The ADDIE Model: Dead or Alive?

Jana Vejvodová
Department of Czech Language and Literature, Institute of Lifelong Learning, University of West Bohemia
Univerzitní 8, 306 19, Plzeň, ČR
vejvod@kcj.zcu.cz

Abstract

This paper discusses the effectiveness of the ADDIE model for online courses development. The author describes her experience with using this model which includes five phases: Analysis, Design, Development, Implementation and Evaluation.

The ADDIE model has been criticized by some as being too systematic, too linear, too inflexible, too constraining, and even too time-consuming to implement (see [4]). In this paper, we will discuss the individual ADDIE phases and try to argue against the objections raised.

1. Introduction

There are many approaches to online courses development. At the University of West Bohemia, we have decided to adopt the ADDIE model because of its simplicity, ease of application, and cyclic nature. This model includes five major steps: Analysis, Design, Development, Implementation and Evaluation.

Unfortunately, it is not possible to answer the question “what is the original source for the ADDIE Model” satisfactorily; it is also hardly possible to find any reliable original source to cite. Origins of the model probably can be found in the American military sphere, later it has been promoted widely, particularly as a basis for design and development of e-learning (see [5]).

There is a tendency in recent literature to accept the ADDIE term as an umbrella term, allowing for different interpretations of the individual phases. 10 different instructional designers following ADDIE might produce 10 different results, depending on the fact that ADDIE is a model, not a theory.

2. Discussion of ADDIE phases

2.1. Analysis

The analysis phase is sometimes considered too time-consuming, and therefore often skipped in the course-development process. Such an approach is in our opinion mistaken, because the great value of analysis phase lies in the fact that without a thorough analysis, we are not able to tailor the course exactly to the needs of the participants, and thus can face their negative response later in the course run.

At the stage of analysis we focus on
- Content analysis
- Target group analysis
- Analysis of objectives
- Analysis of media
- Organization
- Teaching strategies
- Objective realization

2.1.1. Content Analysis

When using blended learning, we identify different parts of the contents: those parts which would be effectively delivered in an online course and those parts which would be more suitable for face-to-face interaction. Blended learning is a fusion of the finest aspects of e-learning and the best features of traditional teaching methods.

Within the content analysis, we distinguish static content, which does not require updating (historical events,
grammar rules, etc.), and dynamic content, which may change in time (new teaching methods, forms of organization). Since such content requires modification from time to time, its position in the course should be identified and a method for its updating should be defined. It might be very frustrating for the online course participants to encounter outdated or wrong information in the course materials.

2.1.2. Target Group Analysis

Considering the needs and abilities of the target group is essential. Whether the participants are students in combined study mode or company employees in their lifelong learning programme, the course author should rely on and make use of their practical experience. It is beneficial with respect to the course progress to formulate such questions for discussion that will enable the course participants to exchange their experience and learn from each other.

The target group analysis involves the following criteria:
- age
- education level
- cultural background
- physical handicap or learning ability handicap
- interests
- experience
- personal goals and attitudes
- study preferences
- motivation
- communication skills
- word processor skills
- cooperation skills
- experience with different methods and ways of teaching
- previous e-learning experience

We usually do not have information on all of these aspects, but the more we know, the better we can tailor the e-learning programme to the needs of the participants.

2.1.3. Analysis of Objectives

We prepare a very general draft of objectives of the course, which means that we ask questions such as: What is the author’s goal with regard to the course participants? What do the course participants need to learn?

Example:
“This course is designed to help English language teachers become competent computer users in their field. This not only includes technical matters such as using programs in an educational context, but also developing a well-considered view on their role in education. Teachers need to be able to make decisions based on what learners gain from their experiences with ICT through their language teachers.” [2]

The objectives are general on the level of analysis, as they apply to the whole course. In addition to these, subsidiary objectives have to be defined for individual topics/lessons/activities.

