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Utah Valley University Aviation Science

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A thesis submitted to the faculty of
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Master of Science

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ABSTRACT

Utah Valley University Aviation Science
Course Development Training

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This report details the development of a training program intended to teach instructional designers (IDs) and subject matter experts (SMEs) how to develop online courses. The training was developed for Utah Valley University's Aviation Science department in order to help meet a course production deadline. The development process follows the Diamond model and a variation on that model was used in producing the training course. Once the training had been developed and implemented, qualitative data was gathered from both IDs and SMEs to help evaluate the training. Additionally the development time and cost for each course was analyzed. The training was shown to have improved production time and in turn, reduce the cost of each course. However, the feedback from the SMEs and IDs indicated that while the training was informative, the use of animated video and narration was less helpful. The biggest improvement was seen to have come from the IDs own improved understanding and confidence in developing their courses.

Keywords: subject matter expert, course development, online education

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Introduction

In May of 2010, Utah Valley University's (UVU) Aviation program undertook an

ambitious project to develop online versions of 49 of their courses. This project was meant to

produce courses that could replace those of a third-party vendor whose contract is set to expire

July of 2012. The Director of Online Education tasked me with producing a course development

process with documentation and training that could produce the courses before the deadline.

This project reports on the creation of that course development process.

Sponsor/Client

The Aviation Science department at UVU has created the Online Education department

and tasked it with the project of creating a total of 49 courses by August 26, 2012. In the first

eight months of the project, the new department had hired about half of their proposed team of

developers, established a process, and begun work on the first course. I was hired, part-time, six

months into the project as their second ID. The Director of Instructional Design was the only

other ID, and he had developed the process they were using to create their pilot course. Shortly

after I was hired, he resigned from his position, leaving their pilot course incomplete without

documentation or anyone who could successfully follow his development process. Between

November of 2010, when the full-time ID resigned, and January of 2011, the department

underwent some restructuring. I was moved from a part-time ID position to full-time and tasked

with creating a new course development process, and training for new SMEs and IDs.

Evidence of Need

In 2009, the Aviation Science department began evaluating their curriculum and

determined that it needed to be revised. While they worked on the planned revision for their

curriculum, they noted that in many ways their courses lacked rigor. Currently, UVU is under

contract with a third-party for their online courses. These courses consist mainly of readings, a

midterm, and a final exam. Students have been known to complete these courses with only a few

hours spent on the course web pages and at times they can do so without even accessing any of

the provided online readings. This indicates that many of the current courses do not require

students to interact with the provided content. While this could be a result of students who

already know the material or who are adept at finding the necessary answer through other

materials, it calls into question the relevance and value of the course content itself. If the

provided content is not adding to the student's knowledge, what value is the student receiving

from the course beyond the credits required for graduation?

In the article, "The demand-driven learning model A framework for Web-based

learning," MacDonald, Stodel, Farres, Breithaupt, and Gabriel (2001) summarize some of the

criticisms or concerns that typically surround Web-based learning. Some of these include

increased time for planning if the faculty has to design the course, a change in the role of the

instructor from teaching to simply administrating, and lower quality of instruction. Similar

concerns were noted by the aviation department as they reviewed the current online courses

provided by the third-party contractor.

To address these concerns, the following conditions were outlined:

- the design and planning of the course would be done by ID's and SME's so as to allow
  the faculty to continue teaching,

- the faculty would need to assume a much more involved role in administering their
  courses and learn to encourage online interaction and collaboration with and between
  their students,

- the instruction would need to be shown to meet the needs of the students (MacDonald et
  al., 2001).

If this project is unable to produce all of the required courses, the AVSC department will have to renew a costly contract with the aforementioned third-party vendor in order to continue offering their online courses. That contract costs one million dollars a year, and the contractor retains ownership of the courses.

It is estimated that over 100,000 dollars was spent last year (May through December) on developing the original process and the first course. These figures are broken down in Table 1 (Appendix E).

During the first round of development, many media-based resources were developed, but the process itself was difficult to use, demanded too many resources and too much time, and failed to produce a complete course. Specifically, it did not account for creating a syllabus, learning objectives, assessments, assignment rubrics, or the specific duties of the SME and ID.

A new course development process was needed that could produce the basic elements mentioned above. This process would need to allow the ID to work on multiple courses at once, be easily understood and repeatable, and complete a course according to a set schedule. A complete course is defined as one that is based on clear learning objectives and includes the following: a syllabus, weekly assigned readings, self-check quizzes for each reading, authentic and original examples of applied principles, assignments that assess the learning objectives, a midterm, and a final.

Circumstance/Constraints

There are several time constraints that exist as a result of an August 26, 2012 deadline, as well as from UVU policy. Because there are 49 courses that need to be re-designed, almost all of the courses need to be worked on simultaneously. This requires each ID to work with at least 4 SMEs at once. Additionally, UVU only allows a contract worker to work 6 months. The ID can continue development, but the SME must create most of the course materials in that time.

Finally, three to four courses have to be finished each month on average in order to meet the deadline.

As with any project, the budget restricts how much can be done. In this case, the number of positions and the type of positions is the most evident constraint. There are only six full-time positions: the director, one-full time ID, one Flash developer, one Web Programmer, one Senior Web Developer, and one Instructional Technologist. These supervisors are only able to spend a small amount of time actually producing courses, so much of the production work is done by 13 part-time employees. Five of those positions are on the instructional design team, leaving only eight employees to work on developing original games, videos, and simulations. While all 49 courses could benefit from media elements, there are not enough resources to produce original media elements for every course. Additionally, much of this year's budget has been used in the purchasing of 14 new iMac computers as well as servers and other necessary software and equipment, totaling over $50,000. Even if the budget were to be increased, at this point there is no additional space to add another workstation.

These constraints determine how long each course can remain in development, how many people can work on it, and how many media elements can be produced. This has a strong influence on the design of the process itself as well as the development of training.

Detailed Preliminary Analyses

In order to develop a new process for course development as well as to provide adequate training, a preliminary analysis was conducted of the target populations, the current process, and the available training. This provided valuable insight that helped to direct the development of the training for the new course development process.

Target population analysis. Both the IDs and the SMEs involved in designing courses for the UVU Aviation Science department are included as a target population. The ID will give

the training on the process to the SME, and both populations have characteristics that need to be

considered.   First, all but one of the IDs that have worked for the AVSC department during this

project have been hired for part-time positions. This position has consistently attracted people

who have only recently graduated from a master's program or who are still working on a

master's degree. Additionally, while there have been both men and women, they have all been in

the range of late 20's to early 30's in age. This places them at the beginning of their careers, and

they have all approached their tasks with an eagerness to learn and gain experience. They have

not had much, if any, experience being solely responsible for a course and its assigned SME.

This means the process needs to be simple and well documented to help make it more repeatable

with less supervision, as well as open to allow for new ideas and creativity. Because these are

some of the first courses these designers have been responsible for, it is important that they

experience success and a sense of ownership.

The SMEs, in contrast, are generally well into or approaching the end of their careers. In

order to even be considered for the position, they have to have a master's degree. In addition,

many of the positions have received several applicants with extensive work histories. The

majority of the SMEs have also been men. Besides their aviation background, many are also of

other nationalities and most from other parts of the U.S. Most have done some training or are

faculty members of other universities. This presents a challenge when the SME starts with the

impression that all they need to do is present UVU with the materials they use for similar

courses. All of these factors have complicated the already complex nature of the ID-SME

relationship as it is discussed below.

