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RESEARCH ARTICLE

Engineering

Empowerment and Reflexivity Vector of Self-Determination, Self-esteem, and Knowledge of one's Own Learning Style and Technological Strategy: Case of the Digital Personal Project

Vector de Empoderamiento y Reflexividad de Autodeterminación, Autoestima y Conocimiento del propio Estilo de Aprendizaje y Estrategia Tecnológica: Caso del Proyecto Personal Digital

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Abstract. AAD Self-Digested Learning is a learning strategy oriented towards the actor subject, capable of reconfiguring one's resources autonomously and responsibly. The latter makes it possible to conceive one's personal and collective action project in a conscious and resonated way. ADA offers adult learners the opportunity to plan and manage their resources, collaborate with their peers to develop cultural, methodological and technological competences. Nevertheless, the implementation of an AAD-centric approach depends on andragogic and pedagogical expertise, by managing the complexity of the teaching-learning situation from the modeling and personalization of a family of learning situation differentiated and personalized to the needs and learning styles of adult learners. At the same time, current andragogic trends continue to proclaim the use of a learning approach to reflexivity and self-management of personal and collective action projects. Identifying the family of self-management problem situations can help learners acquire these skills. However, most academic training schemes favor expository and masterful approaches to the detriment of andragogic approaches, soliciting the power of analysis, reflection and management of their own learning processes. The main objective of this study is to show the importance of self-regulated learning and its close relationship with the planning and management of reflective learning. We propose a systemic and holistic modeling of pedagogical strategies, promoting the self-management of learning. The diversification of teaching strategies and knowledge of andragogic principles constitute the guideline, which guide and help learners to understand the process of construction and self-regulation of updated personal action projects (AHS). The identification of the family of self-management situation of learning (SAA), founds the new device of didactic engineering of tasks (according to an ergonomic aim and professional didactics).

We have adopted two measurement instruments: a reporting tool and a digital and dynamic dashboard. The reporting tool to support the reflection and planning process of learners by leading them to describe their instrumented activities, their action plans and their evaluations on the activities carried out during the project to help and optimize decision-making. These production activities are integrated with self-regulating data in order to improve the quality of formalized projects. The dynamic dashboard allows learners to manage control and performance indicators. Learners can specify the situation data according to the expected objectives. We have implemented this methodological proposal with the development of an intelligent tutoring based on the formalization of conceptualized activities, which integrates the reporting tool and the personalized dashboard. To evaluate our proposal, we first tested the ability to create a large sample of indicators that are proposed in existing research on the analysis of empowerment and cognition activities. In addition, an exploratory study was conducted to assess the usability and perceived usefulness of andragic principles. Based on the results of this research, we found that AAD supports learners' reflections on how they conduct their technological project and provide them with the appropriate means to steer and manage their learning activities, even if the creation of indicators seems difficult for novices.

Keywords: Project-based learning, Self-regulated learning, Project-based learning management system, activity traces, self-declaration, dynamic dashboard, digital personal project.

Resumen

AAD Self-Digested Learning es una estrategia de aprendizaje orientada al sujeto actor, capaz de reconfigurar sus recursos de forma autónoma y responsable. Esta última permite concebir el proyecto de acción personal y colectivo de manera consciente y resonada. ADA ofrece a los estudiantes adultos la oportunidad de planificar y gestionar sus recursos, colaborar con sus compañeros para desarrollar competencias culturales, metodológicas y tecnológicas. Sin embargo, la implementación de un enfoque centrado en AAD depende de la experiencia andragógica y pedagógica, mediante el manejo de la complejidad de la situación de enseñanza-aprendizaje desde el modelado y la personalización de una familia de situación de aprendizaje diferenciada y personalizada a las necesidades y estilos de aprendizaje de los estudiantes adultos.

Al mismo tiempo, las tendencias andragógicas actuales continúan pregonando el uso de un enfoque de aprendizaje para la reflexividad y la autogestión de proyectos de acción personal y colectiva. Identificar la familia de situaciones problemáticas de autogestión puede ayudar a los alumnos a adquirir estas habilidades. Sin embargo, la mayoría de los esquemas de formación académica privilegian los enfoques expositivos y magistrales en detrimento de los enfoques andragógicos, solicitando el poder de análisis, reflexión y gestión de los propios procesos de aprendizaje.

El objetivo principal de este estudio es mostrar la importancia del aprendizaje autorregulado y su estrecha relación con la planificación y gestión del aprendizaje reflexivo. Proponemos una modelación sistémica y holística de las estrategias pedagógicas, promoviendo la autogestión del aprendizaje. La diversificación de las estrategias didácticas y el conocimiento de los principios andragógicos constituyen la directriz, que guían y ayudan a los educandos a comprender el proceso de construcción y autorregulación de los proyectos de acción personal (AHS) actualizados. La identificación de la familia de situación de autogestión del aprendizaje (SAA), funda el nuevo dispositivo de ingeniería didáctica de tareas (según un objetivo ergonómico y didáctico profesional).

