

# Methodological guide for the creation of educational materials based on patterns of needs and design

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## ABSTRACT

Teachers face different roles according to the educational needs a student population may require. One of these roles has to do with the teachers' relationship with the design of educational materials. This paper aims to provide an introductory methodological guide for the creation of educational materials, based on specific patterns of needs and design. It is expected that teachers can also perceive their teaching role as an effective teacher-designer considering four components: needs analysis (NA), instructional design (ID), universal design for learning (UDL), and graphic design (GD). NA is fundamental in the process of creating educational materials to developing actions such as needs inquiry and analysis, allowing the teacher-designer to reflect on the educational material. The use of an ID model provides strong support in the construction of educational materials and allows teacher-designers to generate coherent products that meet the real needs of the student population. The principles of UDL help to make the design of educational resources accessible to the target population. GD goes from being an aesthetic component to making pedagogical contributions, by enhancing the final quality of the material in terms of imagery, color palette, and selected typography. Lastly, educational materials should not lose their main purpose. In this sense, a teacher-designer has to follow patterns of needs and design that can address how particular individuals learn and what they specifically require so a material becomes a functional and successful contribution for the learning process.

**Keywords:** material, teacher-designer, needs analysis, design

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## INTRODUCTION

Within the teaching practice, teachers face many different roles according to the educational needs a student population may require. Within these roles, and in terms of the teachers' relationship with educational materials, it can be highlighted not only the necessary expertise a teacher may have for its successful implementation as a means of strengthening the learning process stands out, but also the necessity in terms of becoming a material designer. Thus, educational materials play an important role, due to their potential in assisting the learning process. But within the result of the creation of a potentially successful educational material for a target population, there is a strong base in terms of parameters used for its design.

As Alghazo (2016) stated, an educational material should consider determinant features that can provide a guide for teachers and learners. In this sense, materials can be categorized into informative (inform about contents), instructional (guide through the access of contents), experiential (provide an experience with contents), eliciting (encourage the interaction with contents) and exploratory (assist to go beyond the content). Due to the complexity of teaching materials, the design

process requires a reflection phase on what the learning needs of the target audience are, which type of material can meet those needs, which resources are available, among others (Augusto-Navarro, 2015).

Considering the proactive role of teachers and an almost immediate need to be in constant interaction with the implementation of educational materials (whatever their feature may be), it may become either a sporadic or periodic necessity to create materials that can fit into a specific need and/or a target population. However, not every teacher has the knowledge and theoretical/practical support to become a designer, and perhaps because of this, a simple process of adopting or adapting materials created by third parties is more accessible. Yet, the reality is that this does not always adjust to the real needs that are required to be approached.

As a result, this paper aims to provide an introductory methodological guide for the creation of educational materials, based on specific patterns of needs and design. It is expected that teachers can also perceive their teaching role as an effective teacher-designer considering four components: needs analysis (NA), instructional design (ID), universal design for learning (UDL), and graphic design (GD).

**Table 1.** Exploring

Target population	Set up the specific population with a possible need by describing its main characteristics.
Difficulties	Define specific troubles shown during the learning process.
Indicators	Indicate actions or behaviors that show a gap in the learning process.
Sources of data	Explicit how data is collected.

Note. The authors own creation

## NEEDS ANALYSIS

A process of designing and creating educational materials is not an empirical result that is later on reflected in a product. On the contrary, it entails a complex process, which starts with the analysis of specific needs and responses that are obtained through the establishment of necessities of the target population, and how and by which means these needs are to be solved.

Yet, it is important to establish first the concept “need” itself in relation to educational scenarios. Elsaid and Nur (2018) defined diverse types of needs. The first one has to do with target needs in the sense that it is related to what students must perform in a specific situation. Target needs encompass the students’ necessities in a specific learning scenario (the requirements); the lacks (the space between the actual knowledge and the necessities); and the wants (the perception of what it is needed). The second one refers to learning needs, which seeks to consider how students learn. It may also include data from learners, a rationale for learning the language, and descriptions in relation to the course.

Considering how needs can be conceptualized, it is important to set up an NA as the series of activities developed in order to obtain data that identifies the ground of the learning needs of a specific population (Barghamadi, 2020). In terms of processes of design and creation of educational resources, NA is carried out as a systematic approach that intends to identify a potential gap in terms of what a target group of students need in a specific learning scenario and that can be approached through an action plan based on what they require.