Speaking generally about IDs, Keppell (2002) describes them as anthropologists working

to understand a foreign culture. That is certainly true of a situation where the IDs employed have

no aviation background. Barab and Duffy (2000) contend that "a community has a significant

history, a common cultural, and historical heritage. This heritage includes the shared goals, belief

systems, and collective stories that capture canonical practice," (p. 14) and that "individuals must

develop a sense of self in relation to a community of practice and this can only arise by

enculturation into the history of the community," (p. 15). According to Barab and Duffy, "It is

only through extended participation in a community that this history and, hence, this sense of

self, can develop" (p.15). The aviation community of practice requires hundreds of hours of

flight time before a pilot can be hired professionally, but once finished, they are at home in the

aviation community. The IDs do not have the luxury of spending hundreds or even dozens of

hours before they are asked to develop an aviation course. In order to create authentic learning

experiences for aviation students they need a valid entrance into the community.

To distinguish "practice fields" and "communities," Barab and Duffy mention three

important aspects of a community: a substantial community with a significant history, the

members and community are part of something bigger, and the "opportunity to learn in the

presence of, and become a member alongside, near peers and exemplars of mature practice—

moving from peripheral participant to core member," (p. 17). Learners, in this case students of

the AVSC program, participate in years of legitimate peripheral participation, ranging from

listening to faculty and other pilots instruct and share experiences to experiencing flight

themselves. They inherit the goals, beliefs, and stories of the community over time to become

"core members." It is impossible for an ID with no aviation background to achieve the same

status as a core member in a community of practice in 6 months of development. However, they

can gain access to core members—SMEs—and with them all the goals, beliefs, and stories that

are important to include in the courses they are developing.

The situation in this project is particularly unique because of the time limits placed on the

course and because the SMEs hired to help, while certainly core members of their own aviation

community, may not hold the same position in the community at the Provo airport. They are certainly experts in their field; they may not, however, understand completely the academic environment that surrounds this particular flight school. And while most have extensive experience training and teaching, dealing with online courses creates a different situation where the ID is much more at home than the SME.

Communication skills are essential in order for the IDs to accomplish the tasks before them. They need to understand the perspective of the SME and communicate their respect for the SME's expertise, while at the same time reaffirming the role of the ID as the designer of the course. The ability to listen and reteach, as well as map concepts to make sure they have understood correctly, is also very important. These are all things that can be accomplished through personal interviews and regular contact with the SME and involving them closely on the project (Keppell, 2002).

Current training and resource analysis. The current documentation of the training and process documentation is incomplete and difficult to follow. Figures 1 and 2, and 9 through 17 in Appendix B, are worksheets that were used as part of the original course development process. However, there exists no documentation to indicate how or when they were used or if these worksheets were completed by the SME, ID, or someone else.

Worksheet A, Figures 1 and 2 (Appendix B), outlines questions regarding the course and how it fits into the curriculum at UVU. Some of these questions are useful in designing the course itself, but the SME would be unable to answer most of them. This worksheet was never actually used because the SME that received it could not answer most of the questions and the ID was not familiar enough with the course to provide the information.

Worksheet B, Figures 3–9 (Appendix B), covers several important questions about the nature of the subject material. This would be important information but the implementation of

the worksheet is unclear. Was the ID to use it as a prompt or simply give it to the SME and wait

for its return? Each figure represents one page in a packet.

Worksheet C, Figure 10 (Appendix B), is the only worksheet of the group that was

actually used in developing a course. However, since the SME was asked to produce objectives

for each column without any further direction, the result was less than ideal. For a course with 14

modules, the SME produced anywhere from 300 to 450 one-sentence objectives for each module

ranging from objectives like, "Students will be able to define lift," to "Design a rocket

propulsion system with optimum fuel injectors for the combustion chamber," with little direction

on what to do with them.

Worksheet D, Figure 11 (Appendix B), was intended to be the last worksheet used to

direct the course development. However, beyond listing the topic and the related objective, it is

unclear what was intended to go in the other columns.

Besides being confusing and lacking implementation, the worksheets produced a more

severe consequence. They ended up, whether intentionally or not, being used as the medium for

communication between the SME and ID. I.K. Davies (1975) depicts the relationship between

the ID and the SME as one of collaboration and states that such collaboration should be "a

process directed towards the achievement of some mutually agreed and valued instructional

result in accord with the organization's mission" (p. 355). Achieving this goal requires more than

passing documents; again, communication is key. Keppell (2000) mentions personal interviews

as an effective tool to not only gathering information, but also for building a dynamic

relationship and making sure both experts are working toward the same goal.

The Director of the AVSC Online Education department has allowed this project to be

developed as part of the regular work schedule of the full- and part-time employees involved.

This allows for the use of the department computers as well as contracting with a voice artist for

the narration of any videos. In addition, acting as the full-time ID on the project, will be able to

assign tasks to two part-time ID's, a producer/editor, an editor, and a flash developer. I have

proposed a timeline of one month for production with the understanding that the planned

materials will be produced no later than October 2011.

Design Goals and Success Criteria

Utah Valley University has established an Instructional Technology Richness (ITR) scale

that gives every course an ITR rating from 1 to 4. This rating looks at various aspects of the

course, from the syllabus to the media, and rates it based on its instructional effectiveness and

consistency of use throughout the course. A course that is rated as a 3 or 4 would need to have a

high level of interaction between the instructor and student as well as between the student and

course materials. A similar scale will be used to direct the design and evaluation of each course

in this project.

The goal is to create a training course that illustrates the kind of course the ID and SME

are expected to produce. This means that it would need to include a full syllabus as well as

examples of interactive games and media resources. This would place the course between an ITR

3 and 4 as defined by UVU Distance Education. The training will consist of 8 presentations and

4 accompanying PDF readings. During the initial implementation of the training, six courses will

be created by different IDs and SMEs. Once the courses are completed, they will also be

compared to the ITR rubric. If the SME/ID teams are able to consistently produce courses

according to a set timeline at least at an ITR 2, the process and training may be deemed a

success.

Training Course Design Process

Gustafson and Branch (2002) identify three classifications of ID models: classroom oriented, product oriented, and system oriented. The differentiation between the models deals mainly with the scope of the intended projects as illustrated in Figure 12 (Appendix C).

The project as commissioned by the AVSC department falls under the Systems category. Within that category, the Diamond model is an appropriate fit for this project, as it takes into account the university's goals and environment. Currently, the project would be in Phase II of the Diamond model as illustrated in Figure 13 (Appendix C), as the higher level analysis of the university environment has already been conducted by the UVU AVSC department.

As each ID works on their assigned courses, they move through the steps in Phase II of the Diamond model. However, because of the constraints on the project, this model has been adapted in several ways. Both the ID and the SME receive specific training and direction on the required course elements that need to be produced. These consist of the following:

- Learning objectives

- Course schedule, curriculum, or blueprint for development

- Reading assignments from the assigned text

- Example application of principles from reading

- Reading review quiz

- Assessment as needed for the learning objectives

- Midterm and Final exams

- Syllabus

In order to produce these elements, the SME receives training on producing learning objectives to introduce them to the first step of the Diamond model, Determine Objectives. Once the objectives have been specified, IDs will receive additional training that will walk them

through the process of creating the curriculum and each course element. These two trainings are

what this project will create. Their development will follow the second phase of the Diamond

model with the two trainings inserted directly before and after "Determining Objectives."

