quality criteria.</p> <p>Connection to standard: The objective connects to standard 6 because students use management and leadership skills to describe the scope of the project to their stakeholders and specify an end date for the project deliverable.</p>
<p>Assessment: Students will show progress toward this objective by developing a document containing a concise statement of scope, a specific end date for the project deliverable, and determine how to measure the quality of the deliverable based on stakeholder requirements.</p> <p>Materials needed: Students will need the provided project charter template and their e-portfolio developed for their team (performance objective B).</p>
<p>Lesson Cycle:</p> <p><i>Opening</i> [5 minutes]– Explain to students the significance of the project charter to the stakeholders and how it represents a contract between the project team and the customer. Connect the need for the project charter to exist in the ‘live’ documentation in the e-portfolio.</p>

Introduction to new material [5 minutes] – Show students an available template of the project charter and a completed example. Emphasize the importance of completing each section to include scope, time constraint, and quality of deliverable. Also included is an agenda for a kick-off meeting and area for sign-off signatures from the team and the customer, approving the agreed upon terms.

Guided practice [15 minutes] – Provide an example of a concise and informational scope statement. Discuss the major parts of the scope statement. Inform students of the project deadline (usually first day of last week of the semester). Discuss necessary topics for kick-off meeting to aid students in developing agenda.

Independent practice [24 minutes] – Students will work with their team members to create a draft of the project charter for review. Feedback from the review will allow students to finalize a copy for submission and sign-off.

Closing [1 minute] – Students are asked to submit document by 11:55pm and refer to associated discussion forum on Moodle.

Modifications and Reinforcement:

Reinforcement - Students are asked to submit project charter document by 11:55pm and summarize the importance of the project charter and how it will be used moving forward in the project, in a discussion forum. The original forum post will be a single team post and the project manager is required to reply to another team's post.

Modification – Learner diversity is addressed in the team communication contract; however, honor students are asked to be the project manager for their team for the project planning phase. Accessibility is addressed case by case based on student needs (and again within the team's communication contract).

Teaching and learning strategies

The teaching strategy I use in project management is slightly different than what I use in teaching a programming language because this particular course is project-based. In programming language courses, the semester project is in support of the learning. For project management, students learn while implementing a project. I assist students in achieving the goal of each lesson by providing an overview of the topics for each project phase, not an overview for the entire class. I also connect them to resources that include a professional view into managing project and templates to use, so they do not have to re-invent the wheel when formatting documents.

There is a repetitive cycle for each phase of the project, so if students see the pattern of implementation, they can easily learn to repeat the steps for future phases. Feedback at the end of each lesson and at the end of each phase is critical for students to learn and move forward through their implementation. I also provide examples of documents (deliverables) for a completed project, so students can mimic the discussion in their own plan and support documents. Examples documents would include agendas, a design plan, and meeting minutes. Learners need to understand terminology, read requirement and example documents carefully, communicate early and often with team members, and use additional resources efficiently. The most important tools for students are the PMBOK, the project management bible provided by the Project Management Institute, Moodle, and their own e-portfolio. Collectively, these items provide a knowledge bank and history for their project.

Evaluating success is important and goes beyond simply presenting their end product, so I use rubrics to assist with providing feedback for each set of deliverables (see Appendix B for an example rubric). As I will mention in the upcoming technology section, rubrics are an area for

improvement in this course. Recently, I received examples on creating useful rubrics that are complete and clear for learners to understand. The rubrics developed at this time do not meet standard. The students present their end product in a final presentation, where all groups members are responsible for a portion. They must introduce the project, the reason for the project, its timeline, and a demonstration of the final product. Prior to this presentation, students presented 1-minute and 3-minute project pitches to help with presentation skills.

These teaching and learning strategies align with standards and objectives by presenting students with an opportunity to manage a real-world project. With this opportunity, students are honing their management and leadership skills, considering methods to choose feasible projects, working with work breakdown structures to schedule project tasks, and performing cost-benefit analysis. Additional soft skills include presenting to a medium-size group (verbal), writing, and working in teams.

Technologies

The primary technologies I use in the course relate to presentation of information. These include Moodle and MS PowerPoint. Moodle is invaluable, as it allows me to create books of content and external resources. I can also quiz students on project management terminology. Students post and reply to discussion forums and view their grades and grade feedback. I also use Trello to create groups and assign planning boards. These allow students to see when assignments are due and provide detail requirements as well as examples and external resources. This is different from Moodle in that it is a collaborative board for which students can drag and drop tasks and chat with students and me concerning tasks. I provided a whiteboard/sticky note collaboration board.