In many cases, the action plan of the NA can lead to the design of an educational material to be used to facilitate the learning process of a target population. It is important not to lose perspective for the teacher-designer that identifying sufficient information about the learners’ needs can direct to a useful decision-making in terms of developing significant materials. In other words, finding the problem and identifying the solution can represent the main goal of NA (Barghamadi, 2020).

In many situations, the NA can be carried out by means of the use of different instruments and techniques in order to gather as much information and data as possible, such as surveys, observations, interviews, etc. Moreover, a teachers’ experiential background constitutes another potential source of information in which recurring experiences, logs or diaries, scoring records or statistics can also help in obtaining accurate information.

The action plan of NA progresses through a series of three phases, and each of those phases directs the teacher-designer to reach a final option, which will be materialized into the educational material. The three phases include a series of activities that allow the teacher-designer to create a preliminary brainstorm of potential ideas, to polish secondary data, and to define a final outcome.

### Phase 1: Exploring

The purpose of this phase is to explore several gaps that may be interfering in the learning process with a determined target population. The teacher-designer can consider past or current experiences during the professional and start determining the gaps that interfere in the learning process that eventually turn into difficulties for the students in terms of the acquisition of skills or knowledge.

**Table 1** shows a matrix that serves to coherently organize the necessary connections in a way that the teacher-designer can easily visualize how NA process explores for and gathers the information. As the first step, the teacher-designer must proceed to set the target population that is likely to be approached during the exploring phase; in other words, it determines the specific population to which it is sought to determine a possible need by giving a description of its main characteristics. Then, a list of minimum three difficulties must be defined; that is, some kind of troubles shown during the learning process that are commonly faced with the target population. Since this is an exploring phase, setting up three difficulties does not mean that all of them will be considered for the final decision-making of the material creation, but for an initial phase, different options must be considered. After that, the teacher-designer indicates a set of actions or behaviors that indicate that there is a lack or gap in the teaching and learning process. That is, for example, how students demonstrate frustration or how low scores reflect a gap in the learning process. The final step explicit how the data is collected, that is, teacher’s constant observation, or a statistical analysis from scores.

### Phase 2: Analyzing Data

Phase 2 represents a deeper process than the previous one, since its intention is to analyze the difficulties stated in phase 1 and transform them into needs. Here, the teacher-designer gets to become aware of the real needs for the target population and establishes parameters that help decide which of the selected needs can become a viable proposal for an educational resource.

**Table 2** facilitates the visualization on how to put together all the information. In the first step, the previous difficulties are taken up and transformed into needs. Here, the teacher-designer must reflect on each difficulty presented in the learning process and from each of them, define what the target population needs in order to fulfill the gap. It is important to note that a given difficulty may have more than one need, so it can be stated as many needs that can be considered as an option. Next, the teacher-designer considers the level of criticality each of the needs have; that is, how crucial the need is, so as to have to pay more or less attention to it. For each of the established needs, it is necessary to enter a rating, on a scale of one to five, of the degree that determines the criticality of the need if it is not approached, with five being the most critical. There are many other facts rather than students’ needs that may help rate them, such as: institutional curriculum, expected competencies, standardized tests, etc. Those facts can only be determined by the teacher-designer who is the person familiarized with

**Table 2.** Analyzing data

Need	Criticality (1-2-3-4-5)	Level of effectiveness (low-medium-high)	Level of feasibility (slightly achievable - fairly achievable-highly achievable)
Transform each difficulty into a need	Define level of criticality for each need	Establish how effective each proposed need is	Set up how feasible each proposed need is for teacher-designer

Note. The authors own creation

**Table 3.** Making decisions

Goal(s)	Set goal(s) that are likely to be approached
Target population	Restate target population
Difficulty	Include chosen difficulty
Selected need	Establish final selected need
Skill(s) & contents	Define skill(s) & contents
Type of material	Pre-selection of type of material (digital or printed)

Note. The authors own creation

the specific learning environment. After choosing the level of criticality, the teacher-designer establishes how effective, within the criteria of low, medium, or high, each proposed need is considered, in terms of how it can get to fulfill an existing educational gap in the target population. This criterion is defined based on what the need proposes on how to reach the difficulty in terms of time, skills, creativity, for instance. Finally, it is important to set how feasible the proposed need is for the teacher-designer, who eventually would be designing and creating the educational resource. In other words, it must be considered how slightly, how fairly or how highly achievable it can be to design and create a product that can effectively meet the needs.

