

The use of ICT and hybrid teaching in support of active pedagogies Case of higher education teacher researchers of the Algerian University

استخدام تكنولوجيا المعلومات والاتصال والتعليم الهجين في دعم طرق التدريس النشطة حالة الأساتذة الباحثين في قطاع التعليم العالي في الجامعة الجزائرية

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Abstract

This research aims to study the main impact of ICT and hybrid education reflected in improving teacher qualifications, changing educational structures and creating learning opportunities. Increasingly integrating learning, improving the quality of education and improving teaching skills. As part of the research, an online questionnaire was sent to university professors and lecturers in several universities in Algeria to show how they use ICT to support active pedagogies. Using descriptive data, (n 120) questionnaires are analyzed and then supplemented by principal component analysis to clarify the relationship between the selected variables. Algerian university teacher-researchers regularly use ICT, most of them are limited to a simple use of ICT but the majority of them who use it effectively are those who have benefited from training on ICT and pedagogical practices.

Keywords : Active pedagogy, use of ICT, hybrid teaching, Algerian university, teacher-researchers.

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ملخص

تهدف هذه الدراسة إلى معرفة مدى انعكاس التأثير الرئيسي لتكنولوجيا المعلومات والاتصال والتعليم المختلط في تحسين مؤهلات الأساتذة وتغيير الهياكل التعليمية وخلق فرص التعلم مع دمج التعلم بشكل متزايد وتحسين جودة التعليم وتحسين مهارات التدريس. كجزء من البحث ، تم إرسال استبيان عبر الإنترنت إلى أساتذة الجامعات والمحاضرين في العديد من الجامعات في الجزائر لإظهار كيفية استخدامهم لتكنولوجيا المعلومات والاتصالات لدعم المتطوعين التربويين النشطين ، تم تحليل البيانات الوصفية للمشاركين (العدد 120) ثم استكمالها بتحليل المكون الرئيسي من أجل توضيح العلاقة بين المتغيرات المختارة. أظهرت النتائج أن الأساتذة الباحثين في الجامعات الجزائرية يستخدمون بشكل منظم تكنولوجيا المعلومات والاتصال ، ويقتصر معظمهم على الاستخدام البسيط لهذه الأخيرة ، لكن غالبية من الذين يستخدمونها بفعالية هم الأساتذة الباحثون حديثي التوظيف الذين استفادوا من التدريب على تكنولوجيا المعلومات والاتصال والممارسات التربوية.

الكلمات المفتاحية: علم أصول التدريس النشط ، استخدام تكنولوجيا المعلومات والاتصال ، التدريس الهجين ، الجامعة الجزائرية ، الأساتذة الباحثون.

1. INTRODUCTION

In recent years, face-to-face teaching practices in the university environment have been characterized by the development of active pedagogy and the increasing use of information and communication technology for teaching (ICT) (Charbonneau, 2013; Tessier, 2012). Despite the rapid development of information and communication technologies, these technologies have not been effectively used in the classroom (Albin 2006, Okojie M, Olinzock, Okojie B, and Tinukwa 2006), but this development exists in several regions of the world. The scope and frequency of use vary not only from region to region, but also from field to field (Guennoun and Benjelloun, 2016); nevertheless, traditional lectures are still the most widely used teaching method, although it tends to give way to more participatory Teaching strategy (Kozanitis and Desbiens, 2016). When students actively participate in homework and encourage them to share insights and reflections (Freeman et al., 2014). It is rapidly increasing among teachers and students in higher education (Barkley, Pete, Norton, etc.).

ICT is usually limited to use, which is the transmission of information (Kirkup and Kirkwood, 2005). In the context of increasing use, the question is whether ICT enriches, enhances or promotes the deepening of university learning. From the perspective of learners, it is not important to consider whether teachers use ICT, but how they use it (Karsenti and Collin, 2011). The impact of ICT on teaching and learning (Paivandi and Espinosa, 2013; Raby et al., 2011). The main advantages of students include easy, free and decentralized access to information (Higgins, Xiao and Katsipataki, 2012; Rogers, 2001), the possibility of synchronous, asynchronous and decentralized collaboration or cooperation (Cruz, Cutchis and Honeyford, 2012), considering Preference for learning styles (Battalio, 2009) and immediate feedback (Johnson and Johnson, 2). This approach promotes students' sense of responsibility and commitment to learning and success (Brooks, 2016; Turney, Robinson, Lee, and Sutar, 2009). In addition, online activities and technical tools promote students' self-control and autonomy. And Loisy, 2014) They also had a positive impact on others. Learning from university students (Rogers, 2004) and leading to high-level development of cognitive processes (Monsakul, 2008).