Hemos adoptado dos instrumentos de medición: una herramienta de informes y un tablero digital y dinámico. La herramienta de informes para apoyar el proceso de reflexión y planificación de los alumnos, llevándolos a describir sus actividades instrumentadas, sus planes de acción y sus evaluaciones sobre las actividades realizadas durante el proyecto para ayudar y optimizar la toma de decisiones. Estas actividades de producción se integran con datos de autorregulación para mejorar la calidad de los proyectos formalizados. El tablero dinámico permite a los alumnos administrar los indicadores de control y rendimiento. Los alumnos pueden especificar los datos de la situación de acuerdo con los objetivos esperados. Hemos implementado esta propuesta metodológica con el desarrollo de una tutoría inteligente basada en la formalización de actividades con-

ceptualizadas, que integra la herramienta de reporte y el tablero personalizado. Para evaluar nuestra propuesta, primero probamos la capacidad de crear una gran muestra de indicadores que se proponen en investigaciones existentes sobre el análisis de actividades de empoderamiento y cognición. Además, se realizó un estudio exploratorio para evaluar la usabilidad y la utilidad percibida de los principios andrágicos. Con base en los resultados de esta investigación, encontramos que AAD apoya las reflexiones de los alumnos sobre cómo llevan a cabo su proyecto tecnológico y les proporciona los medios apropiados para dirigir y gestionar sus actividades de aprendizaje, incluso si la creación de indicadores parece difícil para los principiantes.

Palabras clave: Aprendizaje basado en proyectos, aprendizaje autorregulado, sistema de gestión de aprendizaje basado en proyectos, seguimiento de actividades, autodeclaración, tablero dinámico, proyecto personal digital.

1 | INTRODUCTION

In our research, it is therefore a question of trying to highlight the notion of self-management and the reflexivity of learning among ENS casa University Hassan 2 Casablanca university students, and to verify their impact in the planning and autonomous management of personal and collective action projects. Holec teaches us that autonomy is the ability to take charge of one's learning (Holec, 2008) [1] Addressing this polysemic concept of self-management and reflexivity before, during and after pedagogical action is therefore not always easy to formalize the modalities and indicators required to identify and evaluate it. In addition to these etymological and methodological difficulties, it would be wise to question and contextualize this very notion of reflexivity in the context of the teaching-learning process, to review these theoretical, epistemological and methodological foundations to understand the mechanisms of operationalization.

These terms are in vogue, reflexivity and autonomy pose problems, concerning their modes of expression in the conception of the student's personal project: Analyze the nature of the relationships that are forged between these concepts and how to highlight them in the act of learning? Which indicators and measurement descriptors are valid and relevant? Modeling the degree of autonomy in learners. However, Cantin (2010) [2] points out a point that deserves to be mentioned and also addressed by Anderson and Krathwohl (2001) [3] Revised Bloom Taxonomy).

This point concerns the prioritization of high-level skills (Create, evaluate, analyze) and low-level skills (Apply, understand, memorize). Cantin (2010) [2] mentions that "these levels do not necessarily have to be followed in order, but to use higher-level cognitive processes, factual concepts or knowledge must be known, mastered and have already been applied. Otherwise, this learning may (or may not) occur during the more complex task." In addition, the level of reflexivity therefore refers us to observable behaviors. And, like all learning, the learner's autonomy would depend on the students' learning styles and the teacher's teaching strategies in order to propose mediation activities and let the learner discover for himself the rules and concepts taught to highlight his project(Vienneau. 2010, p.178) [4].

These few elements of reflection on the nature and complexity of cognitive and psychological processes are enough to bring concepts closer together: the dialogical principle, which "combines two terms that are both complementary and antagonistic" and "makes it possible to maintain duality within unity". Morin(2005) [5]: in the introduction to complex thinking. What Edgar Morin reminds us: "It is not the object less us, but the object seen and observed, co-produced by us. Our world is part of our worldview, which is part of our world. That is, the most physical knowledge cannot be dissociated from a knowing subject, rooted in a culture and a history. (Morin,1994, p. 91). This means that design is only perceived through my own filters and personal representations to identify and understand the world.

In addition, the strategy of self-management and reflexivity is understood as seeking a quest for efficiency in the planning of learning. It presupposes a "pedocentric" conception focused on the construction of cognitive and methodological skills for managing learning projects in complete autonomy. Jointly Carré (2005) [6], evokes the concept of "self-direction", which integrates two fundamental aspects:

- Self-determination: includes all the skills and attitudes of an individual allowing him to act and interact directly with his physical and human environment.
- Self-regulation: refers to the different capacities of the subject to adapt to the perpetual changes of the environment. This self-readjustment of his action projects involves continual movements between desired and current states(Martin and Marshall 1997) [7].

The paradigm of self-directed learning focused on conscious and reasoned practices is a challenge for the school to understand the underlying mechanisms of its implementation according to socio-cognitivist, socioconstructivist conceptions and project management (and engineering) approaches. This new trend of self-directed learning deserves in-depth analysis and reflection to identify conceptual and methodological approaches to operative.

However, it is important to point out that Jérôme Bruner (1956) [8], one of the founding fathers of cognitive psychology, points out the limits in terms of the complexity of the educational act, and insists on the need to take into account the learning context that gives it meaning. The notion of autonomy then takes on another dimension that goes far beyond the simple search for individual efficiency.

Didactic, pedagogical and andragogic reflections on the nature of the knowledge to be acquired, the modalities of self-acquisition and self-construction of the expected skills, could constitute an alternative of remediation to the problem of university dropout. And these are the central concern of the Moroccan education system.

