



Students' interests for personalized learning: an analysis guide

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Abstract

The lack of alignment between, on the one hand, what schools seek to teach and, on the other, the students' interests and learning objectives is leading to increasing numbers of students who are unable to derive meaning from school activities. Personalized learning strategies represent one of the most powerful ways to help students attribute meaning and personal value to their learning. This paper has two interrelated objectives. The first is to present a guide to the analysis of educational practices that work with and from students' interests. This tool makes it possible to identify the potential of practices to reinforce and promote the meaning and personal value that students attach to their school learning. The guide is structured around three large blocks (personalization strategies, conceptions of interests, and design and development of practices), which describe the dimensions, sub-dimensions, questions, and levels for the analysis. The second objective is to illustrate use of the guide by analyzing two practices designed and implemented in primary school classrooms, characterized by a focus on students' learning interests. The paper concludes by highlighting the main contributions of the guide presented, identifying some limitations, and pointing to future lines of research.

Keywords Personalized learning · Learners' interests · Analysis guide · Childhood education · Case study

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Introduction

Interests and learning

A concern for exploring the relationship between interests and learning processes has been present in publications since the late nineteenth century, although the number of research papers seeking a deeper understanding of this relationship has increased considerably in recent decades (Boekaerts & Boscolo, 2002; Hidi, 2006; Krapp, 2007). This increase is partially the result of the growing importance attached by theorists, researchers, and education professionals, within the framework of the new learning ecology, to the fact that the value of teaching and learning processes lies in the students themselves, who need to participate and be actively involved in their own learning and school activities (Barron, 2006; Coll, 2016, 2018).

In particular, evidence has been uncovered concerning the key role played by learners' interests in their attention levels (Hidi, 2001), their motivation (Järvelä & Renninger, 2014), their engagement (Ainley & Ainley, 2011), the goals they pursue (Harackiewicz et al., 2000; Ito et al., 2013), their cognitive functioning (Hidi, 2001), their understanding and the depth of their learning (Dewey, 1913; Hidi & Harackiewicz, 2000; Ito et al., 2013), and their performance (Maurice et al., 2014).

A detailed analysis of these and other studies reveals the great diversity in how authors define learning interests. This diversity makes it very difficult to establish a dialogue between the different theoretical approaches, since the notion of interest is underpinned by a broad range of conceptions, which are often not even made explicit. This lack of consensus also makes it difficult to design and use analytical tools that can be shared by the scientific community and education professionals.

In view of this situation and the fact that the main objective of this paper is to present a guide for the analysis of educational practices that work with and from students' interests, it seems necessary to clarify the theoretical assumptions underlying the various ways in which authors define interests.

Theoretical approaches to interests

A review of the literature that focuses on learners' interests, from both a theoretical and an empirical point of view, shows that all definitions share some general assumptions, despite the differences mentioned above. In particular, most of them: (1) assume that interests involve a certain type of relationship between a person and an object of interest (Akkerman & Bakker, 2019; DiGiacomo et al., 2018; Krapp, 2007); (2) refer to behavioral, cognitive, attitudinal, and/or emotional aspects experienced by the person (Ainley, 2006; Hidi & Renninger, 2006); and (3) highlight the engagement that implies interest in a particular object (Azevedo, 2011; Barron, 2006; Slot et al., 2020; Xu et al., 2012). These common assumptions are related to other concepts such as motivation, engagement, agency, and motives (Hilppö & Stevens, 2021; Järvelä & Renninger, 2014; Renninger & Hidi, 2016), which will not be addressed in this paper because they exceed the focus and extension of our work.

However, when analyzing the theoretical development of these definitions, notable differences emerge; these correspond to different assumptions about the ontology of interests, which are, to some extent, related. In particular, these assumptions relate to the following: (1) the focus of the object of interest (restricted or broad); (2) the nature of the interest

(social or individual); (3) the consistency of the interest (stable or dynamic); (4) the educational influence on interests (identification or [re]construction); and (5) the relationship between interests whose origins lie in different contexts (one-way or two-way) (Fig. 1).

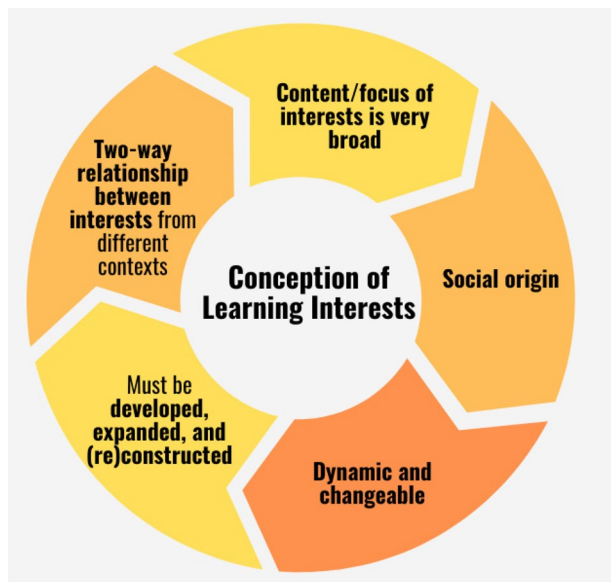
The focus of the object of interest

Different theoretical approaches assume that interests refer to a person's preferential commitment to a specific object, although the nature and breadth of this object of interest vary greatly. Based on the literature review carried out, we identified topic-centered, domain-centered, and practice-centered positions in relation to the content of the interests. An example of a topic-centered position is that of Krapp (2007), who states that "an object of interest can refer to concrete things, a topic, a subject-matter, an abstract idea, or any other content of the cognitively represented life-space" (p. 8).

Progressively expanding the focus, some authors argue that objects of interest can be very diverse, including topics, ideas, activities, events, other people, objects, and tasks (Akkerman & Bakker, 2019; Hecht et al., 2019; Renninger & Hidi, 2016; Slot et al., 2020). For example, Renninger and Hidi (2016) propose a broad spectrum, within which they assume that the focus of interest may be very restricted (topic-centered: a person may be interested in specific topics such as plants) or very broad (domain-centered: interest in general domains such as science).

Based on an analysis of some of the above-mentioned approaches, Azevedo (2011, 2017) postulates the need to remove the focus from the specific content of the interest (whether topic-centered or domain-centered) and place it in social practices in which people participate continually and have experience, and in which interests therefore emerge. As Azevedo explains (2011), "objects are further embedded in a fabric of activities that span several practices" (p. 176) and "it is possible that interest objects simply mediate several aspects of a person's continued participation in the practice and therefore function as vehicles for the person's achieving multiple practice goals" (p. 153).

Fig. 1 Characteristics of learning interests



The nature of interests

The second area in which different theoretical approaches differ is the nature (individual or social) that they attribute to interests. Traditional research approaches “have relied mostly on a theoretical construct that interprets interest as a personal characteristic, as a kind of topic-specific attitude or a motivational trait” (Krapp, 2007, p. 6).

Contrary to these perspectives that conceptualize interests as personal traits or predispositions of the individual, there are other approaches that shift the gaze — to a greater or lesser extent — toward the role played by the social context in which people participate (Ainley, 2006). Thus, some studies assume that interests are the product of interactions between personal characteristics and the social environment (Hidi & Renninger, 2006; Renninger & Hidi, 2016) and analyze how the individual’s agency, daily routines, or membership of certain communities of practice play a fundamental role in the emergence and maintenance of interests (Azevedo, 2011; Slot et al., 2020). This perspective is consistent with the assumption of the context-dependent nature of interests (Akkerman & Bakker, 2019) and with the need highlighted by Dreier (2009) to study people as participants in and through different contexts of social practice, where interests can arise and develop.

Finally, proposals such as that of DiGiacomo et al. (2018) emphasize the importance of also addressing macro-level phenomena such as often contradictory socioeconomic, sociopolitical and sociohistorical forces that converge in the different contexts in which people participate and that shape their interests.

The consistency of interests

Another conception characterized by diversity and closely linked to the previous one relates to the consistency of interests over time. As Krapp (2007) puts it, research on interest can differentiate between definitions that understand interests as “a relatively stable tendency to occupy oneself with an object of interest” (p. 9) and those that conceive them as “a state or an ongoing process during an actual interest-based activity” (p. 9) and focus on the analysis of current engagements.

Most of the studies reviewed assume the potentially dynamic and changing nature of interests, insofar as their emergence and maintenance depend on the social and material opportunities offered by the context (Azevedo, 2011, 2017; DiGiacomo et al., 2018; Hecht et al., 2019; Renninger & Hidi, 2016; Slot et al., 2020). However, interests are also assumed to have different levels of stability and maintenance throughout a person’s life, an idea that is reflected, for example, in the Four-Phase Model of Interest Development proposed by Hidi and Renninger (2006): triggered situational interest, maintained situational interest, emerging individual interest, and well-developed individual interest. Renninger and Hidi (2016) argue that situational interests are difficult to maintain over time, since they largely depend on external triggers. However, individual interests are more stable and lead people to take actions that allow them to re-connect with the content of interest. Now, the word “phase” is used to emphasize the temporary vision in which the emerging situational interests can be transformed into a developed individual interests if the necessary conditions are met. In fact, when we talk about working with students’ interests, we are not only referring to the generation of situational interests, but also to help students to develop these until they become individual interests.

The educational influence on interests

In both the research and the design of educational practices that are structured around students' interests, a certain conception is assumed about how interests should be addressed. As Hidi and Renninger (2006) claim, "teachers often think that students either have or do not have interest, and might not recognize that they could make a significant contribution to the development of students' academic interest" (p. 111). Thus, while some perspectives assume that the only option is to identify the student's existing interests, others argue that these interests can be (re)constructed and developed in school.