**Phase 3: Making Decisions**

Phase 3 seeks to make a final decision on which of all the previously established needs is more suitable to be approached by the design and creation of an educational resource. In order to come up with decisions, it is necessary to re-analyze phase 2 and carry out a cross-check of the established elements; since all of them have to be balanced so that the teacher-researcher can finally set priorities and criteria to choose the final core that eventually will become the base for the design and creation of an educational material that can help closing a gap in a determined learning need.

This is a complex process, since the balance considers not only what is best for students, but also what is feasible for the teacher-designer. You may come up with the proposal of a very innovative, useful and relevant educational resource, but if in the end you do not have the conditions to execute it, then it is not considered a doable project. As a consequence, it is important to highlight that one of the main goals of an NA is to determine what it can be done, and not what it should be done.

As part of the decision making, **Table 3** assists on how to put together all the final resolutions the teacher-designer can finally come up with. After a careful analysis of information gathered during phase 1 and phase 2, the teacher-designer can set the goal(s) that are likely to be approached by developing the educational material. It is important to restate the target population; to include the difficulty that was chosen after carrying out the cross check; and to establish the final selected need, which can not only eventually become a benefit for the target population, but which can also be developed by the teacher-designer. Then, the process of making decisions includes defining the skill(s) and contents that will be covered, implicitly or explicitly, by means of the selected need. Finally, there is a pre-selection of the type of material that the teacher-designer considers may fit better into the selected need. In

this last aspect, teaching materials include a diversity of resources to support the learning process, for example: textbooks, specific software, worksheets, audiovisuals, among others (Alghazo, 2016); they are the set of materials organized methodically, both written and oral, which allow the creation of the environment or atmosphere that allow students to learn (Mariono et al., 2019). It is crucial for the teacher-designer to consider the most appropriate way to display the information according to the type of material, either in printed or digital format, in order to meaningfully serve the target audience.

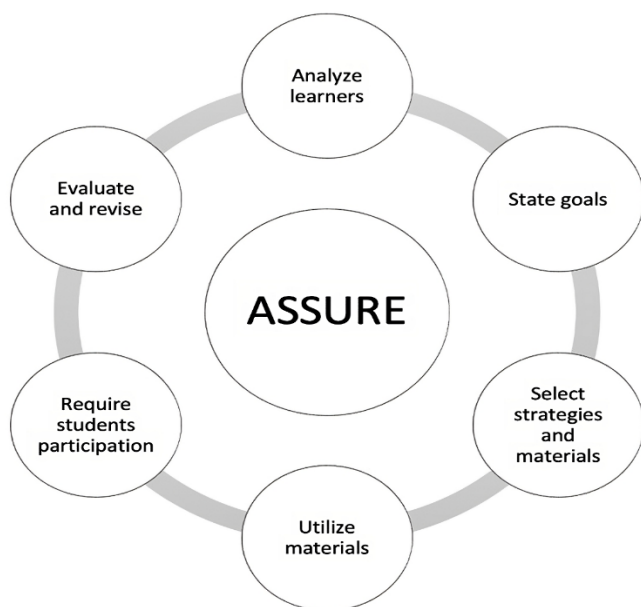
In short, this first component of the need analysis is fundamental in the process of creating educational materials. This phased approach eases the task of developing actions such as needs inquiry and analysis, allowing the teacher-designer to reflect on the educational material to be developed. Each phase leads to focus on a dimension of the initial analysis in order to improve it: how to explore on setting up the population and essential data to define the difficulties; how to conduct an analysis of the data in order to make decisions to prioritize and determine the need to be addressed; and how to obtain a more precise approach on how to design the material.

**INSTRUCTIONAL DESIGN**

ID represents an organized process in a teaching and learning environment delivered by means of the design and utilization of pertinent instructional materials. It represents the practice of designing instructional routes that guide and facilitate the learning process; this is achieved by following a series of steps with a defined purpose and consistent procedures (Mohammed, 2020). In this sense, it is decisive for a teacher-designer to consider the instructional steps that make it go from a simple design of an educational material to one loaded with logic and coherence, especially for its target audience.

