Instructional Design for Online Learning

Instructional Design refers to the practice of developing "instructional experiences which make the acquisition of knowledge and skill more efficient, effective and appealing."[1] Instructional design guides the process of developing training (both resources and experiences) to meet the educational needs of students. Instructional design considers the current learning needs of the student and how best to deliver a body of content or experience to the student to meet his/her needs. Although instructional design applies to any educational experience, its significance and importance increase in the online learning realm.

> Probably the most popular approach to designing instruction is to follow some variation of what is essentially a three-step process:
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> 1. **Analyze** the situation to determine what instruction is necessary and the steps that need to be taken to deliver the instruction
> 2. **Produce** and **implement** the instructional design
> 3. **Evaluate** the results of implementing the instructional design
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> One of the most popular descriptions of this process is ADDIE, an acronym that divides the three steps into five actions: **analyze**, **design**, **develop**, **implement,** and **evaluate** (emphasis added). ADDIE is not a specific instructional design/development model but an illustration of the conceptual components of many instructional design/developmental models.[2]

The topic of instructional design is vast, like the topic of facilitator preparation. The intent of this article is not to provide an exhaustive treatise on the subject, but to give ministries and instructors some guidelines on the use of instructional design strategies for the development of online courses. For the purposes of this article, instructional design will be explored using the ADDIE model. There are other models of instructional design. There is no intent to assess the relative worth or differences among those models. The ADDIE model is utilized because it provides a comprehensive and foundational structure for the instructional design process. The ADDIE model can be used to plan anything from a college degree program to one activity in the

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[1] Merrill, M. David, Leston Drake, Mark J. Lacy, and Jane Pratt, eds. "Reclaiming Instructional Design." *Educational Technology*, 36 (1996): 5-7. Print.

[2] Brown, Abbie, and Timothy D. Green. *The Essentials of Instructional Design: Connecting Fundamental Principles with Processes and Practice*. Upper Saddle River: Pearson, 2006. 8-9. Print.

classroom. Each stage of the ADDIE process builds on the previous stage, so completing each stage to its fullest will only serve to make the next stage easier.

The acronym ADDIE stands for five phases of instructional design:

1. Analysis
2. Design
3. Development
4. Implementation
5. Evaluation

This article will examine these phases of the instructional design process in more detail. In addition, this article will explain how an instructor should use each phase in the development of online courses.

What Does Instructional Design for Online Learning Involve?

As ministries and instructors consider instructional design for online learning, it is important to remember a guiding principle: *just because you **can** doesn't mean you should*. This phrase means that just because a Learning Management System (LMS) offers a particular feature does not mean that feature should be used in the educational process of students. LMSes offer many features and resources to enhance the learning process. It is not necessary (nor desirable) to use every feature that an LMS offers. The choice to use or exclude a feature in an LMS should be guided by the instructional design process, which will define content, experiences, and features of an LMS to provide that training/experience.

- **What are the steps for instructional design using the ADDIE model?**

Analysis

Analysis is the first step of the ADDIE process. In this step the instructional designer (ID) assesses every aspect of the learning situation and identifies the end goal for the course or activities, taking into account the learner's needs and existing knowledge.

The ID starts the Analysis stage by identifying the **instructional problem**: the intent or goal of the course and how the student should change (be that a change in thinking or development of a skill) as a result of the activity or course. The ID must understand what needs the course is intended to accomplish before the ID identifies how to meet those needs through an activity or course. This is the instructional problem.

After identifying the instructional problem the ID should break the instructional problem into manageable and achievable **goals and objectives**. These goals and objectives keep the focus of the course or activity on the previously identified instructional problem, but narrow the larger instructional problem into more focused learning areas.

After the goals and objectives have been identified, the **audience** must be evaluated. This is a vital step that should not be overlooked because it is here that the ID takes into account the users and their characteristics, skills, and existing knowledge. The ID may determine to poll the intended audience to determine their needs for training. The next stage of the ADDIE model will rely heavily on this gathered information.

