UNIVERSIDAD DE QUINTANA ROO

División de Ciencias Políticas y Humanidades

Digital Competence in Undergraduate English Language Students from UQRoo campus Chetumal

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LICENCIADA EN LENGUA INGLESA

Presentan

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Chetumal, Quintana Roo, México, junio de 2017.

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Tesis elaborada bajo la supervisión del comité del programa de Licenciatura y aprobada como requisito para obtener el grado de:

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ABSTRACT

The general objective of this thesis is to determine the digital competence developed by students of the major in English Language Teaching at the University of Quintana Roo (UQRoo), campus Chetumal. Additionally, its purpose is to describe the frequency of development of such digital competence and to explore differences and relationships between variables, such as gender, age, level of English, semester, and years of study at the university.

The research has a quantitative exploratory descriptive design. In order to collect data, a questionnaire with five different sections was applied to 218 students from 2nd semester to 10th semester, the five sections of the questionnaire are: 1) Information Management, 2) Creating Content, 3) Communication, 4) Collaborative Work, and the last section focuses on demographic data. Finally, the scale used for this project is Likert, where 1 is the least developed competence and 4 is the most developed competence.

Results showed that undergraduate English language students' most developed digital competence is Communication and the least developed is Creating Content. Additionally, variations between students' development of digital competence and their semester, years of studying at UQRoo, working situation and ICT training were found. However, no statistical differences were found between students' gender and the digital competence they have.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS i
ACKNOWLEDGEMENTS iii
ABSTRACT iv
TABLE OF CONTENTS v
LIST OF TABLES vii
CHAPTER 1 INTRODUCTION 1
1.1 Background 1
1.2 Rationale 2
1.3 Problem statement 3
1.4 Objectives 4
1.4.1 General objective 4
1.4.2 Specific objectives 5
1.5 Research questions 5
1.6 Significance/relevance of the study 6
CHAPTER 2 REVIEW OF LITERATURE 6
2.1 Review of the relevant literature 7
2.1.1 International studies about Digital Competence in students 7
2.1.2 National studies about digital competence in college students 9
2.2 Theoretical-conceptual framework 11
2.2.1 Definition of competence 11
2.2.2 Digital competence 12
2.2.3 From digital literacy to digital competence 14
2.2.4 Digital competence frameworks 15
CHAPTER 3 METHOD 18
3.1 Research design 19
3.2 Participants 21
3.2.1 Detailed description of the sample 23
3.3 Instrument 23
3.3.1 Instrument design 24
3.4 Procedure 25

3.4.1 Pilot Study 26
3.5 Data analysis 27
CHAPTER 4 RESULTS AND DISCUSSION 28
4.1 The most and the least developed digital competence 29
4.1.1 Most developed digital competence by separate items 29
4.1.2 Least developed digital competence by separate items 31
4.1.3 The most and the least developed digital competence in categories 34
4.2 Differences in digital competence reported by the students regarding their semester . 35
4.2.1 Difference in Information Management section 35
4.2.2 Difference in Creating Content section 37
4.2.3 Difference in Communication section 42
4.2.4 Difference in Collaborative work 44
4.2.5 Differences in digital competence reported by the students regarding their semester (overview in categories) 46
4.3 Relationship between the digital competence reported by the students and the years of study at UQRoo 47
4.3.1 Relationship between the digital competence reported by the students and the years of study at UQRoo (overview in categories) 50
4.4 Difference in the development of digital competence between female and male students 51
4.4.1 Difference in the development of digital competence between female and male students in categories. 52
4.5 Difference in the development of digital competence between students who are presently working and those who are not 53
4.5.1 Difference in the development of digital competence between students who are presently working and those who are not presented in categories. 55
4.6 Difference in the development of digital competence between students who have received some training and those who have not 56
4.6.1 Difference in the development of digital competence between students who have received some training and those who have not (in categories) 62
CHAPTER 5 CONCLUSIONS 64
5.2 Limitations 68
5.3 Recommendations for future research 68
5.4 Pedagogical implications 69
REFERENCES 70
APPENDIX 74
Questionnaire 74

LIST OF FIGURES

Figure 2.1……...15
Figure 2.2……..…….17
Figure 3.2……21

LIST OF TABLES

Table 2.1 18
Table 3.1 22
Table 3.2 23
Table 3.3 26
Table 3.4 28
Table 4.1 29
Table 4.2 32
Table 4.3 34
Table 4.4 36
Table 4.5 38
Table 4.6 42
Table 4.7 44
Table 4.8 47
Table 4.9 48
Table 4.10 50
Table 4.11. 51
Table 4.12. 52
Table 4.13. 54
Table 4.14. 56
Table 4.15. 57
Table 4.16. 63

CHAPTER 1 INTRODUCTION

1.1 Background

Digital competence is both a requirement and a right of citizens in today's society *"It is seen as a need, as society is demanding citizens to be functional in a knowledge and digital environment"* (Ferrari, 2012, p.80). Recently, human beings have greater access to the internet and it lets them do plenty of things not just from one place; for example, working or studying from home, being these possible on account of the integration of the Information and Communications Technology (ICT) in our lives.

From this great invention, the educational world has reached many discoveries and findings; since then, many problems have been solved in unimaginable ways and people live a more comfortable life. It is incredible to look back and see how the world has evolved through the years. It is simply amazing, how the world of technology advances by leaps and bounds. Suffice to look at a movie from the eighties and observe how technology was at those times; all seemed so different of what happens nowadays.

In recent years, technological elements have undergone a very beneficial transformation. Technology helps a lot in education, creating an ideal scenario for innovation and developing an environment that encourages the foundations of education. Hence, through five years as college students, we have noticed the necessity of developing the proper competence. The main purpose of using these technological tools accurately in our field of study is to take advantage of them to become more capable students and good future English teachers.

Likewise, it is a fact that with the integration of ICT for academic purposes, students have a broadened field not only to explore when doing their homework, but also to find information in web sites to study and practice what they have learned in classes in an entirely independent way. Nonetheless, Movarec (2008) stated that such benchmark requires developing specific skills such as interpretation of information, building personal meanings and collaborative work, chaos management and ambiguity.

1.2 Rationale

The research presented is part of the project named Digital Competence in Faculty and Students at the University of Quintana Roo: a diagnostic study, which general objective is:

> *To determine to what extent the digital competence have been developed in both the faculty and students of the University of Quintana Roo. It is also intended to describe the frequency of development of the digital competence, as well as to explore the differences and relationships between the variables of this study, such as academic unit and division, undergraduate degree attended, among others* (Hernández et al. 2015, p.3).

This study offers part of the results of the project mentioned above, because it is focused on a number of students from the UQRoo who were surveyed for the macro research project. These are the undergraduate English language students; this research may also give their most recent level of digital competence.

Moreover, with the provided results, this project aims to have great academic influence on decision makers and professors who are aware of the necessary improvements to the bachelor's program for future generations. In that way, they will take into account the present necessity of integrating ICT training for students with the purpose of promoting the quality of the technological education at this University.

Furthermore, its purpose is to determine digital competence in the undergraduate English Language students and to describe the frequency of its use to help students' enhance their academic life, and also, it is going to benefit them in their profession as future English teachers. Students may become more independent, and teachers could benefit as well, deeming the fact that classes would be flourished in a more dynamic atmosphere with a better management of time, more interest, creativity, motivation and exchange of ideas from student-teacher or teacher-student. In addition, the outcomes of this study could motivate teachers to redouble their level of technological literacy with regard

to the need to create a better teaching-learning process.

1.3 Problem statement

In accordance with the Networked Readiness Index 2016 (NRI) which is *"an indicator of how countries are doing in the digital world that measures how well an economy is using information and communications technologies to boost competitiveness and well- being"* (Breene, 2016, par. 1), Mexico is ranked number 76th in its list where Singapore, Finland, and Sweden are in the top 3 and Haiti, Burundi and Chad (the last two African countries) in the last places 137, 138 and 139. Furthermore, for The Organization for Economic Cooperation and Development (2016), Mexico is among the OECD countries with the lowest Internet usage rate among adults. To put it another way, it is not just about providing countries and schools with technology but qualifying teachers and students to make the precise adoption of it. If students have the technology but they do not know how to take advantage of it, then it is a waste of money and a useless investment.

In many countries, all around the world, different studies about digital competence have been done lately. For example, in Spain, Centeno and Cubo (2015) researched about the Digital Competence and Attitudes Towards ICT of the College Students in the University of Extremadura. Its objectives were to assess the degree of digital competence colleges students have and to learn which attitudes they have towards the digital competence. Results showed deficits in relation to digital competence, as well as a positive attitude towards ICT.

In Latin America, Mon and Cervera (2013) looked into the Digital Competence in Higher Education and its Effective Application Towards the ICT; in Argentina, Matilla, Sayavedra and Alfonso (2014) conducted a piece of research about ICT competence in college students. Its objective was to analyze the competence in students of the Educational Faculty.

In Mexico, Ambriz (2014) wrote a thesis about the Digital Competence of Engineering Students, which objective was to determine the level of development of digital competence or skills that students have before they start the major. Lastly, concerning this

situation, in Quintana Roo, specifically at the Universidad of Quintana Roo, campus Chetumal, some studies related to the topic have emerged in recent years. López (2014) investigated about the attitudes of the Web 2.0 in students of English language as a foreign language and the results indicated that students considered technology a very useful tool because it allows them to improve their English level.

Based on our previous experience as college students of this major, and some studies described above, the statement of the problem of this study is oriented to analyze how skillful *undergraduate English Language students* are when using technology; their use for academic purposes and the neediness of adapting technology and education for students in our country, state and more particularly at the University of Quintana Roo in Chetumal. The concern of the problem is that future generations are not prepared to take advantage of educational technology in this new era, due to poor development of digital competence. For this reason, the importance of this project lies in detecting students' level of digital competence and thus to take action on the matter.

1.4 Objectives

In this section, the general and specific objectives will be defined in order to comprehend better the reasons why this research has been carried out. After taking into account the gaps some research projects have left in regard to this topic, the general objective is the following.

1.4.1 General objective

The general objective of this project is to determine the digital competence that undergraduate English Language students at the University of Quintana Roo campus Chetumal have developed. Additionally, its purpose is to describe the frequency of development of digital competence and to explore differences and relationships among variables, such as gender, age, level of English, semester, and years of study at the university.

What follows are the specific objectives, these are written to make easier to reach the general objective of our study and to give the reader wider information about the purpose

of each research question.

1.4.2 Specific objectives

1. To determine the level of development of digital competence in undergraduate English Language Teaching students at the University of Quintana Roo, campus Chetumal.
2. To explore possible significant statistical differences in the level of development of digital competence in relation with the bachelor's program, gender and level of English.
3. To establish whether there is a significant relationship between the digital competence reported by the students and the years of study at UQRoo.
4. To define whether there is a significant relationship between participants in a working situation and the ones who are not**.**

1.5 Research questions

1. What are the least and the most developed digital competence reported by the Undergraduate English Language Students from UQRoo campus Chetumal?
2. Is there a significant difference in digital competence reported by the students regarding their semester?
3. Is there a relationship between the digital competence reported by the students and the years of study at UQRoo?
4. Is there a significant difference in the development of digital competence between female and male students?
5. Is there a significant difference in the development of digital competence between students who are presently working and those who are not?
6. Is there a significant difference in the development of digital competence between students who have received some training and those who have not?