The students use a variety of technologies in this project management course, many they have not used prior. Starting with Moodle, which they use for discussion forums and viewing requirements for the class, the students must also become familiar with Google Drive or One Drive to build their team portfolio. This e-portfolio is the most vital tool for the students since this is the storage and historical view of their project. Gantt project is a free tool that takes the place of MS Project and allows student to create work breakdown structures, timelines, PERT charts, and Gantt charts. With this information, students can see when they are falling behind in the projects and what tasks are on time. The use of Trello is new this coming fall and students will use my group board to view task timelines. In future classes, I will require students to create their own board for their team and share it with me for viewing. The students, especially online students, will need to use Camtasia (for purchase) or Echo360 (free via CCU), to record video presentations.

Assess and Revise

Since Fall 2018, I've reviewed new technologies for the project management course. A major pedagogical addition has been the project. With its requirement, the new technologies became instrumental to assisting students in thinking about project management in a more application-oriented way. Before the project, students learned terminology and worked through simple exercises. Now students are using a variety of technology to solve a real-world problem. I have the expectation that their analysis and writing skills will improve. Also, because they are required to present pitches for their project and work in teams, I believe their presentation and communications skills will improve.

References

Types of lesson plans and templates. (n.d.). In The Online PD. Retrieved from <https://theonlinepd.wordpress.com/p-3-lesson-planning/types-of-lesson-plans-and-templates/>

Appendix A

Personality Tests

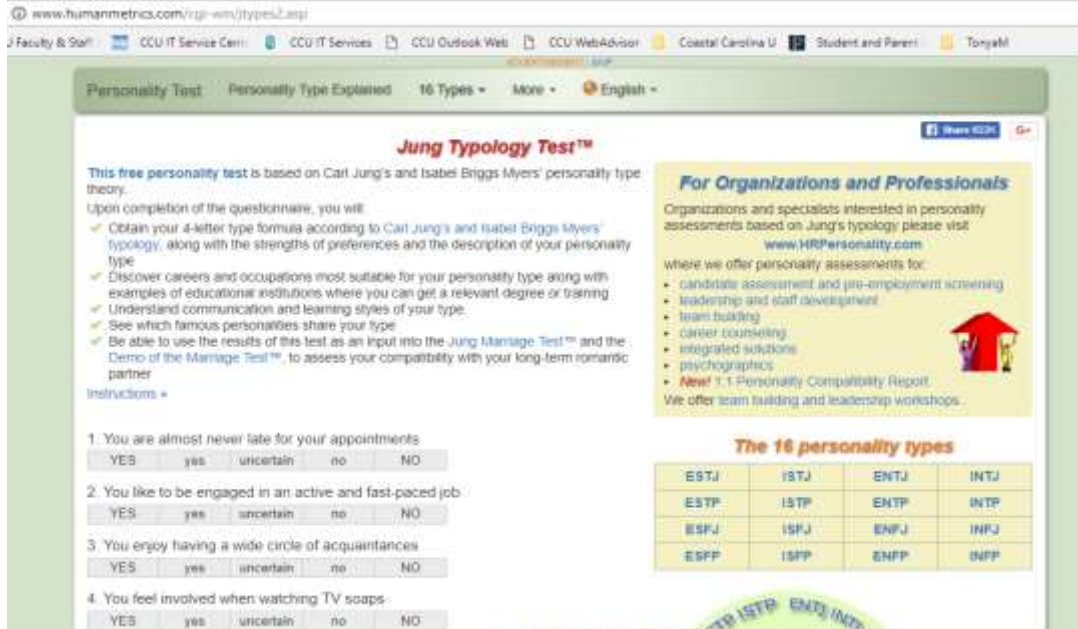


Figure 1 Free personality test based on Carl Jung and Isabel Briggs Myers' personality type theory