When starting the process of creating an educational material, it is necessary to select in advance how the design is going to be carried out, that is, choosing a design instructional model that can provide the necessary framework so that the main goal can be achieved (Cabero & García, 2017). There are different models of ID that serve as a guide to the designer to systematize the experience in the design of educational material; these models are based and planned in the learning theory in a specific learning theory. Therefore, it is the responsibility, in this case, of the teacher-designer to ensure which model is most suitable not only for their needs, but also that anchors with what is required to be designed.

There are different models for ID such as ADDIE, ASSURE, KEMP, Morrison, and Ross, among others. But based on different personal experiences, ASSURE model fits appropriately to the process of building materials based on the students' analysis. Thereby, it can be highly considered since it sets a cyclic methodological guide to design and create materials. ASSURE concept is an abbreviation that represents the six essential actions to develop, as shown in **Figure 1** (Bajracharya, 2020).



**Figure 1.** Steps for ASSURE model (adapted from Mohammed, 2020)

According to ASSURE model, and as part of the whole ID process, it is necessary to refresh the information gathered during the NA process, specifically with the making-decision phase, since it contains general information that allows not to lose perspective of what is going to be designed and why, and to create a connection from one step to the other one. Thus, firstly the teacher-designer must analyze learners based on their characteristics and the required outcomes of learning. In a second step, the teacher-designer states the goals for the learning content intended to be in the material; in other words, there is a strict analysis of the relationship between the content of the material and the goals to be approached. In a third step, there is a selection of strategies and types of material that can make the learning experience more stimulating. The fourth step requires the utilization of materials. In this case, the teacher-designer has to ensure that the material contributes to achieve the goals, so it includes a prior planning for eventually implementing it effectively. The last step focuses on evaluating the effectiveness of the material within the learning process of the target audience from the scope of its objective(s), and even a revision on how the material itself can be improved (Mohammed, 2020).

**Table 4** deals with a mapping on how ID can be approached by teacher-designer, noting that this can only be an initial mapping, since ID is developed throughout entire process of designing, implementing, and evaluating an educational material. Teacher-designer has to first determine number of sections material can have; of course, number of sections depends on amount of content to be addressed. There is a straight relationship between sections and contents since this distribution requires a logical hierarchical organization and to structure and design material accordingly.

Once the quantity of sections is defined, a rigorous definition of elements must be carried out for each of them. As a first step, the contents of the section are stated, as well as the learning objective(s), also indicating the desirable knowledge, skills, or attitudes expected from learners as a result of the interaction with the contents in the section. This organization also demands the planning of the skill(s) that will be integrated within the different sections. For the following step, a prior ID defines the type of instructional strategies that will be

**Table 4.** Instructional design: Planning section

Section 1	
Content(s)	State the contents for the section
Objective(s)	Set the objective(s) based on the knowledge, skills, or attitudes to be achieved
Skill(s)	Plan the skills to be integrated
Instructional strategies	Determine the strategies on how the learning objectives will be reached
Type of activities	Establish types of activities that will be designed

Note. The authors own creation

included in each section in order to reach the learning objectives. In general, this learning process can be sequenced based on outcomes from: easy to more difficult; specific to general; familiar to not familiar (Hill & Jordan, 2021). This sequencing can be best determined by teacher-designer on different experiences in learning environments, interactions with the target audience, and even implementations of other educational materials similar to the one intended to be designed.

Subsequently, the teacher-designer defines the types of activities that will be designed and included in the material, which are categorized into three groups: didactic, active, and collaborative. The issue is that the activities may have different purposes depending on their intention towards the users and how they should interact with the contents of the material; in that sense, the teacher-designer must consider what type of role is required for the user. Didactic activities lead students to have a passive role; they are designed to present information in an efficient way (such as charts, infographics, presentations, videos, etc.); and basically, they mostly require students to think about what is being presented. Active activities require students to solve problems or create products; they are designed to provide a more active role (like participating in games, simulations, problem-solving exercises); they represent opportunities to discover or construct knowledge by means of interaction with the material. Collaborative activities engage students to work together; they are designed to promote interdependence by interacting with others in order to complete the activity (e.g., role-plays, debates, forums). It is important for the teacher-designer to consider that a single section can have different types of activities, as the teacher-designer visualizes, so that the proposed objectives can be achieved. The use of an ID model provides strong support in the construction of educational materials. In particular, the application of the ASSURE model has allowed teacher-designers to generate coherent products that meet the real needs of the student population.

