

Analysis Report

STEM100:
Teaching with Technology in the STEM Disciplines

Prepared for Dr. Wendy Howard



Prepared by Group 4

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Overview

Teaching with Technology in the STEM Disciplines, STEM100, is a mini-faculty professional development course on teaching with technology in the STEM disciplines at the University of Central Florida (UCF). As a professional development course, STEM100 is intended to be a stand-alone course, not a prerequisite for another course. Dr. Wendy Howard from the Center for Distributed Learning (CDL) is serving as both our client and subject matter expert (SME).

According to the United States Department of Education (DOE) website," the President has called on the nation to develop, recruit, and retain 100,000 excellent STEM teachers over the next 10 years. He has also asked colleges and universities to graduate an additional 1 million students with STEM majors." In addition, DOE states that, "...we share the President's commitment to supporting and improving STEM education. Ensuring that all students have access to high-quality learning opportunities in STEM subjects is a priority."

Targeted learners for the course are UCF part and full-time faculty members who are certified, or are in the process of becoming certified, to teach online courses through UCF's 10-week course. Most of the targeted learners have had access to Canvas in the past, either from teaching an online course or from using Canvas resources in a face-to-face or mixed-mode course. STEM 100 will be divided into five modules. Each module is estimated to take two hours to complete. Therefore, the entire course will run approximately ten hours in length.

STEM100 will be offered as an online course through Canvas, UCF's online learning platform. The target learners will access all course content and complete all course related assessments through Canvas. After completing STEM100, learners will apply the newly learned teaching strategies via Canvas in the online and mixed-mode courses they teach.

This Analysis Report includes a goal analysis for the STEM100 course, a subordinate skills analysis for the application of evaluation strategies in STEM learning, and a learner and context analysis.

Goal Analysis

As diagrammed in Figure 1, faculty members will explore STEM learning principles, apply content presentation strategies, apply interaction strategies, apply evaluation strategies, and explore next steps.

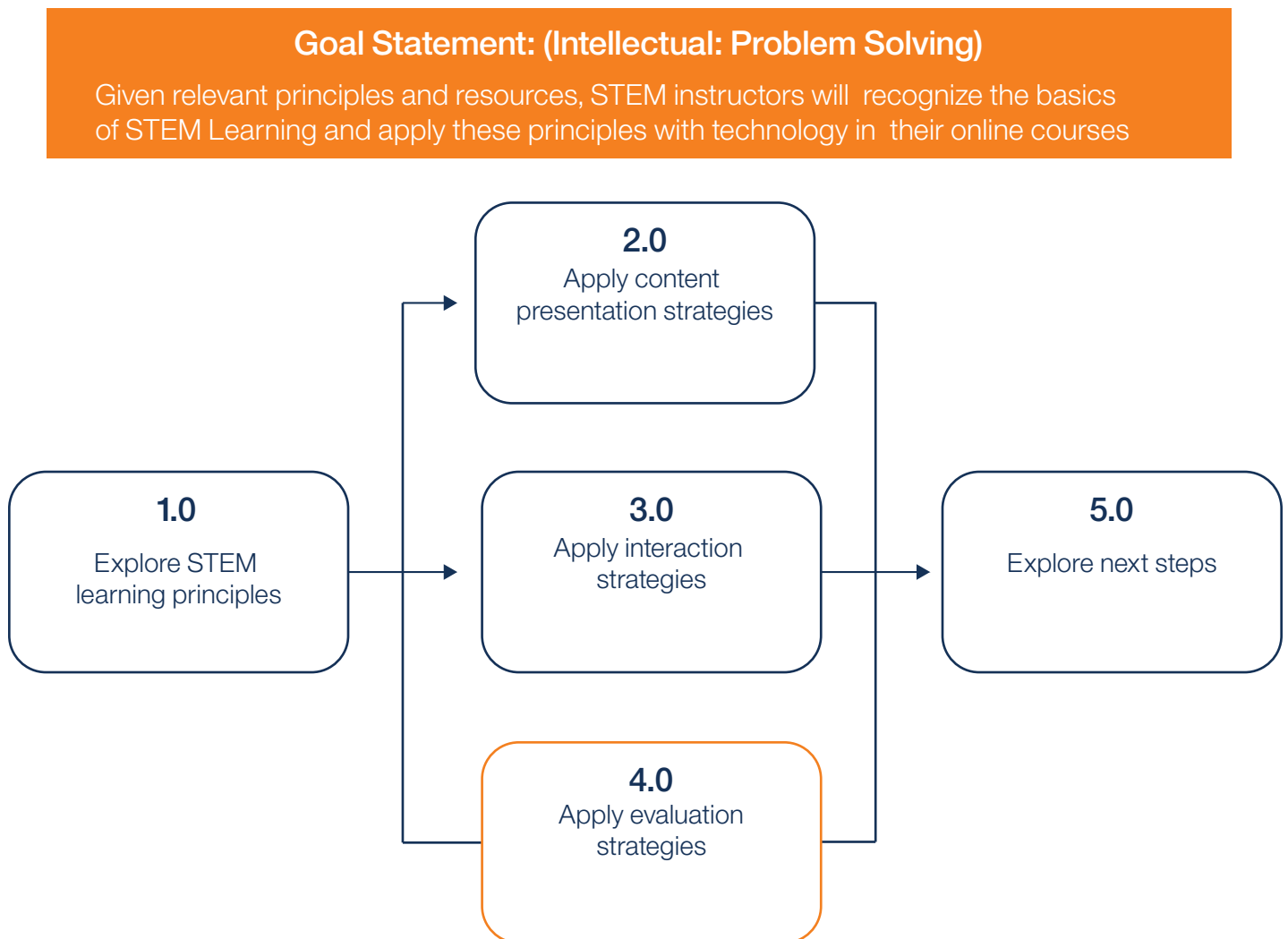
Dr. Chen and subject matter expert (SME) Dr. Wendy Howard identified the goal statement for this course. The goal statement states that:

Given relevant principles and resources, STEM instructors will recognize the basics of STEM learning and apply these principles with technology in their courses.