1.6 Significance/relevance of the study

For academic purposes, this research can be very useful because it will provide a wider overview of how skillful students are, and clarify how students' digital competence can be improved through the years for the future. Moreover, the outcomes may help to enhance the development of future academic degree programs, and the English Language major may be enriched, by improving students' academic life and their profession, as future English teachers.

CHAPTER 2 REVIEW OF LITERATURE

Different types of research studies regarding our topic about digital competence in undergraduate English Language students in recent years is presented in this section. First,

studies related to our topic are analyzed from a general view to a specific view in the world, international to national research. Second, descriptions of the different concepts are described in the conceptual framework, such as: competence, digital competence, the evolution from digital literacy to digital competence and the types of digital competence are presented in this section. This part of the project offers a broader view of what our study is about.

2.1 Review of the relevant literature

Since the interest emerged towards Information and Communications Technology there have been several research projects and investigations all over the world, regarding this topic. In Argentina, Solivellas, Vaquero and Elstein (2016) examine the development of discursive skills under literacies emerging from digital culture in a training instance. In Mexico, Ambriz (2014) explored about ICT in college students. It was a case study with new students at the school of mechanical and electrical engineer as the participants. Another national investigation was Veytia's (2013) about digital skills in graduate students using Moodle. Also in Mexico, Arraz, Torres and Valcárcel (2011) did an interesting research project about Competence in Information Technology and ICT for university students.

In Spain, two other studies were carried on, the first one by Centeno and Cubo (2013). This was about the evaluation of digital competence and attitudes towards ICT of university students; and the second one by Juste and Carballo (2010) about the identification of the domain of digital skills in students' grade teachers.

2.1.1 International studies about Digital Competence in students

Sierra (2013) developed some research project about the use of ICT in the classroom of foreign language, at the University of Almeria (UAL), Spain. The purpose of the study was to analyze ICT in education, in order to obtain a broad range of resources through which students feel more motivated to use them. Apparently, the results revealed that students are motivated and pay more attention when instructors use ICT than with the traditional method of teaching.

Área, Fariña and San Nicolás (2012) did a research project at the University of

Laguna in Spain, about digital competence of teachers and students in the development of virtual teaching. The purpose of the study was to acquire more knowledge about the uses that students and university teachers have in ICT, in order to inquire about their influence on teaching and learning in virtual education. The results showed up that the professors who participated in this study state that they have basic and general skills on the knowledge and use of ICT, meanwhile students said that they have enough knowledge for the management of ICT resources at the user level skills.

Another similar study was carried out in Spain, at the University of Sevilla by Herrero (2014). This study is about the role of ICT in a college classroom for training students; its aim is to assess the need for a new model of learning, based on building knowledge using ICT. The study revealed that students use ICT according to the teachers' demand but they are not entirely aware of the impact ICT resources play in their training and performance as students.

Additionally, Matilla, Sayavedra and Alfonso (2014) in Argentina conducted a piece of research about ICT skills in university students: Dimensions and categories for analysis. This study had the objective to analyze the ICT skills of students' professorships of the Faculty of Education from the rendered descriptions on the use of digital stage. The results revealed that teachers foster the creation of multimedia content, reflection on multimodality, access to more complex knowledge of production procedures, and navigation between different platforms. In this context, teachers facilitate the learning process of students and serve as their model, thanks to their continuing vocational training (individual and collaborative).

Of equal importance is the study from Guthu (2008) named The Digital Citizen, a project which was addressed to Norwegian population's level of digital competence. Its aim was to reveal the level of skills this population owns according to different factors; for instance: level of education, motivation or working. In accordance with this study, digital competence increases with the level of education, it says that "among those with four or more years of higher education, a total of 57 percent are regarded as strong users" (p.19).

Furthermore, an important observation was made to the ones who use ICT at work "The use of ICT in the workplace leads to improved ICT skills" (p. 19). Even though, this

fact and difference is not equal for all educational groups in which the student studies and works. Jones and Shao (2011) pointed that the new millennium student is causing changes in the educational population in regard to the use of technology; they stated that "As new technologies are introduced they roll out through a population at particular periods of time" (p.41) what means that the younger students may demand more educational technology because some of them were born with it.

In Sydney, Markauskaite (2006) wrote about the gender differences in ICT capabilities between males and females in her paper Gender Issues in Pre-service Teachers' Training: ICT Literacy and online learning. She found out the following:

> - *Female students tended to be significantly less intensive users of ICT than males.*
> - *Male students were significantly more confident about their capabilities to plan, to find information and to select ICT tools.*
> - *Male students were significantly more confident about their capabilities for mastering new applications autonomously.*
>
> (p. 14-16)

In the same way, Jiménez, Vico and Rebollo (2017) did a study titled Female University Student's ICT Learning Strategies and Their Influence on Digital Competence. They stated that females' digital competence depend on the different strategies used to learn ICT management and the results showed that those who use a wider variety of strategies have more developed digital skills. Perhaps, this means that the outcomes presented by the authors above, in which women looked as less digital competent than men, are the results of few technological strategies implemented by teachers in the classroom.

The most compelling international research projects were presented in this section. We share, in the following paragraphs, the national studies, which have been carried out to know more about this problematic in México and in the state of Quintana Roo.

2.1.2 National studies about digital competence in college students

Now, we will proceed to mention some relevant studies that were developed in the Mexican context. An interesting study about digital competence in the adult student worker was carried out at Technological University of Mexico (UNITEC), by Camacho, Gomez and Pintor (2015). The main purpose of this study was to learn about digital skills required to the adult students who work. The participants were students who returned to formal education. According to the results obtained in this study, they concluded that from the total sample 93% participants reported to be open to new forms of virtual learning, and the remaining 7% denoted uncertainty on this issue. The benefits for job training, using virtual learning platforms, are reflected in 80% of students.

In the problem statement, the research executed by López (2014) about the Attitudes Students have Towards the Web 2.0 at UQRoo has been mentioned. The results showed that students judged that technology improves their English level. Related to this research topic and the one presented in this paper, Ávila (2017) did a study named Mobile Learning and Digital Competence in English Learning. Its objective was "*to determine the applications in mobile phones and their possible relation with the learning of the English language, and to determine the digital* competence *developed in the students of the Center of Teaching of Languages of the UQRoo."(p. 9).* The students' list of digital competence evaluated in this investigation included these sections: Information Management, Communication, Creating Content, Security, Problem Solving, and Collaborative Work, plus a demographic data section.

The results were interesting; first, the applications that are used the most were the ones related to videos and online English dictionaries. Then, relevant to students' digital competence, it was detected that the most developed was Security and the least developed was Communication. As well, it was found out that there are relevant differences between age and students' English level. First, the older the students, the less the development of digital competence; second, the higher the level of English the closer to technology as a tool of improvement, just to mention some. The previous results are germane and useful to do a deeper analysis and comparison with our results and to find out some highlighted information.

2.2 Theoretical-conceptual framework

In this part, the main concepts are presented, which will help readers to comprehend the purpose and significance of this project better. Likewise, the evolution of the key definition that leads this investigation is mentioned: digital competence. Besides, in this same section, the frameworks that had contributed to the topic are mentioned to clarify readers' doubts.

2.2.1 Definition of competence

Defining competence may be complicated because it can have a different definition depending on its approach or purpose. In this study, competence is seen from the point of view of education. In accordance with Oxford Dictionary (2017) competence is "*the ability to do something successfully or efficiently"*.

McClelland (1973) cited by Hartig, Klieme and Lautner (2008, p.7) mentioned that competence "*refers to the attributes required for successfully performing particular actions.*" Moreover, in the article Innovation Perspective, competence is defined "*as the quality or state of being functionally adequate or having sufficient knowledge, strength and skill*" Vincent (2008, p.1).

The Unit for Development of Adult Continuing Education (UDACE) in 1989 cited in Cross (2009) proclaimed a fuller definition of competence as *"What people can do rather than with what they know"* (p. 104). Furthermore, the UDACE (1989) also stated some other characteristics of such concept:

- *"If competence is concerned with doing it must have a context.*
- *Competence is an outcome; it describes what someone can do. It does not describe the learning process which the individual has undergone.*
- *Competence is a measure of what someone can do at a particular point in time."*

(Cross, 2009 p. 104-105)

Summarizing what those authors stated, competence can be described as the set of abilities that are required to achieve certain activities. All of us are capable of learning and developing new skills which help us to reach new goals in our personal or professional life. Education is not the exception, because schools in general and universities in specific are forming young people to become a more capable professional to face this competitive world.

2.2.2 Digital competence

Nowadays, it is important to manage different kinds of abilities that can distinguish us from others at the moment of looking for a school to study or applying for a job. To manage technology gives anyone a plus and makes you a better option at the moment of selecting from a group of people or candidates. For that reason, to own digital competence provides you more and different opportunities.

Ambriz (2014, p. 23) defined digital competence as "*the use of the computer to get, evaluate, keep, produce, present, exchange information, communicate and participate in collaborative social media through the Internet"*. In the article Digital Competence of Teachers and Students in Development the Virtual Teaching the Case of the University of La Laguna (2012 p. 230), digital competence is described as "*an ability that will not be developed for the students if he/she does not have a good professor with the same abilities*." Some of the characteristics of Digital Competence mentioned in this article are presented here:

a) Knowledge of devices, software tools and network applications, and the ability to evaluate teachers' educational potential.
b) Designing activities and learning situations and evaluation through the use of ICT according to students' educational potential and context.
c) Implementing ethical, legal and responsible use of ICT.

Broadly speaking, digital competence can also be defined as "*the creative, critical and secure use of information and communication technologies to achieve the goals related to work, employability, learning, leisure time, inclusion and participation in society"* (Common Framework Teachers Digital Competence, 2017, p. 10).

In 2009, digital competence according to the University of Rovira i Virgili (URV) is defined as:

> "*supposition of knowledge acquisition, skills and attitudes based on the basic use of computer hardware & software and operating systems for off-line and on-line communication. Besides, the use of ICT has to do with the processes of locating, accessing, obtaining, selecting and using information."* (Gisbert, Vidal, González 2011, p.76)

Furthermore, the URV in Tarragona, Spain is very concerned about its students' digital competence, and the incorporation of the digital competence to university curricula presupposes a challenge. The situation of this University inspires this research project. Dumont et al (2010) cited by Gisbert, Vidal and González (2011, p.160) exposed the following:

> "*the basic skills that everyone would have to acquire in this XXI, which can also be known as Key competence:*
>
> 1. *understanding complex concepts*
> 2. *being digitally literate*
> 3. *acquiring the ability to use ICT in an advanced way*
> 4. *acquiring the necessary social and communicative skills to be able to develop in the working environment.*
> 5. *being able to work in a group."*

Overall, the concept of digital competence that will be adopted for this research is the one created for the project named Digital Competence in Professors and Students at the University of Quintana Roo: a diagnostic study in which this thesis is part of. Digital competence is defined as *"a set of capabilities for managing information, creating content and communicating critically, through self-management and collaborative work to share distributed knowledge"* (Hernández et al. 2015, p. 7).

Finally, this research project is done under the Constructivism by Jean Piaget and Socio-constructivism by Lev Vygotsky. Piaget understands knowledge in a more psychological viewpoint, and Vygotsky in a more social aspect. On one hand, the

constructivism according to Grennon and Brooks (1999) cited by Payer (2005, p. 2) "*seeks to help students internalize, rearrange, or transform new information. This transformation takes place through the creation of new learning and these results from the emergence of new cognitive structures that allow facing situation in the reality*". On the other hand, the socio-constructivism claims that the main work is in the interrelation between the student, others, and the culture, establishing new knowledge as the effect of the student development and their relation with others.