In addition, the combined use of active pedagogy and ICT seems to facilitate in-depth learning, especially through regular and consistent access to resources available on the Internet, because they promote teacher-student interaction (Knight, 2010). However, without considering how ICT is used and the environment in which it is used, we cannot attribute it to the ability of ICT to improve learning (Céci, 2018; Romero and Laferrière, 2015). There are several factors that can affect quality. Therefore, we need to look at the larger picture, taking into account the participants, available resources and training activities involved. Although active teaching methods seem to attract the interest of more and more university professors, including vocational education and training (Bachy, Lebrun, and Smidts, 2010), it is not clear how these learning situations are related to learning and teaching using ICT. University professors are not necessarily trained in the use of digital technologies in teaching (Collin et al., 2015), and such training will not help reflect ICT use practices (Roussel et al., 2017).

In view of the advantages of ICT in learning and the positive impact of active teaching methods on deep learning and the promotion of advanced cognitive processes, especially in the university environment, we are interested in whether teachers use ICT and at the same time suggestions for active learning situations and their applications to support these active teaching methods. To this end, we recommend investigating the following questions: How can university teachers use the potential of ICT to increase and improve the effectiveness of active teaching methods? What factors affect the use of ICT? Have university teachers been trained in active teaching methods or ICT? What are the types and duration of training courses? What is the introduction of ICT and hybrid teaching for university teacher-researchers?

The overall goal of this research is to compile a list of ICTs used in the learning context of active pedagogy. In response to these situations, an online questionnaire was sent to professors and lecturers in three universities in Algeria to make better use of active pedagogy Learning to understand, on the other hand, their ICT integration supports these active teaching methods. The potential factors that may affect the integration of ICT into the higher education environment can be analyzed. To simplify the

text, unless otherwise stated, the term "teacher-researchers" now refers to lecturers and university professors. The following paragraphs provide a conceptual framework that is developed from the existing definitions of hybrid teaching and ICT concepts in the university environment, and then summarizes the methodology before presenting the results and analysis.

Theoretical background

2. Hybrid teaching and active pedagogies

Most authors who proposed the definition of active pedagogy agree that it is characterized by active participation of students; in this case, the nature of the qualifier "active" is related to the teaching intention of teachers to stimulate participation. Students actively participate in the educational process; however, without their consequences—active learning—they cannot be active educators; in addition, Bonwell and Eisen (1991) define an active teaching method starting from the learning pole, that is, any prompting Strategies for students to do something and think about what they are doing. These authors believe that active learning has the following characteristics: Student activities in the classroom are not limited to listening to teachers; activities are diverse (problem solving, debate, research, experimentation, cooperation, etc.); they pay more attention to skill development rather than information transmission; and Leads to the development of higher-order cognitive skills. Prince (2004) clarified and simplified this situation. He pointed out that to explain the active learning in the classroom requires two conditions: First, as Bonwell and Eisen (1991) pointed out, students need to participate in other than listening to teacher lectures and taking notes. Activities; secondly, activities are related to concepts, topics or learning goals. Who developed a tool to measure active learning shows that interpersonal interaction between students is a factor closely related to active learning. According to Smart and Chapo (2007), teaching methods that emphasize active learning provide opportunities for interaction and cognitive interaction through supervised activities. Both students are increasingly seen as a prerequisite for meaningful learning in order to use higher cognitive processes, such as critical thinking, (Al 2011). Freeman et al. (2014) Defined their definition of the active teaching method through interviews with school principals. H. From the teacher's perception

of the concept of active learning or active teaching from the learning center, take Petress (2008) as an example. For example, Carr, Palmer, and Hagel (2015) discovered the concept proposed by Freeman et al. (2014) Active learning is based on passive learning that demonstrates its opposite: "a learning process that allows students to participate in classroom actions or discussions, rather than passive listening." Advanced cognitive processes and (usually) group guidance and mobilization work" (Freeman Et al., 2014, p. 8413, free translation). Palmer and Hagel (2015) pointed out that there are many activities related to active teaching methods, from group discussions to experiential learning through problem solving, modeling, and peer learning. As long as the framework conditions specified in the selected definition are met.

