

Digital Toolbox for Innovation in Nursing Education

I-BOX

ASSURE MODEL: Conceptual Structure of the project and
assessment



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1. SUMMARY

This document titled "ASSURE MODEL: Conceptual Structure of the project and assessment" is presented as a guide for all participants of the I-BOX project (Digital Toolbox for Innovation in Nursing Education) within the Erasmus+ programme, as well as for all teachers who wish to integrate the use of systematic models based on instruction design.

It includes recommendations for the use of ASSURE as a conceptual framework to be used for design, implementation and evaluation of virtual educational materials, created as part of the I-BOX project and aimed at improving the training of nursing students in simulated and virtual learning environments.

Simulation-based learning is a common educational tool used in the Nurse Training and is often designed based on Experimental Learning Theories (ELT). This document details how to use Instructional Design (the ASSURE model) based on existing educational methodologies, and how to apply them in simulated environments.

KEYWORDS: ASSURE model, instructional design, e-learning, simulation.

2. INTRODUCTION

In the context of an overall trend towards digitalization of social processes including education, e-learning can expand opportunities for nurse training and for the work in healthcare services. The e-learning has particular requirement for the educational process, that is why it is in need of new approaches to the organisation of nursing education.

The implementation of the ASSURE Model for e-learning in nursing training, focuses on the implementation of the nursing procedures. By knowledge sharing between the nursing teachers from different countries they prepare future nurses for the work with patients in different cultural contexts.

3. LITERATURE REVIEW

The increase of chronicity and complexity in patient care, as well as digitalization of care processes requires that nurse training programs incorporate training models that respond to the existing needs and new challenges of the 21st century. The evolution of training is directed towards student-centred educational strategies that integrate the principles of the profession with solid scientific evidence, in order to improve quality of care and guarantee patient safety (M, Martins, J Baptista, R Coutinho, 2018).

In the last decade, the upward trend in the use of active educational methodologies that place the student at the centre of their learning has allowed the integration of simulation methodology in the training curriculum of the Nursing Degree. Simulation-based experiences are characterized by an experimental, interactive, collaborative and learning-centred environment (Robinson & Dearmon, 2013). Simulation training is designed to meet the pre-defined objectives and optimize the expected results by generating significant learning progress for the student. To ensure their effectiveness, certain quality criteria must be considered, both in the design phase and in the development of the simulation (Robinson & Dearmon, 2013). Currently, the literature shows that there is a significant need for standardization of methodologies used in simulation in terms of design and implementation (Groom et al., 2013).

It should be noted that the simulation experience can be affected by different attributes of the participant, such as age, gender, self-confidence, as well as preparation for the simulation. Teachers are challenged to implement strategies that promote critical thinking and self-directed, transformative learning for future nursing professionals (Murray, 2018)

The use of new Information and Communication Technologies (ICT) in education provides students with a new and more interactive way of learning. When technology is used with the

aim of improving students' knowledge of technical skills, it allows us to illustrate nursing procedures and techniques in a more realistic way, which facilitates their acceptability and effectiveness in their learning (Robinson & Dearmon, 2013).

Some experiences show the use of instructional models as a conceptual framework for the design of simulation scenarios in the acquisition of technical skills, patient safety competencies and communication (Burke, 2010). The implementation of instructional design has also been tested in the construction of virtual guides so that nursing students have the opportunity to develop autonomous learning in the preparation of a clinical procedure (Acevedo Gamboa et al., 2019)

The systematic use of instructional design is useful as a framework to guide the development of student-centred educational innovation (Heinich et al., 2012) while the use of simulation could provide a safe and appropriate learning environment to assess the impact of interventions, evaluating performance and knowledge transfer to clinical practice.

There is currently little research on exploring the effectiveness and efficiency of different instructional design methodologies appropriate for simulation (Craft et al., 2014) .

4. INSTRUCTIONAL DESIGN

The use of instructional design dates back to World War II when it was established as part of military training incorporating training videos for the U.S. Air Force and Army. Behaviourism, cognitivism and constructivism are the three major learning theories or psychological paradigms that underpin instructional design (Reiser, 2001; Sangsawang, 2015).

Robert Gagné (1965), American psychologist and educator, was one of the pioneers in standardizing the determination of learning objectives and the relationship with appropriate instructional designs. Another famous instructional theorist was *Bloom*, who in 1956 introduced the taxonomy of educational objectives, generating a great impact on the design of the instruction. Bloom's taxonomy allows for the setting of learning objectives and differentiates between levels of cognitive skills, need of deeper learning at higher levels, leading to a greater transfer of skills and knowledge in different contexts (E., 2017; Gagné, R., Briggs L., Wager, 1916).