Digital competence demands social interactions as much as intellectual ones. In constructivism, the professor is just a facilitator of the knowledge, he does not teach in a conventional way, but he uses varieties of material that can be useful for students to interact actively and socially in different contexts. Some other characteristics that digital competence seeks for are: more independent students, to innovate, to create new ways of learning and broader interactions among people breaking the boundaries of distance.

2.2.3 From digital literacy to digital competence

"Digital competence" was known as "Digital literacy". The first focused more on the acknowledging of the use of technology rather than all the cognitive abilities that using technology wisely requires to its proper use.

According to ETS 2007 (as cited by Ambriz, 2014 p.37) digital literacy can be defined "*as the use of digital technology, communications tools and / or networks to access, integrate, manage, evaluate and create information in order to function in a knowledge society."* Morover, Gisbert, Vidal and González (2011, p.161) conceive the definition of digital literacy by Knobel (2008) as "*a sociocultural context, as something inherent to the person, since the digital can be considered a feature of identity of what has been defined as the postmodern society."*

Notwithstanding, the use of technology not only requires to know how to use devices, but it also refers to a properly cognitive use of them, and that is what digital literacy refers to, the lack of cognitive knowledge on the topic. Cabero and Llorente (2008) proposed a set of aspects:

> *Knowing and identifying a neediness of information, working with diversity of sources and information codes, knowing how to master information overload, discriminate the quality of the source of information, organize the information, use the information efficiently to address the problem or research, and know how to communicate the information found to others* (p. 13).

After reading the authors' proposal of aspects that we must know to employ technology correctly we understand better how and why the concepts evolved from digital literacy to digital competence. In accordance with these authors, it can be said that digital literacy has substantial relation with digital competence, because it is the digital literacy the one that develops a set of skills and aspects: knowing when there is a need for information. Historically speaking, digital literacy comes before digital competence. It has been stated that these two concepts can be synonyms, but they are not. They just have a mammoth relation; however, one leaded to the other (digital literacy to digital competence), because the concept of digital literacy has changed and became more practical, including all the aspects mentioned above, not just developing them but using them correctly. This concept turned to: Digital Competence.

2.2.4 Digital competence frameworks

Along the way, many classifications of digital competence emerged since the new way of teaching has revolutionized. Different proposals exist for digital competence for teachers and students. One of them is the classification of Viñas (2013) who proposed the following classification of the digital competence in the article "Digital Competence and Essential Tools to Transform Classes and Improve". The list of digital competence is shown in figure 2.1 bellow.

Figure 2.1 Digital Competence and Essential Tools to Transform Classes and Improve Viñas, M. (2013). Retrieved from http://cursoticeducadores.com/ebook-competencias-digitales.pdf

1. Know **to search, filter and synthesize** between the wealth of information existing.

2. **Extrapolate ideas** about what is known and what has been learned.

3. **Apply** this **knowledge** to new situations.

4. **Create new knowledge** and even have the ability to innovate.

Gavin Dudeney (2015, par. 6-11) proposed in the article "21st Century Skills and Digital Literacy in Action" some digital competence which he named as *21 Century Skills*, which are presented in li list below:

1. *Critical thinking and problem solving*- involves learners considering sources of information in terms of their veracity, appropriateness and usefulness, gaming literacy invites learners to think about situations and dilemmas (from different points of view, from logistical to moral) and to solve problems before being able to move forward in gameplay.
2. *Collaboration and communication*- personal literacy might incorporate ways of communicating with the outside world and of expressing oneself, whilst participatory literacy suggests working as part of a group or collaborating on distance produced content, taking part in discussions and group work, working towards a common goal.
3. *Creativity and imagination*- here we might look at literacies such as multimedia literacy, with its concentration on multimodal content creation, or remix, where proponents not only combine and manipulate media, but subvert it at the same time.
4. *Citizenship*- as a way of expressing values, political opinions or points of view, (inter)cultural literacy.

On January, the project of Common Framework Teachers Digital Competence in Spain (2017, pp. 13-33) also stated its particular classification of the digital competence for teachers. These are the following (9):

1. *Information and information literacy:* identify, locate, retrieve, store, organize and analyze digital information, evaluating its purpose and relevance.

2. *Communication and collaboration:* communicate in digital environments, share resources through online tools, connect and collaborate with others through digital tools, interact and participate in communities and networks, and intercultural awareness.
3. *Creation of digital content:* create and edit new content (texts, images, videos ...), integrate and re-elaborate previous knowledge and contents, perform artistic productions, multimedia content and computer programming, know how to apply intellectual property rights and use.
4. *Security:* protect oneself, data protection, protection of digital identity, use of security, safe and sustainable use of information.
5. *Problem solving:* identify digital needs and resources, make decisions when choosing the appropriate digital tool, according to the purpose or need, solve conceptual problems through digital media, solve technical problems, creative use of technology, to update one's own competence and that of others.

In figure 2.2, we can observe how the list mentioned above has been changed in four years in the same investigation accomplished in 2013.

Figure 2.2 Common Framework of Digital Teacher Competence 2.0 (2013) retrieved from http://educalab.es/documents/10180/12809/MarcoComunCompeDigi DoceV2.pdf/e8766a69-d9ba-43f2-afe9-f526f0b34859

For this study, the definitions of each digital competence are in Table 1. They are taken from a research project named Digital Competence in Professors and Students of the University of Quintana Roo: a diagnostic study by Hernández, M. et al (2015), which definitions were created based on different studies with the same interest (see Table 2.1).

Digital Competence	Definition
Information Management	Process that includes seeking, obtaining, evaluating, selecting and organizing the information found in different digital contexts.
Creating Content	Making and editing new content found in digital contexts (texts, images, videos), integrating knowledge, and highlighting the creativity with the help of emergent technology found in the internet. It takes into account the author's rights and licensing of such technological resources.
Communication	Interacting and sharing in digital environments, resources through online tools in personal and collaborative learning environments safely.
Collaborative Work	Participating and cooperating with others safely, through a variety of online learning communities, to create a collective consciousness in the exchange of information.

Table 2.1 Digital Competence. Hernández M.I, Ancona A. and Fuentes V., (2016) Experiencias en Metodologías y Saberes Compartidos: Aprendizaje en Servicio e Investigación.

The definitions were not adapted or adopted, these are new definitions created after reading different concepts and investigations related to digital competence and some existing frameworks. Furthermore, the questions in our instrument went through the same process. This process will be fully explained in Chapter 3.

CHAPTER 3 METHOD

This investigation is conducted under a quantitative exploratory descriptive design to measure the digital competence of English language undergraduate students at the Universidad de Quintana Roo, campus Chetumal. This section describes the main characteristics of the project: participants, procedure, data analysis, instrument and an explanation of its design.

3.1 Research design

This research focuses on a quantitative exploratory, descriptive design, which is limited to the inquiry into a social or human problem based on the test of a theory composed of variables, capable of being numerically measurable and analyzed by procedures to determine if the predictive generalizations of the theory remain true (Creswell, 1994).

In a descriptive study, a series of questions are selected and information about each of them is measured or collected. For Danhke in Hernández, Fernández and Baptista (2006) cited in Hernández et al (2015) a research is descriptive since *"it seeks to specify properties, characteristics and profiles of individuals, groups, communities, processes, objects or any other phenomenon that is subjected to an analysis"* (p. 14).

Descriptive study works on realities of fact, and its fundamental characteristic is to present a correct interpretation. A simple way to explain the descriptive study is the following definition by Sabino (1992):

> *Its primary concern is to describe some fundamental characteristics of homogeneous sets of phenomena. Descriptive investigations use systematic criteria that make it possible to reveal the structure or behavior of the phenomena under study; thereby, providing systematic information comparable to that of other sources* (p. 44).

Moreover, it is indicated by Méndez (2003) that a descriptive research uses systematic criteria that reveal the structure of the phenomenon in study, and it helps to establish concrete behaviors through the management of specific techniques of data collection. Thereby, the descriptive study identifies characteristics of the research topic, points out behavioral forms and attitudes of the investigated topic, and discovers and verifies the association among research variables of it. Descriptive studies generally support

correlational research, which in turn those research provide information to carry out explanatory studies that generate a highly structured understanding (Dankhe, 1986).

This study is identified as an exploratory research because the objective is to examine a poorly studied research topic or problem, which has probably never been addressed before. An exploratory research makes it possible to extend the knowledge about a phenomenon and then, specify the problematic to investigate. In the words of Cazau (2006) *"an exploratory research study which variables or factors could be related to the phenomenon in question ends when one already has an idea of the variables that one deems are relevant and when one already knows the subject well."* (p. 26)

Cohen, Manion and Morrison (2007) cited by Hernández et al (2015, p.15) mentioned that " *in this type of descriptive studies a convenience sampling is usually used, that is, that the closest individuals are selected to participate and the process is performed until the desired sample size is obtained."* Dankhe (1986) cited by Hernández (2006, p. 60) mentioned that *"descriptive studies seek to specify the important properties of individuals, groups, communities or any other phenomenon that is subjected to analysis"*; in this way, this study aims to analyze deeply the group of 218 undergraduate English Language students of UQRoo campus Chetumal. Correspondingly, in a descriptive study *"a series of questions is selected and each one is measured independently, so to describe what is investigated"* (Hernández, 2006, p, 60).

Under those circumstances, this research project is grounded under specific variables. These are important because "*they are units of information that are studied and interpreted carefully in a research study to find the meaning of how one thing relates to another in a descriptive study"* (The office of Research Integrity, 2017, par. 10-11). Moreover, this study is also a correlational one, because it measures two or more variables related in the same subject, and so, the correlation is analyzed in the final results. Hernández (2006) stated that the main purpose of a correlative study is:

> *Knowing how a concept or variable can behave by knowing the behavior of other related variables. It means, try to*

> *predict the approximate value that will have a group of individuals in a variable, from the value they have in the variable or related variables.* (p. 63)

This study has five independent variables gender, age, years of study at UQRoo, semester and level of English, and one dependent variable the development of digital competence (see figure 3.1)

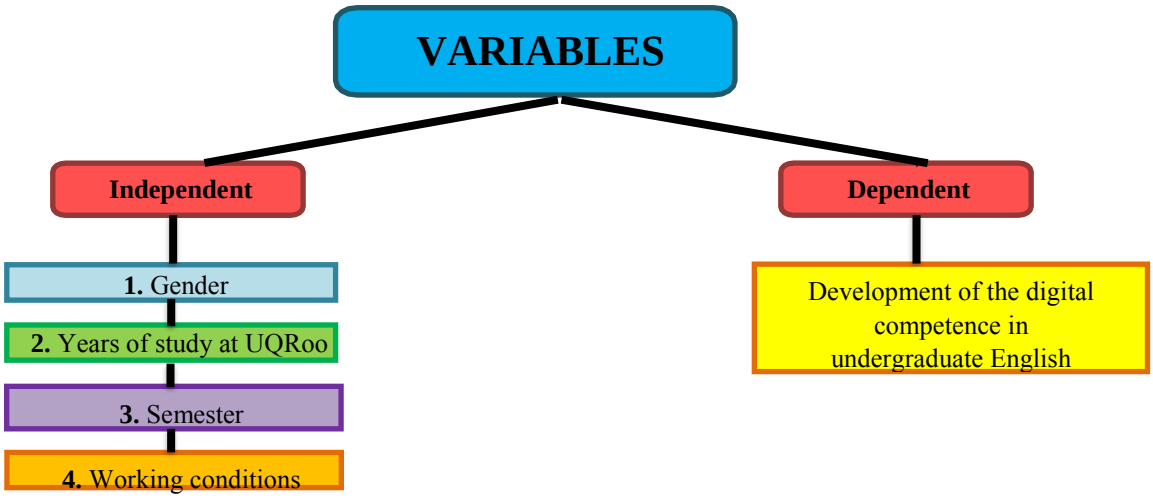

Figure 3.1 Variables

3.2 Participants

In 2016 the University of Quintana Roo had an enrollment of 5,359 students distributed in their respective academic units as follows: The Chetumal academic campus has a total of 3,692 students: 3,573 bachelor's degree and 119 postgraduate. In the Cozumel unit, there are 688 students, 664 bachelor's degree and 24 postgraduates. The one in Playa del Carmen presents an enrollment of 661 in bachelor's degree and finally the unit of Cancun, recently created, presents 166 students in bachelor's degree studies (Department of Monitoring and Evaluation, 2016).