Bandura and Schunk (1981) claim that the greatest challenge of research is understanding "how intrinsic interest is developed when it is lacking" (p. 587). Since then, several studies have been carried out with the aim of identifying strategies that cause interests to appear and/or develop in learners, such as talking about their preferences, highlighting the usefulness, value and relevance of their interests, selecting appealing school topics, connecting what they learn in school with their daily activities, and scaffolding their interests (Barron, 2006; Hulleman et al., 2010; Renninger, 2009; Renninger & Hidi, 2016; Xu et al., 2012). To achieve this, families, community, peers, and teachers play a key role (Rotgans & Schmidt, 2011), and the social and material conditions that enable or constrain the emergence and maintenance of interests must be addressed (DiGiacomo et al., 2018).

Relationship between interests that arise in different contexts

The last area in which differences between authors were observed is the relationship that is assumed to exist between interests whose origin lies in different school and non-school contexts. Some approaches focus on a one-way relationship, as they propose that students' interests that have emerged outside the school be taken into account and linked to academic learning (Hulleman et al., 2010; Renninger, 2009).

By contrast, other approaches highlight the bidirectionality between interests that arise in different contexts (Barron, 2006; Hecht et al., 2019; Ito et al., 2013). In this regard, Barron (2006) argues that when a person is interested in a particular object, he or she is able to take advantage of the learning opportunities offered by contexts, while being able to seek and produce new learning opportunities in different contexts.

Personalization of school learning

Pane et al. (2015) denounce that there is no definition of personalized learning shared by the scientific community. In fact, the concepts of personalization, differentiation, and individualization are sometimes used as synonyms. Bray and McClaskey (2013) explain that the three approaches have as their goal attention to student diversity and attach importance to instruction that is paced to the specific characteristics, needs, and preferences of different learners. However, there are differences between the three concepts, which leads Bray and McClaskey (2013) and Cuban (2018) to state that personalization approaches to learning can be placed along a continuum. At one pole of the continuum would be the proposals in which the leading role in decision-making falls on the teacher, whose goal is to adapt the activities and learning content to the individual performance of the students. At this pole are individualization practices.

At the opposite pole are proposals centered on the learner, which (a) attribute importance to the voice of the students; (b) promote the active participation of learners in their learning based on their needs, characteristics, objectives, and interests; and (c) favor the making decisions about their own learning process (Bray & McClaskey, 2014; Coll, 2016; Lee et al., 2021). At this pole are the practices that we define as personalized learning.

Educational practices that personalize learning, like others that derive from a socio-constructivist approach, require a design and development that meet certain characteristics that contribute to their pedagogical quality: (a) student protagonism, (b) high degree of planning and coherence between the design and its implementation, (c) diversity of resources to scaffold learning, (d) longitudinal and systematic nature, and (e) interdisciplinarity (i.e., Jonassen, 1999; Reigeluth, 2013) (Fig. 2).

According to Coll's framework (2016, 2018), personalized learning strategies are actions aimed at promoting and strengthening the meaning and personal value students attach to what they learn in schools and institutes. This theoretical framework suggests that learning makes sense to learners when it helps them: (a) illuminate and give new meaning to their past experiences and understand themselves better; (b) understand and act on their everyday reality; and/or (c) project themselves into the future personally, socially, or professionally by building action plans and drawing up scenarios that involve them personally.

To promote this learning with meaning and personal value, Coll (2018) proposes that it is useful to implement one or more of the following personalization strategies for school learning: (a) work with the students' learning interests, (b) favor decision-making, (c) promote connections between school and non-school learning experiences, (d) incorporate resources and learning opportunities from the community environment, (e) select socially and culturally relevant content, and (f) encourage reflection on the learning process and oneself as a learner (Fig. 3).

Fig. 2 Characteristics of good educational practices

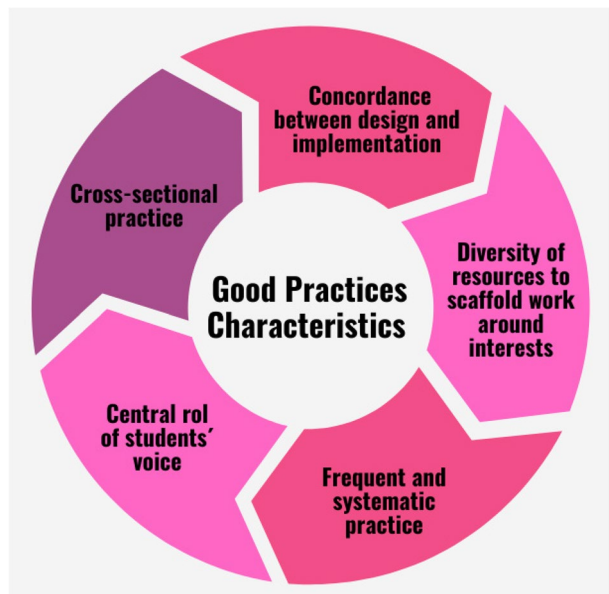
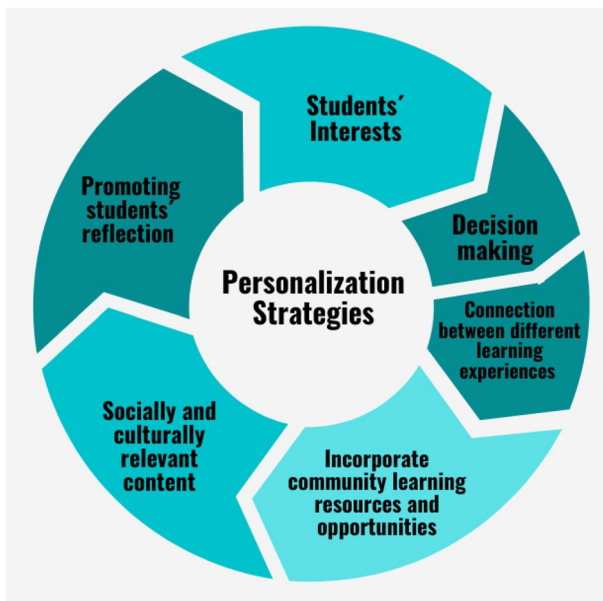


Fig. 3 Strategies for school learning personalization



Next, we will focus on the first of these strategies (work based on students' interests) and we will argue its relevance, alluding to the way in which it can promote the incorporation of the remaining strategies in the design of an educational practice.

Personalization and students' interests

Personalization therefore recognizes the ability of students to conduct their own learning, thereby promoting the expression of their choices and interests, as a means of reinforcing the meaning, sense, and personal value they attach to their school learning. It should be noted that the important thing in this theoretical framework is not only to identify the interests of students, but to work with their interests and make them a learning object. This involves helping students identify, value, contrast, review, and (re)construct their interests, all of which require the design of activities that work with, on and from their interests. In this way, personalized teaching can be designed to promote the emergence and development of students' interests and their maintenance.

In addition to strategies that work directly with students' interests, there are other educational strategies that are closely linked to interests, a list of which is presented below. Based on Coll's perspective (2018), all of these can be considered personalization strategies, as they have the potential to promote and strengthen the sense and value of learning:

1. Promoting students' reflection on their own learning process and on themselves as learners, as a means of (re)constructing their interests. Interventions that require reflection have been shown to positively influence students' understanding and development of interests (Hidi & Renninger, 2006; Renninger & Hidi, 2016).
2. Recognizing and enhancing students' ability to make decisions about different elements of their learning process (what, how, where, when, and with whom to learn), based on

- their interests. Some research also highlights the two-way relationship between decision-making and interest development (Barron, 2006; Bray & McClaskey, 2014; Engel & Conant, 2002; Lee et al., 2021).
3. Fostering the connection between different school and non-school learning experiences, in which students develop interests as they move through different contexts of activity. This connection can occur in two directions: on the one hand, by taking advantage of students' interests that arise outside school and linking them to academic learning and, on the other hand, by generating interests in schools so that students take advantage of the learning opportunities offered outside school (Authors, 2018; Crowley & Jacobs, 2002; Hulleman et al., 2010; Renninger, 2009; Silseth & Erstad, 2018).
 4. Incorporating socially and culturally relevant content into teaching and learning processes so that students value their interests and/or generate new interests (Coll, 2018; Ito et al., 2013).
 5. Taking into consideration and incorporating learning resources and opportunities present in the community environment and/or accessible through the Internet to help students generate and develop new interests. This strategy takes advantage of the distributed nature of learning resources (Barron, 2006, 2010; Coll, 2018), while assuming that the generation and maintenance of interests depend on the social and material opportunities present in the context (Slot et al., 2020).

As mentioned above, many studies have explored the relationship between students' interests and learning processes, although there are notable differences in the way authors conceptualize interests. One of the objectives that may be pursued when working with students' interests is the personalization of learning. Although there are quantitative instruments that can be used as analytical tools to explore the relationship between student interests and learning processes (Hulleman et al., 2017; Priniski et al., 2018), the literature review we carried out did not reveal any qualitative analysis tool specifically designed to study educational practices that consider students' interests as a strategy to promote the sense and personal value they attach to their learning.

Objectives

This article has two closely linked objectives. The first is to present a guide to analyzing educational practices that work with and from students' interests. The guide makes it possible to identify the potential of a given educational practice to reinforce and/or promote the sense and personal value students attach to their learning. This tool is intended for researchers and education professionals, as it can be used for the analysis of practices designed and implemented by other people and the systematic reflection of an individual's own teaching practice.