The last part of the Analysis stage is to assess the delivery options for the course or activity. Possible solutions for course delivery include delivery entirely online (synchronous, asynchronous, blended, etc.) or delivery in a physical setting. The Analysis stage should also determine the scheduling of the activity or course, any needed performance measures, the possible need for training/training materials about the LMS itself, the time frame for the design, and the time frame for the implementation of the course.

Design

In the design step of the ADDIE process the ID starts to create the overall look and feel of the course/activity. The ID should take into account the learning goals and needs from the Analysis section and then craft an environment that provides the best opportunity for the goals to be met. The most vital part of this stage is to utilize the analysis that has already been completed to create the most appropriate and effective course or activity possible.

In this stage, the ID must consider the design (both the look and the techniques) of every activity in the course and within the scope of the LMS. Based upon the analysis completed

previously, the ID should select from among the various learning activities available within the LMS to determine which activities will best achieve the educational goals of the course. Any learning activity chosen must then be designed (including the sequence, anticipated interaction, and presentation) within the course. The design of the course and each activity should not detract or distract from the instructional goals for the course.

Often times mind maps[3], storyboards, and/or prototypes are created during this stage. These tools can be used to create a step-by-step outline for the course which will take into account the manageable goals and outcomes that were previously decided upon in the Analysis stage.

The ID should then create the modules/lessons that will help achieve the goals and objectives. Each module/lesson should be thoroughly tested to determine if it achieves the desired educational goal among members of the intended audience. Changes to the module/lesson can be made based on the outcome of the testing.

Lesson materials are not created at this time; that task is performed during the Development stage. The modules/lessons should be developed enough that a sample user could understand what is going to happen. A step-by-step outline of what the students will do for an activity is sufficient in this stage. This outline should contain enough information to convene the idea of the module/lesson without creating every activity for that lesson. As the lesson is being designed, it is also important to be thinking about what training materials need to be created or located.

Looking back at the bits and pieces of the course that were analyzed earlier, the ID can begin to design the interfaces that the students will encounter. The ID will design how the student will access the course and each module/lesson. For example, the ID should consider how students will be notified of new posts within the LMS (e.g., external e-mail sent to each participant or a messaging system within the LMS). Every course will present different needs in this section of the ADDIE process. Regardless of the course and its needs, the ID should

[3] A mind map is a spider-web diagram that is used to outline information visually. It starts with one word in the center. Subtopics surround the main word and are connected by a line. Other topics, descriptions, or key words branch out from the subtopics, descriptions, and key words to which they relate.

take the time to develop the bits and pieces to make for a frustration-free environment for the students, no matter their level of experience with the LMS.

The ID may now create a prototype of the activity, assessment, or course. The ID will design every learning component in the LMS and let others test and assess its user-friendliness, what makes sense, what is missing, what works, and what could be improved.

Keeping in mind that anything that detracts or distracts from achievement of the instructional goals should be eliminated, the ID will use the information received from the prototype users to go back and design the activity, assessment, or course again, improving the weak areas, removing the failures, and utilizing more of the successes. The ID should not leave the Design stage until most, if not all, of the concerns have been addressed.[4]

Development

In the Development stage the ID will take the design, mind maps, prototypes, and/or storyboards and begin to create the content needed for the course/activity. By the end of this stage every piece of the course should be finalized and ready for distribution in the next stage.

Taking each module/lesson crafted in the last stage, the ID should create the materials that are needed in order to carry out those individual modules/lessons. This might include sequential presentations (such as PowerPoint, Keynote, or Prezi), videos, printable handouts, study guides, quizzes, tests, FAQs, glossaries, and other materials as needed. Any resource that the students need to achieve the educational goals decided upon in the first step is created here.[5] The lessons that the ID designed in the previous step should have been detailed enough that the materials needed are clear and obvious.

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[4] Remember that problems experienced here by prototype users will be experienced by actual users. The goal of this stage is to eliminate difficulties in the instructional process, so the educational goals are achieved for the intended audience. In this regard, remember to pay attention to the Learning Management System (LMS). If the LMS itself presents a problem for sample users (especially those who have experience with an LMS), then the LMS will be a bigger problem for those who do not have any or as much experience. This type of problem might require some training in the LMS system or an introductory week to the course that focuses on navigation of the LMS.