The student population in this study comes from the University of Quintana Roo, campus Chetumal. Such students are majoring in English Language Teaching from

diverse semesters. As it has already been mentioned, the purpose of this study is to describe the frequency of development of the digital competence and to explore the differences and relationships among variables. In Table 3.1, it is mentioned the number of the students that the University of Quintana Roo, campus Chetumal has.

Level and educational program	New Students			Re-entry Students			Total		
	M	W	Sum	M	W	Sum	M	W	Sum
Universidad de Quintana Roo	687	785	1,472	1,860	2,027	3,887	2,547	2,812	5,359
Bachelor degree	660	753	1,413	1,833	1,994	3,827	2,493	2,747	5,240
Division of Political Science and Humanities	89	120	209	272	375	647	361	495	856
English Language	26	39	65	89	135	224	115	174	289

Table 3.1 Number of students at the University of Quintana Roo, at the DCPH and in the English Language major. 2016. From the Department of monitoring and evaluation. Retrieved from (Sigc.uqroo.mx, 2017)

Table 3.1 shows the 5,240 students that are studying a bachelor's degree in UQRoo campus Chetumal; afterwards, it indicates the 856 students that belong to the Division of Political Sciences and Humanities and of those, 289 are students from the bachelor's degree in English Language who are analyzed for this research project.

Specifically, from the 289 total of undergraduate English Language students, 218 are the sample taken for this research. Students are from 2nd to 10th semester and they are between 18 to 25 years. A thorough review was checked out to determine which groups had more students per semester, and thus, to ask the teacher in charge of the class for permission for us to be able to apply the instrument. It was necessary to survey students in both shifts, morning and evening. The total number of students is distributed in Table 3.2.

SEMESTER	SUBJECT	NUMBER OF STUDENTS

Second	English I	**54**
Fourth	Reading and Writing in English	**41**
Sixth	Educational Technology	**41**
Eighth	Materials Design	**39**
Tenth	Teaching Practice	**43**
Total		**218**

Table 3.2 Distribution of participants per semester.

It is necessary to clarify that at the beginning, the idea was to apply the instrument to the 289 undergraduate English Language students; however, it was impossible because of the students' absences, students' previous participation in the pilot study and students' enrollment in two different courses.

Given these points, the sample was reduced, but it is enough to carry on the analysis of this research project. The students who answered the instrument gave us the necessary information to compare the variables.

3.2.1 Detailed description of the sample

In this part, a brief description of the sample will be given. From 289 students of English language bachelor's degree at UQRoo 218 were the sample taken to evaluate and to measure their digital competence. As it was mentioned above, they were from 2nd semester to 10th semester from the spring period of 2017. Besides, they were distributed by semester, gender, whether they work or not, and if they have received some ICT training along their preparation.

3.3 Instrument

This study aims to find possible differences and/or relationships in students, taking into account the variables stated for this investigation (see Figure 3). The instrument of this project is one semi-structured questionnaire. The questionnaire is divided into five sections. The first four sections correspond to digital competence: 1) Information Management, 2) Creating Content, 3) Communication, 4) Collaborative Work. The last section focuses on demographic data. The scale used for this project is Likert, where A represents the least developed ability and E the most developed.

3.3.1 Instrument design

A variety of different instruments were reviewed, and some of the questions in the questionnaires were taken or adapted to create new ones. Others were adapted and some others were built in order to achieve the objectives of this investigation. Different types of resources were evaluated for the development and creation of this instrument: reports, thesis, indexed articles, research projects and online journals, questionnaires or tests. Subsequently, the questions related to our theme were identified from these research documents, questions that were associated with our variables or that can contribute to answering widely or narrowly a variable or research question.

The elaboration of our instrument was based on different techniques, questions were created or adapted, and the finished version of the questionnaire was confirmed and completed with different interrogations that helped us to answer our research questions and variables. The elaboration of the questionnaire was the following:

- *Question creation:* New questions that did not exist in the previously analyzed questionnaires were created, questions that shed any useful or specific information.
- *Question adaptation:* Minor modifications were done in some questions taken from other questionnaires, in order to adapt them to ours.
- *Questionnaire composition:* This questionnaire was based on several questionnaires, previously analyzed for the creation of the instrument.

First, questions were taken from Veytia's instrument (2013) that was part of the study *Proposal to Evaluate the Digital Competence in the Postgraduate Students Using the Moodle*. These items were used in section 1, Information manegement; specifically on questions 1, and 7. In the same way, for this same section were adapted and taken questions from the instrument of Ávila (2017) in her thesis project for Master's dissertation in Mobile Learning and Digital Competencies in Learning English, specifically questions 2 and 8, and from the Ikanos survey (2015) Digital Competence Self-Diagnosis test question 3 and 5 were taken.

Secondly, for section 2 Creating Content from the same study of Veytia (2013)

questions 10 and 11; from Avilas' (2016) questions 13, 14, 17, 18 and lastly question 20 was adapted for this project. From Angulo's instrument (2013) which was part of a research project about *Digital Competence in High School Teachers*, question 6 was taken. Likewise, questions 16 and 12 were taken from the Ikano's *Digital Competence Self-Diagnosis test* (2015).

Thirdly, from Espinosa's research (2009) Professors ICT Competence in the Spain Public University questions 26 was taken for section 3: Communication. From Avilas' investigation (2014) questions 32 and 33 were adapted. Question 25, 27, 30 and 31 were taken and adapted from Ikanos (2015).

Fourthly, for this section: collaborative work questions 41, 42 and 43 were adapted from Ikanos (2015); from Avila (2016) questions 38 and 39 were taken, and 40 was adapted. Hence, question 35 and 36 were adapted from Prendes' (2009) instrument.

Finally, the format of this questionnaire was taken from the instrument of a previous investigation by Méndez, Negrete, Peña, Marín and Hernández (2012) belonging to the research project named The Students' in the Learning of a Foreign Language for their Development.

Therefore, this questionnaire is divided into five sections, which are: 1) Information Management 2) Creating Content, 3) Communication, 4) Collaborative Work and 5) Demographic information.

3.4 Procedure

For this study, the instrument was applied to a sample selected by convenience from 218 students of English Language major in Chetumal, Quintana Roo. First, the piloting of such instrument was carried on, so we could know its errors before applying the instrument to the main group of participants.

The questionnaire was printed out and we went to each selected semester and students' group to apply our instrument in the real sample. It is important to mention, that a lot of emphasis was placed on participants to inform them that data obtained would be used on a confidential basis and only for research purposes. For on-site application with students, permission was requested in advance to the teachers of the course or group to carry

out at the beginning of the class, and not at the end. The permission was previously signed by the head of the Language an Education Department Gilberto Campos Valdes; this permission was showed to every teacher we visited. The data results of the piloting and its measure of scale reliability was done through Cronbach's Alpha program, special for any Likert scale. This Cronbach's Alpha guarantees that the closer the value of the alpha to 1 is the greater the internal consistency of the analyzed items.

3.4.1 Pilot Study

For the purpose of validating the instrument, a pilot study was conducted. The main purpose of this pilot study was the verification of some important information such as: the time it takes the instrument to be answered by students, to identify any ambiguity in the instructions or questions within the sections, to discover errors in the drafting, and last but not least important to notice students' attitudes towards the application.

For this, 24 undergraduate English Language students were surveyed. They were 14 women and 10 men from the seventh semester in the morning. The survey was applied in their English VI class at 7:00 in the morning. At the beginning, we thought the time could affect the results because the students were also about to take their partial exam. The piloting population answered the questionnaire before an important exam; nonetheless, the time they took to answer was considered enough, from 10 to 15 minutes.

A database was created with the results obtained from 24 students' answers to the questionnaires. Afterwards, the reliability of the instrument was evaluated through the Cronbach's Alpha. The reliability obtained was .964.

Reliability Statistics

Cronbach's Alpha	N of Items
,964	44

Table 3.3 Cronbach's Alpha Analysis

In accordance with the Cronbach's analysis, it can be claimed that the questionnaire

is applicable, reliable and useful for the purpose of this project. The application of the questionnaire to a pilot population helped, certainly, to give an idea of the time students spend answering to it, some wording errors were detected by students that were modified for the original application. Likewise, some changes were done to the speech given to students before the questionnaires were spread out to the original sample of 218 students in order to have better answers and therefore, better results.

3.5 Data analysis

The data obtained through the digital competence questionnaire was analyzed with IBM Social Package for the Social Sciences program version 22 software (SPSS for its acronym in English). Descriptive and inferential statistics to answer investigation was used for this study.

The frequency averages for each questionnaire question was the main measure to explore, the relationships between variables and significant differences between them. Also, grouped questions were averaged in categories that represent digital competencies.

In addition, sets of statistical tests were used to obtain the results of the research questions. For example, for question number one descriptive statistics of Mean Frequency was used; in question two one-way ANOVA and post hoc Bonferroni for multiple comparisons was used to compare more than two groups and one independent variable; question three was answered through inferential statistics and data was analyzed with Pearson correlation which shows the relationship between two numerical or continuous categorical variables; finally, for questions 4, 5, and 6 t-test analysis was used to compare two samples.

Furthermore, the collection of data and its analysis was the following. To begin with, as it was mentioned in previous chapters, each questionnaire was composed of four sections related to digital competence and one related to personal information. The first four sections had 9, 10 or 15 questions; a value was given to each answer through codes: 1= competencia no desarrollada todavía or *competence not yet developed*; 2= competencia poco desarrollada or *poorly developed competence*; 3= competencia medianamente

desarrollada or *moderately developed competence*; and 4= competencia totalmente desarrollada or *totally developed competence.*

In the personal section, some data were not openly questioned, for instance, the age but it could be assumed (in most of the students) by their students' registration number or their semester. All the independent variables were answered in this section. There were some demographic questions that were not variables; nevertheless, they can support the process of interpretation and analysis in order to pursue the objective of this study.

Finally, for the second time, all this new data was computed to Excel and another test of reliability was done in order to assure that the questionnaire was useful and reliable for the aims of this research.

Estadísticas de fiabilidad

Alfa de Cronbach	N de elementos
,958	44

Table 3.4 Cronbach's Alpha results of the main study

Table 3.4 shows a .958 level of reliability of the questionnaire, close to the results obtained from the piloting data. This information is meaningful because we can guarantee the clarity of our instrument.