3. Diversity of active pedagogies

In fact, there are many teaching strategies or teaching methods that can create positive learning situations; without claiming to be exhaustive, we can mention that problem-based learning and project-based learning are increasingly used in science And an eloquent example of technology. Technical occupations (Chen et al., 2008); different active teaching methods can be grouped according to different characteristics or standards, such as in this part of the Prince (2004) model, which shows that they are placed in a continuum, From a mainly leftist authority-centric strategy to a more directional strategy. On the student on the right (farting). Two criteria are used to determine which strategies belong to the continuum. The first is to determine who, the teacher or the student, is doing most of the learning activities; from the master's point of view, most of the work is done by the teacher. In the center, students do most of the activities. The second criterion is the duration of activities related to educational strategies. For example, lectures combined with short-term active learning activities, such as "thinkpairshare" discussions that last less than 10 minutes, are held on the side of the Master's Center. Some strategies may take an hour to three hours, for example because they are in the middle of the continuum in the case of methods, puzzles, or role-playing games; after all, long-term activities such as project-based learning are in the far right corner.

However, this does not determine the type or nature of activities performed, so it seems necessary to find a way to organize different teaching strategies. In addition to these two standards, there is an additional standard related to cognitive activities. Or student's behavior, this standard is in full compliance with the accepted definition of active teaching method. On the other hand, we could not find any scientific or non-scientific reference materials, indicating that an active teaching method organization stated these three standards, and the analysis identified The document can be selected according to three storage criteria for active teaching methods, and divided into three groups: 1) interactive reflective learning, 2) curious learning and 3) experimental learning. Before describing this grouping in more detail, it should be noted that any attempt to classify active teaching methods has nothing to do with the choice of the terminology used to identify the group; in fact, when looking for suitable terms, we note that scientific. There are many terms used in the world. The use of terms may vary depending on the author, world region, or application field.

The second difficulty related to the first is the lack of unique and clear definitions of the concepts that these terms are intended to represent; with this in mind, the main drawback of most of the projects considered is the lack of flagships. Links to the accurate identification and differentiation of related concepts; more confusing is that some authors may use multiple terms in the same article when referring to a concept as if they are synonyms without proof of mutuality. The third difficulty stems from the fact that most publications are in English, which may cause the risk of interpretation when the terms are translated from English to Arabic. In addition, it also increases the difficulty of accurately understanding their belonging groups and accurate definitions. Active pedagogy refers to this because the discrimination criteria are not precise enough or mutually exclusive, especially when it comes to criteria for duration and type of activity. Despite these difficulties, the suggested grouping is based on translations of the most common terms used to define the three groups.

This grouping is certainly not exhaustive, because other criteria can be added to influence decision making. The following paragraphs describe each group and give examples of related learning strategies. The first group,

which we call reflexive interactive learning, includes active learning. The strategy on the left side of the Prince Continuum. These strategies are often combined with more traditional teaching methods such as reading in the classroom. These are short-term activities (a few minutes), and the teacher may suggest encouraging students to reflect on concepts or ideas related to the course or subject matter. Mobilize special advanced cognitive skills (analysis, evaluation, discrimination, expectations, reasoning, critical thinking, etc.). They can be done individually, with or without interaction. When strategies promote interaction, they can be carried out only between students, which is usually the case for group discussions, or they can be communicated by the teacher in a group discussion. Several authors have proposed teaching strategies or methods that can be found in this group. It is widely described in the literature (see, for example, Sweat and Michealsen (2012), Barkley (2009), Angelo and Cross (1993), Schreiner and Louis (2011), and even Nilson (2010) (Minner, Levy and Century, 2009). The term "curious learning" or even "exploratory learning" includes strategies such as problem-based learning (Hmelo and Evenson, 2000), opportunity (McNair and Hesum, 1954), and small research projects (Chu, 2009). Students are directly involved in the research, operation, application, and solving of any problems or difficult situations. This group of active teaching methods is closer to the center of the royal continuum, so the duration of training courses can range from several hours to several days. Including not only the duration of the course but also individual or group work. The difference between this group and the first group lies in the nature of the training activities provided. These activities are broader in scope and may require the mobilization of additional skills. Cognitive skills (Prégent et al., 2009).

