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Instructional design taking roots from globalization toward institutionalization

Ali Yılmaz[a*], Ercan Kiraz[b]

ªSürekli Eğitim Merkezi, ODTÜ, Ankara 06531, TURKEY
ᵇEğitim Fakültesi Eğitim Bilimleri Bölümü, ODTÜ, Ankara 06531, TURKEY

Abstract

Generally most of the instructional design (ID) models describe the process for the design and development of instruction as graphical representations of the teaching process. Even though there are many types of ID models, only a few distinctions exist among them. Most of the designers attempted to implement new models onto earlier versions, and, therefore, a vast number of ID models bear a resemblance to each other. Since new learning and emerging instructional theories, technologies, and better comprehension of the human mind are exposed, the improvement of ID models toward better ones becomes crucial. Hence, new instructional design models come into sight due to these constant changes. It is necessary to expand appropriate instructional design models to unravel the troubles of teaching, learning and/or training system.
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1. Adult Training

As Rogers (2002) stated, there is still confusion about the meaning of adult education. Continuing education and lifelong learning are commonly used interchangeably with adult education. In fact they are not. There exist more terms to put together with continuing education and lifelong learning. Those are informal education, non-formal education, and recurrent education. They need to be differentiated. To start with, it is necessary to state what an adult learner is. The term is defined as:
 "a person that is over the statutory school-leaving age and whose principal activity is no longer in education." (OECD, 1977)
"persons not in the regular school and university system and generally older than 15." (UNESCO, 1975)
Learning is also defined as:
"Learning is shown by a change in behavior as a result of experience." (Cronbach, 1963, p. 71)
"Learning is a change in human disposition or capability, which can be retained, and which is not simply ascribable to the process of growth." (Gagne 1965, p. 5)

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 * Ali Yılmaz. Tel.: +90-312-2103540; fax: +90-312-2107961.
E-mail address: yilmaza@metu.edu.tr.

Rogers, (2002) also, defines learning as a natural activity in which we are engaged in our everyday life. Further, he defined education as the *planned* learning. According to Kurt (2000), education is a very broad term. He defines it as the activities aimed to improve one's knowledge, ethical values, and understanding which will be needed throughout his/her life. Since education is a broad term, we may narrow it down to its essential components such as needs. People needs' are considered as an important aspect in designing instruction. In addition, when goals are narrowed down to right way of thinking, it is called indoctrination. When the goals are narrowed down to gaining skills, it can be called '*training*' then (Rogers, 2002; Kurt 2000).

Adult education is the act of educating the adults. It is separated from child education in different ways. It is because the needs are different. Moreover, their learning styles are also different. Adults are mostly self motivated to learn and aware of the benefits of learning. Hence, in many instances they control their own learning (Knowles, Holton, and Swanson, 1998).

1. CISCO and CISCO Networking Academy (CNA)

CISCO is a company which was founded in 1984 by a small group of computer scientists from Stanford University. Since the company's inception, CISCO has been the leading company in networking (CISCO, 2008a). It has its own IOS (Internetworking Operating System) which run on the routers, it has invented many new technologies about routing and as a result, it has the 2/3 of all the networking market.

As a result of common use of CISCO devices, the need to train qualified people increased. To meet this need, CISCO launched the non-profit CISCO Networking Academy (CNA) which is a comprehensive e-learning program that provides students with the Internet technology skills essential in a global economy. It delivers web-based content, online assessment, student performance tracking, hands-on labs, instructor training and support, and preparation for industry standard certifications. After its launch on October 1997 in 64 institutions in seven states, the Networking Academy has spread to more than 150 countries. Since its inception, over 1.6 Million students have enrolled at more than 10,000 Academies located in high schools, technical schools, colleges, universities, and community-based organizations (CISCO, 2008b).

CISCO offers two methods of content delivery: First one is the blended distance learning and second is 100% face to face. In our academy here, at Middle East Technical University CISCO Networking Academy,, 100% face to face method was preferred put into practice.

Because CNA is a worldwide academy, it is considered that the design of its standardized instruction may not be appropriate for all participants around the world. Hence, it would be essential that each academy should develop its unique instructional design due to the different features of its participants.

2. Significance of the Presented Instructional Design

Instruction is the act of making the learning easier and according to Smith and Ragan (2004) delivery of focused educational experiences called as instruction. Driscoll (cited in Smith and Ragan, 2004) defines instruction as "*the deliberate arrangement of conditions to promote the attainment of some intended goal*" (pp. 4-5). If design is an activity for improving the quality, it is related with planning. When the planning activity reaches an end, then we name it as design (Smith and Ragan, 2004). Therefore, instructional design would be defined as

… *the systematic process of translating general principles of learning and instruction into plans for instructional materials and learning* (Kiraz, 2008).