2.1.4. Analysis of Media

We select such multimedia components which enable suitable delivery of the content. Often they are more effective than a presentation of a mere text. The topic of the course is a significant factor in selection of multimedia components. Audio recordings, for instance, may find an appropriate use in language teaching, particularly in phonetics. However, they may be employed in courses on any topic, though. Video recordings are particularly suitable for courses teaching practical skills. Graphics will certainly be useful in courses on any discipline. Simulation may clearly illustrate some processes in physics, biology, mechanical engineering, etc.

For example, one of the most common criticisms of e-learning in language teaching is that it only allows students to read. Students, however, do not often know the correct pronunciation and lack the opportunity to practice communication.

Language courses should therefore include as many audio recordings and video sequences as possible. It is also possible to add synchronous communication via Skype, videoconferences and other features, like a text reader or a translator.

2.1.5. Organization

We need answers to the following question:
- How many students will take part in the course?
- Will a tutor/tutors be available? What would be the time requirements for the tutor(s)?
- What will be the proportion of face-to-face teaching, online coursework, individual assignments and self-study activities (in cases of using blended learning)?
- What will be the course schedule with respect to duration, number of study hours, or ratio of face-to-face and online lessons?

Answering these questions allows us to decide whether we will be able to teach the course ourselves or whether additional tutors are needed.

2.1.6. Teaching strategies

In our courses, we mainly focus on two teaching principles:
- Experiential learning: learning by doing

With this technique, the participants obtain new knowledge and skills through a practical activity.
Therefore, the courses are not focused on mere studying of individual chapters but rather on working through various study activities.

• Collaborative learning
It is profitable especially for the teachers to experience collaborative learning in student roles. They will increase their abilities to assign, coordinate and assess group-oriented activities in their own online courses or F-2-F teaching.

Great attention is paid to building a group. The following criteria apply to forming groups:
• the group is heterogeneous;
• the group is comprised of men and women;
• the group members are of different ages;
• the group is made up of participants coming from different places;
• if there are more participants from one city in the group, they should be employees of different institutions;
• people with different levels of experience with e-learning are members of one group.

2.1.7. Objective realization
There are many tasks to be completed in the process of online course development. Naturally, it is possible - and rather common - for a single designer to take care of multiple tasks. However, as teachers, we need most help with analysis of suitable e-learning tools and solutions, technical and graphical aspects and development of multimedia components. Therefore it is very helpful when an implementation team is available.

We also ask other questions:
• In what learning environment will the course be delivered?
• How will the course be accredited?
• What is the budget?

3. Design
The purpose of the design phase is to split the path towards objectives into steps. We select an appropriate teaching strategy for each step.

The design phase is the best time to create specific detailed objectives. We can still make them more specific at the development stage.

There might be different approaches with regard to teaching: either we have some contents ready and know our goal beforehand or we are undecided yet and we decide the goal and prepare the materials directly during the course writing. In a different approach, we may know our goal in advance but still seek the most effective content to achieve it.

It is obvious that the ADDIE model is rather iterative than linear.

We have to answer three planning questions:
• What will students know after the completion of a lesson, module or a course?
• What will they do to achieve it?
• How can the achieved results be measured?

Individual subsidiary objectives need not necessarily match the units of the course (lessons). One lesson may concern several objectives or, conversely, achieving one subsidiary objective may be spread across several lessons. Measurability of objectives is very important. Definition of an objective should therefore consist of three main elements [6]:
• observable target behaviour;
• conditions, under which the target behaviour should occur;
• definition of (at least one) standard criterion for evaluation of the extent of the target behaviour.

Example:
“The course introduces the basic aspects of Primary CLIL (Content and Language Integrated Learning) teaching. It provides participants with necessary knowledge and skills such as planning, teaching strategies and assessment.”[3]

In such case, the achievement of objectives can be measured. In addition to the selection of methods for evaluation of acquired knowledge and skills, actual tests are created and authentic learning tasks are designed at this stage. If these tests or tasks are prepared after the completion of the course content, they tend to focus on the content of the course materials rather than the achievement of teaching objectives.