The third group is called experiential learning (Kolb, 1984), which can be translated as experiential learning; the latter group includes active teaching methods. They are located on the right side of the Prince's continuum because they involve activities and Tasks. Completion time (weeks or even months). Learning strategies such as project-based learning (Barron, 1998), role-playing games (Chamberland, Provost, 1996), simulation (Hertel, Millis, 2002), and serious games (Alvarez and Djaouti, 2010) are all

conceivable. Active teaching methods provide students with opportunities to shape themselves or assume roles in work-related environments in order to apply the necessary knowledge, skills, or abilities to deal with real-life situations in the environment they encounter in Work after graduation. Since the scale or complexity of the situation may be very obvious, teachers may choose to control certain variables to have an impact. Can perform related tasks. Common variables include team size, result type, reality, time, and support or control provided.

4. Pedago-centered approach to technologies

Information and communication technology (ICT) generally refers to any technology that, when combined, enables individuals and organizations to interact in the digital world (digital world) (Ramey, 2012). These technologies include software (software) and equipment (hardware), infrastructure that enables data to be accessed or stored, and communications that are ubiquitous in our social and professional environments. These technologies have maintained our relationship for decades. , Significantly changed the college. No exception (Limniou, Downes and Maskell, 2015). Therefore, the strong educational potential of ICT means that its popularity among teachers and students continues to increase (Collin and Karsenti, 2013). The educational nature of ICT, especially the value they provide for gesture learning and learning. For example, Colleen (2013) raised the issue of the use of e-learning and digital use in education and warned that possible convergence does not reflect the educational value that ICTs can have, regardless of whether they are used for education. And outside. It is recommended to conceptualize the use of ICT instead of restricting it to an educational situation, but to treat it as a whole in a broader way, linking the educational background with the socio-cultural background (Selwyn, 2010). In this context, Ceci (2018) analyzed the use of ICT and questioned its potential to change the form of university learning (that is, the social form experienced by educational institutions), and believed that technology has the potential to redefine the learning process, increase its efficiency, and make It is easier to complete the task. However, it is said that simply swapping ICT tools (chalk, pencil, etc.) does not guarantee excellent results.

Instead, it is necessary to consider a way to integrate ICT into the university environment, which is why he warned against a purely technology-centric approach and cited the administrator's installation of interactive whiteboards (IDP) in many university rooms. Take full advantage, as an example. Like other experts (Karsenti, 2016; Thibert, 2012), Céci (2018) examined the debate about the usefulness of ICT from a teaching perspective, and sometimes some participants in the education system questioned this. The university format is developing in the digital age, and the use of information and communication technology should coexist with educational equipment. Therefore, priority is given to a teaching method in which the compatibility of information and communication technology and teaching equipment is aimed at strengthening the teaching attitude and learning process. Since ICT is not inherent, researchers have found that technical teaching support is essential for the professional development of teachers (Karsenti, 2016; Villeneuve et al., 2012). In addition, Ceci (2018) suggested that this support includes three basic elements, namely active teaching methods, technology, and digital culture teaching. According to the author, "The educators who are most suitable for technology and can therefore become 'symbiosis' are actually active educators who focus on students and their cognitive activities related to the focus of knowledge acquisition. Therefore, it coincides with the comments of other experts, who recommend reviewing the use of ICT, while considering socio-cultural factors that may affect the use of technology in the school environment, such as socio-demographic, socio-economic, and ethnic cultural factors. (Bennett and Marton, 2010).