Instructional design models provide guidelines to help organize the design and development of educational activities. There are multiple instructional design models such as *Dick and Carey*, ASSURE and the Rapid Prototyping Model, but many of them are variations of the traditional ADDIE (Analysis, Design, Development, Implementation and Evaluation) model. The ADDIE and

ASSURE models share great similarities in their stages of application. ASSURE incorporates one more stage with respect to ADDIE, with a total of six stages, and integrates student participation, making them more active in their learning process and paying special attention to the integration of technology as the fundamental axis of the model (Ocampo López, 2015; Sharif & Cho, 2015).

5. THE ASSURE MODEL

5.1. Definition and phases

The ASSURE model is one of the most widely used models in Instructional Design, based on the approach of *Robert Gagné* (Lima, 2010); it has its theoretical roots in behaviourism, since it is oriented towards the achievement of learning objectives, at the same time we find typical characteristics of constructivism, giving importance to the active and committed participation of the student. ASSURE is a model based on Information and Communication Technologies (ICT) that teachers can use to design, develop and improve learning environments adapted to the characteristics of their students (Sundayana et al., 2017).

The name of the ASSURE model is the acronyms of the six phases:

- **Analyse learners** (analyse the students)
- **State Objectives** (fix objectives)
- **Select media and materials** (Select the teaching method)
- **Utilize media and materials** (Decision on use of media and materials)
- **Require learner participation** (Demand the active participation of students)
- **Evaluate and revise** (Evaluate and review)

Application of the ASSURE model does not require a high degree of qualification from teachers in theories of educational design. The model is easy to use and provides the conditions for promoting an effective distance learning process to advance the achievement of meaningful training for participants. This model is a procedure that helps teachers to consider appropriate technology that is consistent with content standards while meeting the learning needs of all their students. Teachers can effectively integrate technology and media into learning to enhance their students' learning experience (Heinich et al., 2012). Teachers and students can share materials and information in the public domain (scientific articles, audio-visual materials, infographics, etc.) using the ASSURE model.

Several training models can support the educational design of the ASSURE model in order to improve skills, namely, problem-based learning (PBL). After choosing a training model, the

ASSURE model recommends choosing the type of training media (tools) that will be used. Learning tools can assist students in learning the practical skills and abilities of the nursing procedures and also improve students' communication skills. The material of the discipline transmitted through the main means of training should contain adequate standards of competency (Kefee, 1985).

The practical skills of students, future nurses, can be designed in the educational process through an electronic platform using the ASSURE model design structure and the use of appropriate teaching methods and tools, which will improve the educational process using distance technologies.

Phase 1. Analyse learners

A teacher needs to know the skills and abilities of the students they work with, in order to determine where the students need to go. Any form of pre-assessment or communication with the students can provide information for analysing the students.

If instructional media and technology are to be used effectively, there must be a match between the characteristics of the learners and the content of methods, media and materials.

Several factors are critical for making good methods and media decisions: general characteristics, specific entry competencies, learning styles.

- *General characteristics*: Include broad identifying descriptions such as age, grade level, job or position, cultural or socioeconomic factors.
- *Specific entry competencies*: Refer to knowledge and skills that learners either possess or lack: prerequisite skills, target skills, and attitudes.
- *Learning style*: Refers to the spectrum of psychological traits that affect how we perceive and respond to different stimuli, such as anxiety, aptitude, visual or auditory preference, motivation, and so on.

Phase 2. State Objectives

Once it is known where the students are, the standards and objectives need to be applied to see at what point the student is. In education, there is a balancing act between the needs of the students and requirements. This step creates awareness of this balancing act.

What are the learning outcomes each learner is expected to achieve? What new capability should learners possess at the completion of instruction?

The objectives need to be stated as specific as possible. The objectives may be derived from a course syllabus, stated in a textbook, taken from a curriculum guide, or developed by the instructor.

Phase 3. Select media and materials

With the ideas of the content settled, it is now time to determine the activities that will be used to facilitate learning. How this is done depends on the students' needs and the requires as well as the preferences of the teacher. What do instructors need to use for online/face-to-face teaching?

- Choosing a method: any topic/section will probably incorporate two or more methods to serve different purposes at different points in the progression of the topic/section.
- Choose a media format: flip charts (still images and text), slides (projected still images), audio (voice and music), video (moving images on a TV screen), computer multimedia (graphics, text...).
- Obtain specific materials: selecting available materials, modifying existing materials, designing new materials.