<div align="center">**Training Course Design Document**</div>

This project will produce a training course for SMEs and IDs on the course development

process used in the UVU Aviation Online Education department. The training will outline the

materials both the SME and ID are expected to produce in developing a UVU AVSC course. The

actual courses produced will test the understanding of the SMEs and IDs, and provide a guide

and checklist for the elements to be produced.

Physical Description

The final training will contain the following elements:

- Learning objectives

- Course curriculum

- Eight video presentations

- Four accompanying PDF readings

- Example assignments and media from previously developed courses

- Reading quizzes

- List of deliverables or SME assignments

- Syllabus

The SME will access these materials online through Moodle, allowing them to access

them from any Internet connection. Initially the SME will click through slide presentations. Once

complete, animated videos and narration will take their place. These materials will be used by

the ID as the instructor and the SME as the learner as they design their assigned course. The lead

ID is responsible for maintaining and updating the materials.

Site and Hardware Requirements

The course itself requires hosting space on the UVU server with the AVSC department's Moodle install. The media developed for this course is meant to be of the highest quality possible. In order to view some of the example 3D media elements, the SME will need to have a high speed Internet connection and a computer with at least a 1Ghz processor and 2GB of RAM. Also, because the video and animation sequences are high quality, a minimum screen resolution of 1024 x 768 is needed. However, the SMEs will be able to view the essential training documents with almost any modern computer.

Structural/Conceptual Description

The structure of the training presents the SMEs with a framework for the current live course, and helps them understand both how to fill in the gaps for the new course and how much time they have to do it in. Additionally, it creates a collaborative workspace in Google Docs to promote regular contact with the ID no matter where the SME located, an important feature to the original goal of increased communication. Finally, it allows the SME and ID to define what the end goal is for the course, what components they need to create, what information is needed to create each component, and how the SME is expected to provide that information, while also allowing the ID to work with multiple SMEs throughout development to make sure that it all happens.

Goal Structures

The main objective for the training course is to enable the SMEs to produce the required materials, as specified previously, on or before the specified delivery date. This includes the following intended learning objectives and specific learning outcomes; the SME will be able to

1. Write clear and succinct CLOs that;

    a. identify the purpose of the course,

    b. are recognized as actions the students will learn to perform or traits the students should adopt, and

    c. are measurable.

2. Identify the specific tasks within the CLOs to write SLOs that;

    a. break the CLO into specific outcomes, and

    b. identify steps that would require their own lesson/instruction.

3. Create manageable chunks of course content by;

    a. grouping CLOs and SLOs into weekly modules,

    b. splitting modules into multiple lessons where necessary,

    c. identifying reading assignments from the assigned text,

    d. providing authentic examples of applying principles, and

    e. identifying supplemental readings where necessary.

4. Create formative reading reviews with questions that,

    a. cover main principles/ideas in the reading,

    b. focus on the same material that will be important for summative assessment, and

    c. help students identify areas for additional review.

5. Create appropriate summative assessments that,

    a. accurately measure the specified objective, and

    b. include a scoring rubric.

6. Outline a syllabus that informs the student of;

    a. the purpose of the course,

    b. the required assignments, and

    c. important due dates and policies.

These objectives help to illustrate that this training is intended as a crash course on course design. It is hoped that the SMEs will be passionate about the subject matter to the point where they have their own motivation for creating good instruction. This course is designed to make sure they have a basic understanding of what makes up good instruction. Working closely with the ID, the SME will progress through these objectives in a linear fashion. Once they begin developing materials such as supplemental readings, reading reviews, and assignments, the progression will take on an iterative aspect as they will produce these elements for each week of the aviation course they are designing.

Operational Description

The videos and PDF readings are used to provide the SME with a foundational understanding of what is expected of them. They receive the specifics of how and when from their ID as they work together. The additional media provided is used as an example of the types of quiz games they have the option of using as well the unique simulations that have been produced for other courses.

Use scenario. The training for the SME starts out by providing a basic overview of the whole course development process. It then provides a simple list of what the SME is expected to turn in to the ID and provides examples of each. There are two main modes for this. The first is a basic telling, providing the SME with a general idea of what they need to create. Since the telling is done mainly through online presentations or videos, the ID is free to interact one-on-one with the SME. This is the second main mode of instruction. Here the ID provides formative assessment and feedback for the SME and works through their questions with them. This helps them to be more effective in producing the foundation materials and more creative as they begin storyboarding the more advanced media based instruction.

Management. In order to spend more time developing the courses and less time on managing the development of courses, a simple checklist is prepared by the ID which allows the SME to see where they are in the process and understand at a glance what they still need to do. A sample checklist would look similar to the following list:

- Phase 1

    o Orientation

    o Objective List

    o Development Plan

- Phase 2

    o Module 1

        ▪ Reading

        ▪ Review

        ▪ Assignment

    o Syllabus

Much of the management is dictated directly by the fact that the SME is only allowed to work on the project for six months. They have too many materials to produce to do much more. It is left up to the ID to make any decision about whether the course needs more, or less, depending on the time available and the current work load of both the SME and ID.

Assessment. Hopefully the SMEs will have a fair understanding of what is expected of them and how to create it. However, there will likely be some confusion in how to phrase objectives or what is acceptable practice in using copyrighted materials. The ID is charged with catching any such errors and providing personalized feedback and adapting the instruction in order to avoid further problems.

Levels of assessment include a formative assessment of the materials submitted by the SME. This includes the initial draft of learning objectives and outcomes as well as drafts of assignments, quizzes, exams, the syllabus, rubrics, and supplemental instructional materials. Since no grade is given and no data is recorded, the depth of the assessment is completely decided upon by the ID. They may ask other IDs for help or suggestions when SMEs struggle, but ultimately it is their responsibility to make sure the required materials are produced in a timely manner.

Following the course development process/training the ID and SME are expected to include both formative and summative forms of assessment in each aviation course. The most common formative assessment are simple quizzes using the Moodle platform that allow for the use of a question bank as well as immediate feedback to the students. An incorrect selection results in a prompt to make another attempt. Summative assessment can take the form of more traditional exams or papers, but SMEs are encouraged to be creative in designing performance based assessment.

Design Documentation

This document is the first design documentation that resulted from this process. A similar document will be produced for the UVU Aviation Online Development department that will be used as a reference and training guide for new IDs. It outlines the entire development process. Wherever that process requires a deliverable from the SME, additional documentation has been created to provide the needed instruction. Accompanying that documentation is a worksheet or template that provides examples and a framework for the SME so they can see what is expected and how to produce it. Finally, where the SME is producing scripts or outlines for media or Adobe Flash® games to be developed, that documentation is provided to the development team, and they have created their own process and standards for how to produce the media.

Design Rationale

This project will produce a training course by following the Diamond model discussed earlier. The Diamond model has been used as the basis for all course production in the AVSC Online Education department, and is the process SMEs are expected to follow. Using the same model for the training course allows for consistency between what is taught in the training and what is expected from each course.

While the Diamond model has served as a good basis, in many ways it has been used in more of a descriptive manner, after initial design began. This is due to the fact that I came on as the lead instructional designer well after the project had been initiated and had to find a way to explain what had been done, and design a process that could complete the project in the given time frame. After analyzing the Diamond model and contrasting it with what actually takes place during most course designs, the process that has evolved is recognizably different.