5. Use of ICT in a university context

Therefore, the rationale for choosing ICT to support active pedagogy is consistent with the pedagogy proposed by Ceci (2018), which in turn influences the choice of models that should be maintained to classify ICT use. In this sense, it is obvious to teachers that there are many patterns or types in the application or use of ICT in education; for example, we cited Basque and Lundgren Kayrol (2002), Collin and Karsenti (2012), or The work of LeverDuffy and McDonald (2011). Reading these papers allows us to highlight three observations: the first, and perhaps the most important,

they emphasize the complexity of developing a general classification system for technical objects. For example, for teaching and learning, some models target elementary or secondary education (Romero and Laferrière, 2015) or even specific ICT (especially Fisherz (2017) on the use of tablets in the classroom. or a subset of ICT (Example) (e.g. Dejardin, Bachy, and Lebrun (2014) on the use of online platform tools for higher education) The second observation is that each category has many advantages, but also has the disadvantage of limiting transferability because the standard is omitted. The third observation is partly derived from the first two observations, namely that the classification evolves with the evolution of technology, environment, and use. Therefore, the challenge is to find a sufficiently general and comprehensive model that can be adapted to any discipline. In this case, we look at ICT in the broadest sense so as to include both the type of use and the teacher's educational intentions (Lebrun, 2011). And the way we use digital tools (Romero et al., 2016), such as the use of the Internet, various other tools and digital products, email, digital platforms (e.Moodle), or digital learning have been part of the teaching process for many years Environment (Bates, 2015). In addition, higher education increasingly uses network applications (such as online learning platforms) to promote student-to-instructor communication and collaboration. (Lameul, 2008).

In addition, Romero and his team (2016) proposed the application model of ICT in teaching as the theoretical basis for data analysis. This model is particularly interesting because various ICTs are used in the continuous education process. The transition from the most passive to the most active (Romero, Laferrière and Power, 2016), so this model is very consistent with the teaching-centered approach and reflects the continuity of the active teaching method of Prince (2011). Use ICT for educational purposes. These levels are a continuum from simple use to complex use, reflecting the social cognitive process that students participate in: 1 passive consumption; 2 interactive consumption; 3 content creation; 4 joint content creation; 5 joint creation of knowledge. The first two levels are the consumption of information available to students. Students can read or view multimedia content, not interact with the content or the digital learning environment, but only in options that lead to basic, usually predictable, and pre-programmed

interactions. Some examples of these levels are e-books, online exercises, online courses-all of which can be accessed with one click on the digital platform. The third level enables students to create text, pictures or videos based on their learning situation. Examples at this level include conceptual mapping, fun game programming, and creative writing. The last two levels involve students in the process of creating content based on prior knowledge and creativity in order to find solutions to complex problems through collaboration (using discussion forums, collaborative creation of wikis) (Romero, Laferrière, and Power, 2016).

6. Methodology

In compiling our sample, we were supported by educational services from three university institutions in the Tlemcen, Algiers, and Oran (Algeria) regions. We have ensured that the three pedagogical services have mailing lists with teacher-researchers' (lecturers or professor) email addresses. In this study, the identity of the professor or lecturer was not considered. The only selection criterion is that the participant has taught or teach at least one course in that institution. The professors whose names appear on these lists will complete the free short online questionnaire developed for this survey via email. We received 153 completed or partially completed questionnaires. A sample of 120 respondents in six research fields (management/economics, biology/technology sciences, law, humanities and social sciences, natural sciences, engineering sciences, and health sciences) can be collected. Even if it includes professors from different universities and different disciplines, this convenient sample does not represent all university professors in Algeria; this important method limitation must be considered when discussing the results.

7. Results

Since the research standpoint of data analysis is exploratory, we first present the descriptive data of the two most important surviving structures in the form of a frequency table, namely the active teaching method in the university environment and the use of ICT. Next, to identify trends and outline potential universities Introduction of professors Regarding their public practice of using ICT and active pedagogies methods in teaching, we

showed the results of principal component analysis (PCA) research and our interpretation of them.

Use of active pedagogies in university teaching

As for the active pedagogies methods used, except for one participant ($n = 119$), all participants stated that they would integrate these methods into university studies; in addition, as shown in Table 1 below, 29% of participants had almost no more time was devoted to teaching (26% of the time), 39% spent more than a quarter of the learning time (from 27% to 51% of the time), and 25.2% allocated more than half of the learning time (more than 51% of the time).