The second objective is to illustrate the use of the guide by analyzing two practices carried out in primary school classrooms, characterized primarily by a focus on students' learning interests. Applying the guide to the analysis of these practices is designed to reveal the potential of the tool while providing concrete examples of each of the dimensions of analysis.

Method

Study design

The analysis guide is designed based on a longitudinal multiple-case study (Stake, 1995; Yin, 2017). This design makes it possible to examine common and differential patterns between a moderate number of cases, thereby reinforcing analytical generalizations while increasing the robustness and confidence of the conclusions (Ragin, 2011).

In particular, two cases were analyzed in depth, both of which involved a particular practice carried out at a particular school over the course of the 2018–2019 academic year. *Interesting problems* (case 1) and *maps of learning interests* (case 2) have been selected as practices underpinned by work based on the interests of the students as a personalization strategy. Both practices are described below and will be used to illustrate use of the analysis guide.

Observational situations

Case 1

Interesting problems are globalized projects that are structured around a real situation or problem and that cut across different curricular areas. The implementation of *interesting problems* with students in fourth, fifth, and sixth grade (between 9 and 12 years of age) was studied in a medium-sized public kindergarten and primary school (29 teachers and 454 students), located in a municipality of Catalonia (Spain) with a medium–low socioeconomic level.

During the academic year, four wheels of *interesting problems* are carried out. Each wheel is organized into three phases: (a) *generate and remove*; (b) *reasoned choice*; and (c) *development*. Three full mornings a week for 5 weeks are dedicated to each wheel. After two wheels, the students share what they have learned with the rest of the class (Fig. 4).

Interesting problems are developed in three phases:

1. *Generate and remove*: trips to places outside the school are organized, and community agents are invited to share their experiences with students. The trips and visits address a wide range of topics. The students decide which one they will attend, based on their

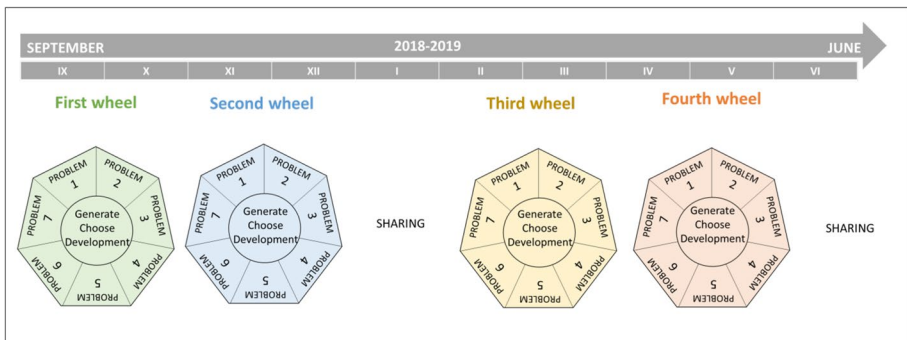


Fig. 4 Interesting problems during an academic year (case 1)

- initial interests. After the trips or visits, they meet to discuss it and share any problems they have identified. From all trips and visits made, a sack of problems is created based on the concerns of the students.
2. *Reasoned choice*: teachers define seven *interesting problems* to propose to students and, in doing so, seek to balance the different curricular areas. They come to an agreement on which teacher will handle each problem. Some students present the range of problems to the whole upper cycle of the primary stage (4th, 5th, and 6th grade) in a plenary meeting. Then, in level groups and with their teacher, each student chooses three problems, in order of preference, and argues his or her choice by sharing it with the rest of the class. Each interesting problem has a maximum number of students per level, which to some extent conditions the choice and forces teachers to guide the debate and group reflection so that they can steer the students back if necessary. Seven groups are formed, one for each interesting problem, and each group is composed of 21 students, seven from each level.
 3. *Development*: In the first session of the project, the teacher explores the students' expectations and previous knowledge of the subject and determines the different ways to solve the problem. The group decides how to define the problem and what they want to investigate. Students can choose, based on their interests, which tasks to participate in, the individuals with whom they want to work, and which tools and materials they wish to use. In this regard, the teacher plays the role of resource facilitator and information source who intervenes by exploiting and generating opportunities from which, based on the curriculum, key learning can emerge.

Case 2

The *maps of learning interests* were designed and implemented in two fifth-grade groups (students aged between 10 and 11) at a medium-sized public kindergarten and primary school (32 teachers and 420 students) in a neighborhood in Extremadura (Spain) with a medium–low socioeconomic level. This educational practice seeks to help students become aware of and reflect on their learning interests, with the aim of incorporating them into the projects carried out during the school year. The design of the maps began in the first few weeks of the year and was revisited several times during the academic year (Fig. 5).

The first two activities were designed to encourage the initial identification of one's own interests (individual map, in which each student wrote down everything she or he wanted

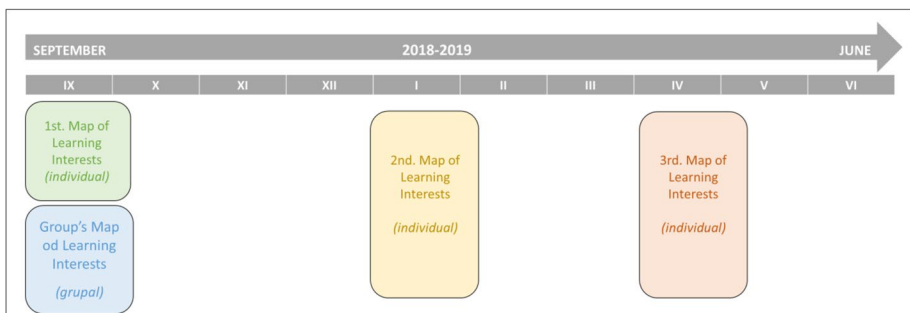


Fig. 5 Maps of learning interests during an academic year (case 2)

to learn) and a joint reflection on shared interests (group map, in which they classified and synthesized the learning interests of the whole class). Students kept their own individual map and group map, to be redesigned during the academic year, either to make decisions or to reflect on what had been learned. Based on an analysis of these initial maps of interests in both groups (fifth grade A and fifth grade B), the teachers designed the projects for the year, which were common to both classes.

In the second and third terms, students designed their second and third individual map of learning interests. These maps were created on different sheets of tracing paper so that the evolution of interests could be seen clearly. To produce the new interest maps, they had to follow the following sequence:

1. Display what they had learned during the term on the first map.
2. Place a sheet of tracing paper over their map and, using different colors, circle the interests they had included in the first map, depending on how their interests had evolved toward that content: green if "my interest in this topic is even greater"; blue if "I'm still interested in continuing to learn about/research this topic"; and red if "I have no interest in continuing to learn about/research this topic."
3. Add their new learning interests to the map in black. This gave students the opportunity to reflect on new learning areas that they had been interested in in recent months and had not previously included.

Data collection tools and procedures

A case study was carried out during the 2018–2019 school year to collect information from both educational practices. Information was obtained from various respondents and complementary strategies were combined, including non-participant observation (in the classroom and in teachers' meetings), interviews (with teachers, students, and the management team), questionnaires (conducted among students, teachers, and families), field diaries, and discussion groups.

Table 1 Data analyzed

Sources and tools for collecting information	Quantity	
	Case 1	Case 2
Documents*	3	12
Narrative records of classroom observations*	19	16
Narrative records of teachers' meetings*	5	11
Audio recordings of families' discussion group*	-	1
Audio recordings of interviews with students (number of students)	10 (6)	9 (9)
Audio recordings of interviews with teachers (number of teachers)*	6 (3)	3 (2)
Audio recordings of interviews with management team*	4	3
Questionnaires conducted with families	-	20
Questionnaires conducted with students	149	49
Questionnaires conducted with teachers	21	12

The data used directly to create the guide are indicated with an asterisk (*)

Table 1 summarizes the data collection strategies used and the dataset analyzed for the overall research project, which included the construction and application of the analysis guide.

Analysis and design of the guide procedures

The procedure followed for the design of the analysis guide involved bottom-up (data-driven approach) and top-down (theory-driven approach) processes, such that it required a continuous recursive dialogue between the theoretical framework and the data obtained in the two cases studied (Creswell, 2013).

The general steps were as follows:

1. Initial proposal for the dimensions of the analysis based on a bibliographic review, with identification of the two extreme poles of each dimension.
2. Reading of/listening to the data collected (narrative/audio recording), in chronological order in each case.
3. Review of the initial proposal for the dimensions of the analysis and reflections on the need to modify, refine, or retain them, as well as identification of the intermediate points between the extreme poles of each dimension.
4. Definition of: (a) subdimensions, some of which are cross-cutting and others specific to each dimension; (b) a question to better describe the content of each subdimension; and (c) levels at which an educational practice can be placed along the continuum between the two poles of each subdimension.
5. Categorization of quotes from both cases at one level of each subdimension.

Some of the strategies used to ensure the quality of data collection and analysis are prolonged engagement in the field, reflexivity, triangulation of methods, and triangulation between researchers (Creswell, 2013; Stake, 1995) (Fig. 6).

Results

Presentation of the analysis guide

Once the initial version of the analysis guide had been designed, it was used to analyze empirical data from the two educational practices outlined above, which are characterized by working with and based on the students' interests. From an analysis of both practices, some aspects of the analysis guide were redefined and refined.

The general structure of the guide is described below, and the five levels of implementation included in it are outlined: blocks, dimensions, subdimensions, questions, and levels.