The different elements that have been identified to define our research object:

- Absenteeism in optional modules
- Lack of meaning, interest, fun, commitment and investment in the proposed learning tasks
- Disinterest shown in learning situations of knowledge transfer and integration.

| Study issue

It is therefore interesting that we can ask a number of essential questions, which challenge us:

- What is the nature and typology of what is called the "learning style"? Does the variability that can be observed in the learning behaviors and processes of adult learners correspond effectively and appropriately to the preferred learning styles and specific learning strategies adopted during the different teaching sequences?
- Should we see in the personal and individual specificities of apprenticeship the expression of simple translation and faithful reproduction of predispositions and prerequisites of apprentices? Can university learning be influenced by environmental, cultural and personal factors (characteristics of the singular uniqueness of the learner "learning style")?

| Objects of the research

The purpose of this study is to study the impact of self-management and reflexivity in the planning, management and management of students' personal action project, i.e. actions that allow the student to build his study path and define his learning strategies:

1. The formalization of individual operating mechanisms through the interface of reflexivity and autonomy.
2. Set up an autonomy training device engineering in order to identify the construction logic of personal projects.

| Expected scientific, technological and socio-economic impacts of the study

The purpose of the research is divided into three registers

1. It is aimed directly at teacher trainers, pedagogical workers and tutors of professional situational internships, who seek to highlight the need and relevance of developing and offering training paths, by offering varied and diversified learning units.
2. The construction of meaning of what andragogic training engineering is in order to question the problem of learning styles in order to integrate it into the design approach and the formalization of vocational university training devices.
3. It is also aimed at adult learners as a motivator and self-management factor of their own personal action projects through a better understanding of their own learning mechanisms. It would also be understood as a powerful lever for optimizing their own learning approaches, especially in the context of collaborative work.

| The operational objectives are intended both to promote:

- Academic performance of university learning.
- Pedagogical innovation through the implementation of the personal action projects
- Development of project management skills required for socio-professional integration and employability in companies (Learner managing his own learning).
- Increased access and success rates in higher education.

2 | THEORETICAL FRAMEWORK

Several researchers have addressed the self-study model, emphasizing the adult learner as the object and subject of learning, i.e. a social subject capable of reconfiguring his resources, mobilizing his previous life and life experiences to dialogue with the learning environment (formal and informal / physical and human. The person takes autonomy and responsibility in the planning of his training course. The underlying philosophy of autonomy in the acquisition of knowledge and the construction of skills refers us to the faculties that adults have to manage their family and professional life. Sociologists of organizations speak of the interplay of actors and powers. Crozier and Friedberg (1977) [9] study the power relations and strategies that actors develop within organizations to grasp the underlying logic and delimit their areas of uncertainty.

Faced with this observation, a number of university professors challenge this new Andrago-centric conception "Copernican revolution", in relation to the concept of self-managed learning, which constitutes the cornerstone of engineering analysis of adult needs in the university training curriculum. Thus, in the context of differential psychology and professional didactics, emphasis will be placed on the process of autonomous construction of learning as a privileged mode of entry into the process of optimizing individualized and personalized learning routes P. Pasré.

3 | METHODOLOGY

This doctoral research study will be based on a descriptive methodological approach and exploratory investigation of mixed types (quantitative and qualitative). A qualitative analysis, as part of this research, makes it possible to identify and model knowledge on the self-management and reflexivity approaches advocated by university students. A quantitative analysis of the data will also make it possible to quantify the data from the focus groups, the questionnaires and the semi-structured interview.

4 | RESULTS AND DISCUSSIONS

4.0.1 | Learning Style and Modeling Teaching Strategy – Learning

The aim here is to analyze the degree of adaptation of the pedagogical scenarios according to the needs of the learners.

Question 1. Is the scripting of teaching methods and techniques adapted to your individual needs and expectations?

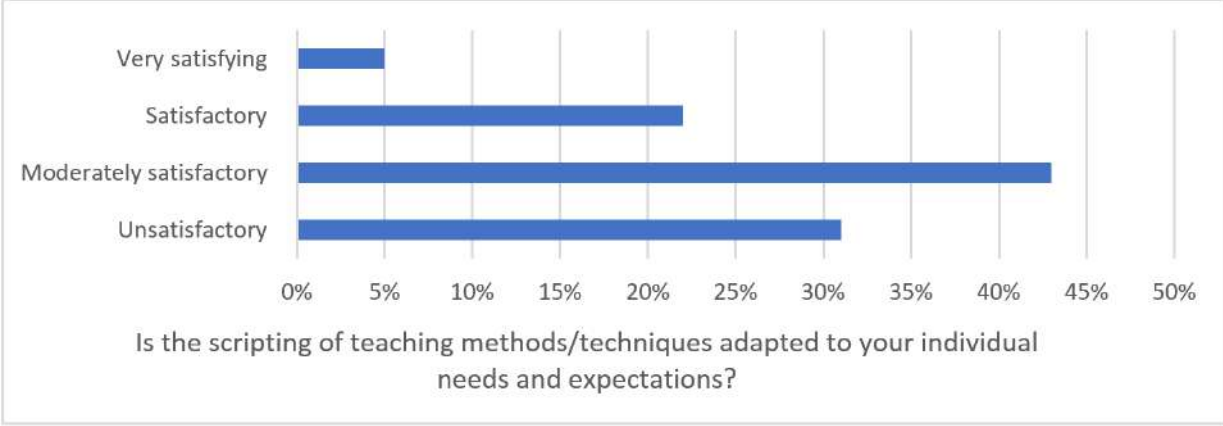

FIG. 1 System flow diagram.