## UNIVERSAL DESIGN FOR LEARNING

The concept universal design (UD) was initially framed in the field of architecture and understood as a process of design that seeks to make life easier and friendlier for all by benefiting not only individuals with functional limitations, but also society as a whole. Yet, more recently educators have begun to apply UD concepts in classrooms to ensure that instructional practices, materials, and environments themselves meet the needs of the wide spectrum of students. In this respect, UDL emerges then in the educational contexts in order to try to ensure that the whole population of students may have access to educational materials and practices that consider not only their potentials, but also their learning styles (Areekkuzhiyil, 2022).

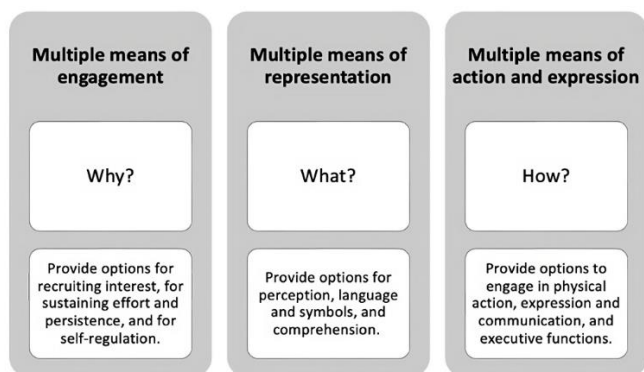


Figure 2. Principles for UDL (adapted from CAST, 2018)

Regarding the design and creation of educational materials, it is practically an obligation for the teacher-designer to apply UDL in a way that it can somehow guarantee access or interaction with the material, considering the population's multiple learning styles, capabilities or limitations. Based on Center for Applied Special Technology (CAST), the idea of applying UDL in a material is that the teacher-designer can consider a variety of three principles—engagement, representation, and action expression—in order to guarantee that the learning material is accessible and relevant for users (CAST, 2018).

Figure 2 shows an overview of these principles and how they should be interpreted during a process of material design. The first principal deals with providing diverse means of engagement, which is directed with the affective filter (motivation) and questioning learners the purpose of learning; some strategies suggest a design of material that copes with interest and effort from users.

The second principle concerning means of representation lines up with the recognition field, which seeks to address what to learn; it intends a design of material that can present information and contents differently, using a diverse range of symbols, language and organization. The third principle referring to action and expression is related to how the learning process is carried out; strategies invite the material designer to include a diversity of functions that imply expression or motor performance (CAST, 2018).

In a way that the teacher-designer can sustain a more linear and coherent process, not only with previous design stages, but also with UDL, Table 5 deals with a mapping on how this last pattern of design can be visualized and planned, and effectively applied in all sections of the material, so that there is a consisted line with the proposed activities. In order to ensure this consistency in the design process, some previous elements from the preliminary stage (ID) are considered, such as the content(s) for each section, and type of activities. Henceforth, the teacher-designer can define UDL principles that will be included in each section in accordance with those activities and take decisions whether they would follow ways of engagement, representation and/or expression for the user. It is recommended, if necessary, to reflect on those activities again, and consider if they require to be restated, so they follow UDL principles. Based on the defined principles, as a last step, the designer works on outlining the different strategies that will support them. These strategies are recognized as the various means to develop each activity successfully, and of course, in accordance with the proposed principle.

In summary, principles of UDL help to make design of educational resources accessible to the target population. Attention has to be

Table 5. Universal design for learning: Planning section

Section 1	
Content(s)	Restate the content(s) for the section
Type of activity	Establish types of activities that will be designed
Principle	Define UDL principles for each activity
Strategy	Outline the strategies to develop the activities based on UDL principles

Note. The authors own creation

addressed to why, what, and how concerns to guide the teacher-designer to make educational resources accessible and available so that the greatest number of people can use the resources for their learning.

## GRAPHIC DESIGN

GD has to do with making an attractive visual convergence of various elements, such as: text, images, color, among others. As for material design, this discipline achieves balance in terms of the integration of areas such as imagery, theory of color and typography (Ambrose & Harris, 2009). However, even when GD theory requires knowledge and experience, teacher-designer does not necessarily have to be a professional in this discipline to be able to execute design for an educational material in accordance with needs of target population.