Throughout this chapter, important characteristics of the research design were widely described, as well as, the participants' features, the adjustment done in the number of the sample, the main information about the instrument and its design were explained; lastly, the procedure followed in the piloting stage and the modifications done to rectify the errors detected in the process were also discussed.

The six research questions and the main objective of this project are answered through the analysis, interpretation and discussion of the tables and charts created by the SPSS program. The explanation of each question and variable is presented in chapter 4.

CHAPTER 4 RESULTS AND DISCUSSION

Once introduced the topic of the study, the literature review, and having described the method used, we proceed to describe the results. In this section, data obtained was analyzed and comparisons were done to explained differences among variables if there was one. This chapter presents the outcomes of the six research questions in the same order presented in chapter one.

4.1 The most and the least developed digital competence

This research question is divided into three sections. First by separate items, 4.1.1 where students' most developed digital competence are presented; then, 4.1.2 with the ten least developed; and finally, 4.1.3 where results are explained in categories.

4.1.1 Most developed digital competence by separate items

Students have developed different skills along all their educational road, within these skills related to technology are an example. Since technology became part of our educational system students' way of learning has changed. For younger students or the millennial students, as Jones and Shao (2011) named them, using technology is as natural as eating, but for the rest who were born before technology boomed our lives learn about technology is a different story. Undergraduate English language students from UQRoo campus Chetumal have developed digital competence in different levels; some are more developed than others. Firstly, to answer this question descriptive statistics were used and Table 4.1 shows students' top ten of the most developed digital competence.

Items	Section	N	MF	Std. Deviation
31. Relate with others through instant messaging (Whatsapp, Telegram, Messenger, Imo, etc.).	Communication	218	3.83	.4866
27. Communicate with others by social networks (Facebook, Twitter, Tumblr, etc.).	Communication	218	3.75	.5785
29. Use e-mail to communicate with classmates and teachers.	Communication	218	3.69	.6237
1. Use different web browsers (Explorer, Mozilla, Opera) and search engines (Google, Yahoo, Bing).	Information Management	218	3.67	.5769
2. Use social bookmarks (tag and hashtags) to organize and share information.	Information Management	218	3.44	.8254
34. Able to communicate accurately in online resources.	Communication	218	3.36	.7877

32. Express correctly to others with different digital tools (graphic schemes, mental/conceptual map, diagrams, etc.).	Communication	218	3.26	.8218
33. Control the information and data shared online with others.	Communication	218	3.19	.8476
30. Establish communication through video conferences in real time (Skype, FaceTime, Hangouts, etc.).	Communication	218	3.15	1.0115
3. Work with shared documents in the cloud (Google Drive, SkyDrive, Dropbox, etc.).	Information Management	218	3.11	.9507

Table 4.1 Top ten of the most developed digital competence

Table 4.1 indicates that the group of the 10 most developed digital competence is mainly between two sections: Communication and Information management. The mean frequency (MF) found among the competence ranged from 3.83 to 3.15. The amount of the most developed competence predominates in Communication section: 31, 27, 29, 34, 32, 33, and 30; then, the rest are from Information management section: 1, 2, and 3. It is important to mention that the number given to each competence refers to the one from for the instrument. The outcomes did not surprise us since we were college English language students and we noticed the necessity of interacting with others using different tools because of the demand of the major. In a way these results were predictable.

For the previously mentioned, the digital competence most developed among undergraduate English language students is Communication. To illustrate, it is item number

31 *relate with others through instant messaging* with a MF of 3.83. Nowadays to communicate with others is essential and easier than ever, for a student can be better to arrange a team work through their most used messaging application rather to be physical reunited with a team, things run faster and the result could be the same. Also, the proper use of implementing this competence among students can be helpful for the ones who study and work and who find it difficult to attend classes or meetings. In addition, NSM (2017), author of the North side Christian Academy, stated that *"in many ways, technology actually fosters communication and enhances collaboration"* (par. 1). According to the same author, here are few of the opportunities students have today: Interactive presentations, online activities, group projects, distance learning, and teacher communication.

Moreover, the rest of the items in the most developed digital competence (Communication) are, in the majority, related to social networks or applications which can be used from different devices as computers, cellphones, tablets, and from different places. This can be the result of the simple access to these tools that help to improve communication among students.

In like manner, students have found useful and easy to develop variety of digital competence related to communication because it means benefits to their learning achievements. However, in Ávila (2017) Communication was the least developed digital competence, perhaps the reason is that the investigation was carried out with students at the UQRoo language teaching center (CEI for its acronym in Spanish). Here students from all the majors from UQRoo have access and some of them do not need technology as much as others. After comparing these results, we believe that the development of digital competence can depend on how much is the demand of it in each major.

Otherwise, outcomes showed that into the ten most developed digital competence, three items are from the Information management section. These are mostly related to be competent in finding, organizing and sharing information found online. The fourth member of this top ten is digital competence number 1 *Use different web browsers and search engines*. We believe that this were the results since undergraduate English language students are constantly searching for information for the requirements of some subjects part of their curriculum chart; as a consequence, they are kind of forced to develop this type of digital competence.

In general, as illustrated in Table 4.1, undergraduate English language students seem to be digital competent mainly in Communication and Information management sections. It means, these students have discovered solutions to improve their learning process by being good at searching for information and good at sharing it correctly with others thanks to the digital competence they have developed the most.

4.1.2 Least developed digital competence by separate items

After analyzing the group of the most developed digital competence, we proceed to show the ones which outcomes indicated as poorly developed. Numbers in the MF indicates how these groups of competence are widely less evolved than the ones seen above. These are

presented in Table 4.2.

Items	Section	N	MF	Std. Deviation
43. Create collaborative communities or thematic social networks (NING, ZYNCKO, SPRUZ)	Collaborative Work	218	1.55	.8420
13. Use educational software to create and promote multimedia knowledge (Clic, Anagramarama, Sephonics, etc.)	Creating Content	218	1.79	.9434
12. Design and manage online learning environments (PLE)	Creating Content	218	1.84	.9176
18. Create learning activities through Web 2.0 resources (Webquest, GoAnimate, Wikis, etc.).	Creating Content	218	1.93	1.0068
4. Use and organize information in search managers (Diigo, Pocket, etc.).	Information Management	218	1.94	.9363
11. Design and modify a wiki (Wikispace, Nirewiki, Wikipedia, etc.).	Creating Content	218	1.94	.9439
5. Search information in online database (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).	Information Management	218	1.98	1.0021
23. Distinguish among different authors' royalties (Copyright, Copyleft, Creative commons, etc.).	Creating Content	218	1.99	.9233
40. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Collaborative Work	218	2.05	1.0125
6. Use online information programs (Académica, AulaBlog, Maestroteca, etc.).	Information Management	218	2.26	1.0117

Table 4.2 Ten of the least developed digital competence

In contrast to Table 4.1, this presents the top ten of the least developed digital competence among all the 218 undergraduate English language students from our University. The mean frequency found among them ranged from 1.55 to 2.26. These items lie in three different digital competence: Creating Content, Information management and Collaborative work.

At first glance, we can notice that the least developed digital competence is Creating Content with five items in the list 13, 12, 18, 11, and 23; then, from Information management are number 4, 5 and 6; and thirdly, from Collaborative work are competence number 43 and 40.

In more specific words, we can see in the table that the least developed item is number 43 from Collaborative work: *Create collaborative communities or thematic social networks.* This competence has a MF of 1.55, which means that many of the 218 students are slightly prepared to *create collaborative communities settings with the use of social networks such as NING, ZYNCKO, or SPRUZ*. Probably, this can be the reflection of little request from the major to students do this kind of work during their formation as English

teachers, so students are not related to this type of activities as they should for this competitive world.

The rest of the digital competence which conform this list are part of the sections Creating Content and Information Management. It can be seen in the table how English language students are need to boost digital competence that have to do with the use, design and modification of websites to create activities. As well, we can notice the lack of preparation English language students' own at the moment of distinguishing among different authors' royalties (competence number 23), this fact is very important in order to avoid being accused of plagiarism. Moreover, in the Information management section, it is noticeable how important is to prepare better the students in regard of teaching them how to use databases, find information in it, and organize it in search engines. In Table 4.1, we saw that students have well developed the digital competence of using different browsers to find information, but in Table 4.2 we can also notice that there is a lack of preparation for this section.

If we analyze this in a deeper way this situation could be a problem in the future. Chiefly, the reason is that one never knows when such group of digital competence can be necessary for the formation of English teachers. Related to the topic, Herrero (2014) found that in the University of Sevilla students use ICT according to the teachers' demand but they are not entirely aware of the impact they play in their training and performance as students; similar information can be found from the researchers Área, Fariña and San Nicolás (2012) in the University of La Laguna, Spain, where results showed students said that they have enough knowledge for the management of ICT resources at the user level skills. The important part here is that UQRoo should not let this happen to

English language students, must be prepared not just in the level of a user, but as an English teacher with their digital competence well formed to face anything that stands in his or her professional career.

As you can see, we must concern about the improvements of students' digital competence in all the sections in Table 7, but mainly the ones related to create content. Nowadays, to use technology is now a necessity and a requirement for professionals. As teachers, we must update the strategies to teach to give our pupils a better performance. In

this way, students will be offered a variety of didactic material and innovation through activities for better learning.

4.1.3 The most and the least developed digital competence in categories

For a wider explanation, in this part we found the outcomes of the most and least developed digital competence by categories. Although, we can notice that the most developed one is section III or Communication by the number of items in Table 4.1 (see Table 4.1) in Table 4.3 this is more evident. After observing the mean in each digital competence, it is noticeable that everything said before make sense.

Categories				
Digital Competence	**N**	**Minimum**	**Mean**	**Std. Deviation**
1. Information Management	218	1.38	2.73	.60304
2. Creating Content	218	1.00	2.40	.64256
3. Communication	218	1.33	3.24	.56420
4. Collaborative Work	217	1.00	2.44	.74157

Table 4.3 The most and least developed digital competence in categories

In summary, as it was mentioned before results were a little bit predictable. Perhaps it influenced that we were English language students and we could have an idea of the digital competence the bachelor's program help us to enhance during the five years of college education. Now, after knowing the actual results provided by the SPSS such prediction is confirmed. The most developed digital competence is Communication (3.24) followed by Information management (2.73) and the least developed is Creating Content (2.40) followed by Collaborative work (2.44).

4.2 Differences in digital competence reported by the students regarding their semester

In a like manner, to determine if there is any difference regarding students' semesters and their digital competence inferential statistic and one way ANOVA were used as well as an analysis through a post hoc Bonferroni. As a result, several differences were found in all the 4 sections noticing that students from the first semesters have less developed their digital competence than the ones from the last semesters.

4.2.1 Difference in Information Management section

Previously, we observed that some of the items of these results are part of the list of the most developed ones by students. Notwithstanding, it is important to determine which semesters have better developed the competence and so contribute with something to solve such outcomes. For this answer, Table 4.4 bellow shows the significant variances between the students' semester and their development of digital competence in Information Management.