It currently follows a few basic design principles that are evident in many development models, namely:

1. Identify learning objectives

2. Discuss what students need to know to meet the objectives and identify a source, generally a text book

3. Identify any gaps in the assigned readings and identify/create appropriate supplemental materials

4. Design assignments tied directly to the objectives

The training that this project produced is constantly evaluated by the IDs as they use it and it is adapted as needed to specific circumstances. However, while it is the intent to regularly evaluate every course that is included as part of the UVU AVSC curriculum, that evaluation is being postponed until the deadline is met. Once that is accomplished the ITR scale will be used

to evaluate the courses current level and identify a target level to guide course revisions. Currently, if the course contains the required basic materials and passes a simple review for content accuracy and usability, it passes. This review is conducted by at least two IDs and the Director of Online Education regularly conducts an additional review of random courses. It is then offered to students. However, the department does not have any dedicated testers or quality assurance employees, thus the department presents them as Beta courses, soliciting additional feedback from the students. Currently most courses actually fall somewhere between a 2 and 3 on the ITR scale previously mentioned.

Development of Training for Online Course Creation

In order to develop the training course, we first identified the objectives for the training. An initial draft of these objectives was provided previously under *Goal Structures* on pages 24-25, but they will be evaluated and refined. Once the objectives are set, the content will be gathered and draft scripts for video presentations will be created. These will help the development team begin working on the videos themselves while the scripts are edited and sent out to be recorded. The development of the initial training is projected to span 4 weeks on the following schedule:

- Week 1
    - Review proposed learning objectives and organize course content
- Week 2
    - Create slide presentations and draft video scripts
    - Edit
- Week 3
    - Revise and send scripts to audio
    - Begin storyboarding video

- Week 4

  o Create Moodle course with slide presentations

The Instructional Design team will be the first to review the training as well as being the first to be trained. The IDs, content developers, and web techs involved will have to understand the whole process in order to effectively contribute to the production of the course. Their training and involvement seems to be beyond the scope of this document, however, it has been documented and placed on the network drive for the use of the UVU Aviation Online Development Department.

Training Implementation

Once completed, the training will appear on the UVU Aviation Moodle site and SMEs that are hired will be directed there as soon as they accept the position. Their progress through the training will be monitored by the ID assigned to their course and they will maintain regular contact through e-mail and phone conversations, using Google Docs to submit their materials. The viewing of the training should be completed within a few days and the SME will begin drafting learning objectives. At that point, the ID will take over any necessary remaining training in a tutoring capacity.

Training Evaluation

Once implemented, the training will also enter the evaluation phase. As course development is an ongoing process in the AVSC department, the training will receive continuous feedback from stakeholders and revised as necessary.

Stakeholders. The stakeholders consist of primarily the AVSC department faculty. They commissioned this project and will be reviewing each course produced by the development process. Some of the faculty members maintain ties to the third-party that UVU previously contracted for the production of the online courses. This could pose a potential conflict of

interest depending on how heavily they are involved in the evaluation of the actual courses

produced, but will not affect the evaluation of the training produced for the IDs and SMEs.

Additional stakeholders include all those hired to work on this project in the AVSC

Online Development department. Their workload and jobs depend on the success of the

development process to produce courses and materials for them to work with.

Course evaluation standards. As previously mentioned, UVU's Distance Education

department has established a set of Instructional Technology Richness standards that they use to

evaluate their courses. These standards are listed in Appendix D.

The AVSC Online Development department has adopted these standards for the

evaluation of their online courses. They will be modified for the purpose of evaluating the SME

training, but will maintain the focus on the main categories listed above.

Formative evaluation. The formative evaluation will be ongoing as the AVSC Online

Development department makes use of the process. Once the SME has received the training they

are interviewed by their ID to check their understanding and get feedback on the training. The

IDs mainly will be expected to refine and improve the process as they use it, but any member of

the department can offer feedback. Also, the instructors that are assigned as instructors and the

students that take the course will provide feedback through end of course evaluations.

Summative evaluation and reporting. The summative evaluation will be at various

levels. Initially, the IDs are responsible for making sure the course is complete and conforms to

the ITR standards. Ultimately, the most important measure of success that has been determined

by the AVSC department is whether or not the process is able to produce all 49 courses by

August 26. They have not made any specific requirements on quality, level of technology, or

instructional richness. Moving beyond the immediate deadline of August 26, 2012, for the

project as a whole, the learning objectives for each course will receive a much more in-depth

review by the AVSC department faculty. Any revisions will have to be evaluated and

incorporated into future versions of the course. Additionally, the next large-scale project will be

to evaluate every course that has been produced, assign it an ITR level, and identify how to raise

its ITR level. Each course will be assigned a priority level by the Director of Aviation Online

Education. The results of this evaluation will be published in the corresponding development

project report via ETD at the Harold B. Lee Library.

Cost Projections

As mentioned previously, from May to December of 2010 the Online Development

department spent roughly $121,420 on the original development process and first course. From

January to May of 2011 the department spent roughly $139,000 on revising the development

process and testing it by developing three courses as illustrated in Table 2 (Appendix E).

The SME training is expected to take one month to produce. While producing the

training, the Full-Time ID will continue developing courses, but is expected to devote at least

half his time to developing the training course. It is expected to cost $5,500 as illustrated in

Table 3 (Appendix E).

Once the training is completed, it—along with the new process—is expected to greatly

reduce the cost of producing courses. One of the main ways it will do this is by reducing the time

the ID has to spend on each course. Over the course of six months, one part-time ID is expected

to be able to handle the development of roughly six courses. They are compensated on average

$19.33 per hour, with 29 hours a week, for 6 months (26 weeks), which equals $14,574.82. If we

divide that by the six courses they are working on, it works out to $2,429.13. This is almost

exactly ten percent of the cost of paying an ID to produce one course with just the new process,

and only five percent of the original cost of paying an ID to develop a course.

The artifact will be used until all of the required courses are completed, hopefully by August 26, 2012 deadline, at which point the production process is expected to shift focus to the maintenance and updating of the produced courses. New courses will continue to be developed but they will most likely not have the same time constraints or priority. Before the deadline is reached, each course will be evaluated by the AVSC faculty and the Director of Online Education and arranged by priority for revisions and media enhancements. Moving from there, the Director, along with the Instructional Technologist and course ID, will evaluate the ITR of each course as it is worked on and establish a new target ITR level.

<div align="center">

Project Outcomes

</div>

Once the objectives of the training were developed, scripts for videos were written, and the training entered production. However, not everything went as smoothly as planned, and the training cost more time and money than initially projected. After a necessary revision, the videos were implemented in training new IDs and SMEs.

Training Production

When the projected costs were calculated, they were based on the assumption that the full time producer/editor would be assigned to the project. By the time the project started, the producer had been assigned to a higher priority project and so this project was shared between a full-time Flash developer and a part-time assistant graphic designer. Initially, the Flash developer completed the entire project on his own in only 3 weeks. However, the animated videos produced did not follow the visuals that had been described in the provided scripts. The videos and scripts were reviewed and the scripts revised. This took an additional 2 weeks, and the assistant graphic designer was given the task to create the visuals based on the new scripts.

The revised version of the videos took an additional 6 weeks to produce. While they did not incur a significant cost, by the time they were finished, the project had taken 11 weeks instead of the projected 4. The estimated actual cost is detailed in Table 4 (Appendix E).

Additionally, during the revision of the scripts, the original eight PowerPoint presentations were condensed and summarized into four video presentations to more accurately reflect changes that had been implemented in the development process. The PDF readings were initially dropped since they covered no new material. However, they will be revised to cover the content in the video presentations and included in the course. This is discussed in more detail later. These changes are reflected in the revision of the learning objectives as listed below:

1. Write clear and succinct CLOs that:

    a. identify the purpose of the course,

    b. are recognized as actions the students will learn to perform or traits the students should adopt, and

    c. are measurable.