Blocks There are three large blocks that allow three complementary perspectives on the educational practices under analysis to be adopted:

1. *The presence of personalization strategies* to develop learning interests. In particular, strategies such as reflection, decision-making, and the connection of learning experiences are identified.

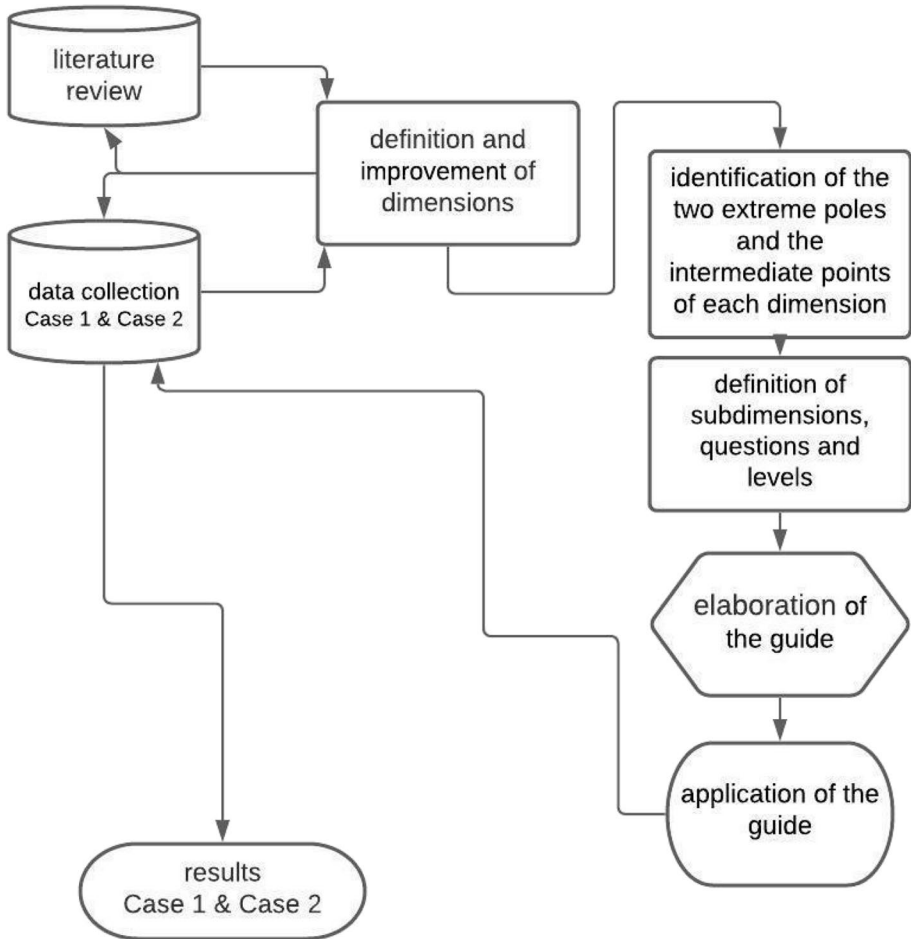


Fig. 6 Diagram of the procedure to design the guide and analyze the cases

2. *Conceptions about the interests that underlie the design and implementation of educational practices.* In particular, the way in which the practice demonstrates a certain way of understanding interests as stable or dynamic, individual, or social, etc. is analyzed.
3. *Characteristics of the design and development of educational practice,* which identify more instructional aspects of the practice. For example, it identifies whether it is a one-off or longitudinal practice, whether it is specific to an area of knowledge or cuts across different areas, etc.

Dimensions Each block consists of several dimensions of analysis. Dimensions are defined not in dichotomous terms, but as a continuum along which practices can be characterized, depending on their potential to promote learning with meaning and personal value.

Subdimensions Each dimension includes subdimensions that, as a whole, allow the practice to be characterized in that dimension. Some subdimensions are present in several

dimensions (for example, “planning,” “frequency,” and “use of resources”), while others are specific to certain dimensions (“decision-making agent”).

Questions For each subdimension, a question is included to facilitate the identification of evidence in the analysis of the practice. This approach is particularly useful for the design and evaluation of practices carried out by teaching teams, as the questions provide a guide to encourage teachers to reflect on their own practices.

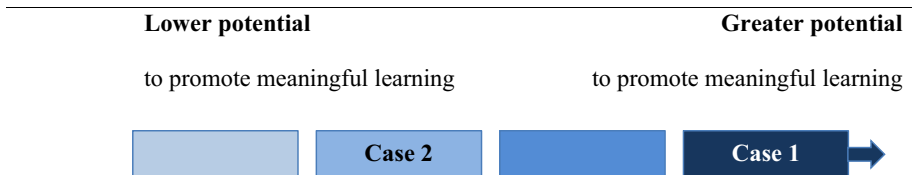
Levels For each question, four levels at which the practice under analysis can be placed are proposed. These levels represent intermediate degrees of a continuum, ranging from the lowest (1) to the highest (4) potential of the practice to contribute to meaningful learning. In addition, these levels allow each of the subdimensions of analysis to be operationalized.

The complete analysis guide can be found in Appendix 1. However, the following is a general outline of the blocks and dimensions (Table 2).

Application of the guide to the two cases analyzed

The guide was used to analyze the two cases presented above, which consist of educational practices that work with and from students’ interests: *interesting problems* (case 1) and *maps of learning interests* (case 2). Although both practices were subject to a meticulous analysis that took account of all the dimensions and subdimensions of analysis, as shown in Appendices 2 and 3, below is a summary of the main results obtained in the three blocks that make up the analysis guide.

Block 1. Coordination of personalization strategies



In the design of the practice *interesting problems* (case 1), different personalized learning strategies appear to closely based on working with and from students’ interests, which are also reinforced by teachers in direct interactions with students.

Specifically, in the first phase of *generate and remove*, teachers prepare the trips and visits they will go on with the students based on the learning opportunities presented by the school’s surroundings (factories, mines, rivers, etc.), or they invite community agents close to the students (journalists, musicians, filmmakers, etc.) to share their experiences. Students may choose and decide on the trips they wish to go on, depending on their interests and with the help of their families. The purpose of these activities is not only to help students identify and value their interests but, more importantly, to generate new interests (dimension 1.5).

After each activity, participants meet to share the questions that arose during the trip. Based on these questions, the teaching team defines the seven problems they will

Table 2 Guide to the analysis of educational practices that work with students' interests

Block 1		Coordination of personalization strategies
Dimension	Lower potential	Greater potential
	To promote meaningful learning	To promote meaningful learning
1.1	Absence of teaching and learning activities and/or teachers' actions aimed at encouraging students to reflect on their interests	Presence of various teaching and learning activities and/or teachers' actions aimed at promoting students' reflection as means for (re)construct their interests
1.2	Absence of teaching and learning activities and/or teachers' actions that allow students to make decisions about their learning process, based on their interests	Presence of various teaching and learning activities and/or teachers' actions that allow students to make decisions about their learning process, based on their interests
1.3	Absence of teaching and learning activities and/or teachers' actions aimed at fostering the connection between different learning experiences (school and non-school) related to students' interests	Presence of various teaching and learning activities and/or teachers' actions aimed at fostering the connection between different learning experiences (school and non-school) related to students' interests
1.4	Absence of teaching and learning activities that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests	Presence of various teaching and learning activities that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests
1.5	Absence of teaching and learning activities that seek to value interests and/or generate new interests by leveraging and incorporating learning resources and opportunities present in the community environment and/or accessible via the Internet	Presence of various teaching and learning activities that seek to value interests and/or generate new interests by leveraging and incorporating learning resources and opportunities present in the community environment and/or accessible via the Internet
Block 2		Conception of learning interests that underlie the practice
Dimension	Lower potential	Greater potential
	To promote meaningful learning	To promote meaningful learning
2.1	The content/focus of interests is highly restricted	The content/focus of interests is very broad
2.2	Interests are a phenomenon that is individual in nature	Interests are a phenomenon that is social in nature
2.3	Interests are stable	Interests are dynamic and changeable
2.4	Interests must be identified/discovered	Interests must be developed, expanded, diversified and (re)constructed
2.5	Disconnection between interests whose origin lies in different contexts	Two-way relationship between interests whose origin lies in different contexts

Table 2 (continued)

Block 3 Dimension	Characteristics of the design and development of educational practice
	Lower potential To promote meaningful learning
3.1	Strong distance between practice design and implementation
3.2	Lack of resources to support/scaffold/adjust help in work based on interests
3.3	One-off practice
3.4	Practice in which interests play a peripheral role
3.5	Specific practice (of an activity type/knowledge area)
	Greater potential To promote meaningful learning High concordance between practice design and implementation Diversity of resources to support/scaffold/adjust help in work around interests Longitudinal practice (throughout the course or through several courses) Practice in which interests play a central role Cross-sectional practice (interdisciplinary, in different subjects/areas of knowledge/learning spaces)

propose to students for each wheel. A number of the problems, despite falling into different curricular areas, focus on culturally and socially sensitive content that is relevant to students, such as questions about how waste is recycled in their municipality or the consequences for them and their families if a theme park were to be built in their village (dimension 1.4).

In the second phase, *reasoned choice*, students select the interesting problem they would prefer to solve, based on a series of activities designed to encourage them to reflect on the interests that cause them to choose one option over another (dimension 1.1). These activities are first carried out individually and as a writing exercise, with a focus on their own interests and preferences, before a collective and oral reflection on the interests and preferences of others is carried out. During these activities, teachers encourage students to share and value their interests, tastes, and what appeals to them as a tool to help them construct and (re)construct their interests.