Phase 4. Utilize media and materials

Incorporating the use of technology is one of the distinct traits of the ASSURE model. How this is done is again up to the teachers preferences. The use of media and materials by the students and teacher.

- Preview the Materials
- Prepare the Materials
- Prepare the Environment
- Prepare the Learner
- Provide the Learning Experience

Phase 5. Require learner participation

Students need to be active learners in the class, this need for participation means having activities that provide opportunities for activity. The active participation can happen through use of technology or by other means.

The most effective learning situations are those that require learners to practice skills that build toward the objective. Learners should receive feedback on correctness of their response. The feedback may come from the teacher, or students may work in small groups and give one

another feedback. Feedback may also be achieved through a self-check activity or may come from a computer or mentor.

Phase 6. Evaluate and revise

Evaluating happens with the assessment that comes after the learning experience. It allows the teacher to see if the students has demonstrated mastery of the content. The options for doing this depends on how the class and teaching material was developed.

- Assessment of learner achievement: assessment procedures should correspond to the objectives
- Evaluation of methods and media: discussion (online), individual interviews, observation of student behaviour should be used to evaluate instructional methods and media
- Evaluation of instructor: self-evaluation, student feedback, peer/colleague evaluation, administrator evaluation
- Revision: look at the results of your evaluation data gathering; if your evaluation data indicate shortcomings in any of these areas, go back to the faulty part of the plan and revise it.

6. ASSURE MODEL IN I-BOX

6.1. Application of the ASSURE model in I-BOX

The digital educational material designed in I-BOX is available in an e-learning platform that aims to facilitate the interaction of the participants, as well as the previous preparation of the simulation or *pre-briefing* session.

The *International Nursing Association for Clinical Simulation and Learning* (INACSL), in its “good practice” document, identifies the importance of providing pre-preparation materials and resources to promote participants' ability to meet their objectives, including recommended activities and resources such as pre-reading or viewing of audio-visual materials. Pre-briefing in the simulation experience not only plays the role in generating a psychologically safe space for the participant, but also plays an essential role in the previous preparation of the session (Ahrq, 2020) .

The following table 1 provides a quick guide to implementing the principles of instructional design using the ASSURE model.

Table 1. Tools for the implementation of the ASSURE model, by phase.

A	Analyse learners	Evaluate general characteristics of students Review the curriculum of the Grade Evaluate the teaching plan of the subject Assess the participants' prior knowledge Evaluate the Learning style
	S	State Objectives
S	Select media and materials	Select the material required for pre-preparation or pre-briefing ¹ for the student Select the modality (online, blended learning or face-to-face) in which you will implement the educational action.
	U	Utilize media and materials
R	Require learner participation	Use the e-learning platform of the I-BOX project to encourage student participation
E	Evaluate and revise	Assess the suitability of Learning Objects using LORI Evaluate the impact of educational intervention on your students performance. Evaluate student satisfaction.

Source: Own Elaboration

6.2. Phases ASSURE model in I-BOX

6.2.1. Analyse learners

For the application of the first phase of the ASSURE model, it is recommended to evaluate the general characteristics of the students, as well as those relevant academic aspects where the educational action that the teacher wants to carry out is framed: the University Degree Study Plan and the subject in which it will be implemented.

Previous knowledge and skills already acquired by students should be assessed, as well as learning style preference. There are multiple tools that evaluate learning styles (Alzain et al., 2017) , this document includes two of the most widely used instruments:

- **The Kolb Learning Style Inventory:** It is an inventory with 12 items and one of the most widely used learning style models, revised in 2005, developed by *David A.Kolb* and designed to help people identify how they learn from experience determines four

¹ **Prebriefing:** An information or orientation session held prior to the start of a simulation activity in which instructions or preparatory information is given to the participants. The purpose of the pre-briefing is to set the stage for a scenario and assist participants in achieving scenario objectives (Ahrq, 2020)

preferred learning style styles: divergent, assimilative, convergent, and accommodating (A. Y. Kolb et al., 2015; D. A. Kolb, 2014; Manolis et al., 2013).

- **VARK:** The VARK (Visual, Auditory, Read and Write, Kinesthetic) learning style model was expanded from the VAK model by *Neil Fleming* in 2006 (Othman & Amiruddin, 2010). It consists of a 16-item instrument that assesses the learning style as "characteristics" of an individual, identifying which are the sensory preferences when it comes to our knowledge".

It is recommended to evaluate all those aspects that, according to the teacher's criteria, are relevant to know before carrying out the design of the educational action. Some examples of other characteristics that can be included in this phase are: determining the level of motivation of students, exploring study habits or evaluating the perception of the learning environment.