2. Identify the specific tasks within the CLOs to write SLOs that:

    a. break the CLO into specific outcomes, and

    b. identify steps that would require their own lesson/instruction.

3. Create manageable chunks of course content by:

    a. grouping CLOs and SLOs into weekly modules,

    b. splitting modules into multiple lessons where necessary,

    c. identifying reading assignments from the assigned text,

    d. providing authentic examples of applying principles, and

    e. identifying supplemental readings where necessary.

4. Create appropriate summative assessments that:

      a. accurately measure the specified objective, and

      b. include a scoring rubric.

The original goal structure as presented on pages 24–25 included the creation of quizzes and a syllabus. These are now tasks performed solely by the ID and are covered in a separate training. This has allowed the course development process to be compressed into as little as eight weeks, which has in turn changed the workload of the ID. Originally, it was intended that the ID would start one course each month, and development on that course would take four months. Each ID would be expected to work on a minimum of four courses at a time. What was observed was that it was more typical for development to spill over into five or six months for various reasons. In one particular case, this resulted in an ID carrying over eight courses at once in different stages of development.

Since the new process and training have been used together, IDs expect their SMEs to submit all materials for a course in as little as eight weeks. While IDs are still expected to carry up to four courses, this allows them to move through development much more rapidly. It has been observed that IDs have also had more time to work collaboratively, which has further enhanced development. Since the new process and the slide presentations were implemented in August of 2011, five courses have been completed and another seven are expected to be completed by the end of October. Four of those courses were started after August 1, and the other eight were completed ahead of schedule as a direct result of the collaboration of the IDs. Eleven more courses have been started since September 1 and are projected to be finished before January 2012.

This success is not solely because of the implementation of the training, but it has come about as the training and new process have allowed the IDs to take greater control of development. Now that they are driving the development more, they have gained a greater

confidence. This is evident in the IDs willingness to question materials and objectives as presented by SMEs. Rather than accepting things outright, the IDs have spent additional hours interviewing SMEs to make sure the materials align with the objectives. This in turn has led to greater collaboration and better courses. Something also needs to be mentioned about the experience level of the ID team. Most have little industry experience. For the majority this is their first position where they are directly responsible for designing instruction and most have only been in this position since March of 2011. As a necessity because of time constraints, the courses produced are mainly between an ITR 2 and 3.

It would appear that several factors have influenced IDs' own growth. First, actually completing courses, seeing students enrolled, and receiving positive feedback from the instructors has been instrumental in the IDs increased confidence. Second, the amount of interaction and feedback from SMEs, who have in some cases decades of professional experience, has reassured the IDs that the process works, and that they are very capable of producing quality courses. Third, having a simple process with clear objectives and training has eased much of the difficulty in communicating to the SME what is needed for the course, where originally there was a regular tension between some IDs and their SMEs because of confusion produced by the old process.

Training Implementation

As may be evident from the previous paragraph, the implementation of the training went fairly smoothly and has been fairly well-accepted. At least 15 SMEs have been trained using the slide presentations or the completed videos and all have expressed that they understand very well what is expected from them even before they begin the process. One SME specifically stated in an e-mail that, "The information in the videos is great and was scripted well." To make sure, the

IDs always work with the SME to produce a development checklist that outlines each element to be produced for the course.

As they have continued through development, it has been observed that, while what they need to produce is clear, most struggle initially with the how. The videos and the reading materials are lacking in this area as far as how to write lectures or authentic examples as well as how to produce the required elements of assignment descriptions and instructions. As originally intended however, the IDs have stepped in at that point and provided one-on-one tutoring with examples and specific feedback that have covered the lack in automated training materials.

While the training has been a big part of the overall improvements, as previously observed, it has been mainly the growth of each of the individual IDs that has been much more influential in the improved development time and quality of materials developed by SMEs. Where in the past it was not uncommon to receive anywhere from 5 to 500 objectives for a course it is now much more common to receive one clearly identified CLO per module with 3–5 accompanying SLOs. The following is an example of what one SME submitted:

- CLO 1: Students will discuss forms of airport organization and rules that govern airport management
- SLOs:
  - Students will identify Federal Regulations and advisory circulars that influence airport operations.
  - Students will discuss the ownership characteristics of airports in the US and Internationally.
  - Students will differentiate airport categories within the National Plan of Integrated Airport Systems (NPIAS).

- Students will explain the different regulatory agencies and trade organizations that affect airport management.

In addition SMEs are now regularly producing original reading materials and creative summative assignments that move beyond the simple quizzes and exams that were typical of previous courses. The feedback received from SMEs has been mostly positive, but has lacked any real substance. It seems that the training is fairly sufficient, however, in order to receive more detailed feedback a different method will need to be identified. Most likely the feedback will need to be gathered anonymously through survey or by an ID other than the one that trained the SME.

Improvements in the aviation courses are evident in many areas. The syllabus, produced by the ID at the end of development, provides more information to the students through a consistent presentation in each course. Previous online aviation courses were largely text and quiz based. The quizzes did not address higher level learning and often they were not tied specifically to course content. The new courses encourage both students and instructors to participate more in the course and interact with each other. There have been previous instances where students reported that they weren't sure whether they had an instructor or not. The ITR 2 standard established by UVU Distance Education has not been evaluated by a certified expert. However, the two full-time IDs as well as the Director of Online Education for the Aviation department have spent time comparing each course produced against the written standards mentioned previously under Standards on pages 28-34. All courses, except one which is discussed later, have been assigned an ITR 2 or higher by all three evaluators. In most cases all three evaluators also worked on the courses. More objective evaluations will be requested once an acceptable version of all courses has been produced.

Results

The training produced can be viewed at

http://moodle.flyuvu.com/sandbox_2010/course/view.php?id=2207. There is currently a guest

user set up with the username smeguest, and password uvuavsc1!. The following figures are

screenshots taken of the training.

Figure 14 (Appendix E) illustrates the main page and navigation.

Figure 15 (Appendix E) is a still image of the introduction video. This video is intended

to acquaint the SME with the main ideas behind the development process.

Figure 16 (Appendix E) is an example of the layout and design used in the PDF reading

materials. This is the same design used in the actual aviation courses.

Figure 17 (Appendix E) is a graphic representation used to help explain the purpose of

learning objectives. These are referred to in the training as Course Level Objectives and Specific

Learning Outcomes.

Overall the project, as part of a larger push to improve development, has been very

successful. However, the videos produced to replace the slide presentations have actually been

received with mixed feelings by the IDs. Where they could easily review a slide presentation

with their SMEs when needed, the SMEs typically view the videos on their own. When they do

have questions it is difficult to reference the exact point in the video to discuss with their ID.

While only a week has passed since the videos replaced the slides, it is fairly evident that

for various reasons they have not had a significant impact. Because of the nature of the videos, it

is more difficult for a SME to quickly return to a specific point and review information. Where

the slides allowed for much quicker skimming of material, the videos dictate the pace to the

SME. Though the videos do provide a much better example of the possibilities of media

production, this is currently irrelevant. No course during this phase of the project is even

considering multimedia simply because there is not time to produce it before the August 26,

2012 deadline. It has been proposed that the PDF reading materials be revised and included. The

revision is intended to make the readings more applicable to both SME and ID and at the same

time serve as a searchable reference in place of the videos.