Table 1. Portion of university courses allocated to active pedagogies (declared practices)

Portion of the course allocated to active pedagogies	$n = 119$
10% and less of the course	7.2%
12% to 25% of the course	29%
From 27% to 51% of the course	39%
More than 51% of the course	25.2%

Source : Author's with SPSS software

In terms of the diversity of active teaching methods used, according to the respondents who answered the questionnaire, 86% of the respondents indicated that they used 3 to 7 active teaching methods in the options suggested in the case Methods (80%), discussion (70%) and problem learning (66%) are shown in Table 2 below. Showing the types suggested in the questionnaire.

Types of active pedagogies used	$n = 119$
1 Case method	79.9%
2 Discussion	70.7%
3 Problem-based learning	66.5%
4 Project-based learning	53.9 %
5 Simulation	40.5%
6 Collaborative learning (<i>team-based learning</i>)	37.9%
7 Reverse class (<i>flipped classroom</i>)	36.2%

8 Peer teaching (<i>peer instruction</i>)	32%
9 Cooperative learning (<i>puzzle</i>)	24.5%
10 Roleplay	16.9%
11 By play (<i>game-based learning or gamification</i>)	$n = 3$

Table 2. Use of each type of active pedagogy (declared practices)

Source : Author's with SPSS software

Use of ICT and hybrid teaching in support of active pedagogies in university

In Answer to the question "When you use these positive teaching methods, do you use ICT in the classroom?" , 80% of the participants gave a positive answer ($n = 93$). Among the ICTs that support active education mentioned by the participants, the most commonly used are ICTs (Socrative, Kahoot, Poleverywhere) used to create or manage surveys. , GoogleForms, Surveys), as shown in Table 3. Teachers also use technologies that allow access to educational resources through the Internet (YouTube, Zoom, Microsoft Teams, Moodle). To a lesser extent, some teachers use social media and technology tools to achieve Reflection and collaborative content creation (Facebook, Wiki).

Table 3. ICT used to support active pedagogies

	Most used ICT	
1	Poll (Zoom,Microsoft Teams, GoogleForms, Surveys)	$n = 42$
2	Google (Classroom, Docs for Education, Notes, Search)	$n = 33$
3	Videos (YouTube, cameras, google meet) Digital	$n = 17$
4	learning environment (Moodle) Social networks (Facebook,	$n = 18$
5	Professional email	$n = 10$
6		$n = 12$
7	Bulletin Board (Blackboard, Google Calendar)	$n = 8$
8	Wiki	$n = 4$

Source : Author's with SPSS software.

Another question in the questionnaire aims to create an ICT usage profile to support the active pedagogy of the participants, and they must indicate whether they rate "small users" (5 ICT or less) as

“normal users”. (5 to 10 TICE) or "active users" (12 TICE or more). The results are shown in Table 4 below.

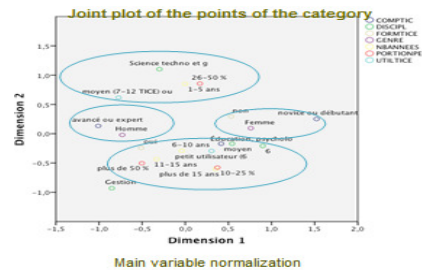
Table 4. Declared use of ICT in support of active pedagogies (declared practices of the 93 respondents claiming to use ICT when using active pedagogies in their university education)

Declared ICT user profile	n = 93
"Small user" (5 TICE or less) "medium user" (from 5 to 10 TICE)	n = 58
"High user" (12 TICE and more)	n = 27
	n = 8

Source : Author’s with SPSS software

Examination of this table shows that few teachers who report using ICT in university courses consider themselves active users of ICT. In the context of the exploratory analysis shown below, "average user" and "heavy user". Multiple Coincidence Analysis (PCA) Results PCA identified two main dimensions related to the collected data. The color codes assigned to the acronyms in the legend in Figure 1 below allow visualization of the structure of the two dimensions so that dimension 1 mainly distinguishes participants based on variable ICT skills, gender, and ICT usage; dimension 2 depends on subject and length of teaching It differs from the type of ICT user. Based on this distribution, some groups can be proposed to define a profile of university professors who use ICT to support active pedagogy in their courses.

Figure 1. Results of the principal component analysis with proposed trend plots



Source : Author’s with SPSS software.