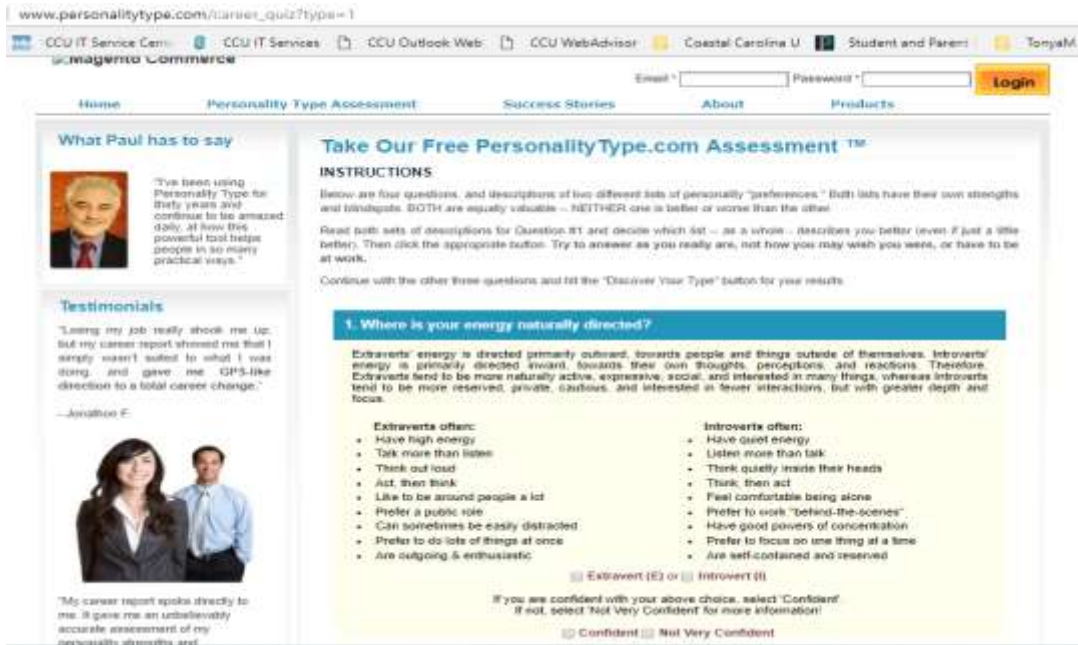


Figure 2 Free personality test created by Paul Tieger

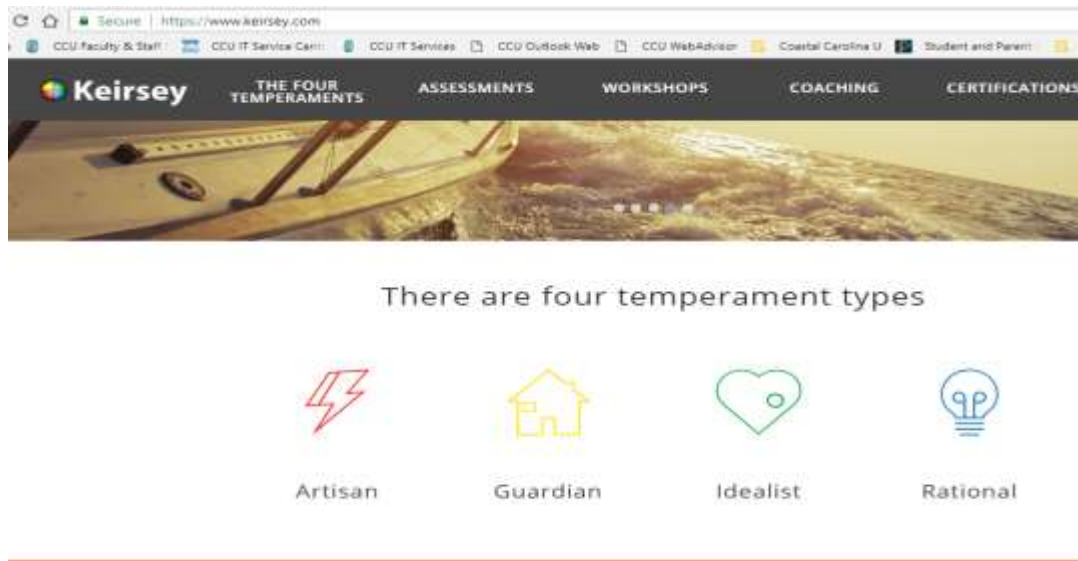


Figure 3 Personality test based on research on temperaments by David Keirsey (Keirsey Temperament Theory)

Appendix B

Project Management Process

Rubric grades completion of student project based on project phases: initiating, planning, executing, monitoring and controlling, and closing.

Grading is based on submission accuracy and percentage completion of project phase and deliverable.

Feedback is provided in the far-right comment column.

Score to grade mapping rules

Submission	Submitted using team portfolio and link provided in Moodle <i>10points</i>	Submitted team information, but not in team portfolio <i>5points</i>	No team submission <i>0points</i>	
Deliverable	Submitted all required documents <i>30points</i>	Submitted 75% of required documents <i>20points</i>	Submitted 50% of required documents <i>10points</i>	Insufficient document submission <i>0points</i>
Format	Follows APA style <i>10points</i>	Minor errors (2-3) <i>5points</i>		Major Errors - insufficient to say that APA was followed <i>0points</i>
Content	Each deliverable contains necessary content with minor to zero errors; Represents the quality needed for the project <i>50points</i>	Each deliverable contains 75% of necessary content and represents most of the quality needed for the project <i>40points</i>	Each deliverable contains 50% of necessary content and represents little quality for the project <i>25points</i>	Each deliverable contains little of the necessary content and has little quality for the project <i>0points</i>