Again, while the training in its various formats has been valuable as a tool to the IDs, it

appears that the growth of the IDs themselves has been more influential on improving

development. IDs that are confident in their own understanding of the process and what makes a

good course are willing and able to adapt the process as well as the materials submitted by their

SME to create a higher quality course. When IDs have tried to follow the process exactly, the

process itself has tended to act like a middle-man between the ID and SME. They tended to

expect the training and worksheets to explain to the SME what they needed and were hesitant to

adapt to the needs of the SME—the learner in this instance—often accepting materials without

questioning their connection to the learning objectives.

It was mentioned previously that good communication is vital for an ID. Additionally

personal interviews and concept maps were mentioned as tools that might be utilized by IDs in

working with SMEs. I would add the training that this project was meant to produce to that list of

tools. A clear identification of the role of the SME and what they are expected to produce is vital

to any SME/ID pair. However, the confidence of the ID stands out as a much more important

factor.

When the ID is confident in their explanations and use of the provided tools, whether

they be printed handouts or 3D animated videos, it seems to make little difference in the learning

of the SME. It is the ID that makes it clear in the end to the SME exactly what they need to do,

and provides the feedback and additional instruction on the way to empower the SME to fulfill

their commitment. This project would propose discussing further what factors help contribute to

the confidence that has been observed in some of the IDs in the UVU AVSC Online

Development Department.

Earlier, it was noted that the main criteria for the success of this project would be whether

the ID team is able to produce courses at a consistent rate and quality level. Up until April of this

year when the process was completed and the initial training outlined, the ID team had

completed two courses. Between April and September they completed another 14. Since then,

they have completed seven more courses and are currently on track to complete another nine

before the end of the year. If they maintain that pace they will complete 28 courses in eight

months, leaving 19. It is expected that these courses will be completed as early as March and no

later than May.

Unforeseen Challenges

While the project has produced a development process that works, is well documented,

and provides the necessary training to consistently produce courses at an ITR 2 level, it had to

overcome several issues before it was completed. The first and ongoing issue was the need to

split my time between multiple high-priority tasks. The need to find, hire, and train quality IDs

has demanded a large amount of time and was often fruitless. Of over 8 different searches,

including roughly twenty interviews, and at least ten job offers, we have been able to hire six

part-time instructional designers, only two of which still work regular hours at the airport. Three

have left for various reasons, often leaving projects unfinished to be picked up by other

designers, and one is only working ten to fifteen hours. While this has taken time, it has provided

multiple opportunities to deliver the training to new IDs and refine it based on the results.

The second issue came up when the full-time producer received a higher priority task

from the Aviation Department Chair. This highlighted the need to not delay the project, and

additionally challenged me to be more creative and flexible with my design. The graphic

designer and flash developer that were assigned in his place had some trouble interpreting my scripts and initially produced videos that needed heavy revision. I had to change plans in order to work with them and their strengths.

Both instances emphasized the need for a well-documented process. Before the course development process was completed and documented, training new IDs was difficult and confusing even though I designed the process. One part-time designer that was trained before the process was completed struggled consistently with producing a finished product, and has recently left UVU. This designer worked on four courses. The first two assigned back in February and March were complete, however, upon review one was designated as unusable and assigned to a new ID for revision. Because it was worked on before the documentation was completed, it in turn had not been documented well by the designer and so could not be salvaged. The other two courses that were assigned in May and June—after the process had been finalized, but before the training and documentation were complete—were left unfinished. However, the designer had provided additional documentation that allowed for their completion.

Only one new ID has accepted a job offer since the documentation and training have been completed. This designer has already been assigned four courses, one of which is already complete. Initially this designer worked with a full-time ID on the assigned courses but was able to continue without supervision after the first month. While this could provide evidence to the value of the documentation and training, credit must also be given to the individual in this case. Additional IDs would still need to be trained and observed to further evaluate the effectiveness of the training and documentation.

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Appendix A – Cost of Development

Table 1 First Round Development Costs

Team Members	Cost
Full-Time ID	$48,000
Full-Time Programmer (Half Time)	$26,000
Full-Time Flash Developer	$17,000
Part-Time Flash Developer	$9,600
Part-Time Web Developer	$9,600
Subject Matter Experts (3)	$5,220
Director (Time spent supporting SME)	$6,000
Total	$121,420

Table 2 Cost of Revising and Testing New Development Process

Team Members	Cost
Full-Time ID	$25,000
2 Part-Time IDs	$24,000
3 SMEs + Travel	$20,000
Full-Time Instructional Technologist	$15,000
Full-Time Programmer (Half Time)	$15,000
Full-Time Flash Developer	$10,000
2 Part-Time Flash Developer	$10,000
Part-Time Web Developer	$5,000
Part-Time 3D Designer	$5,000
Director	$10,000
Total	$139,000

Table 3 Projected Cost of Developing the Training Course

Team Member	Cost
Full-Time ID	$1,600
2 Part-Time IDs	$1,100
Producer/Editor	$1,600
Editor	$500
Part-Time Flash Developer	$300
Voice Artist	$400
Total	$5,500

Table 4 Actual Cost of Developing the Training Course

Team Member	Cost
Full-Time ID	$2,500
2 Part-Time IDs	$400
Editor	$200
Part-Time Flash Developer	$1,500
Part-Time Assistant Graphic Designer	$1,500
Voice Artist	$400
Total	$6,500

Appendix B – Worksheets

Worksheet A
Sources of Significant Learning

Effective objectives are ultimately derived from the real world. They describe authentic knowledge, skills and abilities. There are a number of inputs and requirements you must consider when developing objectives. This worksheet is designed to get you thinking about these inputs and requirements.

MODULE –
Part 1 – Situational Factors to Consider

Specific Context
Is the course lower or upper division?

What are the pre-requisites?

What courses immediately follow this module?

General Context
What learning inputs or expectations are placed on this module by:
The University?

The Government?
   FAA –

   NTSB –

The Department?
   COMET Outline & Objectives –
     Topic title-

     Related Objectives-

     Related Traits-

   Textbook –

   Faculty Input –

   AABI Outcomes –
     General Program-
     Aviation Core-

Figure 1 Worksheet A Page 1

Nature of the Subject
Is this subject primarily theoretical, practical, or a combination?

Are there important changes or controversies occurring in the field?

Characteristics of the Learner
What prior knowledge, experiences and initial feelings do students usually have about this subject?

What are students required to learn in pre-requisite courses/modules that might only be reviewed or skipped now because of the pre-requisite knowledge?

What knowledge and abilities should be developed in this course to prepare students for courses that follow?

What are the student's learning goals and expectations?

Related to the subject, which areas are often challenging or difficult for students to grasp?

Figure 2 Worksheet A Page 2

Worksheet B
Describing Significant Learning

These questions are designed to generate thought with regards to the learning that should take place in the course. It's a way for you to formulate and communicate ideas without worrying about a specific format. There are six types of significant learning and associated questions for you to consider. Some may not be needed for the subject you are working on.

Knowledge
What key information, terms, formulae and ideas are important for students to gain and remember in the future?

Figure 3 Worksheet B Page 1

Integration

What connections (similarities and interactions) should students recognize
        among ideas?

        among the information, ideas, and perspectives in this module and those in other modules?

        among the information, ideas, and perspectives in this module and those in other courses?

        among material in this course and the student's own personal, social, and/or work life?

