

**DESCRIPTIVE ANALYSIS OF THE ATTITUDINAL AND PROFESSIONAL DEVELOPMENT COMPONENTS REGARDING INFORMATION AND COMMUNICATION TECHNOLOGIES FROM UNIVERSITY PROFESSORS FROM THE DEPARTMENT OF SUCRE IN COLOMBIA**

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**ABSTRACT:**

This research study aimed to know and describe attitudes from a sample of university professors from the Sucre Department in Colombia regarding information and communication technologies (ICTs) as a learning tool, and how professors have been trained in ICT in this Colombian region. The instrument of Agreda et al., (2016) was applied to a sample of 354 professors from the Sucre Department through digital media. The information analysis was descriptive and done only for dimensions: "attitudes towards ICT in higher education" and 'professional development of university professors in ICTs'. As a result, it was established that professors surveyed in the Sucre Department have a positive and favorable attitude regarding use of ICTs as pedagogical mediation tools, that

the learning that professors have developed in this Colombian region has been more self-taught than in formal training processes, and that it is suitable that higher education institutions from the Sucre Department expand their professional development for professors in relation to ICT management as pedagogical mediation tools.

## 1. INTRODUCTION:

The European Councils of Lisbon (2000), Stockholm (2001), and Barcelona (2002) established a reference framework, whose objectives include capacity development for “lifelong learning” facing globalization and inclusion in the knowledge economies. They recognized as key lifelong learning competences: 1. Communication in the native language, 2. Communication in foreign languages, 3. Mathematical competence and basic competences in science and technology, 4. Digital competence, 5. Ability to learn how to learn, 6. Social and civic competences, 7. Sense of initiative and entrepreneurship, and 8. Consciousness and cultural expressions. Digital competence involves safe and critical use of information society technologies for work, leisure, and communication based on basic ICTs skills such as computer use to obtain, evaluate, store, produce, present, and exchange information; and communicate and participate in collaborative networks through the Internet. Use of the referenced technologies requires that people have a critical and reflective attitude with respect to the available information and a responsible use of interactive media. This competence is also based on the interest to participate in communities (Commission of the European Communities, 2006).

In the Latin America case, the alpha tuning project determined, among other generic competences, the ability to learn and update oneself, and the skills in using information and communication technologies (TUNING, 2007). In this sense, universities as knowledge institutions, must adopt the expansion of the digital and the social web through professional development of its professors, in such a way that it can achieve more effective performances in the substantive functions of teaching, research, extension, and social projection (Jean & Jessica, 2016).

Learning on ICTs usage, as any other type of learning, is supported by three basic variables: 1. Type of teaching material in use, i.e., contents; 2. Tasks proposed by the professor, i.e., teaching methodologies in use; and 3. Learner motivation (Perera-Cumera & Veciana-Pita, 2013).

In the competency-based training model, the attitudinal component is essential to reach learning processes, so it is suitable to ask: how is the attitude of university professors from the Sucre Department in Colombia towards ICTs as learning tools? And what competencies do they recognize as owning regarding management of ICTs as pedagogical tools? Therefore, the objective of this research study is to know and describe the attitudes of a sample of university professors from Sucre Department regarding ICTs as a learning tool and how the training of university professors has been in ICT usage in this Colombian region.

## 2. METHODOLOGY:

The instrument from Agreda et al., (2016) was applied to a sample of 354 professors from the Sucre, Department in Colombia via digital means, indicating that the collected information represents a professors’ self-report who answered the questionnaire. The applied instrument contemplates 4 dimensions, but for the interest of this research study,

only the dimensions considered for the analysis were: ‘Professional Development of university professors in ICTs’ and ‘Attitude towards ICTs in higher education’. Each question in each

instrument dimension became a study variable, measured with a Likert scale that, in the dimension of "Professional development of university professors in ICTs" ranged from 1 to 4, where 1 means a ‘zero’ knowledge or competence, and 4 a “Very high” knowledge or competence. In the ‘Attitude towards ICTs in higher education’ dimension, the Likert scale also ranged from 1 to 4, but in this case 1 corresponded to "Strongly disagree" with the dimension’s sentence, and 4 corresponded to "Totally agree".

With the obtained information, a descriptive analysis was done focused on diagnosing the state of the competences from the professors sampled in the different variables contemplating the referenced dimensions. For the information classification of the ‘Attitude towards ICTs in higher education’ dimension, answers provided by the professors were divided in two categories. The ‘agree’ and ‘totally agree’ components were added to establish the evaluation positive side. On the contrary, the ratings "Disagree" and "Strongly Disagree" were also added to establish the negative side or opportunity for improvement. Similarly, information of the ‘professional development from university professors in ICT’ dimension was classified into two categories: ‘high’ and ‘very high’ ratings were added to establish the self-report positive aspect, and, on the other hand, ‘low’ and ‘zero’ ratings were added together to establish the negative aspect.

In the results analysis for the ‘Attitude towards ICTs in higher education’ dimension, the categories were organized in a positive sense, considering account percentage ranges starting from 50%; and for the ‘Training of university teachers in ICT’ dimension, categories with a negative and positive sense were organized, in the same way starting from 50%.