Requirements for initial knowledge should be realistic/adequate – among others. The best way to check if students have such knowledge, is a pilot run. If the requirements are too high and the students do not have an opportunity to meet them, it will not be possible to build on such knowledge during the course.

When drafting a course plan, we think about the future students first, rather than just focusing on the course contents. To be able to motivate the students, one should consider the following factors as early as in the course planning:
• both physical and mental activities of students form an important part of the learning process; the interactive mode is yet another feature to be included;
• fun is closely related to motivation;
• variety can be introduced through different activities, tasks, or media;
• social interaction includes discussions, teamwork, tutor-student contacts, students’ mutual contacts;
• choice – broad range of activities for students to choose from;
• feedback – there should be a continuous positive feedback in the form of problem-solving tips,
suggestions for skills improvements, prevention of mistakes, encouragement, tests and self-tests;
- challenge is involved in tasks requiring creative thinking;
- appreciation – the required study progress must be achievable, i.e. tasks, exercises, tests and self-tests should be adequately difficult for the students.

The above list of the motivation factors suggests that a study article should not be comprised of a single study activity. The focus of the study must involve such activities which keep students motivated.

When planning the lesson structure, we are aware of two conflicting approaches: a unified structure of lessons makes them easier to survey, more comfortable to use and makes students more secure. On the other hand, a uniform pattern may lead to a dull visual appearance of the course. Therefore, we make an effort to incorporate interesting features into each lesson.

4. Development

At this stage we try to find and assess previously created (and available) materials. High-quality materials can often be found on Internet, particularly for online teaching. These materials can be included in our own course as either links or citations. We prepare our own materials for topics where existing materials cannot be used.

At this stage a large portion of creativity is desirable. In addition to texts, study materials can contain animations (with sound) and simulations, sound recordings, images, video sequences and other features. However, it is not practical to include multimedia components wherever possible just because they are simple to obtain/create. Virtually all types of study materials and tests in particular should be used first in a pilot run of the course.

We prepare the textual materials in a suitable format:
- extensive scrolling should be avoided (1 study article – 2 screens at most);
- the text should be split into smaller sections (bullets, numbering, different levels, lower level headings);
- the fewer colours, effects and font types and sizes on the page, the better;
- sans serif typeface (ARIAL) is generally easier to read on the screen than serif fonts (TIMES NEW ROMAN), unlike in printed materials;
- using bold typeface or italics (which, however, is more difficult to read on the screen) is more suitable for highlighting text than underlining. Underlining disturbs the row of letters, to which our eyes are used, and slows down your reading.

There are some essential elements of a course we should not [6]:
- Course information:
  - Course description
  - Course objectives
  (If possible, it is desirable to include those course objectives which are related to the use of equipment. For instance, language course participants may learn to work with corpora).
- Tutor’s introduction
  Tutors can introduce themselves both with text statements and their photographs or audio/video recordings. This adds a human touch to the course. They can also include a link to their website.
- Introductory word
  Welcoming students is the first of many ways toward creating a personal relationship. It has great importance in an anonymous online environment. Its form can be a text message. A text combined with a photograph or an audio or video recording is very suitable as well. It is more appropriate for those with visual or hearing impairment.

The introductory word motivates participants. In addition to greeting them, one may introduce them to the topic. One can point out the relations between their previous pieces of knowledge and their importance for the upcoming work. One can stress the practical application of such knowledge or inform them about new study resources.
- Contact with the tutor
  It is good to set up rules for communication during the course.
- Consulting
  One should show his/her consulting hours, place, phone number and the rules for online communication (chat, discussion forums).
- Discussion boards
  Some issues are better to resolve in discussion forums, such as assignment of and instruction for work, notices, discussion of the current situation on the course, group work or technical problems. Advantages of discussion forum communication:
  - all students (in accordance with their settings) have access to our responses. We do not have to send a number of individual messages;
  - students can work on problems with one another;
  - both questions and answers are permanently available.