The analysis in Fig. 1 shows that 43% of students experience average satisfaction with the scripting of teaching methods and techniques and that 31% of respondents describe this scripting as unsatisfactory. The statistical sum of the two levels of Likert (Moderately Satisfactory, unsatisfactory) gives an alarming percentage of 74%. Such a rate reveals an image sufficiently marked by an approach of directivity towards the design of learning objects and activities, omitting the needs and expectations of adult learners.

TABLE 1 Distribution of percentages and frequencies of andragogic principles.

Components of andragogic principles	Result areas											
	Subjective experience				Motivation/Self-esteem				Learning autonomy			
Percentages and frequencies of distribution	VS 5%	S 15%	M 50%	I 30%	VS 7%	S 10%	M 32%	I 51%	VS 2%	S 8%	M 30%	I 59%

Question 2. Does the adult education approach adopted solicit your personal perception and privileged learning process to give meaning to your personal and individual learning projects?

Answer 2. 82% of respondents reveals a timid mobilization of personal resources. The observation of the reality of the class remains faithful to the classic pedagogical approach based on the presentation followed by a circle of discussion without any connection between the units and the sequences of learning of the chronogram (vertical and horizontal coherence). Similarly, the andragogic approaches recommended do not take into account the diversity of learner profiles (personal profile, learner profile, professional profile in the case of a student civil servant / ”standardizing pedagogy”).

Question 3. How do you assess the degree of consideration of the components of andragogy experienced in sequences and learning units: revisited questioning of the model of Mouton and Blake (1984). It is a question here of analyzing the capacity of self-management and motivation of the learners and to mobilize their

subjective experience, to measure the value given to the concept of self-valorization, in order to infer the effectiveness of the andragogic principles.

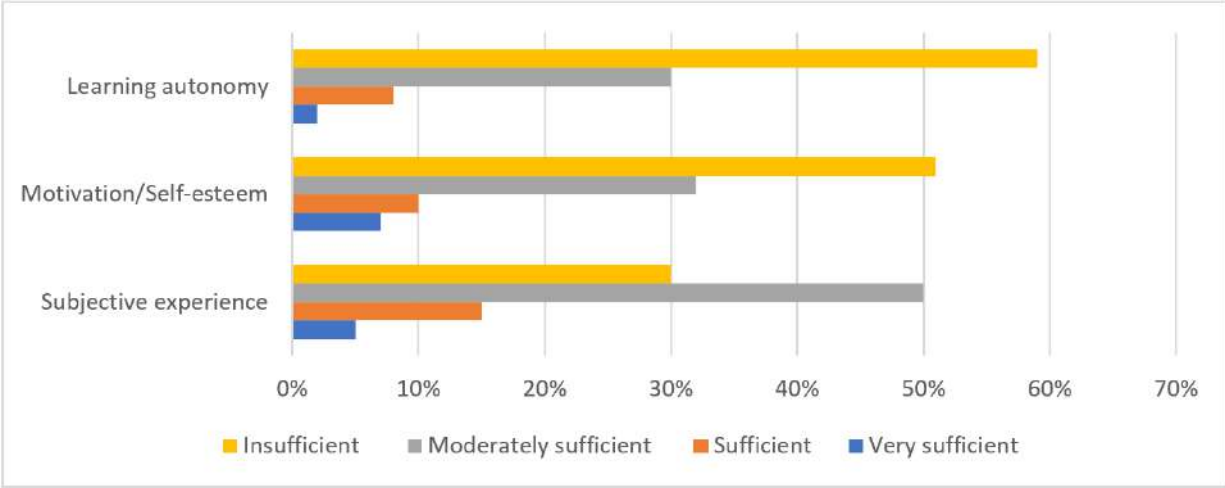

FIG. 2 Frequency distribution of andragogic principles.

Answer 3. First of all, we saw in the analysis of the literature review that adult learner do not learn in the same way as children. According to the andragogic conception of Knowles (1990) [10], they differ in a set of andragogic principles, including subjective experience, (Fig. 2) the actualization of self-esteem and autonomy in setting personal goals and projects. In addition, the descriptive analysis of the statistical results of the responses of the frequency distribution of the andragogic principles. The analysis shows a modest consideration of the experiential capital of adult learners on which the trainer will relate to create the favorable conditions for the appropriation of knowledge and the construction of new learning experiences that are more relevant and agile.

Table 1 allows us to clearly see the repair of the frequencies of the different principles according to a percentage of 80% for the learners' experience variable, of which 30% of the responses are moderately sufficient against 30% for insufficient answers). Together we found that the percentage of the development of the self-learning capacity of learning subjects reveals an alarming indicator (89% of respondents expressed their dissatisfaction with the approaches of Planning, Organization, Metacognition and Steering of the learning process, which leaves little autonomy and self-management of personal and collective action projects).

TABLE 2 Distribution of the degree of coherence of the components of technological practice

Self-learning ability	Frequency repair			
	Very sufficient	Sufficient	Moderately sufficient	Insufficient
Planning	6%	54 %	36 %	4%
Management	3 %	25 %	35 %	37 %
Co/and Self-assessment	0.5%	29 %	32%	34%

Question 4. Does the planning and management of educational objectives through debriefing sessions take into account personal and individual objectives? Check the box for your choice.