**Table 1. Percentage of professors who expressed themselves according to the variables of the ‘Attitude towards ICTs in higher education’ dimension.**

Consecutive Order	Variables	Disagree	Agree	General Total	Disagree (%)	Agree (%)
1	Renewal and pedagogical professional development in ICTs from the university professor is essential in the information Society.	7	347	354	1,98	98,02
2	ICTs favors collaborative networking and	10	344	354	2,82	97,18

	establishes a contact network with experts and professionals.					
3	ICTs allow students to foster creativity and imagination to carry out innovations in their future teaching work	12	342	354	3,39	96,61
4	ICTs improve education quality, but do not solve all problems that may arise in the classroom.	18	336	354	5,08	94,92
5	Hybrid learning environments (usage of online and face-to-face learning environments) provide a better teaching-learning process and a more complete enrichment for both, students and professors.	19	335	354	5,37	94,63
6	Free and open source applications and resources supported by external servers (Cloud Computing) facilitate professor and student work.	20	334	354	5,65	94,35
7	Emerging technologies such as Big Data, Augmented Reality for Analytics	20	334	354	5,65	94,35

	Learning, will favor and enrich both face-to-face and virtual learning environments.					
8	ICTs offer greater flexibility and enrich the teaching-learning process.	24	330	354	6,78	93,22
9	Use of mobile devices in the classroom will enhance the implementation of emerging technologies (Augmented Reality, Analytics Learning, QR Codes) in the Higher Education field.	25	329	354	7,06	92,94
10	ICTs are leading towards education ubiquity, towards invisible learning beyond time and space. Learning happens everywhere.	46	308	354	12,99	87,01
11	Use of ICTs in teaching methodology increases student and the professor motivation	47	307	354	13,28	86,72
12	ICTs have restraints due to technical difficulty in their use.	51	303	354	14,41	85,59
13	Education accessibility through ICT is only possible for	98	256	354	27,68	72,32

	those with regular internet access.					
14	Classrooms have been upgraded but their full pedagogical potential is not used for training.	98	256	354	27,68	72,32
15	Professional development offered in terms of ICTs at a pedagogical level is enough for competency upgrading of the professor.	233	121	354	65,82	34,18
16	Investment in ICTs is considered a waste of time by the professors.	302	52	354	85,31	14,69

Source: Self-made.

### 3. RESULTS:

Regarding the ‘Attitude towards ICT in higher education’ dimension in table 1, it is evident that:

1. 94.92% to 98.02% of the surveyed professors recognize that renewal and pedagogical professional development in ICTs by university professors is essential in the information society because it favors work in a collaborative network and facilitates establishment of contact networks with experts and professionals in various disciplines. Similarly, they allow to promote creativity and imagination of students to carry out future innovations and improve education quality, but they do not solve all problems that may arise in the classroom.

2. 92.94% to 94.63% of the sampled professors consider that hybrid learning environments such as use of personal online and face-to-face learning environments provide a better teaching-learning experience and a more complete enrichment for both students and teachers, bearing in mind that ICTs offer greater flexibility and enrich this experience. They also recognize that free and open source applications and resources supported by external servers (Cloud Computing) facilitate work for professors and students, that emerging technologies such as Big Data, Augmented Reality, Analytics Learning, will favor and enrich both face-to-face and virtual learning environments and that use of mobile devices in the classroom will promote the implementation of emerging technologies (Augmented Reality, Analytics Learning, QR Codes) in Higher Education.

3. Between 86.72% and 87.01% of sampled professors consider that use of ICTs in teaching methodologies increases student and the teacher motivation and facilitates education ubiquity towards invisible learning beyond time and space.

Generally, the information analysis of the ‘Attitude towards ICTs in higher education’ dimension shows that the professors surveyed in the Sucre Department in Colombia, have a positive attitude towards the use of ICTs as a pedagogical mediation tool, representing a favorable fact for the digital skills development, considering what was developed by Perera-Cumera&Veciana-Pita (2013).

**Table 2. Percentage of professors who stated that they had zero or very high competencies in the variables of ‘Professional development of university professors in ICT’.**

Consecutive order	Variables	High+Very High	Low+Zero	General Total	% High + Very High	% Low+Zero
1	Participation in innovation projects based on use of ICTs.	61	293	354	17,23	82,77
2	Dissemination of their ICTs experiences on the web.	67	287	354	18,93	81,07
3	Notion and knowledge about different reports that predict inclusion of ICTs in the short and medium term (Horizon Report).	86	268	354	24,29	75,71
4	Professional Development in software dedicated to research, data processing	94	260	354	26,55	73,45

	and collection.					
5	Professional Development received in ICTsvia e-learning or b-learning.	111	243	354	31,36	68,64
6	Participation in professional development courses on ICTsfrom official educational institutions in person.	112	242	354	31,64	68,36
7	Understanding and comprehension of both national and international indicators and standards of digital competence.	125	229	354	35,31	64,69
8	Professional development received in the use of mobile devices as a pedagogical Resource.	128	226	354	36,16	63,84
9	Resolution of learning problems and attention to diversity through ICTs.	153	201	354	43,22	56,78
10	Integration of ICTs in the curriculum	156	198	354	44,07	55,93