The goal statement for STEM100 is classified as an **intellectual, problem-solving skill** according to Gagne's taxonomy of learning.

The goal analysis identifies five major steps that will help learners move toward the course goal and achieve the goal statement. The following sections of this report will focus on Step 4.0: Apply Evaluation Strategies.

Figure 1: Goal Statement & Goal Analysis Diagram for STEM100: Teaching with Technology in the STEM Disciplines



Subordinate Skills Analysis

Figure 2 depicts an outline of the subordinate skills and procedural tasks associated with Step 4.0: Apply evaluation strategies.

After their completion of the course, faculty members should be able to recognize key concepts related to the key principle in Step 4.0, identify relevant evaluation strategies, and demonstrate their ability to apply evaluation strategies in their online and mixed-mode courses. Entry level skills for learners include prerequisite skills such as knowledge of UCF's online learning management systems, Canvas.

Figure 2: Subordinate Skills Analysis

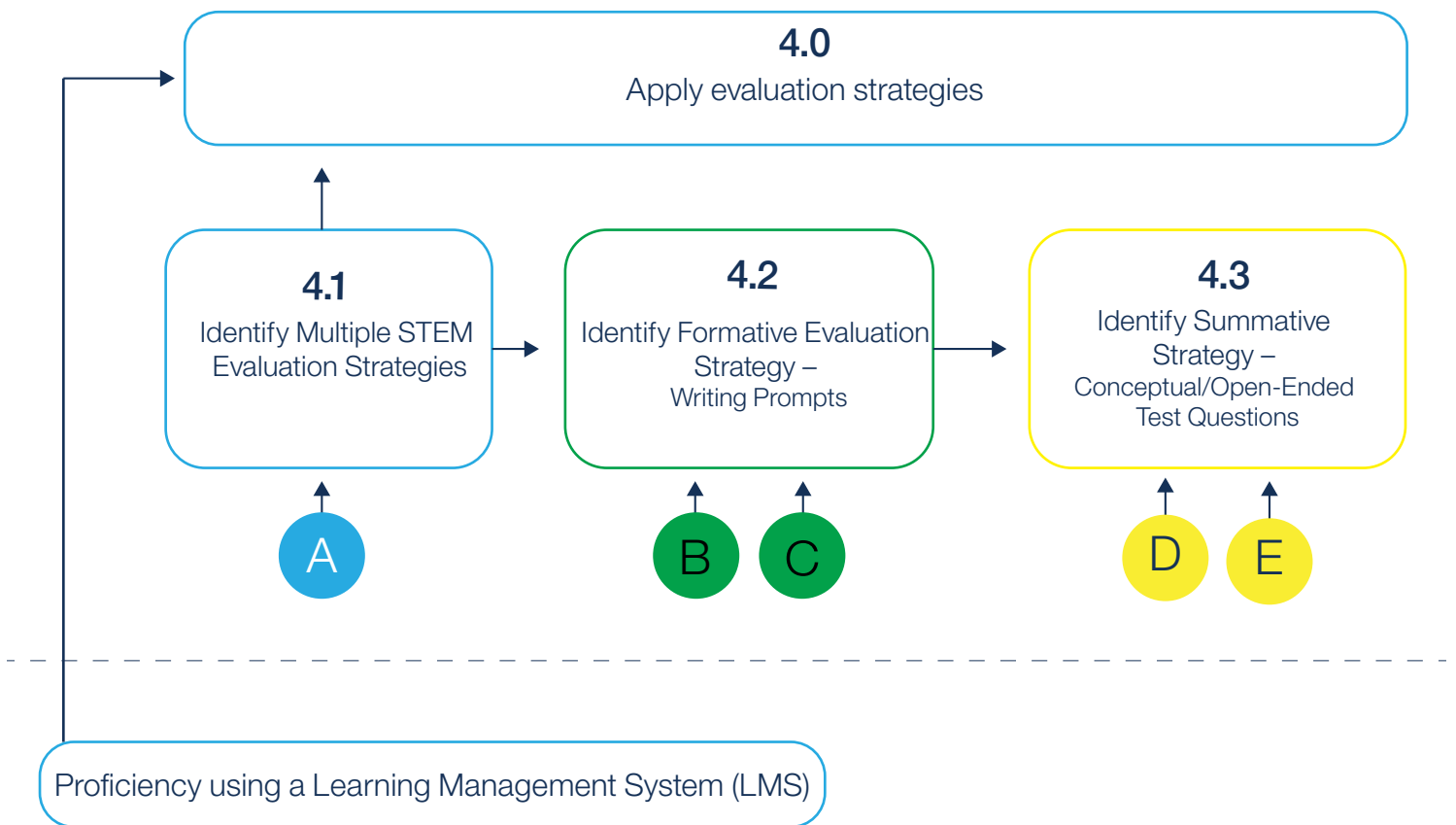


Figure 3: Subordinate Skills Analysis for step 4.1: *Identify multiple STEM evaluation strategies*