In the third phase, *development*, teachers have considerable flexibility to adjust the resolution of the interesting problem to the expectations and interests of the students in the group. This flexibility is designed to allow students to decide on the tasks they wish to participate in, whom they want to work with, where to do so, and what tools and materials to use, depending on their interests (dimension 1.2), such that students' interests sometimes lead them to resolve a problem in a way that the teachers had not initially envisaged. For example, in a problem defined as "Is what we see all that there is?," the teachers had planned to focus the activities on microbiology. However, the students' interests led the group to work on the anatomy of the human eye.

Cross-cutting activities in *interesting problems* allow teachers to take the previous knowledge of their students into account and link what they do and learn in school to the experiences they acquire through participation in everyday activities in non-school contexts or encourage them to explore interests that they have developed in school and expand them to other contexts (dimension 1.3).

The original approach to the practice *maps of learning interests* (case 2) did not incorporate different personalization strategies beyond the consideration of students' learning interests. This is partly because 2018–2019 was the first school year in which this practice was implemented. Throughout the academic year, however, teachers redesigned and improved this educational practice, mainly as a result of their participation in training activities and reflections on their own professional practice during teacher coordination meetings. The main improvements identified were the incorporation of two other personalization strategies that were progressively structured around and integrated into the implementation of maps of learning interests: reflection on learning and decision-making.

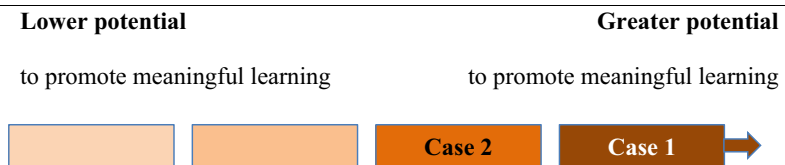
First, the various activities proposed for the implementation of interest maps involved setting aside time and space for students to reflect on their learning processes and on themselves as learners (dimension 1.1). While this reflection takes place spontaneously and is not overly planned, teachers encourage various activities throughout the year to allow students to become aware of their learning expectations and interests before starting each project, as well as to analyze the extent to which these have been addressed at the end. These reflections are carried out with various resources and combine individual and group reflection, and sharing orally and in writing. Furthermore, beyond the interest map, which is in itself a tool to encourage the students to reflect on their interests, complementary materials are used in this practice to encourage reflection: Post-it Notes to indicate what they are interested in

learning and how they want to do so; a daily learning journal to record the most relevant aspects they have learned; and a self-assessment form at the end of each term to, among other things, assess themselves as learners and the relationship between their interests and assess their learning.

Second, at the beginning of the academic year, the interest map was used by teachers to design the projects based on the interests of the group. However, over the months, these maps were used to help students make decisions about their own learning process, in terms of their personal interests, an issue that both teachers and students frequently mentioned in class (dimension 1.2). Based on an analysis of the interest map itself and as a result of the flexible and adaptive nature of the projects, students make decisions about what they want to learn (for example, about what city in the world they would like to do research and where they would like to plan a trip) and how they want to learn (which strategies and resources they want to use to search for information and how they would like to share their learning with the rest of the class).

The remaining personalization strategies do not have much presence in practice nor are they intentionally structured around the work based on students' interests. It should be noted that the connection between different learning experiences related to students' interests is made spontaneously during classroom interactions, but no activity involves the establishment of this link as an intentional and planned goal (dimension 1.3). Finally, although the projects incorporate content that is socially and culturally relevant to students (e.g., those relating to refugee camps) (dimension 1.4) and take advantage of certain learning opportunities present in the community environment or via the Internet (dimension 1.5), these are not designed to encourage students to (re)construct their interests or generate new interests.

Block 2. Conception of learning interests that underlie the practice



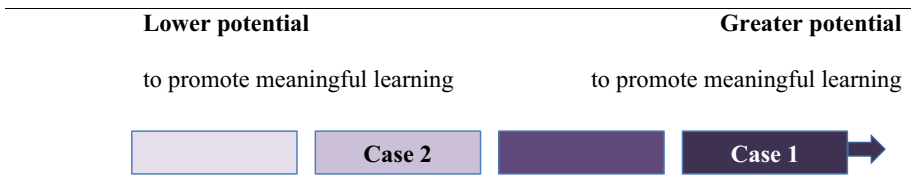
In case 1, the interesting problems arise from the trips with a view to generating questions and concerns, which leads one to think that teachers assume that participation in social practices allows students to develop a new curiosity that can turn into an interest (dimension 2.1). The activities designed for the *reasoned choice* and *development* of interesting problems present clear indications that the team must consider that interests can not only be identified, but can (and must) be constructed and (re)constructed (dimension 2.4), and that this construction is encouraged in situations in which students can participate with others to assess and contrast their interests and those of their peers (dimension 2.2). The continuous references, which we mentioned in the previous section, to the daily activities of relevance to students and the practice of encouraging students to explore the interests that arise in school in situations outside the school context reveal an underlying idea that there is a two-way relationship between the interests that originate in different contexts and the assumption that it is the teacher's responsibility to encourage students to bring the interests generated

outside school into school, and to expand the interests generated in school to non-school contexts (dimension 2.5). The interviews conducted with teachers who participated in *interesting problems* helped us understand that most consider students' interests to change depending on the context and to evolve over time (dimension 2.3).

In the case of the *maps of learning interests* (case 2), a significant change in teachers' conceptions was observed throughout the academic year, since they gradually increased their potential to promote meaningful learning. Over the months, it was observed that the approach to this practice was underpinned by a conception of interests as a dynamic and changing phenomenon (dimension 2.3). This was evidenced by the fact that students had to create several versions of their maps (one at the end of each term), in which they were required to reflect how their interests had evolved and indicate whether they stayed the same, increased, or disappeared over time. This fact was often made explicit by teachers and students through the statement "interests are active."

The strategies designed to help students decide what to include in their interest maps (talking to peers, asking questions, thinking about learning experiences outside of school, etc.) show that teachers assume that interests are eminently social in nature (dimension 2.2.), that they can be developed and (re)constructed (dimension 2.4) and that there is a two-way relationship between interests that originate in school and those that arise in other, non-school contexts (dimension 2.5). Finally, an analysis of the maps developed by students and the interactions between students and their teachers led us to conclude that this practice is underpinned by the idea that interests involve a preference for a specific topic or content (dimension 2.1).

Block 3. Characteristics of the design and development of educational practice



In *interesting problems*, the distance between the design and the implementation of the practice was very small. This was a practice developed in several years, jointly designed and regularly reviewed by the teaching team, who agreed on the objectives and competencies that must be achieved by students, as well as the dynamics and class activities (dimension 3.1). The practice is designed to offer a wide range of support, as pointed out in the results relating to block 1, as well as other spontaneous support that arises in direct interactions between teachers and students, aimed at the construction and (re)construction of students' interests (dimension 3.2). As shown in Fig. 1, the activity *interesting problems* is carried out over the course of the school year and takes up a considerable number of school hours, i.e., three mornings a week for 5 weeks (dimension 3.3), periods during which working with and from students' interests plays a central role (dimension 3.4). Finally, it should be noted that *interesting problems* do not constitute the school's only learning activity in which students' interests are addressed (dimension 3.5). In this respect, the presentations that students from elementary school to sixth grade of primary education select according to their interests, prepare with their families, and offer to their peers are of particular relevance.

As shown in Fig. 2, the interest maps represent an activity that is longitudinal (i.e., conducted throughout the academic year) and intermittent (maps are revisited at the end of each term) (dimension 3.3), although it is carried out exclusively by the teachers of the group, without participation from teachers of other subjects (dimension 3.5). Interests play a fairly central role in this practice, as all maps are created based on students' reflections on their own learning interests and objectives (dimension 3.4). Based on classroom observations, we can conclude that there was good alignment between the design and the implementation of the practice and, in situations where there were mismatches, it was usually because the initial planning was improved as the activity progressed (dimension 3.1). This was due largely to the expertise and flexibility shown by teachers to readjust activities according to the needs, interests, and concerns expressed by students during classes (dimension 3.2).

Discussion and conclusions

The first objective of this article was to present a guide for the analysis of educational practices that work with and from students' interests, in terms of their potential to promote learning with meaning and personal value for students. The guide itself represents this article's main contribution, since the literature review we carried out did not uncover any researchers who had published the analysis guides they had used. This objective was achieved by effectively integrating the contributions of the different authors who have addressed the question of interests from a number of theoretical perspectives and with different analytical approaches, and by obtaining a range of empirical evidence. We would like to highlight three aspects relating to this integration.

First, we believe that our guide is not designed based merely on the juxtaposition of various author approaches; on the contrary, we coordinated the authors' contributions, which, despite having their origin in theoretical frameworks that differ considerably from one another, appear as complementary when reinterpreted in an overall scheme based on personalized school learning.

Second, this integration made it possible to develop a multidimensional guide for the comprehensive analysis of three complementary dimensions: coordination of personalization strategies, conception of learning interests that underlie the practice, and characteristics of the design and development of the educational practice.

Third, the contributions of the different authors allowed us to identify the extreme poles of each dimension and subdimension of analysis and the levels of each one along the continuum between these poles. In this regard, we believe that the guide adequately reflects the diversity of theoretical positions and empirical evidence that exist in relation to students' interests.