Smith and Ragan (2004) also state that instructional design is a "*systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation*" (p. 4). Therefore, instructional designer works like engineers. They both use the systematic processes, build their practices on past experiences, and find solutions which are functional and attractive. They also follow the problem solving steps and concerned with building up the final product for practicing professionals.

The instructional design presented here (see Figure 1) was developed for CISCO CCNA training program. This program aims to prepare participants for an industry certification, CCNA (CISCO Certified Network Associate). The training program is for the ones who want to specialize on the network. It is a technical course offered at the Middle East Technical University (METU) Continuing Education Center (CEC).

The target audience for this course includes students with advanced problem solving and analytical skills typically associated with degree programs in engineering, math, or science. The attendees are mostly engineers (computer engineers, electrical engineers, electronics engineers, telecom engineers) and generally hold a university degree or are undergraduate students at the 3rd or 4th year. They also have adequate English knowledge since all the course materials and medium of instruction are in English. Participants of the program are volunteers (they pay a significant amount off attendance fee for course) and their motivation is generally at high level. On the other hand, they aware that the skills they gain at the end of the course are very valuable and may shortly result in getting a better position or promotion at their existing work or finding a better job.

The instructional design proposed for CCNA course is given in the Figure 1. Here, it shows that the main goals are defined by the CISCO Networking Academy and delivered to the local training centers (such as METU CEC) with the course materials. Local training centers cannot alter the goals and objectives since there is the certification exam at the end. The presented design process may either start with analyzing learners or predetermined strategies. Predetermined strategies are shown as A, B and C. Those are experiential learning, cooperative learning, and guided discovery. There are two learner analyses as can be seen from the figure. One of them is done by CISCO, and the other one conducted by the *instructor*. Since we are not allowed to do any modification, on the CISCO's learner analysis, we continue the process with the instructor's learner analysis part. The instructor has the chance to overview the preregistration forms of the participants in order to have an idea with respect to educational backgrounds, ages, and jobs of the participants that are essential to direct the instruction. Second step is *determining strategies*. Those strategies may be differed according to the results of learner analysis part. However, it should be noted that there are some predetermined strategies since it is a highly technical training. In this case, there are three instructional strategies considered to be useful; experiential learning, cooperative learning, and guided discovery, which are explained in detail below.

When the content is analyzed, it can be seen that the program is a technical training program. It can be a good idea to start with the definition of technical training. There can be different approaches for technical training such as action learning, on-the-job learning, a-day-in-the-life simulations, apprenticeship, near-the-job training, board games, assessment-based learning activities, card games, coaching activities, email games, instructional puzzles, interactive lectures, pair learning, procedural simulations, production simulations, simulators, structured sharing, textra games, troubleshooting simulations, web-based games.

In this unit experiential learning, cooperative learning, guided discovery are being used. Experiential learning is used with the hands on labs, cooperative learning is used in forming groups for the hands on labs, and lastly guided discovery is achieved throughout the class lecture sessions by asking questions.