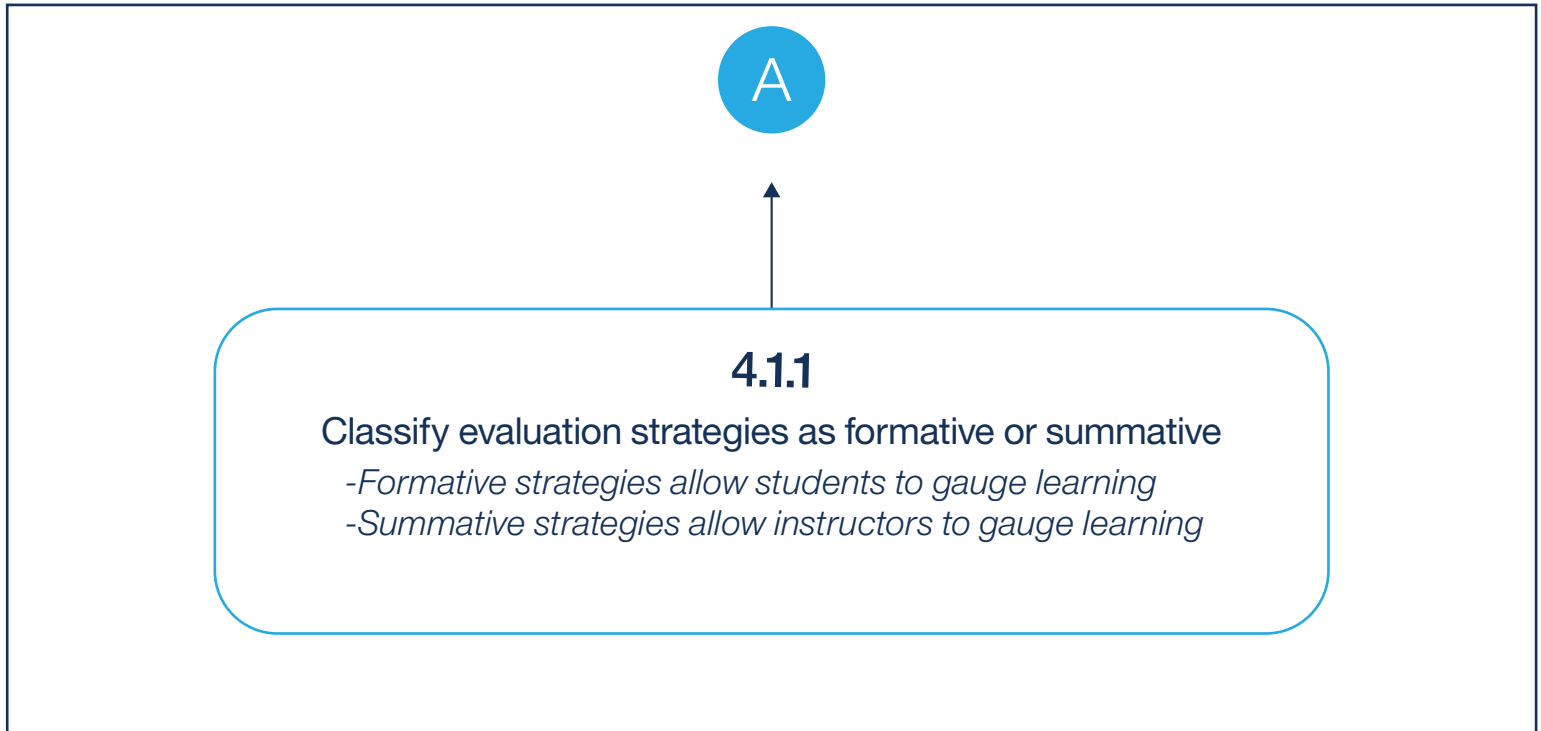


Figure 4: Subordinate Skills Analysis for step 4.2: *Identify formative evaluation strategy – Writing prompts*