According to Trejo (2018), turning teachers into designers is a complex task, since the issues that concern GD can be far from the educational contexts and interests of the teacher. Yet, sensitizing the teacher on basic issues of design including the selection of images, use of color, typography, among others, could be a beneficial process that allows as a consequence to have a better management and display of information in order to create more interesting learning material for the student. modern day digital. Thus, it is essential for the teacher to consider at least some of these criteria in the design of an educational material, seeking to offer and adapt their content based on innovative currents that seek to improve the way of understanding and conceiving access to communication.

As a broad term, imagery encompasses photographs, graphs, charts sketches, infographics, and icons to complement text in materials of all forms. When having a selection of imagery, the characteristics of the target audience must be reconsidered; that leads to determining the goal of the image(s), in other words, what message is the image to convey or represent, and how such how the image will be used (Murchie & Diomed, 2020). In this sense, the teacher-designer must make a careful selection of the type of images that constitute the educational material, so that each of them is consistent with the target population and keep a relationship to the general objective of the material and what it intends to transmit. Regardless of the type of image, it is important to maintain a high-quality and lineal selection of imagery. Images should be coded in similar style, shape, color and dimensions in such a way that balance, unification and quality can be maintained in terms of the type of image(s) used throughout the material.

Related to the imagery in an educational material, and as part of GD process, it is necessary to define a proposal for a pedagogical metaphor. This metaphor is a communicative resource, usually graphic, photographic, illustrative, animated, etc., that repeatedly conveys the central educational message of the teaching material. Part of its formative value consists in reinforcing and contributing, through repetition of the message and content, learning and internalization of

the knowledge, values and behaviors that, simultaneously, are communicated through other semantic forms. Similarly, a pedagogical metaphor has great power of synthesis since it assists in focuses the users' attention; contributes to improving the graphic component of the design of the material; and facilitates the use of hyper textuality as it allows texts to be identified with clear (UNED, 2008). Likewise, the pedagogical metaphor represents a consistent visual image element throughout the educational material, and through its graphic line, helps to establish content connections. By way of example, this metaphor may be represented by a specific object or character through which the target audience will be identified each time they interact with the material.

Another important aspect of GD relies on the color palette of the educational material. In accordance with Hannah (2021), the color palette guides on how the colors are consistently combined in the material in order to form a visual and aesthetic design. These palettes are based on color theory, which is a framework that aids on how to choose balanced combinations of colors, and which also helps transmitting an effective communication aesthetic and psychological message (in terms of design). As stated before, the teacher-designer does not need to have full knowledge of color theory, since nowadays the Internet offers a variety of options for free color palette generators that can be used for making an adequate selection. However, what is decisive for the teacher-designer is to carry out good research on who the target audience is since the reaction or acceptance to determined colors can be associated with cultural background, age range, and individual preferences. Getting to know all this information about the target population will be decisive for stating a proper color palette that will guide GD throughout all the sections of the educational material to be designed.

Additionally, choosing the right typography is among the main elements to consider when designing an educational material. Typography involves typeface and font style that would elicit emotions and convey specific messages during the interaction with the material (Hannah, 2022). Yet, understanding the difference between typeface and font is determinant, since they cannot be understood as synonyms. A typeface refers to the appearance, or face of the letterform, for example: helvetica, times new roman, and arial. A font, on the other hand, refers to the sizes and weights available for a typeface, such as arial narrow, arial regular, and arial bold (Murchie & Diomedea, 2020). In this sense, the teacher-designer should proceed with selecting the most appropriate typeface that will be used in the different sections of the educational material, both for titles, subtitles, text, and others. An adequate typography defines how the text is displayed and this brings a graphic balance to the material. Also, the idea of why the teacher-designer should know in advance the target audience is reinforced, since one of the main purposes of choosing the adequate typography is that it provides the opportunity for the material to be more effective by providing greater readability and amenity (Hannah, 2022).