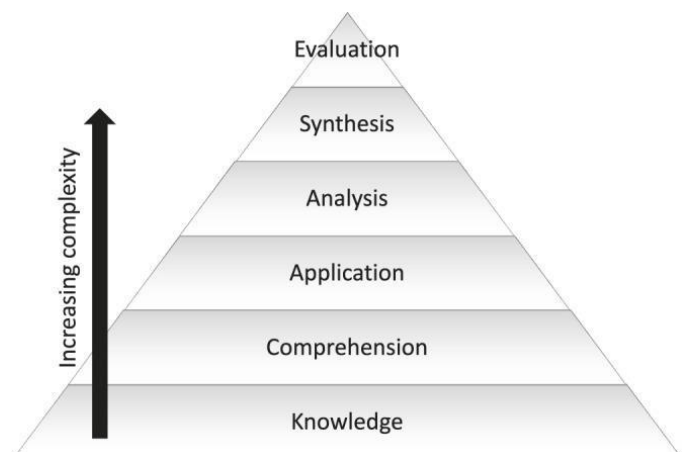
6.2.2. State Objectives

In this phase it is specified in terms of observable and measurable behaviours on what each student is expected to acquire and master at the end of each learning experience. In general, the aim is to determine what their knowledge (know how), attitudes and values (know how) and performance (know how) will be at the end of the learning experience (Dávila-Judith et al., 2007).

Bloom's Taxonomy is widely used in education for the determination of learning objectives, it is recommended to use as a tool for the development of this phase of the ASSURE model.

Bloom's Taxonomy is a standardized method for setting learning goals. It contains six categories of cognitive skills ranging from lower order skills with less cognitive processing to higher order skills that require deeper learning and a greater degree of cognitive processing (Allen & Mugisa, 2010).

Figure 1. Bloom's taxonomy



6.2.3. *Select media and materials*

The term *Learning Objects (LO)* Any refers to any digital resource that can be reused to support learning (Leacock & Nesbit, 2007). The LO in I-BOX is based on the 9 basic principles of quality, as assessed by the Learning Objects Review Instrument (LORI):

- Content quality
- Learning goal alignment
- Feedback and adaptation
- Motivation
- Presentation design
- Interaction usability
- Accessibility
- Reusability
- Standards compliance (Ahrq, 2020).

There are three types of Learning Objects (LO) included in this project: videos, computer graphics and podcasts. Below are the characteristics of the materials included in I-BOX.

Table 2. *Characteristics of the Learning Objects (LOs) included in I-BOX*

LO in I-BOX	Characteristics
Videos	- Based on Nursing procedures and techniques
Graphics	- Maximum duration of 10 minutes (<i>micro-learning</i>)
Podcasts	- Updated and evidence-based material - Developed in simulation environments - Patients, actors and health professionals are involved to seek the highest level of fidelity ²

Source: Own Elaboration

***The following points for the application of the ASSURE model will be determined in the most advanced steps of the project.*

6.2.4. *Utilize media and materials*

As indicated above, in the I-BOX project the use of technology has been key. Different materials (videos, infographics and podcasts) have been developed and are available on a public platform that allows filtering by topic, viewing the skills required and adding comments, among other options, and makes the user experience optimal. All this facilitates the work of teachers, students and professionals alike, to be able to carry out the following actions:

- Preview the Materials
- Prepare the Materials
- Prepare the Environment
- Prepare the Learner
- Provide the Learning Experience

The design and development of this platform has been done through a Human Centered Design approach, defining users and their needs, and involving them in different phases of the process. A validation and test of the online platform within the subjects of the study plan was carried out to evaluate the usability, acceptability, and quality through the Systems Usability Scale (SUS) questionnaire and the User Version of the Mobile Scale (UMARS).

6.2.5. Require learner participation

The learning event “Simulation-Based Training Program for Nursing Practice” took place from 19 April to 6 May 2022 at TecnoCampus.

A total of 15 international nursing students and 13 teachers from four different universities (UMIT, TUAS, UM and TecnoCampus) participated in the program to be able to implement and assess the materials and the platform created in this project. This gave the opportunity to collect feedback and create a best practice manual or guidelines.

6.2.6. Evaluate and revise

In this project the evaluation is done through the Learning Object Review Instrument (LORI) designed by Nesbit, Belfer and Leacock, which is a tool for obtaining scores on the assessment of learning resources (Nesbit, J., Belfer, K., 2009).

²**Fidelity:** *The level of realism associated with a particular simulation activity* (Ahrq, 2020)

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