Section I. Information management				
Items	**Semester**	**N**	**Mean**	**ANOVA results**
3. Work with shared documents in the cloud (Google Drive, SkyDrive, Dropbox, etc.).	2nd	54	2.85	F= 8.324 p< .001 df= 4
	4th	41	2.80	
	6th	41	2.87	
	8th	39	3.61	
	10th	43	3.51	
	Total	218	15.64	
4. Use and organize information in search managers (Diigo, Pocket, etc.).	2nd	54	1.59	F= 7.946 p< .001 df= 4
	4th	41	1.75	
	6th	41	1.73	
	8th	39	2.41	
	10th	43	2.32	
	Total	218	9.8	
5. Search information in online database (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).	2nd	54	1.53	F= 8.394 p< .001 df= 4
	4th	41	1.78	
	6th	41	1.87	
	8th	39	2.33	
	10th	43	2.51	
	Total	218	10.02	
6. Use online information programs (Académica, AulaBlog, Maestroteca, etc.).	2nd	54	2.03	F= 4.450 p= .002 df= 4
	4th	41	2.09	
	6th	41	2.04	
	8th	39	2.76	
	10th	43	2.44	
	Total	218	11.36	
7. Use graphic organizers (Mindmap, Mindomo, Bubble.ub, etc.).	2nd	54	2.07	F= 8.818 p< .001 df= 4
	4th	41	2.29	
	6th	41	2.39	
	8th	39	3.00	
	10th	43	3.04	
	Total	218	12.79	
8. Identify and verify reliable and appropriate information online.	2nd	54	2.66	F= 3.309 p= .012 df= 4
	4th	41	3.09	
	6th	41	3.00	
	8th	39	3.25	
	10th	43	2.95	
	Total	218	14.95	

Table 4.4 Difference among semesters in Information Management section

To begin with, in section I there were found differences in seven digital competence, from 3 to 9. First, in items number 3, 4 5, and 6 highlighted contrast is noticed among 2nd, 4th, and 6th semester towards 8th and 10th semester. The results showed that students from the three first semesters of the major are considerably less competent in: *Working with shared documents in the cloud through Google Drive, SkyDrive, Dropbox, etc.* (2.85, 2.80, 2.87 vs 3.61, 3.51); *Using and organizing information in search managers with Diigo,*

Pocket, etc. (1.59, 1.75, 1.73 vs 2.41, 2.31); *Searching information in online database like Proquest,*

EBSCO, Elsevier, Emerald, DOAJ, etc. (1.53, 1.78, 1.87 vs 2.33, 2.51); *Using online information programs as Académica, AulaBlog, Maestroteca, etc.* (2.03, 2.09, 2.04 vs 2.76, 2.44) than students from the last semesters.

Likewise, another difference is observed in digital item 7, there is also difference among 2nd (2.07) and 4th (2.29) semester with 8th (3.00) and 10th (3.04), but there is also a separate difference between students from 6th (2.39) and 10th (3.04) semester. In the same way, students' answers showed that the ones from the first semesters are less competent in *Using graphic organizers with tools like Mindmap, Mindomo, Bubble.ub, etc.* than the ones from the last semesters. In contrast, in digital competence number 8 one main difference is found. The difference lies between 2nd and 8th semester, results were 2.66 vs 3.25 noticing that students from the 2nd semester seem to be less competent in *identifying and verifying reliable and appropriate information online* than the ones from 8th semester.

In conclusion, students who are studying their last semesters of the English language bachelor's degree seem to have higher developed this competence facing the results from the students of the first semesters.

4.2.2 Difference in Creating Content section

Similarly to section I, there are several differences among semesters in this section. Curiously, it is this section the least developed one, and now it is where more differences among semester have been found. To continue, Table 4.5 presents varieties among students and their semesters in 14 items from Creating Content.

Section II. Creating Content				
Items	**Semester**	**N**	**Mean**	**ANOVA results**
10. Create and manage blogs and websites (Blogger, Wordpress, Google Site, Wix, Jimdo, etc.).	2nd	54	1.87	F= 5.800 p< .001 df= 4
	4th	41	2.31	
	6th	41	2.17	
	8th	39	2.74	
	10th	43	2.62	
	Total	218	11.71	
11. Design and modify a wiki (Wikispace, Nirewiki, Wikipedia, etc.).	2nd	54	1.57	F= 5.800 p< .001 df= 4
	4th	41	1.90	
	6th	41	1.61	
	8th	39	2.43	
	10th	43	2.32	
	Total	218	9.83	
12. Design and manage online learning environments (PLE).	2nd	54	1.29	F= 15.288 p< .001 df= 4
	4th	41	1.65	
	6th	41	1.73	
	8th	39	2.48	
	10th	43	2.23	
	Total	218	9.38	
13. Use educational software to create and promote multimedia knowledge (Clic, Anagramarama, Sephonics, etc.)	2nd	54	1.42	F= 5.495 p< .001 df= 4
	4th	41	1.85	
	6th	41	1.58	
	8th	39	2.12	
	10th	43	2.11	
	Total	218	9.08	
14. Create and edit images with special software (Coreldraw, Photoshop, Gimp, etc.).	2nd	54	2.07	F= 3.668 p=.007 df= 4
	4th	41	2.14	
	6th	41	2.17	
	8th	39	2.79	
	10th	43	2.41	
	Total	218	11.58	
15. Use of podcasting and videocasts (YouTube, Flicks, Spotlight, Screencast, etc.).	2nd	54	2.44	F= 6.233 p< .001 df= 4
	4th	41	2.87	
	6th	41	2.63	
	8th	39	3.41	
	10th	43	2.95	
	Total	218	14.3	
16. Create digital, original and creative products (Prezi, PowToon, Goanimate, etc.).	2nd	54	1.92	F= 13.538 p< .001 df= 4
	4th	41	2.31	
	6th	41	2.56	
	8th	39	3.33	
	10th	43	3.02	
	Total	218	13.14	

Table 4.5 Difference among semesters in Creating Content section

Section II. Creating Content				
Items	**Semester**	**N**	**Mean**	**ANOVA results**
17. Use of interactive graphics for multimedia presentations (Prezi, Glogster, PowToon, etc.).	2nd	54	2.14	F= 13.831 p< .001 df= 4
	4th	41	2.17	
	6th	41	2.70	
	8th	39	3.25	
	10th	43	3.23	
	Total	218	13.49	
18. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	2nd	54	1.37	F= 15.629 p<.001 df= 4
	4th	41	1.53	
	6th	41	1.92	
	8th	39	2.51	
	10th	43	2.48	
	Total	218	9.81	
19. Know about editing different files (photos, videos, recordings, texts) created by me or by others.	2nd	54	2.61	F=6.700 p< .001 df= 4
	4th	41	2.82	
	6th	41	2.95	
	8th	39	3.30	
	10th	43	2.79	
	Total	218	14.47	
20. Know to take online exams to evaluate my own knowledge.	2nd	54	2.48	F= 6.700 p< .001 df= 4
	4th	41	2.97	
	6th	41	3.14	
	8th	39	3.41	
	10th	43	3.07	
	Total	218	15.07	
21. Manage personal courses in any educative platform online (Moodle, Edmodo, Schoology, etc.)	2nd	54	2.38	F= 8.922 p< .001 df= 4
	4th	41	3.14	
	6th	41	3.24	
	8th	39	3.30	
	10th	43	3.25	
	Total	218	15.31	
23. Distinguish among different authors' royalties (Copyright, Copyleft, Creative commons, etc.).	2nd	54	1.63	F=5.602 p< .001 df= 4
	4th	41	1.92	
	6th	41	1.87	
	8th	39	2.41	
	10th	43	2.25	
	Total	218	10.08	

Table 4.5 Difference among semesters in Creating Content section (Continued)

In Table 4.5, we can notice how students from the first semesters are less skillful from the ones from the last semesters in all the digital competence presented in this table. First, in number 10, students from 2nd (1.83) semester are less competent in *creating and managing blogs and websites in Blogger, Wordpress, Google Site, Wix, Jimdo, etc.* than the ones in 8th (2.74) and 10th (2.62). Then, in number 11 students from 2nd (1.57) and 6th (1.61) are not as

skillful in *designing and modifying a wiki in tools like Wikispace, Nirewiki, Wikipedia, etc.* as the ones from 8th (2.43) and 10th (2.31). Following, in number 12, students in 2nd (1.29), 4th (1.65), and 6th (1.73) are less competent in *designing and managing online learning environments* than students from the 8th (2.48) and 10th (2.23). Another distinction is found in number 13 where students from 2nd semester (1.42) are not as good as students from 8th (2.12) and 10th (2.11) in *using educational software to create and promote multimedia knowledge through Clic, Anagramarama, Sephonics.* To follow, in number 14 contrast is found among 2nd (2.07) and 4th (2.14) semester versus 8th (2.79) semester in *creating and editing images with special software like Coreldraw, Photoshop, Gimp, etc.* After, one more variation is in number 15 where students in 2nd (2.44) and 6th (2.63) semester are not as capable in *using podcasting and videocasts in YouTube, Flicks, Spotlight, Screencast, etc*. as the ones from 8th (3.41) semester. Then, in number 16 *creating digital, original and creative products through software as Prezi, PowToon, Goanimate, etc.*, a wide inequality among semesters is found; first, 2nd (1.92) versus 6th (2.56), 8th (3.33), and 10th (3.02); second, 4th (2.31) versus 8th and 10th; and third, 6th versus 8th. Afterwards in number 17 *use of interactive graphics for multimedia presentations in Prezi, Glogster, PowToon, etc.*, the main discrepancy is among first semesters 2nd (2.14) and 4th (2.17) versus the lasts semesters 8th (3.25) and 10th (3.23). As well, in number 18, there some variation found in students from the third first semesters 2nd (1.37), 4th (1.53), and 6th (1.92) versus 8th (2.51) and 10th (2.48) semester, noticing that students from the first semesters do not need to *plan and follow collaborative projects through Web 2.0 resources like Teambox, Basecamp, Do.com, etc.* as the ones from the lasts semesters. Then, in number 19 the difference is just between 2nd (2.61) and 8th (3.30) semester, discovering that students who are just at the beginning of the major are not as acquainted in *knowing about editing different files (photos, videos, recordings, texts) created by their own or by others* as students in 8th. Following in number 20 diversity is noticed among 2nd (2.48) semester versus 6th (3.14), 8th (341), and 10th (3.07) revealing that students from the last semesters are more concerned about *knowing how take online exams to evaluate their own knowledge* than the ones from 2nd semester. One more significant distinction is found in number 21 *managing of personal courses in any educative platform online as Moodle, Edmodo, Schoology, etc.* where it is noticeable that students from 2nd (2.38) semester are not familiarized yet with this kind of resources as much as students from

4th (3.14), 6th (2.24), 8th (3.30), and 10th (3.25). As well as number 10, in number 23 it is difference among 2nd (1.63) semester opposite 8th (2.41) and 10th (2.25) presenting that students from 2nd semester have not yet many information about *distinguishing among different authors' royalties like Copyright, Copyleft, Creative commons, etc.*as the ones from 8th and 10th.

It is evident that students from lower semesters are not as competent in Creating Content as the ones from higher semesters. Before obtaining ANOVA results we thought that at least from items 10-15 not much contrast would be found because most students are capable to create blogs, design wikis, manage online learning environments or using YouTube or Flicks to improve their learning, not only their English learning, but subjects in general. It is noticeable that 2nd semester students are not as curious to find new ways of learning in contrast to students from last semesters who have learned through the road about the necessity of developing such competence.