2) The second, more general profile includes university professors in economics, management, law, and biology. , Technical sciences, or humanities and social sciences, with at least six years of professional experience, and taking into account their average ability in the ICT field; say that they use six or less ICT to support them in varying proportions of degree programs (less than 20% or more than 55% of the time) provides active teaching methods, as shown in Figure 1. That is the proportion of courses dedicated to active teaching methods and the number of ICTs used. Regarding the use of ICTs, participants answered "yes" or "no". We determined two profiles related to gender and variables: 3) On the one hand, Self-proclaimed senior male university professors or ICT professionals tend to use ICT to support active pedagogy in the classroom. 4) Conversely, university professors who describe themselves as ICT novices generally do not use ICT in their courses to support active pedagogy.

8. Discussion

The presented results summarize what university professors claim are related to active teaching methods and ICT-related university pedagogical practices to support them; the first obvious observation is that the vast majority of university professors say they use active teaching methods. Interestingly, they stated that they devote a lot of teaching time to them, and the results are consistent with recent studies (Kozanitis and Desbiens, 2016), which show that university teaching methods tend to develop. It seems that traditional teaching methods are being replaced by more active methods. In addition, the most widely used teaching methods and strategies belong to the categories of curious learning and experimental learning, which are located on the pedo-centered side of Prince (2004). Also use interactive learning categories, especially in discussions and when using strategies such as collaboration. Rational or cooperative learning, the latter is located in the left-center of the continuum, so instructors may think that magistro-centered teaching methods still occupy an important position in instructors' teaching choices, but they seem to prefer quantitative teaching methods. Pedo-centered (Bachy, Lebrun, and Smidts, 2010). In fact, the data seems to indicate that teachers use mixed teaching methods in a lesson to provide multiple learning activities.

However, the most widespread use of survey techniques is in the classroom, which is consistent with some of the active learning strategies popular in our sample (co-education and peer learning). According to Romero, Laferrière, and Power's (2016) classification, teachers claim to be at the first and second levels, but some teachers seem to use them at higher levels, especially through social media and wikis. For the impact of other variables on ICT use, the PCA results seem to indicate that gender could be a socio-demographic variable linked to the frequency of use, as men seem to use it more frequently than women. On the other hand, we note that training could be a variable linked to the frequency of use, since teacher-researchers from the Algerian University who have benefited from training on ICT and pedagogical practices appear to use them more than the untrained one. They checked the data and found that a large percentage of men said they had received this type of training, which may partly explain these results; these results will also be consistent with studies that increase the importance of teacher training for the use of ICT (Karsenti, 2016, Villeneuve Et al., 2012), a study by Dejardin, Bachy and Lebrun (2014) is associated with the use of For online learning platform subject variables (according to BiglanBecher (1989) typological classification, cited in Berthiaume (2007)) with Some results, especially learning using platform work tools, namely according to the typology of Lebrun (2011), for the author, it is the only tool to combine it with the interactive form in higher education, which is assigned to HardApplied (corresponding to civil engineering) and SoftApplied (corresponding to social work) or applied science disciplines. Although we cannot use the same subject type in this research, some trends related to this factor have emerged, namely, teachers who teach science and technology or engineering, these subjects can be found in Hard Applied poles. The use of ICT supports active pedagogy more than peers in other disciplines, which is consistent with the findings of Guennoun and Benjelloun (2016) who observe the differences between disciplines.

9. Conclusion

University professors and lecturers generally use ICT, most of them are limited to simple ICT use, namely H. Regarding the transmission of information (Kirkup and Kirkwood, 2005), or passive consumption by

students (Romero and Laferrier, 2015).). In the context of increasing use of ICT and active pedagogy in the context of universities, and in the context of future research, it seems appropriate to ask how much ICT enriches, improves, or deepens students' learning in the learning process. From this perspective, what really needs to be considered is not whether teachers are using ICT, but how they use it. This exploratory study attempts to provide preliminary answers to these subsequent questions. It is necessary to conduct in-depth research on the factors and methods that enable ICT to effectively support active teaching in the higher education environment and continue to provide higher education teachers with ICT training recommendations to help them in their efforts to integrate ICT to support the active teaching methods they have used in their courses.

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