The article's second objective was to illustrate the use of the guide by analyzing two real-world cases. The results obtained allowed us to conclude that the tool has sufficient flexibility to allow a thorough analysis of highly diverse educational practices to be carried out. We also showed that the guide can be used to analyze educational practices that work

with students' interests, regardless of the development stage of these interests (Hidi & Renninger, 2006).

On the basis of the results obtained, we can conclude that the analysis guide presented plays three complementary roles. First, it is a research tool that can be used for the rigorous and systematic analysis of educational practices that revolve around students' learning interests. Second, it is a valuable guide for the evaluation and improvement of teaching practice. In particular, it can serve as a useful tool for teachers to reflect on their own professional practice (Schön, 1991), and for teachers and managers to analyze in detail the educational practices being carried out at their school. Finally, the guide can serve as a good model for moving toward greater learning personalization (Bray & McClaskey, 2013; Coll, 2018) by guiding the design and implementation of teaching practices that work with students' interests in terms of their potential to promote meaningful learning.

We identified three limitations in the analysis guide. First, its proper use requires very thorough knowledge of educational practice and the use of various information access methods (e.g., interviews, observations, and documentary analysis). Second, the guide focuses on the level of analysis corresponding to classroom practice, but it does not address macro levels such as educational politics, characteristics of the institution, and the school's educational and curricular project or more micro levels such as analysis of interactions and the speech that occurs in the classroom (Bronfenbrenner, 1992; Coll & Edwards, 1997; Coll & Onrubia, 1993; Edwards & Mercer, 2013). Third, the guide is designed for constructivist environments (focused on inclusive education, personalized learning, inquiry methodologies, etc.), but its use in special education or other specific teaching and learning contexts is not envisaged. Fourth, the guide does not include an element that is key to the analysis of the design and implementation of any educational practice: evaluation.

To continue testing the usefulness of the analysis guide, future lines of work would involve the analysis of a more heterogeneous sample of cases to find out whether it can be adapted to different types of educational practices that focus on students' interests that are implemented at different sociocultural contexts and educational levels and designed for multiple student profiles.

We also believe that it would be appropriate for this guide to be applied by researchers who were not involved in its design and to be self-administered by active teachers. This would allow us to identify any problems they may encounter while using it and to make the necessary adjustments to the guide.

Finally, another future line would involve contrasting the results obtained on the potential of the two cases analyzed with a view to promoting meaningful learning according to the perception of the students themselves concerning the meaning and personal value they attach to the learning process. While the responses were not analyzed in this article, as shown in Table 1, we do have interviews with a large sample of students who participated in both practices. This analysis will allow us to understand the extent to which the potential identified through analysis of the practices using the guide actually translates into the implementation of meaningful learning, in terms of the perspective of students.

Appendix 1. Guide to the analysis of educational practices that work with students' interests

Block 1	Coordination of personalization strategies	
dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning

- | | | |
|------|--|--|
| 1.1. | Absence of teaching and learning activities and/or teachers' actions aimed at encouraging students to reflect on their interests | Presence of various teaching and learning activities and/or teachers' actions aimed at promoting students' reflection as a means of (re)constructing their interests |
|------|--|--|



Planning level. Are teaching and learning activities planned that aim to help students to reflect on their learning interests?

1. No such activity is planned or carried out.
2. These activities are not previously planned but arise spontaneously from the needs identified during the course of the practice.
3. These activities are pre-planned, and time and spaces are intentionally set aside for them.
4. These activities are pre-planned, time and spaces are intentionally set aside for them, and other activities are spontaneously proposed based on the needs identified during the course of the practice.

Frequency. How often are teaching and learning activities designed to help students to reflect on their learning interests actually carried out?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Degree of coordination with interests. To what extent is the reflection integrated with the consideration of students' learning interests?

1. Not at all.
2. Poorly.
3. To some extent.
4. Strongly.

Resource use. Are resources (materials, tools...) used to encourage students' reflection on their learning interests?

1. No resources are used.
2. The same resource is always used.
3. A range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.
4. A very wide range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.

Fostering reflection. Are students encouraged to reflect on their own interests?

1. This is not made explicit by any of the classroom participants.
2. This is occasionally made explicit by teachers.
3. This is frequently and systematically made explicit by teachers.
4. Both teachers and students express the importance of reflecting on interests.

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
1.2.	Absence of teaching and learning activities and/or teachers' actions that allow students to make decisions about their learning process, based on their interests	Presence of various teaching and learning activities and/or teachers' actions that allow students to make decisions about their learning process, based on their interests



Planning level. Are teaching and learning activities planned that aim to help students to make decisions about their learning process, based on their interests?

1. No such activity is planned or carried out.
2. These activities are not previously planned but arise spontaneously from the needs identified during the course of the practice.
3. These activities are pre-planned, and time and spaces are intentionally set aside for them.
4. These activities are pre-planned, time and spaces are intentionally set aside for them, and other activities are spontaneously proposed based on the needs identified during the course of the practice.

Frequency. How often are teaching and learning activities designed to help students to make decisions about their learning process, based on their interests, actually carried out?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Degree of coordination with interests. To what extent is decision-making about particular elements in the learning process integrated with the consideration of students' learning interests?

1. Not at all.
2. Poorly.
3. To some extent.
4. Strongly.

Resource use. Are resources (materials, tools...) used to encourage students' decision-making according to their learning interests?

1. No resources are used.
2. The same resource is always used.
3. A range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.
4. A very wide range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.

Fostering reflection. Are students encouraged to reflect on the importance of making decisions about elements of their learning process, based on their interests?

1. This is not made explicit by any of the classroom participants.
2. This is occasionally made explicit by teachers.
3. This is frequently and systematically made explicit by teachers.
4. Both teachers and students express the importance of making decisions about particular elements of their learning process, based on their interests.

Decision-making agent. Who makes decisions about elements of the learning process, based on students' interests?

1. Decisions are made by teachers, without regard for students' learning interests.
2. Decisions are made by teachers, taking into consideration students' learning interests.

3. Decisions are made jointly by students and teachers, considering students' learning interests.
4. Decisions are made by students considering their own learning interests.

Ability to decide what, how, when, with whom, and where to learn. What elements of their learning process can students make decisions about, based on their interests?

1. They cannot make decisions about any components of their learning process.
2. They can make decisions about one or two components of their learning process (what, how, when, with whom or where to learn).
3. They can make decisions about most of the components of their learning process (what, how, when, with whom or where to learn).
4. They can make decisions about all the components of their learning process (what, how, when, with whom and where to learn).

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
1.3.	Absence of teaching and learning activities and/or teachers' actions aimed at fostering the connection between different learning experiences (school and non-school) related to students' interests	Presence of various teaching and learning activities and/or teachers' actions aimed at fostering the connection between different learning experiences (school and non-school) related to students' interests

Planning level. Are teaching and learning activities planned to promote the connections between different learning experiences (school and non-school) related to students' interests?

1. No such activity is planned or carried out.
2. These activities are not previously planned but arise spontaneously from the needs identified during the course of the practice.
3. These activities are pre-planned, and time and spaces are intentionally set aside for them.
4. These activities are pre-planned, time and spaces are intentionally set aside for them, and other activities are spontaneously proposed based on the needs identified during the course of the practice.

Frequency. How often are teaching and learning activities aimed at fostering the connection between different learning experiences (school and non-school) related to students' interests carried out?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Degree of coordination with interests. To what extent is the connection between different learning experiences integrated with the consideration of students' learning interests?

1. Not at all.
2. Poorly.
3. To some extent.
4. Strongly.

Resource use. Are resources (materials, instruments, etc.) used to promote the connection between different learning experiences (school and non-school) related to students' interests?

1. No resources are used.
2. The same resource is always used.
3. A range of resources are used, varying in terms of their focus, social organization (group-

- individual), form of expression (oral-written), etc.
4. A very wide range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.

Fostering reflection. Are students encouraged to reflect on the importance of establishing connections between learning experiences (school and non-school) related to their interests?

1. This is not made explicit by any classroom participant.
2. This is occasionally made explicit by teachers.
3. This is frequently and systematically made explicit by teachers.
4. Both teachers and students express the importance of establishing connections between learning experiences (school and non-school) related to their interests.

Level of connection between different learning experiences (school and non-school). Are connections established between students' learning experiences in school and non-school contexts, related to their interests?

1. No reference is made to learning experiences that students have had in different school and non-school contexts.
2. Teachers present activities that are supposedly relevant to students' learning experiences but do not ensure that they relate to their interests.
3. Students' learning experiences related to their interests in different contexts are mentioned, but the establishment of connections between them is not encouraged.
4. Students' learning experiences related to their interests in different contexts are mentioned, and the establishment of connections between them is encouraged.

Diversity of contexts of learning experiences. In what contexts are connections made between the learning experiences (linked to their interests)?

1. No connections are made between different learning experiences.
2. Connections are made between learning experiences in the same context.
3. Connections are made between learning experiences in more than one context.
4. Connections are made between learning experiences in very diverse contexts (in the classroom, home, after-school activities, the Internet, activities organized by the center, neighborhood, excursions).

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
1.4.	Absence of teaching and learning activities that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests	Presence of various teaching and learning activities that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests

Planning level. Are teaching and learning activities planned that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests?

1. No such activity is planned or carried out.
2. These activities are not previously planned but arise spontaneously from the needs identified during the course of the practice.
3. These activities are pre-planned, and time and spaces are intentionally set aside for them.
4. These activities are pre-planned, time and spaces are intentionally set aside for them, and other activities are spontaneously proposed based on the needs identified during the course of the practice.