Moreover, we cannot expect that students from the first semesters be equally competent than students from 6th, 8th, or 10th in creating presentations in different resources like Prezi, PowToon, Goanimate, creating activities in such tools, editing different type of files, using platforms as Moodle or Edmodo, knowing how to take online exams or distinguishing Author's royalties. The reason is simple, newly students of the bachelor's degree:

- Have not attended technological subjects of the curriculum chart of the major.
- Have not taken important English exams as in the last semesters from the bachelor's degree.
- Have not experimented when classes are not always in the classroom as in some subjects of the last semesters.
- Have not taken subjects which required activities such as investigations like Análisis comparativo Inglés/Español for 8th or Thesis research projects for 10th semester students.

In general, in this section we could observe that students from 2nd, 4th and sometimes from 6th semester need more digital learning in regard to Creating Content. It

could be useful for those students to learn more about this competence before takin certain subjects in future semesters, in addition, Wilson (n.d) cited in Kelly (2013) said that "*it's a really good pedagogical practice to have the students involved in the mental task of generating content for a course. They're more invested in [the course] if they're generating it themselves"* (par. 2).

4.2.3 Difference in Communication section

In the same way, variation is found in Communication section, that is the most developed digital competence (see Table 4.1), and in this research question few differences are illustrated in Table 4.6 among semesters, perhaps because of the previously mentioned.

Section III. Communication				
Items	**Semester**	**N**	**Mean**	**ANOVA results**
25. Participate in discussion forums online or blog, micro-blogs and wikis.	2nd	54	1.68	
	4th	41	2.36	
	6th	41	2.70	F=23.831 p< .001 df= 4
	8th	39	3.25	
	10th	43	3.20	
	Total	218	13.19	
26. Interact in learning activities done in educative platforms.	2nd	54	2.40	
	4th	41	3.00	
	6th	41	2.90	F= 7.306 p< .001 df= 4
	8th	39	3.28	
	10th	43	3.14	
	Total	218	14.72	
28. Able to relate through virtual institutional systems (videoconference and audioconference).	2nd 4th	54 41	2.35 2.65	
	6th	41	2.78	F= 9.021 p< .001 df= 4
	8th	39	3.43	
	10th	43	3.14	
	Total	218	14.35	
30. Establish communication through video conferences in real time (Skype, FaceTime, Hangouts, etc.).	2nd 4th	54 41	2.87 2.95	
	6th	41	3.00	F= 4.914 p= .001 df= 4
	8th	39	3.64	
	10th	43	3.39	
	Total	218	15.85	

Table 4.6 Differences among semesters in Communication section

To start, in item number 25 there exist contrast among 2nd (1.68) semester versus 4th

(2.36), 6th (2.70), 8th (3.25), and 10th (3.20); plus, there is difference in 4th semester opposite 8th and 10th noticing that students from lower semesters *don't participate in discussion forums online or blog, micro-blogs and wikis* as the ones from the higher semesters. Following, in number 26 distinction is observed in 2nd (2.40) semester versus 4th (3.00), 8th (3.28) and 10th (3.14) semester revealing that younger students from the university *interact in learning activities done in educative platforms* less than more advanced students. Next, in number 28 two inequalities were found, one in the first three semesters 2nd (2.35), 4th (2.65), 6th (2.78) contrary 8th (3.43) and 10th (3.14) and second, 6th versus 8th semester, clarifying that at the beginning of the major students are not as *able to relate through virtual institutional systems* as the ones about to finish the bachelor's degree. Then, the last variation in this section is in item 30 *establishing communication through video conferences in real time*, it is among 2nd (2.87), 4th (2.95), and 6th (3.00) semester opposite 8th (3.39) semester in.

In general, it is plain to say that students from second semesters showed up significant contrast towards students mainly from 8th semester and 10th semester. These outcomes are probably because in second semester students are getting use to the changes from high school to college, even though there are not many variations among semesters in these sections, the ones found are relevant. For instance, in number 25 and 26 students from lower semesters have not the necessity to use those platforms, yet. The subjects they study do not require the use of platforms, and few teachers ask students to participate in forums. Furthermore, two other good examples are in items 28 and 30, due to the fact that at the beginning of college education it is hard to comprehend for newly students the institutional system, and plus, they definitely do not need to communicate with others through video conferences, at least for educational purposes.

In addition, Barthi (2014) added that Communication skill is indispensable to become successful in this new 21st century, we agree with her in that communication skill is required in every part of life, and as the Pacific Policy Research Center (2010) claimed *"student population poses new communication challenges"*(p. 6). Students must be better prepared no matter how simply the digital competence seems to be, it should be a requirement that since the beginning students can manage communicative digital competence.

4.2.4 Difference in Collaborative work

Of equal important are the results from this last section Collaborative work. This division highlighted eight differences among semesters, within these eight there are two of the least developed digital competence from Table 4.2. Table 4.7 bellow shows those variations between students' semester and their digital competence more specifically.

Section IV Collaborative work				
Items	**Semester**	**N**	**Mean**	**ANOVA results**
35. Capable to collaborate in professional networks through the use of digital tools.	2º	54	2.03	F=8.888 p< .001 df= 4
	4º	41	2.51	
	6º	41	2.31	
	8º	39	3.10	
	10º	43	2.81	
	Total	218	12.76	
36. Participate in research groups of my major using online spaces.	2º	54	1.94	F= 8.461 p< .001 df= 4
	4º	41	2.40	
	6º	41	2.22	
	8º	39	2.82	
	10º	43	2.86	
	Total	218	12.24	
37. Interact and contribute actively in different online forums.	2º	54	1.63	F= 21.245 p< .001 df= 4
	4º	41	2.22	
	6º	41	2.53	
	8º	39	3.00	
	10º	43	3.09	
	Total	218	12.47	
38. Collaborate online with others to create files or shared presentations (Dropbox, Google Drive, OneDrive, etc.).	2º	54	2.27	F= 13.987 p< .001 df= 4
	4º	41	2.70	
	6º	41	2.80	
	8º	39	3.59	
	10º	43	3.39	
	Total	218	14.75	
39. Work with others to design digital content.	2º	54	1.98	F=17.360 p< .001 df= 4
	4º	41	2.22	
	6º	41	2.63	
	8º	39	3.35	
	10º	43	3.14	
	Total	218	13.32	
40. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	2º	54	1.48	F= 12-001 p< .001 df= 4
	4º	41	1.82	
	6º	41	2.02	
	8º	39	2.66	
	10º	43	2.44	
	Total	218	10.42	

41. Participate in virtual communities to share knowledge, information, content, and resources.	2º	54	1.96	F= 8.432 p< .001 df= 4
	4º	41	2.14	
	6º	41	2.36	
	8º	39	2.79	
	10º	43	2.86	
	Total	218	12.11	
43. Create collaborative communities or thematic social networks (NING, ZYNCKO, SPRUZ).	2º	54	1.24	F= 8.441 p< .001 df= 4
	4º	41	1.36	
	6º	41	1.39	
	8º	39	1.82	
	10º	43	2.04	
	Total	218	7.85	

Table 4.7 Differences among semesters in Collaborative Work section

First, in number 35 there is contrast with 2nd (2.03) and 6th (2.31) semester versus 8th (3.10) and 10th (2.81) in *being capable to collaborate in professional networks through the use of digital tools*. Then, there is distinction in number 36 among 2nd (1.94) and 6th (2.40) semester opposite 8th (2.82) and 10th (2.86) observing that 2nd and 6th semester are less *participative in research groups of the major using online spaces* than 8th and 10th semester. Following, in number 37 exists three inequalities: one, within 2nd (1.63) versus 4th (2.22), 6th (2.53), 8th (3.00), and 10th (3.09); two, 4th contrary 8th and 10th; and three, 6th between 10th semester all of them showed difference in *interacting and contributing actively in different online forums*. Next, in item number 38 the variation is among 2nd (2.27), 4th (2.70), and 6th (2.80) semester opposite 8th (3.59) and 10th (3.39) presenting less *online collaboration with others to create files or shared presentations* in students from the first semesters than from the ones in the last semesters. Afterwards, in number 39 discrepancy is found in 2nd (1.98), 4th (2.22), and 6th (2.63) semester versus 8th (3.35) and 10th (3.14) observing that students from the firsts semesters *work* less *with others to design digital content* than students from the higher semesters. Then, item 40 *planning and following collaborative projects through Web 2.0 resources like Teambox, Basecamp, Do.com, etc.* shows diversity among 2nd (1.48) semester versus 6th (2.02), 8th (2.66), and 10th (2.44). Also in this same item, there is difference within 4th (1.82) semester opposite 8th and 10th, and one more variation between 6th semester facing 8th. To continue, number 41 shows variation in the 2nd (1.96) and 4th (2.14) semester opposite 8th (2.79) and 10th (2.86) in students' *participation in virtual communities to share knowledge, information, content, and resources*. Last but not least, in number 43 the

contrast is found among 2nd (1.24), 4th (1.36), and 6th (1.39) semester towards 8th (1.82) and 10th (2.04) in students' ability to *create collaborative communities or thematic social networks in sources like NING, ZYNCKO, or SPRUZ.*

One more time, outcomes showed that students who are part of the 2nd semester have less evolved this digital competence than the students from the 8th or 10th semester. Such discrepancy could be for the same reasons given in the rest of the sections. Students who have recently started the bachelor's degree have not yet the necessity to collaborate in professional networks or participate in research groups; likewise, in 2nd semester students subjects do not required the use of platforms like Moodle (the one used at UQRoo) or do not plan big collaborative projects.

In contrast, it is a fact that in the last semesters the use of such tools are implemented to facilitate students learning because of the demand of their subjects and also because classes become unnecessary inside the classroom, but from home or any other place where students can work with technology; according to this Sanders (2016) "*Without technology, collaborating can be difficult to do outside of the classroom, forcing you to use the precious class time to facilitate it; with technology, students can collaborate on almost anything, anytime with Internet connection and the right tools"* (par. 9). For that reason, students should be motivated to use technology to create a collaborative learning environment and simplify their learning process.

4.2.5 Differences in digital competence reported by the students regarding their semester (overview in categories)

After analyzing the results in the 4 tables above, one can believe that it is in section II Creating Content where more variation is foud among semesters because of the number of items analyzed, but it is not true. Then, if we observe Table 4.8 we could notice how the stronger differences among the five semesters are in Collaborative work (F= 20.502) followed by Creating Content (F= 17.585).

Categories				
Digital competence	**Semester**	**N**	**Mean**	**ANOVA results**
1. Information Management	2º	54	2.46	F= 10.085 p< .001 df= 4
	4º	41	2.62	
	6º	41	2.61	
	8º	39	3.07	
	10º	43	3.00	
	Total	218	13.76	
2. Creating Content	2º	54	1.98	F= 17.585 p< .001 df= 4
	4º	41	2.29	
	6º	41	2.86	
	8º	39	2.68	
	10º	43	2.40	
	Total	218	12.21	
3. Communication	2º	54	2.96	F= 8.906 p< .001 df= 4
	4º	41	3.21	
	6º	41	3.17	
	8º	39	3.58	
	10º	43	3.40	
	Total	218	16.32	
4. Collaborative Work	2º	54	1.93	F= 20.502 p= .001 df= 4
	4º	41	2.28	
	6º	41	2.35	
	8º	39	2.94	
	10º	43	2.88	
	Total	218	12.38	

Table 4.8 Differences in digital competence reported by the students regarding their semester

To sum up, there is contrast in digital competence reported by students regarding their semester in all the four sections presented in this project. Those differences are not in the same level; notwithstanding, it has been proved that huge variation exists between the first semesters and the higher semesters of the English language bachelor's degree. Thus, we dare to say that the results are because their subjects do not demand as much use of technology or development of certain digital competence as the ones for 8th, 10th and sometimes 6th semester.