Taking into consideration all the previous information, **Table 6** helps the teacher designer to delineate the basic elements that can guarantee achieving a coherent graphic of the material. Even when it seems to be repetitive information already considered in previous patterns, it is essential not to lose sight of the basic elements of the material, since they directly influence the selection of the optimal GD. For this reason, it is crucial to reconsider the main objective of the material to be designed, as well as the target audience (age, characteristics, among others). All these inputs certainly help to make a

**Table 6.** Graphic design: Planning section

Goal(s)	Set the goal(s) that are likely to be approached
Target population	Restate target population
Pedagogical metaphor	Designate the main communicative resource
Color palette	Select the combination of colors
Typeface	Pre-selection of the type of material

Note. The authors own creation

better designation of pedagogical metaphor for the material; in other words, the main communicative resource, that will repeatedly transmit the central engaging message of the material. The combination of colors, or the color palette, must also be selected in a thoughtful way; that is, the colors must have a clear intention, which sets the tone and the communication design of the material, which allows generating a link of interest with the target audience. And, likewise, the selection of the appropriate typography is essential for the teacher designer. The function of the typography does not merely rely on a simple reading; it also provides personality to the material. It is important to consider that the shape of the letters, their size, the between them, the combination of fonts (without having an overload) can provoke emotions in the target audience towards the material, so a reminder of the user's characteristics is mandatory.

In short, during the design process of an educational material, and based on the features of the target population and the needs to be met, it is necessary to make an adequate selection of GD elements that lead to enhancing the final quality of the material; the imagery, the color palette, even the selected typography must make a special hook so that the material meets the general objective.

## CONCLUSIONS

Facing today's challenging teachers are obligated not only to become facilitators of knowledge, but also to explore, collaborate, and investigate how this whole process can be delivered more effectively (Chen et al., 2022). Yet, considering the fact that it is necessary to adapt to the needs of the students, and how it is essential to find the resources and materials that maximize the learning process, it is then necessary to consider an extra role for the teacher: the designer. This article has been pointing out the value of the concept of teacher-designer in relation to the creation of educational materials. In this regard, instructional materials represent means of transmission that teachers can use to concretize knowledge during the learning process (Samuel, 2009); and even when they can be adopted or adapted from third parties, there will always be a particular setting that merits the design of specific material. Thus, by following a methodological guide based on specific patterns of needs and design, the tasks of a teacher-designer can be empowered.

Being a teacher-designer is not a complex job, but neither should it be an intuitive experience. The design of materials becomes an inquiry process that must be properly planned by determining and meeting the demands of the target population. In this regard, the teacher-designer executes an NA process through various phases: by exploring gaps that may be interfering in the learning process; by analyzing data that can be transformed into needs; and finally, by making final decisions on the need to be approached by the design and creation of an educational material.

ID is the process of analyzing, delineating and developing digital learning materials, based on the students' needs, in order to achieve

pre-stated objectives. ID includes different models, such as ASSURE, which can guide the process to design and develop learning materials by means of a coherent cyclical and procedural working plan that considers the contents of the material, its objective, instructional strategies on how the learning objectives will be reached, and the activities to be designed. By applying ID, the teacher-designer is able to determine pleasant and appealing methods to deliver the educational content by means of effective learning experiences.

In attention to the learning diversity, UDL must be considered, since it guarantees that the material is accessible to the entire target population. When considering UDL, emphasis should be placed on three essential elements: engagement, representation, and action and expression. Engagement means getting involved; different ways of contributing to the interest of the learners are provided, in order to promote their self-regulation capacity. Representation refers to the content and knowledge; several options will be offered for accessing the content in the material, including a perceptive and comprehensive level. Action and expression respond to how to learn; a variety of active methodologies are supplied so all learning styles can be addressed. The teacher-designer not only correlates these principles to the activities that will be designed, but also outlines the strategies to develop them according to these principles.

GD goes from simply being an aesthetic component, to making pedagogical contributions in educational materials and their accessibility. Initially, GD involves the analysis of the target population, its context and learning goals, in order to establish characteristics that guide to which material is suitable for this purpose. Subsequently, the teacher-designer defines the structures that best fit these features, such as, the most adequate selection of images, color palette, and typography. All elements are essential, not only to generate a powerful visual connection with the material, but also to enhance levels of motivation, and encourage learning during interaction with the material.

Lastly, educational materials should not lose their main purpose. The basis of designing educational materials is to make more accessible the teaching learning process and to expose the learner to primary experiences by enriching learning (Samuel, 2009). In that sense, the best course of action for a teacher-designer is to follow patterns of needs and design that can address how particular individuals learn and what they specifically require so a material becomes a functional and successful contribution for the learning process.

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