Frequency. How often are teaching and learning activities that incorporate socially and culturally relevant content, so that students value their interests and/or generate new interests, carried out?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Degree of coordination with interests. To what extent are the socially and culturally relevant content in integrated with the consideration of students' learning interests?

1. Not at all.
2. Poorly.
3. To some extent.
4. Strongly.

Resource use. Are resources (materials, instruments, etc.) related to socially and culturally relevant content used in order for students to value their interests and/or generate new interests?

1. No resources are used.
2. The same resource is always used.
3. A range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.
4. A very wide range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.

Fostering reflection. Are students encouraged to reflect on the importance of their interests and/or generate new interests by carrying out activities related to socially and culturally relevant content?

1. This is not made explicit by any classroom participant.
2. This is occasionally made explicit by teachers.
3. This is frequently and systematically made explicit by teachers.
4. Both teachers and students express the importance of their interests and/or generate new interests by carrying out activities related to social and culturally relevant content

Use of socially and culturally relevant activities. Are the socially and culturally relevant content used to encourage students to value their interests and/or generate new interests?

1. No teaching and learning activities incorporating socially and culturally relevant content are carried out.
2. Teachers provide (supposed) socially and culturally relevant activities but do not ensure that they are useful for students to value and/or generate new interests.
3. Teaching and learning activities incorporating socially and culturally relevant content for students are carried out but are not used to value their interests and/or generate new interests.
4. Teaching and learning activities incorporating socially and culturally relevant content for students are carried out and are used to value their interests and/or generate new interests.

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
1.5.	Absence of teaching and learning activities that seek to value interests and/or generate new interests by leveraging and incorporating learning resources and opportunities present in the community environment and/or accessible via the Internet	Presence of various teaching and learning activities that seek to value interests and/or generate new interests by leveraging and incorporating learning resources and opportunities present in the community environment and/or accessible via the Internet

Planning level. Are teaching and learning activities planned that aim to value students' interests and/or generating new interests by taking advantage of learning resources and opportunities present in the community environment and/or accessible through the Internet?

1. No such activity is planned or carried out.
2. These activities are not previously planned but arise spontaneously from the needs identified during the course of the practice.
3. These activities are pre-planned, and time and spaces are intentionally set aside for them.
4. These activities are pre-planned, time and spaces are intentionally reserved set aside for them, and other activities are spontaneously proposed based on the needs identified during the course of the practice.

Frequency. How often are teaching and learning activities carried out that aim to value students' interests and/or generating new interests by taking advantage of learning resources and opportunities present in the community environment and/or accessible through the Internet?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Degree of coordination with interests. To what extent are the learning resources and opportunities present in the community environment and/or accessible through the Internet integrated with the consideration of the student's learning interests?

1. Not at all.
2. Poorly.
3. To some extent.
4. Strongly.

Resource use. Are resources (materials, instruments...) used to value interests and/or generate new interests in students, taking advantage of learning resources and opportunities present in the community environment and/or accessible through the Internet?

1. No resources are used.
2. The same resource is always used.
3. A range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.
4. A very wide range of resources are used, varying in terms of their focus, social organization (group-individual), form of expression (oral-written), etc.

Fostering reflection. Are students encouraged to reflect on the importance of valuing and/or generating new interests, taking advantage of learning resources and opportunities present in the community environment and/or accessible through the Internet?

1. This is not made explicit by any classroom participant.
2. This is occasionally made explicit by teachers.
3. This is frequently and systematically made explicit by teachers.
4. Both teachers and students express the importance of value their interests and/or generate new interests by taking advantage of learning resources and opportunities present in the community environment and/or accessible through the Internet.

Use of learning resources and opportunities present in the community and/or accessible through the Internet. Are learning resources and opportunities present in the community and/or accessible through the Internet used in order to enable students to value their interests and/or generate new interests?

1. No use is made of teaching and learning activities that incorporate resources and opportunities present in the community and/or accessible through the Internet in order to enable students to value their interests and/or generate new interests.
2. Teachers incorporate resources and opportunities present in the community and/or accessible through the Internet but do not ensure that they are useful for students to value and/or generate new interests.
3. There are teaching and learning activities that incorporate resources and opportunities present in the community and/or accessible through the Internet but they are not used to value students' interests and/or generate new interests.
4. There are teaching and learning activities that incorporate resources and opportunities present in the community and/or accessible through the Internet and they are used to value students' interests and/or generate new interests.

Block 2**Conception of learning interests underlying the practice**

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
2.1.	The content/focus of interests is highly restricted	The content/focus of interests is very broad

Focus of interests. What conception of the content/focus of students' interests underlies the practice design?

1. Students' interests imply preference for certain topics/contents, which are fun or attractive to them.
2. Students' interests imply preference for certain topics/content which they want to learn about.
3. Students' interests imply an orientation both toward participation in certain social practices and toward certain topics/contents which they want to learn about.
4. Students' interests imply an orientation toward persistent participation in certain social practices, through which they can respond to their learning objectives.

Degree of explicitation of the conception. Is the conception of the focus of students' interests made explicit in the classroom?

1. It is not made explicit by any classroom participant.
2. It is occasionally made explicit by teachers.
3. It is frequently and systematically made explicit by teachers.
4. Both teachers and students make the focus of students' interests explicit.

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
2.2.	Interests are a phenomenon that is individual in nature	Interests are a phenomenon that is social in nature

Origin of interests. What conception of the origin of students' interests underlies the design and implementation of the practice?

1. The origin of interests is a kind of "essence" or "innate predisposition" of the students.
2. The origin of interests is both individual and social, although students' individual inclinations have a greater weight.
3. The origin of interests is both individual and social, although the social contexts and practices in which the students participate have a greater weight.
4. The origin of interests is mainly in situations in which the students participates with others (peers, teachers, family...).

Degree of explicitation of the conception. Is the conception of the individual or social nature of students' interests explicit in the classroom?

1. It is not made explicit by any classroom participant.
2. It is occasionally made explicit by teachers.
3. It is frequently and systematically made explicit by teachers.
4. Both teachers and students explicitly state that students' interests are individual and social.

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
2.3.	Interests are stable	Interests are dynamic and changeable



Changing interests depending on the context. What conception of the nature of students' interests underlies the design and implementation of the practice, in relation to its degree of stability across different contexts?

1. Students' interests are always the same, regardless of the context and activities in which they participate.
2. Students' interests tend to remain relatively stable, regardless of the context and activities in which they participate.
3. Students' interests may vary to some extent, depending on the context and activities in which they participate.
4. Students' interests may vary depending on the context and activities in which they participate.

Dynamism of interests over time. What conception of the nature of students' interests underlies the design and implementation of the practice, in relation to its degree of stability over time?

1. Students' interests do not change over time.
2. Students' interests can minimally change over time.
3. Students' interests can change to some extent over time.
4. Students' interests can change considerably over time.

Degree of explicitation of the conception. Is the conception of the stable or dynamic nature of interests made explicit in the classroom?

1. It is not made explicit by any classroom participant.
2. It is occasionally made explicit by teachers.
3. It is frequently and systematically made explicit by teachers.
4. Both teachers and students explicitly state that students' interests are stable or dynamic.

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
2.4.	Interests must be identified/discovered	Interests must be developed, expanded, diversified and (re)constructed

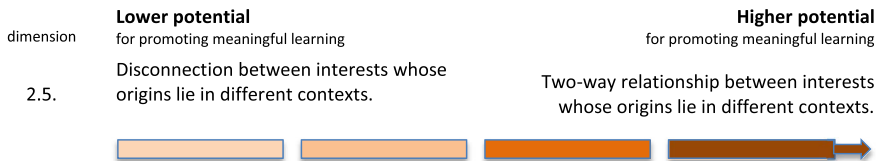


Educational influence on interests. What conception underlies the design and implementation of the practice, with regard to the best way of exploring and work with students' interests?

1. The best way to explore interests is through individual introspection and reflection by students, which allows their identification/discovery.
2. To explore interests, it is necessary to participate in both social activities (dialogue, use of tools,...) and individual activities, although the individual and introspective activities are more important.
3. To explore interests, it is necessary to participate in both social activities (dialogue, use of tools,...) and individual activities, although the social and introspective activities are more important.
4. The best way to work with interests is through dialogue with other people and using certain mediating tools, which allows their development and (re)construction.

Degree of explicitation of the conception. Is the conception of whether interests should be “identified” or “(re)construct” explicit in the classroom?

1. It is not made explicit by any classroom participant.
2. It is occasionally made explicit by teachers.
3. It is frequently and systematically made explicit by teachers.
4. Both teachers and students explicitly state whether interests should be “identified” or “(re)constructed”.



Relationship between interests with different origins. What conception underlies the design and implementation of the practice, regarding the relationship that must be established between interests whose origin is in different contexts (school and non-school)?

1. There is no relationship between interests originating in school and non-school contexts.
2. There is a one-way relationship between interests originating in school and non-school contexts (either interest generated outside the school must be brought to school, or interest generated in the school must be projected into non-school contexts).
3. There is a two-way relationship between interests originating in school and non-school contexts (interests generated outside must be brought to the school, the interests generated in the school must be projected toward non-school contexts), but this relationship occurs spontaneously.
4. There is a two-way relationship between interests originating in school and non-school contexts (interests generated outside must be brought to the school, the interests generated in the school must be projected toward non-school contexts), and it is the teacher's responsibility to promote this relationship.

Degree of explicitation of the conception. Is the conception of the relationship between interests whose origin is in different contexts (school and non-school) made explicit in the classroom?