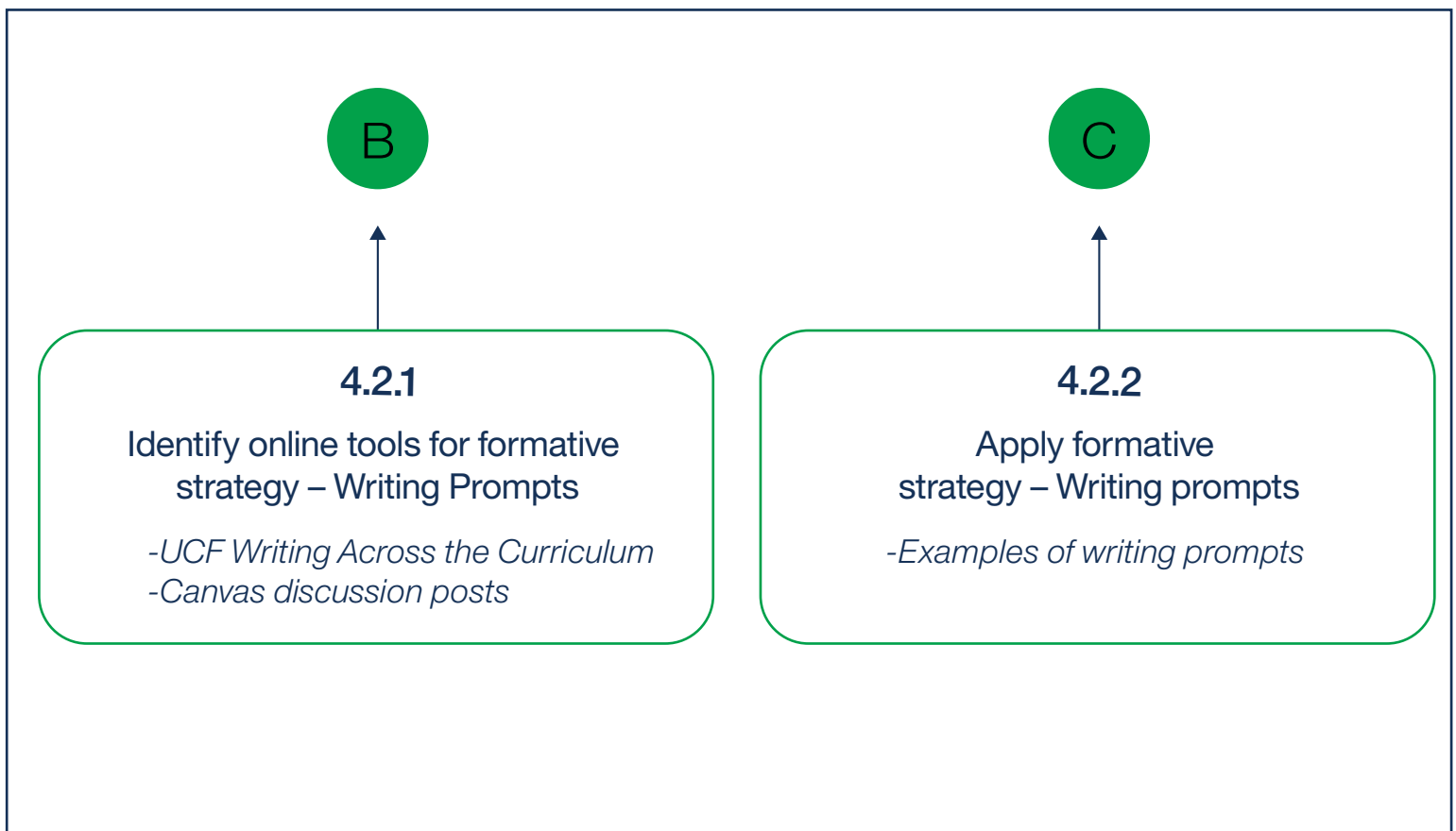
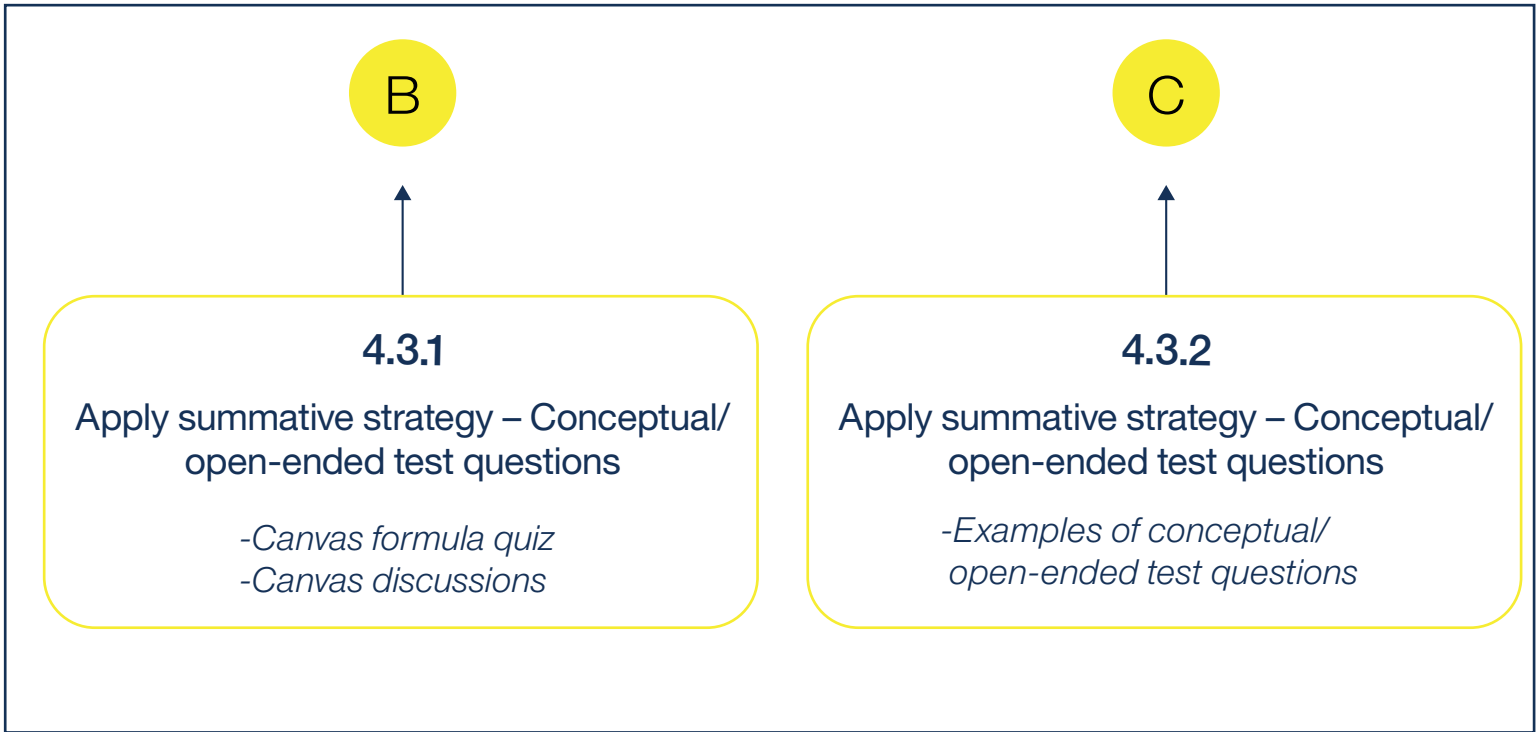


Figure 5: Subordinate Skills Analysis for step 4.3 Identify summative strategy – Conceptual/open-ended test questions



Learner Analysis

In order to effectively design instruction, it is necessary to identify learner characteristics. Table 1 contains nine information categories for learner analysis: entry skills, prior knowledge of topic area, attitudes toward content, attitudes toward delivery system, academic motivation, education and ability levels, general learning preferences, attitude toward organization, and general group characteristics. Table 1 also includes data sources and characteristics for each information category and implications for design, delivery, and/or evaluation.

To obtain data for the learner analysis, our team asked Dr. Wendy Howard (SME), from the Center for Distributed Learning (CDL), to fill out an online questionnaire. We also followed up with her via email to gather additional information about the target learners. Our team also surveyed current online UCF faculty members, who are our target learners, through an electronic survey. Additional information was gathered from several UCF web resources.