[5] Be aware of a major mistake that frequently appears during this stage of instructional design. Many well-intentioned instructors come at the educational process with a predefined set of content; they come believing that if students only absorbed this set of content, everything would be well. There may be nothing wrong with the content, and it may be exactly what is needed in the

As with the Design stage, each piece of instructional material created in this Development stage should be assessed and critiqued by people having different levels of ability and experience. As needed, correct the materials to be as effective as possible. Repeat this step as many times as necessary to produce the best quality materials for the course.

Implementation

This stage of ADDIE puts the educational plan into action. All of the materials that were created in the previous stage are added to the LMS and prepared for the first day of the course. The ID and instructor/facilitator should check every link and make sure nothing is missing or needed before the students log in on the first day.

The course now begins; it is implemented. The students are enrolled, the teacher teaches/facilitates, the materials are distributed to the students, and the effectiveness of each piece of material is evaluated as it is employed. In addition to students being assessed for their ability to learn, the course is evaluated for its ability (or lack thereof) to instruct. The teacher, the ID, and the students gauge the effectiveness of each lesson and each piece of instructional material to see if the instructional goals identified in the Analysis stage are being met. If this evaluation occurs naturally during the course, then steps can be taken to remedy issues that arise without waiting until it is too late for anything to be done for those students.

Evaluation

This phase consists of **formative** and **summative** evaluation. Formative evaluation is actually present in every step of the process, but summative evaluation only occurs during this end stage. The main goal of evaluation as used here is to determine the extent to which the assignments, materials, and course are **able to teach**. This is intentionally different from evaluation that focuses on the extent to which students have learned a body of material. Certainly the evaluation of students is necessary and essential, but for the purposes of

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course. The problem comes when the course is made to fit the predefined content and not the instructional goals based on the analysis of student needs and institutional goals. Content should serve to meet instructional goals and not be self-serving or ego boosting to an instructor. If the content does not meet the goals defined in the Analysis stage, the instructional designer must make the difficult decision to exclude the content or to limit its use to appropriate chunks as needed to meet the instructional goals of the training.

instructional design, evaluation is to determine the ability of course materials and the course itself to be of benefit to the instructional needs of students.

Formative evaluation techniques are used throughout a course. Every time a student completes an assignment within a lesson, formative evaluation has occurred. Every time a student makes a comment on a post or asks a question in a forum, that is also formative evaluation. Any piece of information that gives insight **into the learning process** of the student is formative evaluation, and it should be used by the teacher to adjust the present and future experience of the assignment, material, project, or course.

For the ID, formative evaluation tasks give insight into each lesson. The formative evaluation will demonstrate what materials, assignments, or lessons are effective and what are not effective. Additionally, formative evaluation will demonstrate what materials, assignments, or lessons need to be modified and what does not need to be modified.

Summative evaluation is typically performed at the end of a unit or course. It is a cumulative assessment that provides information to show what the students have learned. Summative evaluation provides tests that are designed with criterion-related referenced items. This allows the ID to see if the overall goals and objectives have been met. Based on this summative evaluation, the ID may identify what modules/lessons need to be adjusted. Do not be surprised if the evaluation does not give specifics as to which materials could be improved.

This stage also consists of allowing the students to provide feedback on the course and the teacher. The students must feel free (i.e., no penalty) to give negative comments constructively, as well as positive comments. The evaluation questions should be constructed to encourage students to discuss effective and ineffective lessons/materials and not only the course in general.

The last part of this stage is one of the most important in the ADDIE model: **revision**. Once the evaluation has been finished, the ID must make revisions to the course, improving what can be improved and removing what was ineffective. This may involve replacing activities with new ones coming from another Design stage. Sometimes the ID must go back to the first stage and analyze all over again (e.g., new students, new objectives).