Question 5. Does learning planning take into account the profiles of adult learners by offering tailor-made training adapted to your previous knowledge and skills?

Answer 4/5. We know that the dropout or failure rates among adult learners in a university education are correlated with many extrinsic and intrinsic factors, the potentialities and needs of learners such as: motivation, conditions of the learning environment, lack of autonomy and self-management (pedagogy of devolution and

collaborative approach), sense of competence and self-determination, etc. To move from a pedagogy focused exclusively on the transmission of knowledge where the learner is passive to an andragogic approach based on education to autonomy in the planning and management of his learning in an autonomous and responsible way (see Table. 2 and Fig. 3).

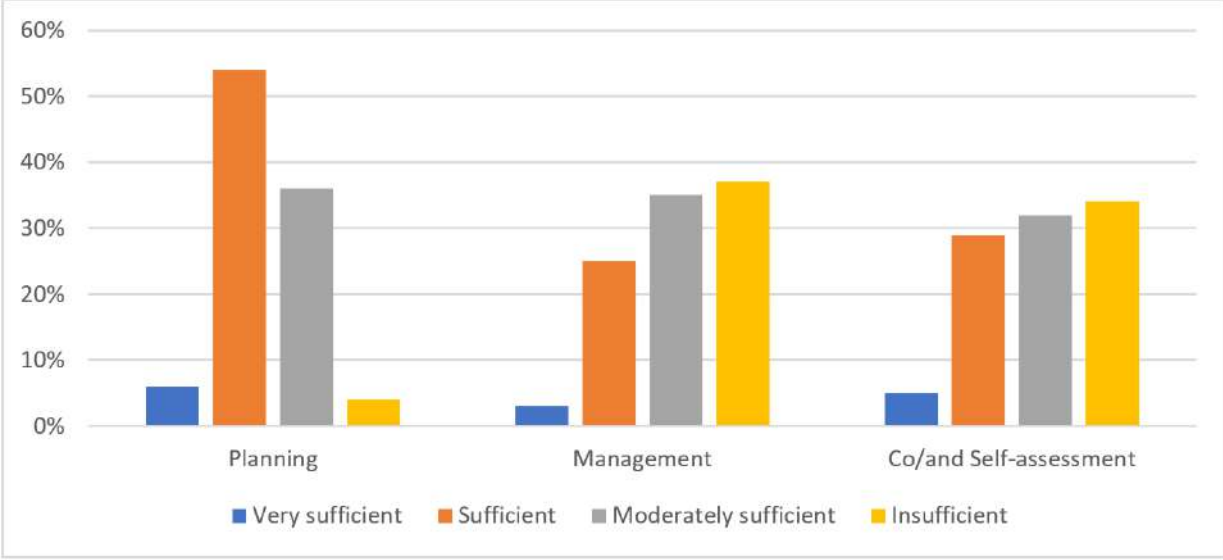

FIG. 3 Distribution of Self-Learning Abilities.

| Articulation and coordination instructors

Question 6. Pedagogical mediation promotes collaborative solicitations in the development of the personal and collective action project.

Question 7. Does the role assumed by the trainer make it possible to accompany and personalize learning, taking into account the learning styles and rhythms of the learner? (i.e. take into account preferences, preferred learning patterns, skills and motivation to learn) In our sample, the majority of respondents 76.50% mention that the pedagogical support model used is unsuited to the context of master training and the expectations of students, which leads to behaviors of boredom, anxiety, flight and decrease in investment and productive commitment in assigned tasks. It should be noted a kind of mismatch between the ultimate purpose of the accompaniment process which aims at the emergence of the full potential of the subjects on the personal, professional and organizational level and the reality of the daily life of the class, which reveals the absence of a coaching, mentoring and intelligent tutoring program (the use of e-learning), which make it possible to value and recognize personal and individual needs. However, the increasing heterogeneity of students entering higher education requires appropriate pedagogical support methods(Peretti, 2009) [11]. In this register the establishment of a relevant teaching infrastructure and psycho-sociological assistance is a coveted alternative solution, allowing the support and development of individual or organizational skills relating to adult learning and training based on: Needs Analysis, Target Audience Analysis and Analysis of Themes and Tasks, as well as the design of the Suggested Pedagogical Strategy and Training Modalities to create an interactive learning environment.

Question 8. Are the knowledge and skills targeted by the pedagogical scenarios of the different teaching disciplines consistent with the preferential needs of adults?

Question 9. Is the ITEF Master Competency Framework in line with pedagogical and educational training practices?

Question 10. Is the training plan negotiated and co-conceptualized between the main actors "learning communities and adult learners" to create the conditions of autonomy, and development of AHS and PACA?

We are content to point out that the study of the coherence of the components of technological practice has indeed allowed us to deduce a weak coherence upstream of a strategic work of the interdisciplinary type and, which negatively and directly influences the process teaching learning. This mismatch between the technological practices and personal needs of adult learners therefore leads to difficulties in participatory management of the social space (management of productive learning times, management of teaching materials and management of the "group of needs" workforce).

TABLE 3 Distribution of the degree of coherence of the components of technological practice

Questions	Absent	Weak	Insufficient	Consolidated	Excellent
Question 8	0%	19%	52%	22%	7%
Question 9	0%	15%	45%	36%	4%
Question 10	0%	12%	41%	43%	4%

The five modalities of coherence are in the following multiple forms:

1. horizontal pedagogical coherence;
2. vertical pedagogical coherence;
3. coherence between institutional texts and class practices;
4. coherence between objectives and evaluation;
5. Educational coherence.