Table 1: Learner Analysis for STEM100: Teaching with Technology in the STEM Disciplines

Information Categories	Data Sources	Learner Characteristics	Implications for Design, Delivery and/or Evaluation
<p>Entry Skills</p>	<p>Questionnaire: Dr. Wendy Howard (SME), Target learner Survey</p>	<p>According to Dr. Wendy Howard, some of the target learners have 1-4 years of experience teaching online classes, some have less than 1 year of experience teaching online classes, and most have no experience teaching online classes. According to the SME, all learners have utilized Canvas in face-to-face and mixed-mode classes to deliver syllabi and handouts, which has given them at least some exposure to Canvas. Indeed, the target learner surveyed had experience using Canvas in mixed-mode courses and as a supplement in face-to-face courses. According to the SME, by the time learners are exposed to STEM100, they will be enrolled in IDL6543. IDL6543 is a non-credit professional development course that will introduce learners to skills necessary to manage an online course in Canvas.</p>	<p>By the time learners are exposed to STEM100, all will have some experience using Canvas, either having taught online classes or having used features of Canvas to deliver resources in face-to-face and/or mixed-mode classes. Additionally, all will have been enrolled in IDL6543. According to the SME, IDL6543 provides learners with an in-depth study of Canvas, including its advanced features. This information helps to establish a baseline for entry-level skills for STEM100. Given that all learners will have entry-level skills prior to taking STEM100, the course can address teaching with technology in the STEM disciplines instead of entry-level skills that relate to teaching online.</p>

<p>Prior Knowledge of Topic Area</p>	<p>Questionnaire: Dr. Wendy Howard (SME), Target learner Survey</p>	<p>According to Dr. Wendy Howard, target learners are experts in various fields of STEM. However, while they have expertise in their respective fields, they may be less informed about pedagogical approaches and teaching strategies for teaching in STEM, particularly using technology in the online environment. The target learner surveyed indicated that he/she did not feel comfortable with the principles of STEM learning (evidence-based pedagogical practices). Dr. Wendy Howard went on to state that the target learners tend to be younger, newer faculty members. They have not been exposed to professional development courses on this topic in the past.</p>	<p>Given that most target learners are unfamiliar with pedagogical approaches and teaching strategies that facilitate STEM learning, and have not been exposed to professional development courses on STEM learning practices in the past, the need for instruction on this topic has been demonstrated. To keep learners engaged, it will be important to focus on cross-disciplinary approaches to STEM learning, for example, suggested pedagogical strategies for each component of STEM: science, technology, engineering, and mathematics.</p>
<p>Attitude Toward Content</p>	<p>Questionnaire: Dr. Wendy Howard (SME), Target learner Survey</p>	<p>According to Distributed Learning Impact, UCF faculty who teach online “overwhelmingly indicate that a course with Web components requires more time in both development and in weekly administrative duties than a similar course delivered face-to-face.” However, 80% are satisfied with their experience of teaching Web or Web-enhanced courses at UCF and indicate that they would be willing to teach these courses in the future. Faculty members mention that, despite challenges they face in teaching Web and Web-enhanced courses, they enjoy being able to learn new technologies. Additionally, faculty members noted that, in order to meet the challenge of teaching online, they felt it was</p>	<p>The target learners realize the need to use technology in their courses. They also understand they must be careful to deliver content in a way that will meet student needs. Given that faculty members are experts in their field, but not necessarily in STEM pedagogy, STEM100 can offer support by exposing faculty members to new technologies and ways of designing course content that will help meet student needs. Course content in STEM100 should focus on practical tools faculty can apply in their courses.</p>
	<p>Records: Distributed Learning Impact Evaluation</p>		

		<p>necessary to adjust course development and delivery and respond to student needs. That being said, when asked about his/her interest in learning more about STEM learning principles, the target learner surveyed was “not sure.” However, that same learner stated he/she was “somewhat interested” in learning more about STEM evaluation strategies.</p>	
Attitude Toward Delivery System	Questionnaire: Target learner Survey	<p>The target learner surveyed preferred a “mixed-mode/hybrid” learning environment, as opposed to an online or in person/face-to-face learning environment. The target learner surveyed was “somewhat satisfied” with Canvas as an online learning environment.</p>	<p>Given that one target learner prefers a mixed-mode/hybrid learning environment, designers might consider adding a mixed-mode/hybrid component to the STEM100 course. Likewise, the lack of enthusiasm for using Canvas as an online learning environment may indicate a need to explore other online learning environments for STEM100. However, given that the number of survey responses was small (only one respondent), it is fair to assume other learners might have differing opinions. More surveys are needed to gauge learner attitude about the delivery system.</p>
Academic Motivation (ARCS)	Questionnaire: Dr. Wendy Howard (SME), Target Learner Survey	<p>The target learner surveyed was “not sure” about his/her desire to learn more about STEM learning principles and only “somewhat interested” in learning more about evaluation strategies in STEM learning. The target learner surveyed felt “somewhat comfortable” making changes to courses based on suggestions from current research. The same learner noted he/she was not familiar with principles of STEM learning and “not sure” about confidence</p>	<p>As target learners are unfamiliar with STEM learning principles, it is natural for them to be unsure of their interest in learning about such principles. Content in STEM100 should demonstrate relevance to target learner’s courses.</p> <p>Given that the target learner surveyed was unsure about his/her confidence level, STEM100 should provide specific examples, and demonstrate practical applications, that instructors can use to build confidence</p>

		<p>on this topic.</p> <p>According to Dr. Wendy Howard, UCF is encouraging all instructors to implement evidenced-based teaching practices in their courses. The target learners understand the top-down push for evidenced-based teaching practices and will likely welcome a course that could help them meet that demand.</p>	<p>in their courses.</p> <p>The number of survey respondents was small, so additional surveying is necessary to gain a representative sample of target learners.</p>
Educational and Ability Levels	Questionnaire: Target Learner Survey	<p>Educational Levels: According to Institutional Knowledge Management, UCF has 1,961 teaching faculty and adjuncts. Of those faculty and adjuncts, 77% have doctoral degrees, and the other 33% have master's degrees.</p> <p>Ability Levels: Faculty target learners enrolled in STEM100 will be from a variety of STEM disciplines and will be expected to have at least some experience teaching online at the university level. There are no prerequisites for STEM100, though all instructors will have completed IDL6543 before taking STEM100. While faculty learners are considered experts in their STEM fields, they may not be well versed in STEM pedagogy.</p>	<p>Educational Levels: Our team can create content appropriate for learners who have studied at a master's or doctorate level.</p> <p>Ability Levels: By determining the ability level of the target learners, we can design instruction to build on their prior knowledge. As all target learners are experts in STEM, we can assume that most will recognize terminology commonly used in STEM disciplines. By using such terminology, and by providing pedagogical suggestions specific to the various fields within STEM, we can engage target learners.</p>
General Learning Preferences	Questionnaire: Target Learner Survey	<p>The target learner surveyed preferred a "mixed-mode/hybrid" learning environment, as opposed to an online or in person/face-to-face learning environment. When asked to rate methods of instruction based on personal preference, the target learner surveyed rated lecture "very helpful," discussion "helpful,"</p>	<p>Judging by the target learner's response, STEM100 would be more effectively delivered as a mixed-mode/hybrid course. To address the challenge this presents, emphasis should be placed on finding ways to motivate learners in Canvas, potentially by offering live, synchronous learning experiences.</p>