The following step is choosing among the provided performance objectives, considering the learner analysis, and the sequence of the learnable pieces. This step is indirectly affected by the CISCO predetermined content because the course is not free of the CISCO content. When the objectives are chosen, it is time to pick activities according to objectives and learner characteristics. Those are generally hands-on lab activities, simulation activities, quizzes, drag and drop activities, fill in the blank activities.
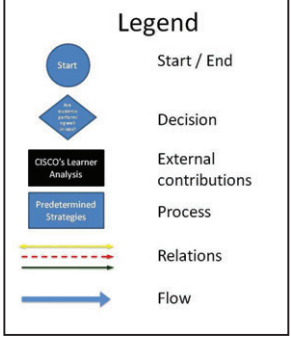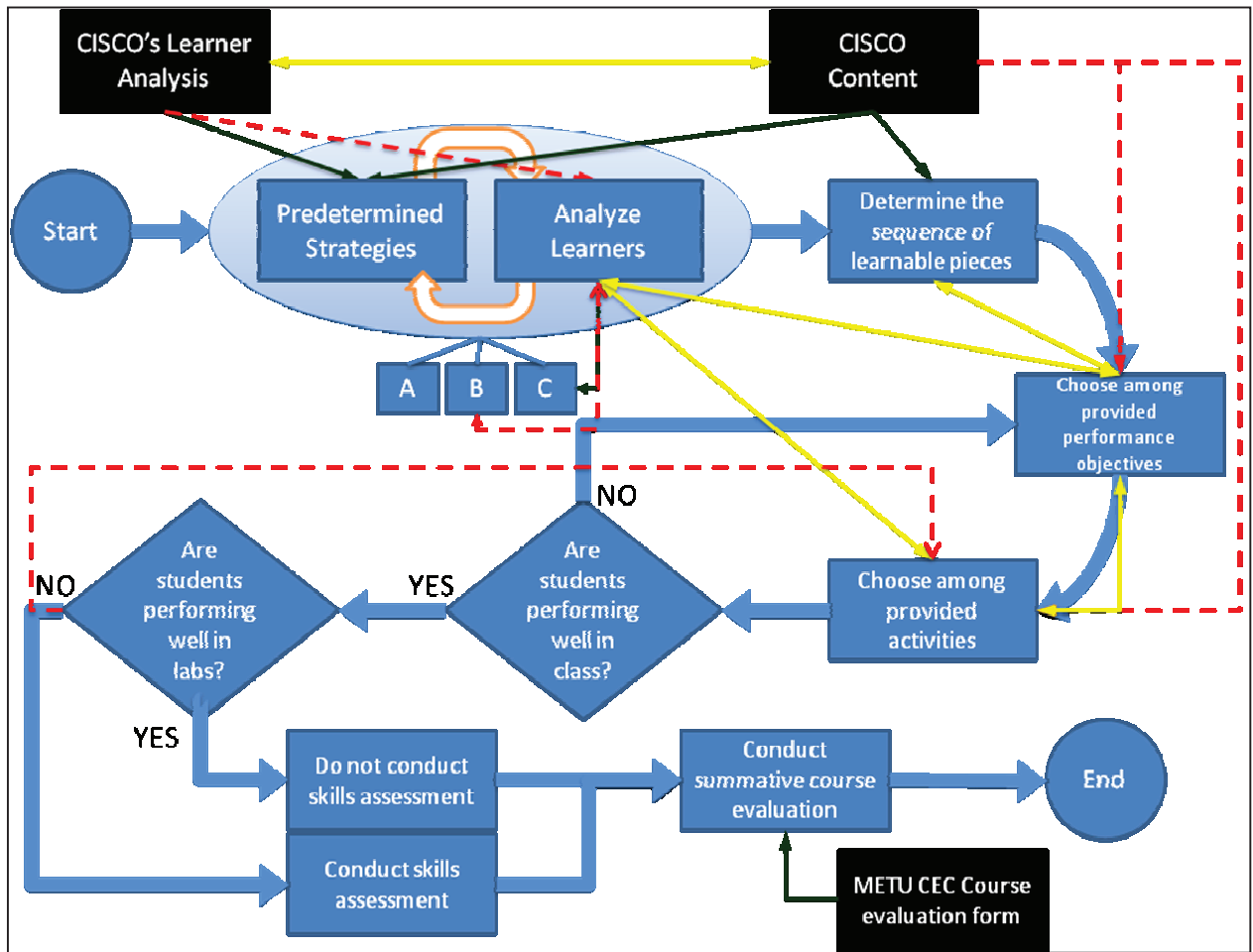
Figure 1: Proposed Instructional Design

The thick arrows show the direction of the flow. The thin arrows indicate the relations. The yellow arrows indicate bidirectional direct relations. That is if there is a yellow arrow between any two boxes, they are affected from each other. If there is a black arrow, then, the relation is direct and unidirectional. If the arrow is red and discontinuous (intermittent), then it shows the indirect relations.

In designing process instructor has be a good observer of the students while lecturing and while conducting the activities. Then s/he should be able to choose different objectives and activities if necessary. The second decision about the hands on activities. They are important part of the course program since the graduates will experience al cases after the course. Therefore, participants generally are divided into groups of 4 or 5 during the hands on tivities, before conducting a skills assessment. If the participants are performing well in the hands-on activities, e instructor may choose not to conduct skills assessment.

3. Conclusion

   Considering the essentials of a technical training and participants/candidates profiles who attend in our academy (Middle East Technical University Cisco Networking Academy), the purpose of this study is to demonstrate an instructional model and its components that is developed based on specific needs of specific institution. The model can be used or adopted as a base by other CCNA instructors in CISCO Networking Academy. Even, it can be used while training the trainers. This study aims to shed light for other instructional designers in relation to stages and processes of developing unique designs. As mentioned before, ID process is not a generic or single shaped. Different institutions may need different versions of instruction designed.

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