These modalities constitute a powerful entry to effective and relevant learning(coherence between training objectives and program content), Table 3 and Fig. 4, they aim to improve the level of motivation of learners and their academic performance.

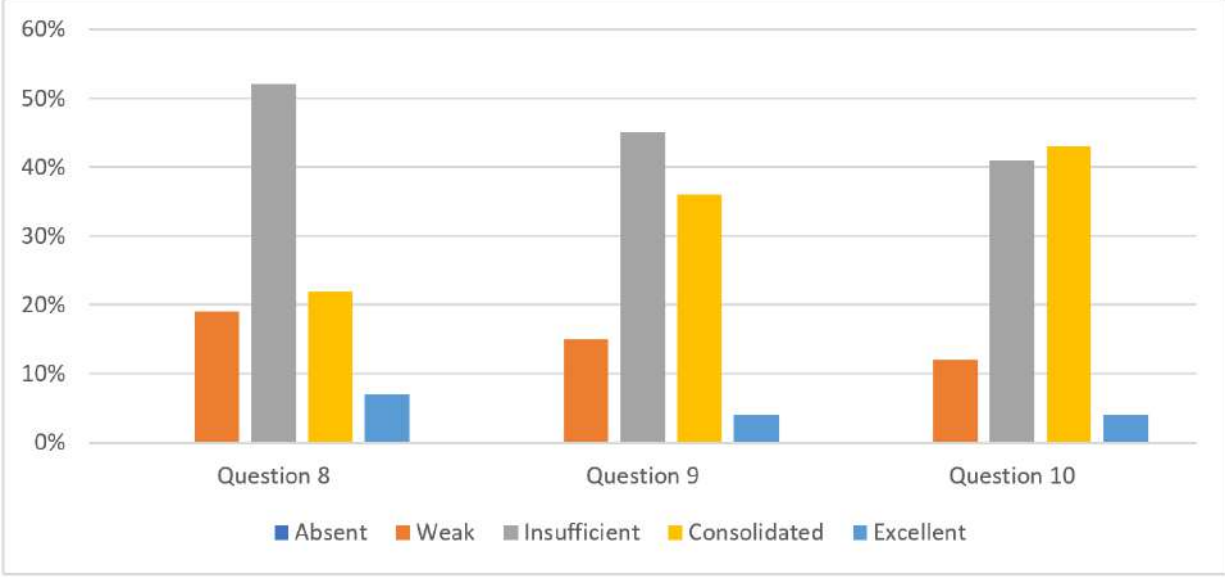

FIG. 4 Distribution of the degree of coherence of the components of technological practice.

As a result, the learning community is challenged to formalize a training system and coherent skills (internal and external) that carries meaning and creates interest and pleasure in the targeted clientele, so that they remain active and aware of their transformational and organizational process. Bielaczyc, K. and Collins, A. (1999) [12].

However, it should only be noted that the bundle of questions revealed within this institutional and didactic-

pedagogical reflection, as well as curricular, aims to improve the quality of learning processes among adult learners to solve complex and unprecedented problems.

| Learning style, experience, self-esteem, motivation and cognition.

Question 11. Are the andragogic principles advocated at the basis of the creation of favorable conditions for the valorization of subjective experiences, the personalization of paths and the empowerment of learning approaches? ***The contextualization of the response*** the empowerment of learning paths and approaches based on the input mode by experience is a key methodological and behavioral skill to be acquired by adult learners. The ultimate objectives of the Master's training program were aimed at the acquisition and development of the values of autonomy in the design of personal and collective action projects. The expected competency framework makes it possible to direct andragogic action towards the development of a reflective, self-directed practice where learners feel and develop the feeling of self-determination and competence, by Deci and Ryan (1985 a and b) [13] [14]. In this perspective they are led to self-and co-evaluate the demand of the task and the mains (resources) they have at their disposal to achieve the objectives set from indicators and benchmarks, to set up action projects. It is also interesting to emphasize the role of the teacher (Montessori 1948 [15]; Freinet 2013 [16]) which becomes a vector for self-knowledge, building the empowerment of its apprentices in particular by giving them the opportunity to evaluate and choose their own learning path based on a collaborative and agile approach with the aim of building empowerment.

Answer 11. Analyses of the data from the students' comments show that 83% of respondents confirmed beforehand that the learning activities to be carried out and the tasks of the different teaching sequences were less negotiated and less organized according to a collaborative and interactive approach. It involves carrying out research on themes structured according to a pre-established and prescribed timetable, which dictate and guide the guideline to be followed according to criteria for carrying out the task. The data collected also showed that the students' leadership learns reactively by following the instructions and carrying out the defined activities. In addition, the andragogic principles advocated seem to focus on the timid valorization of subjective experience and learning strategies to acquire knowledge and build procedural skills. Simply a teaching content transmitted or "offered" by the teacher or student who provides the presentation (The teacher is often the author who manages the rules of the operation that govern the teaching-learning process).

| Learning style and assessment modalities

Question 12. Does the training system involve the learning subject in the formalization of the approaches and instruments / tools for evaluation, co-evolution and self-evaluation of his own learning?