It is good to separate communication on technical issues and that related to the actual study. One can create a separate technical discussion forum.
- Rules of the game
  Explaining the “rules of the game” includes topics like attendance, activity, cheating, netiquette, duties, assessment rules etc.

General assessment of participants’ work should include their activity during the course. We clarify the level of their involvement: whether students should complete all exercises, how often they should respond to proposals in discussion forums, how to work in groups,
communication rules. We set rules for absence and attendance.

Online courses are ideal environment for collaborative methods which, on the other hand, are very difficult to structure correctly and deploy effectively. We have to have a clear idea about what we want to achieve. We create groups but we are aware that we may have to change them during the semester. We designate group coordinators for particular tasks responsible for their completion. We provide a detailed procedure for collaboration between groups, handing over the work and we define rules for completing tasks.

- **Recommended literature**
List of recommended references should be provided, preferably with a short comment.

- **Assessment**
We describe the procedure for completion of the course and conditions for awarding the credit or passing the examination to participants. We define the required numbers of points from running tests or the final test, number of pieces of homework, we specify a presentation to be prepared or we define the activity in discussion forums.

5. **Implementation**

At this stage, all materials and procedures are put to use. Although this phase may seem to be the simplest stage, it is not. It would be a mistake to expect that the materials will simply be handed out and the course will follow the desired path on its own. The success of the course greatly depends on the tutor and the way of teaching. The fewer face-to-face lessons there are in the course, the more intense should be the communication between the tutor and course participants. It is desirable to set rules for communication during the course and publish them. Both tutors and course participants should get to grips with the learning environment. In pure online courses, this can be achieved in the introductory tutorial. Its content should be less demanding. Instead, it should provide participants with a secure feeling about working in the online learning environment.

6. **Evaluation**

Some say that the worst problem lies in the fact that the **evaluation** is the last step of the ADDIE model. It takes place, however, throughout the whole preparation period. After the course starts, we obtain information from course participants. This continuous - **formative** - assessment is focused mainly on verifying the processes during the course. It provides continuous feedback for immediate response by a tutor. Another element of the course assessment is the **summative** assessment [7]. It typically takes place at the end of the course. Its focus is evaluation of the course and its outcomes as a whole: the extent, to which it met students’ expectations, the level of study materials and discussions, relevance of knowledge, skills and attitudes acquired by students, and other aspects. Responses of course participants are most often gathered through questionnaires or polls. All elements of the assessment are useful - not only for tutors: they also facilitate reflection and self-reflection in students and improve the learning process.

In addition to such subjective references by students, the tutors can find a substantial source of information on the overall success of students in running and final assessments (tests, individual or group assignments).

Where tests were used, an important part of the assessment can be obtained from test items - using standard methods.

7. **Conclusion**

Despite many objections to ADDIE model raised, ADDIE is not dead. It is just one model of many, but one that is easy to follow. It provides a great deal of flexibility, which we consider crucial in online course development. This model is only meant to suggest possible activities at each of its phases. Any given e-learning project may decide to include some of the activities and not others, or to add its own, different activities if needed. The team members at any given phase may also vary, depending on the scope of the project and the skills and capabilities of the staff.

This model is very systematic. We believe it is nothing to be criticized, it is its advantage. Being systematic prevents unnecessary mistakes. ADDIE was never meant to be a linear process. We use it as an iterative process where we continually come back to previous stages to validate our work. Its most important phase is the phase of analysis. Some designers see this stage as too time-consuming. However, in the long run it saves money and time because when a suitable training tool is applied in a corresponding situation, the outcome is a satisfactory course for all concerned.

We use the ADDIE model as a useful heuristic framework for e-learning courses development. ADDIE is not a constraining process, it is a tool. It opens possibilities, but the outcome is always dependent on its user.

8. **References**