- **Must the five stages of ADDIE be used each time a course is reused?** The ADDIE model does not have to be done from stage 1 to stage 5 every time a ministry reuses a course. It is always a good idea for the instructor to conduct Analysis, especially of the target audience, to determine if the needs of the audience have changed significantly from that of the audience for whom the course was originally created. This analysis may determine that a new audience has a different existing knowledge. If so, the course may need to be modified accordingly by either removing components that are unnecessary or by adding new components that were not previously needed.
- **ADDIE seems like a lot of work. Is it worth it?** Is instructional design time-consuming? Yes. Is it worth the effort? When a course has been created that accomplishes instructional goals and equips students for future ministry, the ADDIE process is indeed worth it. eDOT has experienced the frustration of ministries that have sought to develop online courses without the benefit of instructional design. Those ministries fell victim to a predetermined content that was deemed too important to deviate from at all. As a result, they failed to teach students because they failed to assess student needs and define educational goals.
- **How will instructional design affect instructor creativity?** The goal of instructional design is not to stifle instructor creativity in the development of online courses. Rather, the goal is to provide the best possible educational solution to the ministry's needs.

  Having an ID develop courses in connection with a course instructor will produce courses that are better suited to meeting the educational needs of the students. An ID will also seek to create continuity across courses, especially in terms of navigation through courses. To the extent that the students can have similar experiences across online courses, the better equipped those students will be to learn in the online learning environment. Instructional design does not address facilitator roles within an online course. As we have seen in the previous article, the development of effective facilitation skills requires a great amount of creativity and flexibility.

Conclusions

The goal of instructional design is to create an instructional experience that is efficient, effective, and appealing. Each ministry has a set of instructional goals for students, while the student

audience has more or less experience with the topics of instruction. Instructional design allows a ministry to develop instructional experiences (be they courses, activities, or resources) that meet the instructional goals of the ministry but are specifically targeted to the learning needs of the student audience.

This article discusses instructional design through the use of the ADDIE model, a popular and comprehensive structure for instructional design. The ADDIE model contains five stages: Analysis, Design, Development, Implementation, and Evaluation. Each stage should be completed fully before progressing to the next stage as each stage builds on the work completed in previous stages. The process should be repeated as needed or identified through both formative and summative evaluation.

Although instructional design requires time and effort, it is effort well spent. The result of a thorough instructional design process will be an instructional experience that both meets the goals of the ministry and provides training that meets the learning needs of students. In short, use of instructional design will produce efficient, effective, and appealing instructional experiences.

Things We Did Not Say

Written communication only allows for one-way communication: from author to audience. In this section eDOT desires to clarify some common misunderstandings given what has been said above.

- eDOT does not desire to convey that ADDIE is the only model of instructional design a ministry should use. Although ADDIE is popular and comprehensive, it is not necessary to use this model exclusively. Other models of instructional design exist. To the extent that such models provide stages for the key steps of analysis, implementation, and evaluation, those models may be considered a substitute for the ADDIE model.
- Although eDOT has used the term *Instructional Designer* in this article, eDOT does not intend to convey that the process of instructional design may only be conducted by an ID. Not all ministries have the means to employ a specific ID. The teaching faculty of a ministry may need to act as its own ID. Anyone who follows the instructional design process given in this article may be designated an ID.

- eDOT does not desire to convey that the assessment of students is unnecessary or unimportant. In the discussion about the Evaluation stage, the emphasis of evaluation is on the learning instruments (assignments, materials, and the course). Just as an instructor would evaluate the worth of a potential textbook for a particular course prior to requiring it for said course, so each component of an online course must be evaluated for effectiveness to communicate and guide students according to the instructional goals and student learning needs. Student assessment should consider the extent to which a student has developed a grasp of a body of content and also should provide assessment of the ability of course materials, assignments, and the course itself to accomplish the instructional goals identified in the Analysis stage of the instructional design process. If a majority of students fail to achieve mastery of instructional goals, that might indicate that the learning experience has failed to achieve the identified instructional goals.

Resources to Consider

With each article in this series, eDOT recommends some resources for a ministry to consider as it evaluates the issues leading to implementation of an online learning program. It is to be understood that these resources provide fuller treatment and give greater explanation of these issues than is possible in these articles.

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