Answer 12. 66% of respondents confirmed that the training system has evaluation modalities that do not measure the personal progress of adult learners, measure the quality and effectiveness of learning scenarios and activities on skills development and reflect on ways of being and designing one's teaching (AH-SandPACA) These evaluation processes should use tools to assist in the design and formalization of Self- and Co-evaluation instruments and dashboards incorporating performance criteria, which make it possible to assess the sequences and relevance of learning strategies, as well as the way in which the objectives and means of implementation designed to achieve them in the short and medium term depending on the context, are regulated. The adult learner will therefore have at his disposal assessment tools that they could manage according to his training objectives, his interests and according to the demand the task. Question 13: Do you choose the appropriate teaching strategies for your learning style?

Answer 13. As we can see from the data in the responses. We were able to see that 67% of students could not recognize and identify their preferred learning styles. However it would seem that the choice is made according to the knowledge of active learning strategies by putting in occurrence in a hierarchical way Case Study (45%), Games and Simulation 26%, Project Design Method (24%) and Discussion Panel (5%). On the one hand, the analysis that reveals the limits of the lack of knowledge of the learning style in the formalization and self-management of AHS and PACA. On the other hand, the possibility of choosing the learning style makes

it possible to specify how we script the teaching activities when the student is in a situation of autonomy in the management of the teaching sequences "Didactic Devolution". It is interesting to note also even if there is partially accurate answer 33% to the question of identifying the profiles of learning styles we find that respondents have put forward an arsenal of choices of learning strategies that are included in different categories of learning profiles.

It is clear in this regard that the identification and use of the learning style as self-knowledge and teaching-learning approach can contribute to the quality and effectiveness of students' learning, promoting the emergence of full personal, organizational and motivational potentialities, as well as the development of knowledge and skills to learn and progress.

However, this variable of knowledge should not be taken into account and emerges from the concept of self. This is why we defend the idea that it is important to create the conditions for self-assessment of the learning style, promoting its integration into the engineering process of needs and prerequisite analysis. Also this knowledge will allow us to know the logic of functioning of adult learners, creating favorable conditions for self-management and self-management of all learning and teaching situations. It is important to question the value of identifying teaching styles and strategies as a powerful vector for the choice of personalized training content and how to convey this content.

TABLE 4 Report specific skills of the pedagogical self-management process and specific objectives of the technological project.

Proyect level descriptors	Degree of empowerment				
	Very satisfying	Satisfactory	Unsatisfactory	Not satisfactory	Not affected
Investigation	20%	40%	23%	17%	0%
Planning	33%	43%	10%	14%	0%
Action	15%	38%	25%	36%	0%
Regulation	23%	50%	15%	12%	0%
Evaluation	18%	40%	30%	12%	0%

I could have done an analysis after each device but some results would then have been repeated for several devices. It seemed to me more judicious to describe first what I did in class with the students to develop a self-taught posture and then in a second time to make a global analysis and not by the device. The first observation is to say that students are more invested in learning with a self-management pedagogy that highlights planning phases. Teaching skills have had an impact on the design of the teaching project, academic results have been better and the competency framework has made it possible to develop a self-management posture. You could say that you learn better independently. It should be noted that the process of interpreting the results is always delicate. The interest of the analysis of individual and social autonomy lies above all in the process of supporting decision-making. The assessment consists in defining the changes that have occurred in personal and professional development (autonomy, independence, self-confidence, didactic-pedagogical decision-making); in relationships; in the organization of the session. What knowledge and learning have been acquired by those concerned? How to evaluate progress and acquisitions? What formal and informal source did they use? Have they really learned something or have they limited themselves to solving tasks, to complying with instructions without learning, without an attitude of appropriation of knowledge?

4. Teaching Methods and Techniques and Learning Style Question 14: Please select the teaching methods and techniques that you actually use in the design of the learning activities. Please select the ones that are actually integrated into your learning units. Rank your in order of priority and importance (completely favorable, favorable or unfavorable).

It would seem that teaching strategies that favor "methodical" profiles with the aim of meeting the requirements in the field of applied sciences, in this case the field of technologies applied to education and training (Specialized Master in Engineering for Education and Training). Nevertheless, it is important to stress that didactic strategies will not be understood as a simple integral and simple translation of learner profiles. "Pedagogical methods" or "pedagogical models" have an impact on the quality of learning and the effectiveness of

the pedagogical relationship (Jean Jacque Houssaye 1988 [17] and 2014 [18]). The analysis of the data allowed us to retain that the majority of teachers conceptualize their didactic methods by favoring the transmissive style (interactive presentation) whose objective is the transmission of disciplinary knowledge (see Fig. 5).

TABLE 5 Distribution of Teaching Methods and Techniques.