1. It is not made explicit by any classroom participant.
2. It is occasionally made explicit by teachers.
3. It is frequently and systematically made explicit by teachers.
4. Both teachers and students make explicit their conception of the relationship that exists between interests whose origins lie in different contexts.

Block 3 Characteristics of the design and development of educational practice

dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
3.1.	Notable distance between practice design and implementation.	High concordance between practice design and implementation

Degree of joint planning of the practice. To what extent has the educational practice been planned jointly by the teaching team?

1. The teaching team shares the general sense of the practice, and each teacher designs it individually.
2. The teaching team has jointly planned the objectives and competences that students must achieve and the stages in which the practice will be developed, and each teacher designs the dynamics and activities of teaching, learning and evaluation that they consider appropriate.
3. The teaching team has jointly planned the objectives and competences to be achieved by the students, the phases in which the practice will be developed and the type of dynamics and activities of teaching, learning and evaluation of each phase.
4. The teaching team has jointly planned the objectives and competences to be achieved by the students, and the dynamics and activities of teaching, learning and evaluation of all the sessions in which they will develop the practice.

Distance between practice design and implementation. To what extent does the practice developed correspond to the previously defined design?

1. The distance between the design and implementation of the practice is considerable: most of the teaching team have not been significantly involved in the teaching, learning and evaluation activities planned.
2. The distance between the design and implementation of the practice is medium: almost all the teaching team have been involved in approximately half of the teaching, learning and evaluation activities planned.
3. The distance between the design and implementation of the practice is small: most of the teaching team have carried out most of the teaching, learning and evaluation activities planned.
4. The distance between the design and implementation of the practice is very small: the entire teaching team has carried out practically all the teaching, learning and evaluation activities planned.

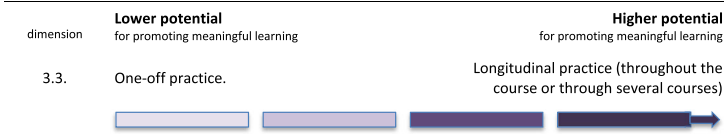
dimension	Lower potential for promoting meaningful learning	Higher potential for promoting meaningful learning
3.2.	Lack of resources for supporting/scaffolding/adjusting help in work based on interests	Diversity of resources for supporting/scaffolding/adjusting help in work around interests

Presence of resources to support work with interests. Are there different kinds of activities, materials and instruments oriented toward the construction and (re)construction of students' interests throughout the course of the practice?

1. Never.
2. Occasionally.
3. Often.
4. Very often.

Adjustment in teaching help. Are different types and degrees of help offered to foster the construction and (re)construction of students' interests according to their needs throughout the development of the practice?

- 1. Never.
- 2. Occasionally.
- 3. Often.
- 4. Very often.

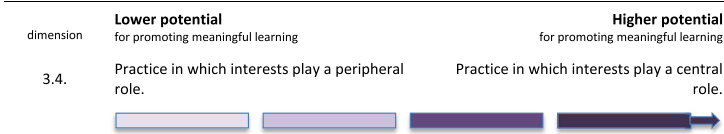


Temporal breadth of the practice. For how long do students participate in this practice?

- 1. Less than one didactic sequence
- 2. One didactic sequence.
- 3. One school year.
- 4. More than one school year.

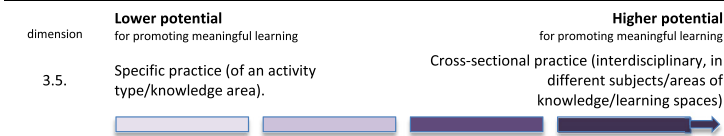
Frequency of implementation of the practice. How many times is the practice implemented?

- 1. Occasionally.
- 2. Intermittently.
- 3. Quite continuously.
- 4. Continuously and uninterruptedly.



Centrality of interests in the practice. What role do students' interests play in the practice?

- 1. A peripheral role.
- 2. An important role at some points in practice, but not central.
- 3. A central role at some points in practice.
- 4. A central role in the implementation of the whole practice.



Level of integration of the practice within the set of teaching-learning activities. To what extent is the practice incorporated into the teaching and learning process developed by students in the school?

- 1. It is an isolated activity that is occasionally implemented in some subjects or teaching and learning spaces at the school (bubble practice).
- 2. It is integrated only in certain subjects or teaching and learning spaces that are taught by the same teacher.
- 3. It is integrated only in some subjects or teaching and learning spaces at the school.
- 4. It is integrated into the school's set of subjects or teaching and learning spaces at the school.

Appendix 2. Results of the application of the analysis guide to case 1

Block 1. Coordination of personalization strategies	1.1. promote reflection as a means for (re) construction of interests	1.2. make decisions about their learning process, based on their interests	1.3. connect different learning experiences related to their interests	1.4. incorporate relevant content to value and/or generate new interests	1.5. take advantage of learning opportunities available in the community and/or accessible via the Internet
Planning level	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1□ 2□ 3✓ 4□	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Frequency	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Degree of coordination	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Resource utilization	1□ 2□ 3✓ 4□	1□ 2□ 3□ 4✓	1□ 2✓ 3□ 4□	1□ 2□ 3✓ 4□	1□ 2□ 3□ 4✓
Fostering reflection	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1□ 2□ 3✓ 4□	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Decision-making agent		1□ 2□ 3□ 4✓			
Ability to decide		1□ 2□ 3□ 4✓			
Level of connection			1□ 2□ 3✓ 4□		
Diversity of contexts			1□ 2□ 3✓ 4□		
Use				1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Block 2. Conception of learning interests that underlies the practice	2.1. restricted – wide focus	2.2. individual- social nature	2.3. stability - dynamism	2.4. identification - (re)construction	2.5. connection - disconnection between contexts
Focus	1□ 2□ 3□ 4✓				
Origin		1□ 2□ 3□ 4✓			
Changes between contexts			1□ 2□ 3□ 4✓		
Temporal changes			1□ 2□ 3□ 4✓		
Educative influence				1□ 2□ 3□ 4✓	
Relationship between interests					1□ 2□ 3□ 4✓
Degree of explicitation	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓	1✓ 2□ 3□ 4□	1□ 2□ 3□ 4✓	1□ 2□ 3□ 4✓
Block 3. Characteristics of the design and development of practice	3.1. concordance between design and implementation	3.2. resources for adjusting help	3.3. isolated - longitudinal practice	3.4. peripheral - central role	3.5. specific - cross-sectional practice
Degree of joint planning	1□ 2□ 3□ 4✓				
Distance	1□ 2□ 3□ 4✓				
Presence of resources		1□ 2□ 3□ 4✓			
Adjustment of help		1□ 2□ 3□ 4✓			
Breadth			1□ 2□ 3□ 4✓		
Frequency			1□ 2□ 3□ 4✓		
Centrality				1□ 2□ 3□ 4✓	
Level of integration					1□ 2□ 3□ 4✓

Appendix 3. Results of the application of the analysis guide to case 2

Block 1. Coordination of personalization strategies	1.1. promote reflection as a means for (re) construction of interests	1.2. make decisions about their learning process, based on their interests	1.3. connect different learning experiences related to their interests	1.4. incorporate relevant content to value and/or generate new interests	1.5. take advantage of learning opportunities available in the community and/or accessible via the Internet
Planning level	1□ 2✓ 3□ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□	1□ 2□ 3✓ 4□
Frequency	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□
Degree of coordination	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2□ 3✓ 4□
Resource utilization	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□
Fostering reflection	1□ 2□ 3✓ 4□	1□ 2□ 3✓ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□
Decision-making agent		1□ 2□ 3✓ 4□			
Ability to decide		1□ 2✓ 3□ 4□			
Level of connection			1□ 2□ 3✓ 4□		
Diversity of contexts			1□ 2□ 3✓ 4□		
Use				1□ 2✓ 3□ 4□	1□ 2□ 3□ 4✓
Block 2. Conception of learning interests that underlies the practice	2.1. restricted – wide focus	2.2. individual- social nature	2.3. stability - dynamism	2.4. identification - (re)construction	2.5. connection - disconnection between contexts
Focus	1□ 2✓ 3□ 4□				
Origin		1□ 2□ 3✓ 4□			
Changes between contexts			1□ 2□ 3✓ 4□		
Temporal changes			1□ 2□ 3□ 4✓		
Educative influence				1□ 2□ 3✓ 4□	
Relationship between interests					1□ 2□ 3✓ 4□
Degree of explicitation	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□	1□ 2□ 3□ 4✓	1□ 2✓ 3□ 4□	1□ 2✓ 3□ 4□
Block 3. Characteristics of the design and development of practice	3.1. concordance between design and implementation	3.2. resources for adjusting help	3.3. isolated - longitudinal practice	3.4. peripheral - central role	3.5. specific - cross-sectional practice
Degree of joint planning	1□ 2□ 3✓ 4□				
Distance	1□ 2□ 3✓ 4□				
Presence of resources		1□ 2□ 3✓ 4□			
Adjustment of help		1□ 2✓ 3□ 4□			
Breadth			1□ 2□ 3✓ 4□		
Frequency			1□ 2✓ 3□ 4□		
Centrality				1□ 2□ 3✓ 4□	
Level of integration					1□ 2✓ 3□ 4□

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Declarations

Conflict of interest The authors declare no competing interests.

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Most relevant publications in the field of Psychology of Education:

- Arriazu, Rubén & Solari, M. (2015). The role of education in times of crisis: A critical analysis of the Europe-2020 Strategy. *KEDI Journal of Educational Policy*, *12* (2), 129-149.
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