	and relationship with educational practice and curricular policy.					
11	Evaluation of their teaching work using ICTs.	161	193	354	45,48	54,52
12	Knowledge of "good practices" through ICTs.	162	192	354	45,76	54,24
13	Creation and maintenance of a contact network.	167	187	354	47,18	52,82
14	Lifelong learning and recycling in digital competence due to evolution of educational technology.	169	185	354	47,74	52,26
15	Ability to select and discriminate different tools and information tools for use in the classroom.	172	182	354	48,59	51,41
16	Management and use of ICTs in operation and organizational processes of teaching and research	204	150	354	57,63	42,37

	tasks (files for monitoring students, absences, grades).					
17	Updating and self-regulation of professor's own knowledge in the face of ICT changes within the educational field.	209	145	354	59,04	40,96
18	Ability to solve problems through ICTs	216	138	354	61,02	38,98
19	Ability to work in personal networks and learning environments in the cloud.	216	138	354	61,02	38,98
20	Distinction between the different uses of ICTs: educational resource, leisure, communication, and so on.	225	129	354	63,56	36,44
21	Self-taught learning and experimentation in ICTs.	236	118	354	66,67	33,33
22	Ability to use ICTs as a pedagogical Resource.	238	116	354	67,23	32,77

23	Ability to use educational cloud tools in the classroom and create an interactive learning environment with students.	244	110	354	68,93	31,07
24	Understanding of the importance of digital competence in future trainers.	275	79	354	77,68	22,32
25	Teaching role as guide, mediator and learner of the teaching-learning process, bidirectional relationship with students.	281	73	354	79,38	20,62

Regarding the ‘Professional development of university teachers in ICTs’ dimension in Table 1, it is noted that:

1. More than 80% of surveyed professors acknowledge having had little or no participation in innovation projects based on the use of ICTs and dissemination of their ICTs experiences on the Internet.
2. More than 70% of professors surveyed acknowledge having had little or no professional development in software dedicated to research, treatment, and data collection and little or no notion and knowledge about the different reports that predict the inclusion of ICTs technologies in the short term or medium term (Horizon Report).
3. More than 60% of professors surveyed admit having had little or no professional development in ICTs via e-learning or b-learning, and in face-to-face ICTs professional development courses from official educational institutions, especially in the use of mobile devices as pedagogical resources. Similarly, they acknowledge having little or no

understanding and comprehension of both national and international indicators and standards of digital competence.

4. More than 50% of professors surveyed acknowledge having little or no knowledge of 'good practices' through ICTs, creation and maintenance of a contact network, evaluation of their teaching work using ICTs, resolution of learning problems and attention to diversity through ICTs and integration of ICTs in the curriculum, and relationship with educational practice and curricular policy. They themselves have little or no ability to select and discriminate the different tools and information devices to use in the classroom. Similarly, they acknowledge having little or no permanent learning and recycling in digital competence due to educational technology evolution.

5. More than 50% of surveyed professors acknowledge having a high or very high management and use of ICT in organizational operation processes of teaching and research tasks (files for monitoring students, absences, grades and so on) and professional development and self-regulation of the professor's own knowledge in the scope of ICT changes within the educational field.

6. More than 60% of surveyed professors acknowledge having high or very high ability for self-taught learning and experimentation in ICTs, their use as a pedagogical resource, problem solving, and work in personal networks and learning environments in the cloud. Similarly, they are clear about the different uses of ICTs, as an educational resource, leisure, communication, and others. Finally, show the aptitude to use the educational tools of the cloud in the classroom and create an interactive learning environment with the students.

7. More than 70% of surveyed professors recognize having high or very high levels of understanding about the importance of digital competence in future trainers and the teaching role as a guide, mediator, and learner of the teaching-learning process, and as a two-way relationship with the students.

The analysis of the 'Training of university professors in ICTs' dimension demonstrate that, surveyed professors in the Sucre Department have had little or no formal training in digital competences, recognizing the importance of this competence, therefore, self-taught learning about ICTs knowledge and its use in university education prevails. This reflects a debt from the responsible parts towards formal education in this Colombian department, if digital competence is considered to have been recognized in Europe as suitable since the 2000s, as seen in the document, 'Commission of the European Communities, 2006'; and in Latin America since 2004, when the project was adopted and adapted (TUNING, 2007).

#### **4. CONCLUSIONS**

From the analysis of the presented information in this research study, it can be concluded that:

1. Surveyed professors in the Sucre department have a positive and favorable attitude towards the usage of information and communication technologies as tools for pedagogical mediation in their teaching experience.

2. The earning and knowledge that professors have developed in this Colombian region have been more self-taught than in formal professional development processes.
3. It is suitable that higher education institutions such as the universities in the Department of Sucre expand their formal professional development processes regarding management and usage of ICTs for professors as tools for pedagogical mediation.

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