Teaching methods "Didactic strategies"	Completely favorable	Favorable	Unfavorable
Simulations	16%	23%	61%
MRP-based learning	16%	42%	42%
Role-playing game	12%	19%	69%
Educational game	0%	15%	85%
Lectures	85%	15%	
Discussion panel	72%	22%	6%
Brainstorming	6%	8%	86%
Case Study	8%	40%	52%
Question and creative method	10%	20%	70%
Project pedagogy	26%	27%	48%
Inquiry	0%	10%	90%
Collaborative learning	55%	25%	15%
Individualised teaching	26%	35%	49%
Scheduled teaching	0%	21%	79%

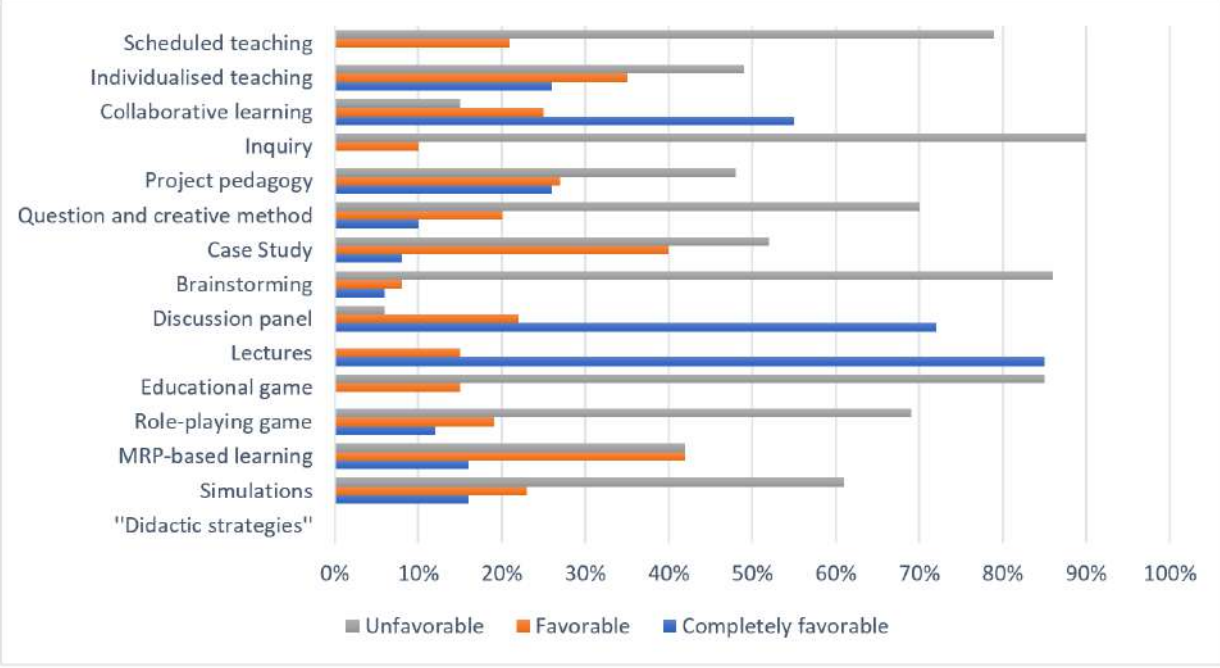

FIG. 5 Distribution of Teaching Methods and Techniques.

In addition, we note two other preponderant modalities of the didactic relationship are highlighted: the incentive style (debate, discussion panel and maieutic mediation of Socrates), the associative style (Collaborative learning and group dynamics) on the other hand the permissive style reveals less significant percentages of fundamental choice (self-learning computer-assisted "programed teaching and project pedagogy') Fig. 5. Together, the analysis of the results highlights a shortage in terms of teaching strategy that solicits creative and metacognitive cognitive processes, promoting knowledge of their own learning mechanisms. In this context

Jean Therer 1998 [17] showed that if one systematically contradicts the cognitive style of an adult learner, one disrupts his learning and increases the risk of failure and abundance. Similarly, he states that " any attempt to normalize the intellectual approach of a learner, any attempt to prescribe an ideal and orthodox style of learning, Is a normative fantasy that does not qualify to teach." Therefore, it would be wise to diagnose the different profiles of learners upstream of their training to implement a real differentiated pedagogy(Therer 1998) [18].

5 | CONCLUSION SYNTHESIS, LIMITATIONS AND RESEARCH PERSPECTIVES

To the questions of the study, we will try to confirm that the autonomy of the student is part of a methodological approach is more profitable and generates profitable and relevant learning gains. ADA is therefore a powerful vector for the development of adult learners' self-management skills in the university context. However, not all teaching strategies have the same weight, and some do not have an impact in the sense of professionalizing academic performance. Nevertheless, we believe that in the concept of autonomy, students do not have the same preferential behaviors or the same ways of proceeding. They don't all learn the same way, use specific learning strategies, and in the end, we find that they don't have the same abilities/skills to use self-training. In this perspective it is important to question the mediating role of the teacher in andragogic action where the latter would be called upon to play the roles of a "pedagogical engineer - manager - coach." Would he be able to adapt to the new constraints of ossification of the learner that would impose on him the new role of the learner? This new role would consist of accompanying learners in self-direction. Indeed, moving from a hetero-directed system to a self-directed system. The ultimate objective would be to develop in the student a strategy that can be reused later, that is to say that "the student becomes capable of theory" (Piaget). It is a learning conception based on the model of "learning to learn" and "learning to undertake", to move towards a development of conscious and actualizing autonomy.

Limitations, recommendations and prospects for improvement It seems important to us to reconsider the empowerment approach from a socioconstructivist and interactive perspective of learning (from the teaching–learning system: what are the aspects that take into account to establish effective and relevant andragogic principles?)

- Taking care of the adult learner's prerequisite
- The psychological profile of the learner (nature of the motivations)
- Learning style and cognitive style
- Skill and ability level
- The technological profile / The learner's portfolio
- Teaching and pedagogical material

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