		<p>group learning “not helpful,” problem-based-learning “helpful,” and independent e-Learning “helpful.” The same respondent rated text “helpful,” audio “not helpful,” video “helpful,” graphs/charts “helpful,” and images/illustrations “helpful.”</p>	<p>All learning media/methods, except for group work, were rated “very helpful” or “helpful.” STEM100 should include some or all media types. However, it might be best to avoid group work in STEM100.</p> <p>The number of survey respondents was small, so additional surveying is necessary to gain a representative sample of target learners.</p>
Attitudes Toward Organization	Questionnaires: Target Learner Survey	<p>The target learner surveyed indicated he/she was “somewhat satisfied” with UCF’s professional development options, but did not provide additional details.</p>	<p>Motivation in a professional development course can be a reflection of how a target learner feels about the organization. If the learner has had negative experiences in the past, they are less likely to engage in new professional development courses. Learners who have had positive experiences are more likely to engage in new professional development courses.</p> <p>Given that the number of survey respondents was small, and that the learner surveyed indicated “somewhat satisfied,” it is difficult to gauge learner attitude toward the organization. Additional surveying is necessary to gain a representative sample of target learners.</p>
General Group Characteristics	<p>Questionnaires: Dr. Wendy Howard (SME); Target Learner Survey</p> <p>Records: Distributed Learning Impact Evaluation; 2014-2015 Online Programs websites; Canvas Guides</p>	<p>Heterogeneity: UCF offers online courses in 16 undergraduate and 24 graduate level degree programs. Faculty target learners teach in a wide variety of STEM disciplines at various academic levels. According to the Distributed Learning Impact Evaluation, the average age of online faculty is 50, and instructor</p>	<p>To engage the diverse learner population, STEM100 will support the common goal of improving STEM learning through technology. The course can also engage learners by taking a cross-disciplinary approach that includes relevant information for each field in STEM. All learners have some experience using Canvas, but</p>

		<p>age ranges from 32-67. According to Dr. Wendy Howard, target learners are full-time and part-time faculty members with 1-4 years of experience teaching at UCF.</p> <p>Overall impressions: The learners are diverse. However, all share expertise in the STEM field, and all have at least some experience teaching online, face-to-face, and/or mixed-mode courses.</p>	<p>not all are experts. Given that learners have varying degrees of familiarity with Canvas, links to Canvas Guides should be provided as a supplement with all LMS-specific course activities.</p>
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Learner Analysis: Additional Information Requirements

The design team submitted the survey request to 20 UCF STEM faculty members. 1 out of 20 faculty members responded to the survey. Another deployment of the survey is needed to accurately analyze attitude toward content, attitude toward delivery system, academic motivation, general learning preferences, and attitudes toward organization.

Performance Context Analysis

In order to effectively design instruction for online courses, a complete performance context analysis is conducted.

Table 2 outlines four information categories: managerial/supervisory support, physical aspects of the site, social aspects of the site, and relevance of skills to the workplace. The table also includes data sources, the characteristics for each information category, and the implications for design, delivery, and/or evaluation. The performance context is the online courses the faculty will apply the STEM strategies to after the STEM 100 course is complete.

Data for the performance context analysis is from interviews with Dr. Wendy Howard. Results of the electronic survey and web resources are included as well. Research recommendations for missing or unclear information are included below the table.

Table 2: Analysis of Performance Context for STEM 100

Information Categories	Data Sources	Performance & Site Characteristics	Implications for Design, Delivery and/or Evaluation
Managerial/supervisory support	<p>Interview: Dr. Wendy Howard (SME)</p> <p>Records: Five Visionary Goals that Guide letter from President Hitt</p>	<p>Managerial Support: One of the Five Visionary Goals that Guide UCF from President Hitt encourages making learning “more inclusive and diverse.” This presidential goal is the organizational and managerial support for courses and applications of STEM principles.</p> <p>Reward System: Dr. Howard stated that learners will be given a stipend for completing IDL 6543 but not for STEM 100.</p> <p>Nature of Supervision: Faculty learners have minimal supervision as they are responsible for their own classes.</p>	<p>Managerial Support and Nature of Supervision: Managerial support is appropriate and supervisory support is not an issue for design, delivery, and evaluation.</p> <p>Reward System: Learners that are not motivated by self-development may need a reward to take STEM 100 as the course is currently voluntary, but made available through IDL 6543.</p>

<p>Physical aspects of the site</p>	<p>Interviews: Dr. Wendy Howard (SME)</p> <p>Records: Online@ UCF Computer Settings Checklist</p>	<p>Facilities/Resources: This course is held in an online environment provided by UCF in the Canvas Learning Management System (LMS). Resources include an Internet connected computer or mobile device with a web browser. The Online @ UCF Computer Settings Checklist states that Internet Explorer 9 or 10, Firefox, Safari, and Google Chrome browsers are supported. Learners are supported through online help tools through Canvas Guides and the UCF Service Desk.</p> <p>Equipment: A computer is required with a mouse or touchpad, keyboard, and an Internet connection. A set of speakers, webcam, and microphone are optional, but recommended. A tablet with similar specifications would be supported which would replace mouse input with a basic touch.</p>	<p>Facilities/Resources/ Equipment: Since the course is offered online, there is no need for physical facilities such as traditional classrooms, but providing computer labs is important to give access to learners who do not have a computer or mobile device. The Center for Distance Learning (CDL), Faculty Center for Teaching and Learning (FCTL), and Student Disability Support (SDS) may experience larger demands for support for applications of STEM principles in online courses.</p> <p>Time: As the learners apply STEM in their classrooms, they will need to consider the additional preparation time. More information would need to be collected from the learners about the classroom application of the STEM course to determine recommended preparations times.</p>
<p>Social aspects of the site</p>	<p>Questionnaire: Dr. Wendy Howard (SME)</p>	<p>Supervision: In reference to information gathered from the SME, learners will independently implement STEM principles in their own courses with minimal supervision.</p> <p>Interaction: The CDL, FTCL, and SDS are available for additional support for application of STEM principles.</p>	<p>Supervision: Supervisory support is not an issue for design, delivery, and evaluation.</p> <p>Interaction: The goal of discussion throughout the course is to have learners connect with other faculty cross-disciplinary regarding STEM principles.</p>