Figure 4 Worksheet B Page 2

Application & Analysis

What important skills do students need to gain?

What important tasks do students need to be able to complete?

Do students need to learn how to manage complex projects?

What kinds of thinking are important for students to develop . . .

   Creative thinking in which students imagine and create?

   Practical thinking in which students solve problems and make decisions?

Figure 5 Worksheet B Page 3

Synthesis

What do students need to be able to design, construct or set up?

What do students need to arrange, sort or organize?

Figure 6 Worksheet B Page 4

Evaluation

Do students need to be able to critique, judge or rate information, ideas, or procedures?

Do students need to estimate or assess performance?

Are there important decisions that students should be able to make?

Figure 7 Worksheet B Page 5

Human Dimension & Caring

What could or should students learn about themselves?

What could or should students learn about understanding and/or interacting with others?

What changes/values should students adopt?

Feelings?

Interests?

Values?

Figure 8 Worksheet B Page 6

Module #, Title Topic(s)	Learning Objectives	Learning Resources	Learning Activities	Assessment/ Evaluation	Discussion Topics
What content will be covered in this module?	What do you want students to demonstrate they have learned to do? How? And how much?	What are the resources that students will have to work with? (Text book, readings, videos, web sites, etc.)?	What, and how do you want students to practice, using the Resources to meet the Learning Outcomes?	What evidence must students present to show they have met the learning Objectives? How will they be grades?	What discussion/ interactions /reflections would allow students to demonstrate movement towards the Learning Objectives.

Figure 9 Worksheet B Page 7

Worksheet C
Carving out the Objectives

Objectives:

Objectives are measurable or observable **behaviors** that describe exactly what the student will be able to do when they have completed a lesson module.

It is important to formulate objectives that start with verbs, to indicate what it is you actually want students to do. Choose your words carefully, as your choice will ultimately determine the kinds of learning experiences and assessments selected and developed by the instructional design team.

It is also important for these verbs to be concrete and a specific as possible. To help with this process refer to the following list of verbs that are appropriate for each type of objective.

Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation
Count, Define, Describe, Draw, Find, Identify, Label, List, Match, Name, Quote, Recall, Recite, Sequence, Tell, Write	Conclude, Demonstrate, Discuss, Explain, Generalize, Identify, Illustrate, Interpret, Paraphrase, Predict, Report, Restate, Review, Summarize, Tell	Apply, Change, Choose, Compute, Dramatize, Interview, Prepare, Produce, Role-play, Select, Show, Transfer, Use	Analyze, Characterize, Classify, Compare, Contrast, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Outline, Relate, Research, Separate	Compose, Construct, Create, Design, Develop, Integrate, Invent, Make, Organize, Perform, Plan, Produce, Propose, Rewrite	Appraise, Argue, Assess, Choose, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritize, Prove, Rank, Rate, Select

Figure 10 Worksheet C

Instructional Strategy
Worksheet D

Topic Group	Objective	Classification	TB	AR	Level	gt	Strategy

Figure 11 Worksheet D

Appendix C – Development Model

Selected Characteristics	Classroom Orientation	Product Orientation	System Orientation
Typical Output	One or a Few Hours of Instruction	Self-Instructional or Instructor-Delivered Package	Course or Entire Curriculum
Resources Committed to Development	Very Low	High	High
Team or Individual Effort	Individual	Usually a Team	Team
ID Skill/ Experience	Low	High	High/Very High
Emphasis on Development or Selection	Selection	Development	Development
Amount of Front-End Analysis/ Needs Assessment	Low	Low to Medium	Very High
Technological Complexity of Delivery Media	Low	Medium to High	Medium to High
Amount of Tryout and Revision	Low to Medium	Very High	Medium to High
Amount of Distribution/ Dissemination	None	High	Medium to High

Figure 12 A taxonomy of instructional development models (Gustafson, 2002).
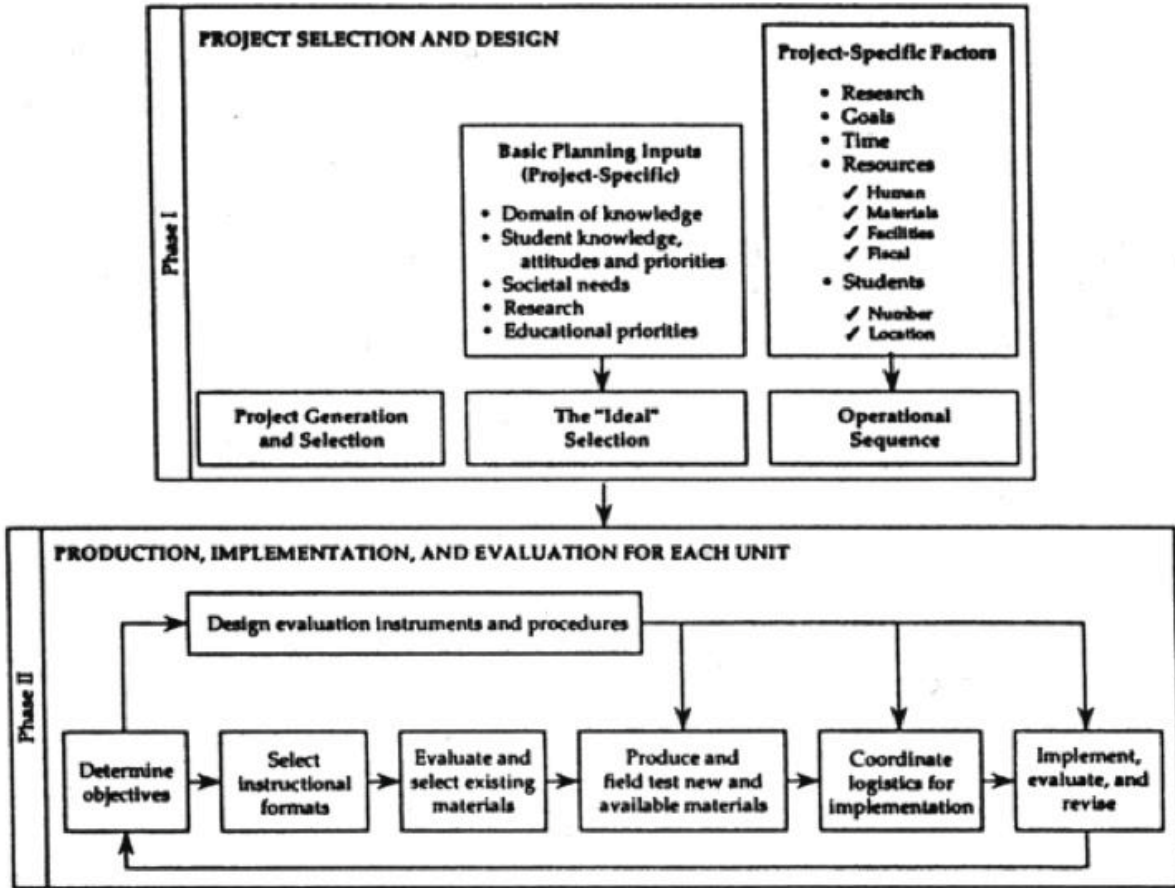
Figure 13 Diamond Model (Gustafson, 2002)

Appendix D – Instructional Technology Richness Standards

1. Course Content

    a. Upfront materials

        i. Course Intro w/ Goals

            - Includes Basic information, tutorial and an in-depth audio or video introduction to course

        ii. Syllabus

            - Includes basic and additional information, as well as information to ensure student success, such as a syllabus quiz, time management advice, and links or references to outside resources.