Relevance of skills to the workplace	Interviews: Dr. Wendy Howard (SME) Records: Five Visionary Goals that Guide UCF letter from President Hitt; Letter from the Office of the Provost and Vice President of Academic Affairs	Meet identified needs: One of the five visionary goals that guide UCF per the President's letter encourages making learning "more inclusive and more diverse." Current/Future applications: The overall goal encompassing this course is to give learners the ability to learn different strategies to apply to their own courses to meet the needs of all learners.	Meet identified needs: The STEM course will help expand learner knowledge to meet the needs of all learning styles and students with or without learning disabilities. Current/Future applications: Learners will be encouraged to apply the strategies in their workplace-the online classroom.
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Performance Context Analysis: *Additional Information Requirements*

A survey to assess whether the intended learners have enough computers and technical support to succeed in the performance context is recommended. In addition, continued communication and support from CDL will ensure that the performance contest is meeting learner needs and standards. Another survey after the mini-course to determine the time necessary for faculty to redesign their courses to meet STEM standards is also needed.

Learning Context Analysis

The last step in creating a cohesive instructional plan is the learning context analysis. Table 3 outlines the main four information categories: site compatibility with instructional needs, feasibility for simulating workplace, site compatibility with learner needs, and learning site constraints affecting design and nature/number of sites. Other information categories included in the table are data sources, characteristics of each information category, and the implications for design, deliver, and/or evaluation.

Data collected for the Learning Context Analysis included information gathered from personal interviews with Dr. Wendy Howard from the Center for Distributed Learning (CDL). The attempt to garner further information for additional faculty members was sent via emailed surveys.

Table 3: Learning Context Analysis

Information Categories	Data Sources	Learning Site Characteristics	Implications for Design, Delivery and/or Evaluation
<p>Site compatibility with instructional needs</p>	<p>Interview: Dr. Wendy Howard</p>	<p>Instructional strategies: Individual and group work, multimedia instruction and discussion can all be utilized in the canvas tool.</p> <p>Delivery Approaches: Web-based delivery is the main instructional approach through the learners use of computers, tablets or other multi-media devices.</p> <p>Time: Learners will complete the course on their schedules with a ten-hour completion time which does not include group discussions or group work.</p> <p>Personnel: STEM subject matter experts (SMEs) will monitor, facilitate, and assess the learner's progress.</p>	<p>Instructional Strategies: Dr. Wendy Howard indicated that administration would like to see evidenced-based teaching practices. Independent work is interspersed with group work and group discussions.</p> <p>Delivery Approaches: Canvas is the main delivery approach with application based learning in Webcourses available through the LTI link in Canvas. Activities and assessments will be embedded within each module.</p> <p>Time: Course modules will be two hours long and will not exceed 10 hours total.</p> <p>Personnel: Dr. Wendy Howard, along with approximately twelve other faculty, are facilitating and assessing the learner's progress for STEM 100.</p>

<p>Feasibility for simulating workplace</p>	<p>Interview: Dr. Wendy Howard</p>	<p>Supervisory characteristics: Faculty members will have a continual presence within Canvas to provide any guidance or clarity when needed.</p> <p>Physical characteristics: Web-based course fully facilitated within Canvas.</p> <p>Social Characteristics: Canvas allows for cross-content and cross-discipline discussions and group work.</p>	<p>Supervisory characteristics: Faculty members with extensive STEM and on-line instructional experience will have a continual presence on Canvas.</p> <p>Physical Characteristics: The workplace is going to be the same for learning and performance with the addition of instructing in mixed-media platforms. Essentially, learners will be learning STEM 100 in the exact same environment they will be instructing STEM courses in.</p> <p>Social Characteristics: Canvas allows for in-depth social interaction through discussion boards, postings, collaborations and email. This multi-faceted social approach allows the learners to be able to share ideas in not only a verbal manner but also a visual manner.</p>
<p>Site compatibility with learner needs</p>	<p>Interview: Dr. Wendy Howard</p>	<p>Location (distance): Learning can take place in in multiple venues where Canvas access is available.</p> <p>Conveniences: Learners can access Canvas at any time using a computer or multi-media device. This allows for personally scheduled learning.</p> <p>Space: Since learning can take place in multiple venues, space is unnecessary unless learners have to use a lab for computer access or faculty needs office space.</p> <p>Equipment: Computer, tablet or multi-media device.</p>	<p>Location/Conveniences/Space/ and Equipment: Because STEM 100 is web-based, location and space are of little importance unless the learners need to meet for group meetings. Most learning will be done at the learners' preferred location and at the learners' preferred convenience unless a computer lab is needed to access Canvas or other course materials. Equipment is any computer or multi-media device.</p>

		Telephone or microphone to participate in group work if done via the web.	
Number/nature of sites	<p>Interview: Dr. Wendy Howard</p> <p>Records: Online Canvas Tutorials and Guidance</p>	<p>Facilities/Equipment/Resources: Canvas is reached via the web on any computer, tablet, or multi-media device. Although Canvas is the main instructional site, there can be multiple other sites indicated if the learners are encouraged to visit them for more in-depth information or supplemental course materials. A computer lab facility is needed for learners with no computer access.</p> <p>Constraints: Learners may experiences network difficulties, site maintenance issues, computer difficulties or exceptional conflicts that may constrain optimal learning.</p>	<p>Facilities/Equipment/Resources Learning accessibility is of utmost importance. In order to get the most out of STEM100, learners must have unfettered access to Canvas and its teaching modules. It is the responsibility of UCF to provide equal opportunity to all of the learners to access Canvas. Learners can access help tools for Canvas and UCF.EDU if needed.</p> <p>Constraints: Constraints to learning might be interrupted or unavailable access to Canvas. Accessing STEM100 supplemental materials may be problematic if links have moved or changed.</p>

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Appendix A: Target Learner Survey

The following survey was sent via email to 20 UCF faculty members with online course experience of some kind.

- How many years of teaching experience do you have?
 - o Less than 1 year
 - o 1-4 years
 - o 5-9 years
 - o 10+years

- Do you have experience using Canvas?
 - o Yes
 - o No

- Your experience with Canvas includes (select all that apply):
 - o No experience in Canvas
 - o Taking a course in Canvas as a student
 - o Teaching a face-to-face course with Web components in Canvas
 - o Teaching a mixed-mode course
 - o Teaching an online course

- Do you find Canvas to be an effective LMS for course delivery?
 - o Have not taught in Canvas
 - o Not satisfied with Canvas
 - o Somewhat satisfied with Canvas
 - o Very satisfied with Canvas

- What is your preferred learning environment?
 - o Online
 - o In-person/face-to-face
 - o Mixed-mode/hybrid

- Rate each method of instruction based on your personal preference:
 - o Lecture
 - Not helpful
 - Helpful
 - Very helpful
 - o Discussion
 - Not helpful
 - Helpful
 - Very helpful
 - o Group learning
 - Not helpful
 - Helpful
 - Very helpful

-
- Problem-based learning
 - Not helpful
 - Helpful
 - Very helpful

 - Independent e-Learning
 - Not helpful
 - Helpful
 - Very helpful

 - Rate each type of media for learning online based on your personal preference:
 - Text
 - Not helpful
 - Helpful
 - Very helpful
 - Audio
 - Not helpful
 - Helpful
 - Very helpful
 - Video
 - Not helpful
 - Helpful
 - Very helpful
 - Graphs/charts
 - Not helpful
 - Helpful
 - Very helpful
 - Images/illustration
 - Not helpful
 - Helpful
 - Very helpful

 - Are you familiar with the principles of STEM learning (evidence-based pedagogical practices)?
 - Yes
 - No

 - How confident do you feel in your knowledge and experience with the STEM learning principles?
 - Not sure
 - Not confident
 - Somewhat confident
 - Very confident

 - How interested are you in learning more about STEM learning principles?
 - Not sure
 - Not interested
 - Somewhat interested
 - Very interested

-
- How interested are you in learning more about evaluation strategies in STEM learning?
 - Not sure
 - Not interested
 - Somewhat interested
 - Very interested

 - How comfortable do you feel making changes to your courses based on suggestions from current research?
 - Not sure
 - Not comfortable
 - Somewhat comfortable
 - Very comfortable

 - How satisfied are you with UCF's professional development options?
 - Not sure
 - Not satisfied
 - Somewhat satisfied
 - Very satisfied

Appendix B:

The following survey results are collected from the online survey (Appendix A). The survey was created at Instantly.com (an online survey builder) and distributed through individual emails to 20 UCF faculty members. 1 out of the 20 faculty members responded to the survey. In addition, Dr. Wendy Howard (SME) provided answers to some of the questions asked on the survey.

- How many years of teaching experience do you have?
 - o Less than 1 year 0%
 - o 1-4 years 0%
 - o 5-9 years 0%
 - o 10+years 100%

- Do you have experience using Canvas?
 - o Yes 100%
 - o No 0%

- Your experience with Canvas includes (select all that apply):
 - o No experience in Canvas 0%
 - o Taking a course in Canvas as a student 0%
 - o Teaching a face-to-face course with Web components in Canvas 100%
 - o Teaching a mixed-mode course 100%
 - o Teaching an online course 0%

- Do you find Canvas to be an effective LMS for course delivery?
 - o Have not taught in Canvas 0%
 - o Not satisfied with Canvas 0%
 - o Somewhat satisfied with Canvas 100%
 - o Very satisfied with Canvas 0%

- What is your preferred learning environment?
 - o Online 0%
 - o In-person/face-to-face 0%
 - o Mixed-mode/hybrid 100%

- Rate each method of instruction based on your personal preference:
 - o Lecture
 - Not helpful 0%
 - Helpful 0%
 - Very helpful 100%
 - o Discussion
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
 - o Group learning
 - Not helpful 100%
 - Helpful 0%
 - Very helpful 0%

- Problem-based learning
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
 - Independent e-Learning
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
- Rate each type of media for learning online based on your personal preference:
 - Text
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
 - Audio
 - Not helpful 100%
 - Helpful 0%
 - Very helpful 0%
 - Video
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
 - Graphs/charts
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
 - Images/illustration
 - Not helpful 0%
 - Helpful 100%
 - Very helpful 0%
- Are you familiar with the principles of STEM learning (evidence-based pedagogical practices)?
 - Yes 0%
 - No 100%
- How confident do you feel in your knowledge and experience with the STEM learning principles?
 - Not sure
 - Not confident
 - Somewhat confident
 - Very confident
- How interested are you in learning more about STEM learning principles?
 - Not sure 100%
 - Not interested 0%
 - Somewhat interested 0%
 - Very interested 0%

- How interested are you in learning more about evaluation strategies in STEM learning?
 - o Not sure 0%
 - o Not interested 0%
 - o Somewhat interested 100%
 - o Very interested 0%

- How comfortable do you feel making changes to your courses based on suggestions from current research?
 - o Not sure 0%
 - o Not comfortable 0%
 - o Somewhat comfortable 100%
 - o Very comfortable 0%

- How satisfied are you with UCF's professional development options?
 - o Not sure 0%
 - o Not satisfied 0%
 - o Somewhat satisfied 100%
 - o Very satisfied 0%