        iii. Schedule

            - Comprehensive breakdown of all dates for assignments, quizzes and exams on a semester calendar, with the option for students to export calendar to their personal calendars.

    b. Lessons or lectures

        i. Course Learning Objective (CLOs) and Specific Learning Outcomes (SLOs)

            - CLOs and SLOs must be outlined and presented to both instructor and student. These will dictate the rest of the course design process.

        ii. Course design

            - Defined framework with a complete introduction and specific plan identified. Includes text, slides, audio, or video content to accompany readings or activities.

iii. Course Elements

- The highest level is reserved for courses that are significantly

  richer in lesson/lecture content, content that is cohesive with other

  lesson elements, e.g. different media for the same material to

  accommodate learner preferences, richly interactive content. The

  content's ability to be independent from a specific textbook is also

  considerable.

iv. Guided instructional materials

- Combination of original materials employed systematically

  throughout the course.

c. Reference or resource material

i. Authentic materials

- Authentic materials of different media types are employed

  systematically throughout the course.

d. Interactive Components

i. Interactive components

- Use of original games, simulations, or other computer-based

  interactions. Level 4: Systematic use of original games,

  simulations, or other computer-based interactions throughout the

  course.

e. Video Segments

i. Discussion segments

- # finished hours

ii. Lectures/demonstrations

- # finished hours

2. Assessment

   a. Assessment for Learning

      i. Activities and Assignments

         - Accompanying elaborated rubric for each assignment/activity. Some prewritten feedback provided for instructors based on common errors. May include examples.

      ii. Self assessment

         - Additional levels might be acquired by utilizing online self-assessment exercises regularly, corresponding with each lessons, and by providing students with rich and useful feedback for questions as well as answer choices (the more, the better!).

      iii. Formative Assessment ("Learning Check")

         - Additional levels might be acquired by the use of different forms of assessment systematically throughout the course, including regular use formative assessment tools (such as feedback prompts or surveys) that gauge student progress or understanding.

      iv. Grading criteria for specific assignments

         - Systematic methods for establishing scoring criteria and providing student feedback are employed throughout the course for each assignment and activity.

      v. Examples/Samples

         - Additional levels may be acquired by: Providing examples or samples corresponding to each assignment, activity, paper, and

project. Requiring some pre-assessment of examples or samples. Providing both good and bad examples or samples corresponding to assignments, activities, papers, or projects.

b. Assessment for Credit

    i. Assignments and Exams

- Additional levels may be acquired for the use of multiple forms of valid online summative assessments. Higher levels will require the use of rubrics or learning objectives indicate how students will be assessed, as well guidelines, study guides, and review notes indicate what students will be assessed on. The highest ITR levels should require automatic feedback for questions and answer choices on assessment questions.

    ii. Strategies to Mitigate Cheating

- Level 4:Assessment questions are all pulled from pools containing at least 2x as many questions; assessment activities or are cycled through from semester to semester, or are randomly assigned. Alternate activities are careful to measure the same objectives, but may appeal to different learner preferences.

    iii. Online Grading

- Level 4: Plans to regularly communicate feedback to students indicated in syllabus or in assessment descriptions. Plans to hold online student conferences during the semester. Some prewritten feedback and responses for assessments.

3. Communication and Interactivity

a. Interactivity

    i. Student-instructor

- Varying degrees of student-to-instructor interaction may be measured by:

    a. Mail tool or other forms of contact made available

    b. Online office hours posted.

    c. 24hr reply policy noted in syllabus.

    d. Plans to make frequent postings/moderate the board noted in syllabus.

    e. Plans to send form messages occasionally noted in syllabus.

    f. Regular required peer-to-instructor postings on discussion boards.

    g. Plans to send form messages often noted in syllabus.

    h. Plans to send individualized feedback noted in syllabus.

    i. Plans to conduct chat sessions beyond office hours noted in syllabus. Plans to interact frequently on discussion boards.

    ii. Student-student

- Varying degrees of student-to-student interaction may be measured by:

    a. Discussion Board, chat tool or equivalent available.

    b. Expected student-student communication use noted in syllabus.

   c. Regular required peer-to-peer response/review on discussion board, chat tool, or equivalent.

   d. Group projects

   e. Peer review of activities or assessments

  iii. Student-Content

- Varying degrees of student-to-content interaction may be measured by:

   a. Lesson material/readings or other basic content media provided

   b. Some basic multimedia such as illustrations, charts, graphs, sounds, video, or photographs provided

   c. Authentic references provided.

   d. Formative and preparative resources provided.

   e. Content is tied to course rubric or learning objectives.

   f. Interactive practice or simulations available.

 b. Communication Technology

  i. Mail

- Levels 2-4: Some pre-written instructor announcements and messages for mailing students provided, regular weekly emails planned, other creative use of e-mail for instruction.

  ii. Discussion/Bulletin Board(s)

- Level 4: Some pre-written instructor announcements and messages for mailing to students provided. Discussion questions may vary

from semester to semester. Students might be allowed to determine

discussion prompts. Feedback on discussion activity is provided.

iii. Synchronous Learning (chat, whiteboard, live web conferencing)

- If an instructor is going to utilize a technology to facilitate live

   conferencing or discussion with students, the expected student

   usage of the tool should be noted in syllabus. Varying degrees of

   technology-assisted live interaction may be measured by:

   a. Scheduling of Online conferences scheduled (at least 2 live

      conferences per semester).

   b. Use of online/virtual office hours posted.

   c. Providing for online study sessions.

   d. Directing student-led live chats

Appendix E – Training Course Screenshots

Subject Matter Experts are responsible to help instructional designers and other development personnel ensure that the course experience follows the university model of being engaged, serious and inclusive.

Aviation Subject Matter Experts will work with the Aviation Instructional Design and Development Team to develop performance objectives based on university, industry, accreditation and department standards; identify, explain and/or create original instructional resources, activities and assessments; provide technical expertise and guidance to designers and developers; and validate functionality and accuracy of course materials.

Introduction Video

News forum

Working as a Subject Matter Expert for Aviation Science

Syllabus

Phase 1 Curriculum Development

Before the SME signs their contracts they should have reviewed the Introduction video, insight, and syllabus. If there are any questions or concerns they should be openly addressed up front. Once the ID and SME are ready to start the ID will need to make sure that the SME has received all the necessary materials and that they have reviewed and signed the following:

- Work for Hire contract
- Memorandum of Understanding
- Course Development Timeline

The CLO/SLO Video and Curriculum video should be viewed immediately before attempting the first draft of learning objectives. The ID should have sent sample objectives and should make sure the SME understands what is required. While we realize that the learning objectives will be related to the course materials, they need to be the original work of the SME and ID. **They should not be copied from the text or any other resources.**

Writing Objectives

CLO and SLO video

Developing Curriculum

Phase 2 Course Development

Remember that at the end of Phase 1 the SME is expected to spend some time at the Provo Airport campus working in person with the ID. During this time they should make sure that they complete the Course Development Plan and that it is clear exactly what elements the SME and ID will develop and when they are expected to be done. **Every element should directly relate to one or more learning objectives.** Refer to the Syllabus, or discuss with your ID for more information on the various elements.

Overview Video

Creating Assignments

Sample Course Elements

Examples of Standard/Reusable Activities

Figure 14 Main Moodle Interface

Figure 15 Introduction Video

Figure 16 PDF Reading

Figure 17 Learning Objectives