4.3 Relationship between the digital competence reported by the students and the years of study at UQRoo

Once again, the following research question was answered through inferential statistics and data was analyzed with Pearson correlation to determine relationship between students' digital competence and their years study at UQRoo. Following, outcomes are revealed in Table 4.9 below where Pearson correlation is represented in the column with

letter “r”; moreover, relation was found in 33 of 44 items. This means that in all the 4 sections exist relation between the development of digital competence and the years of study. (See Table 4.9).

Items	Digital Competence	r	Sig. (2-detailed)	N
3. Work with shared documents in the cloud (Google Drive, SkyDrive, Dropbox, etc.).	Information Management	.257	p< .001	218
4. Use and organize information in search managers (Diigo, Pocket, etc.).	Information Management	.310	p< .001	218
5. Search information in online database (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).	Information Management	.424	p< .001	218
6. Use online information programs (Académica, AulaBlog, Maestroteca, etc.).	Information Management	.204	p= .002	218
7. Use graphic organizers (Mindmap, Mindomo, Bubble.ub, etc.).	Information Management	.360	p< .001	218
8. Identify and verify reliable and appropriate information online.	Information Management	.164	P< .001	218
10. Create and manage blogs and websites (Blogger, Wordpress, Google Site, Wix, Jimdo, etc.).	Creating Content	.216	p= .001	218
11. Design and modify a wiki (Wikispace, Nirewiki, Wikipedia, etc.).	Creating Content	.245	p< .001	218
12. Design and manage online learning environments (PLE)	Creating Content	.382	p< .001	218
13. Use educational software to create and promote multimedia knowledge (Clic, Anagramarama, Sephonics, etc.)	Creating Content	.236	p< .001	218
14. Create and edit images with special software (Coreldraw, Photoshop, Gimp, etc.).	Creating Content	.194	p= .004	218
15. Use of podcasting and videocasts (YouTube, Flicks, Spotlight, Screencast, etc.).	Creating Content	.216	p= .001	218
16. Create digital, original and creative products (Prezi, PowToon, Goanimate, etc.)	Creating Content	.405	p< .001	218
17. Use of interactive graphics for multimedia presentations (Prezi, Glogster, PowToon, etc.).	Creating Content	.418	p< .001	218
18. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Creating Content	.404	p< .001	218
19. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Creating Content	.141	p= .038	218
20. Know to take online exams to evaluate my own knowledge.	Creating Content	.193	p= .004	218
21. Manage personal courses in any educative platform online (Moodle, Edmodo, Schoology, etc.).	Creating Content	.246	p< .001	218
22. Able to quote online resources with the proper format (APA, MLA, Harvard, etc.).	Creating Content	.184	p= .006	218

23. Distinguish among different authors' royalties (Copyright, Copyleft, Creative commons, etc.).	Creating Content	.326	p< .001	218
25. Participate in discussion forums online or blog, micro-blogs and wikis.	Communication	.489	p< .001	218
26. Interact in learning activities done in educative platforms.	Communication	.241	p< .001	218
28. Able to relate through virtual institutional systems (videoconference and audioconference).	Communication	.313	p< .001	218
30. Establish communication through video conferences in real time (Skype, FaceTime, Hangouts, etc.).	Communication	.245	p< .001	218
35. Capable to collaborate in professional networks through the use of digital tools.	Collaborative Work	.222	p= .001	218
36. Participate in research groups of my major using online spaces.	Collaborative Work	.277	p< .001	218

Table 4.9 Relationship between the years of studying at UQRoo and students' digital competence

Item	Digital Competence	r	Sig. (2-detailed)	N
37. Interact and contribute actively in different online forums.	Collaborative Work	.446	p< .001	218
38. Collaborate online with others to create files or shared presentations (Dropbox, Google Drive, OneDrive, etc.).	Collaborative Work	.357	p< .001	218
39. Work with others to design digital content.	Collaborative Work	.398	p< .001	218
40. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Collaborative Work	.339	p< .001	218
41. Participate in virtual communities to share knowledge, information, content, and resources.	Collaborative Work	.345	p< .001	218
43. Create collaborative communities or thematic social networks (NING, ZYNCKO, SPRUZ).	Collaborative Work	.329	p< .001	218

Table 4.9 Relationship between the years of studying at UQRoo and students' digital competence (Continued)

The results reported in Table 4.9 is that in Creating content (CC) and Collaboration work (CW) are bigger number of correlations between students' digital competence in regard to their years of study with 14 and 8 items, consecutively. Then, we can observe Information management (IM) with 6 correlations and Communication (COM) with 4.

Under those circumstances, item number 16 from CC showed the highest correlation within this group with r=.405; next, in CW the more elevated item is number 37 with r=.446; afterwards, number 5 is the more advanced item in the IM section with r=.424;

finally, number 25 is the more significant from COM section with r=.489.

To sum up, we can say that the more years at UQRoo, the more developed are students' group of digital competence. Some items are more evolved than others, for example: to search information in databases, to use different graphic tools like Prezi or Glogster for presentations, to participate, interact or contribute in discussion forums, just to mention some. Perhaps, this have some relation with what Guthu (2008) stated about the augmentation of students' digital competence according to their level of education, in his investigation he added that students with four or more years of higher education seem to be stronger users.

4.3.1 Relationship between the digital competence reported by the students and the years of study at UQRoo (overview in categories)

To continue, we proceed to show a specific view of which digital competence has the highest correlation in regard to students' years at UQRoo according to Pearson correlation results (see Table 4.10). Table 14 above showed this information by items, it presented the number of each individually and we could notice which one is where more correlation exist in a general view.

Categories			
Digital Competence	**r**	**Sig. (2-detailed)**	**N**
1. Information Management	.367	p< .001	218
2. Creating Content	.421	p< .001	218
3. Communication	.292	p< .001	218
4. Collaborative Work	.425	p< .001	218

Table 4.10 Relationship between years of studying at UQRoo and students' digital competence in categories

Table 4.10 presents the results in a global way. In this table we can observe further information, such as the highest correlation between the variables is firstly in Collaborative Work with a r=.425; second, in Creating content with a r= .421; third, in Information management with a r=.367; and lastly, in Communication r=.292. We can conclude through these outcomes that the more years of study at UQRoo the more Collaborative

Work digital competence is strengthened by students.

4.4 Difference in the development of digital competence between female and male students

For this question, a t-test was implemented to reach the answer. After analyzing the outcomes, they did not show significant differences to say that there is actually some inference between the development of digital competence and students' gender. For that reason, Table 4.11 presents an example of 8 items where no variance among the results can be found.

Item	Gender	N	Mean	Std. Deviation
1. Use different browsers (Explorer, Mozilla, Opera and search engines (Google, Yahoo, Bing)	Female	133	3.677	.6099
	Male	85	3.659	.5245
2. Utilize social markers to organize and share information in Twitter, Instagram, and Facebook.	Female	133	3.526	.7445
	Male	85	3.318	.9285
3. Work with shared documents in the cloud (Google Drive, SkyDrive, Dropbox, etc.).	Female	133	3.105	.9476
	Male	85	3.129	.9610
4. Use and organize information in search managers (Diigo, Pocket, etc.).	Female	133	1.895	.9476
	Male	85	2.012	.9193
5. Search information in online database (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).	Female	133	2.038	1.0618
	Male	85	1.894	.9000
6. Use online information programs (Académica, AulaBlog, Maestroteca, etc.).	Female	133	2.233	1.0509
	Male	85	2.306	.9515
7. Use graphic organizers (Mindmap, Mindomo, Bubble.ub, etc.).	Female	133	2.489	1.0704
	Male	85	2.600	1.0374
8. Identify and verify reliable and appropriate information online.	Female	133	2.910	.8480
	Male	85	3.071	.8134

Table 4.11 Difference in the development of digital competence between female and male students

Table 4.11 shows a sample of 8 items from Information management section where no prominent contrast is found. In like manner, this results are the same for the four digital competence evaluated for this research project. We expected to discover differences because

all of us have different ways of developing our skills, and in such situation, we are also different at the moment of developing our digital competence.

Furthermore, results were unexpected because there are investigations that supports the difference between the use of ICT and students' gender, such is the case of Markauskaite (2006) who analyzed Pre-service teachers and their gender differences in ICT capabilities between males and females, and results showed that female tend to be less intensive users than males, and males tend to be more secure at the moment of using new technology or applications. Moreover, our results probably have to do with the few strategies used in class to implement females' interest in technology and so increase their digital competence. Likewise, Jiménez, Vico and Rebollo (2017) stated that females' digital competence depends on the different strategies used to learn ICT management and that those who use a wider variety of strategies have more developed digital skills.

4.4.1 Difference in the development of digital competence between female and male students in categories.

In addition to this, further information can be found in Table 4.12 where it is presented the global results of the four sections. As it was mentioned before, no significant changes exist between the variables (see table 4.12).

Categories				
Digital competence	**Gender**	**N**	**Mean**	**Std. Deviation**
Information Management	Female	133	2.73	.59738
	Male	85	2.74	.61525
Creating Content	Female	133	2.38	.62056
	Male	85	2.43	.67808
Communication	Female	133	3.26	.57091
	Male	85	3.22	.55608
Collaborative Work	Female	132	2.42	.76235
	Male	85	2.49	.71050

Table 4.12 Difference in the development of digital competence between female and male students in categories

Indeed, there is not distinctness among the variables. We believe that this

contrast between students' gender and their evolution of digital competence do not exist because of the augmentation of interest to technology no matter age, gender or even social status in students.

As a matter of fact, UQROO's undergraduate English language students' gender do not influence in their development of digital competence; nowadays, this world is looking for more capable professionals and the result of this research question is probably the reflection of how young people, both men and women, are increasingly interested at the same level to technology no matter their gender, encouraging them to develop their digital competence in a consciously or unconsciously way. Finally and to conclude, gender do not define a person's skill or what he or she can or cannot do, this was the proof that it does not influence in students' digital competence.

4.5 Difference in the development of digital competence between students who are presently working and those who are not

Moreover, after being study with some classmates who study and work at the same time, this interrogation came up to our mind, we wanted to know if those who work have developed their digital competence more than the ones who only study. For the purpose of this question, statistical analysis through t-test was done to reach the results, and as clarification, many results in the table did not pass the first filter *Levene's Test for Equality of Variances*, so numbers are taken from the *Equal variances not assumed*. Table 4.13 determines the results of this research question.

Items	Digital competence	Presently working	N	Mean	Std. Deviation	t-test results

4. Use and organize information in search managers (Diigo, Pocket, etc.).	Information Management	No	163	1.82	.8814	t=-3.065 df= 83.334 p= .003
		Yes	55	2.29	1.0124	
12. Design and manage online learning environments (PLE)	Creating Content	No	163	1.76	.8789	t= -2.025 df= 84.086 p= .046
		Yes	55	2.07	.9973	
36. Participate in research groups of my major using online spaces.	Collaborative Work	No	163	2.30	.9974	t= -3.353 df= 109.903 p= .001
		Yes	55	2.76	.8381	
37. Interact and contribute actively in different online forums.	Collaborative Work	No	163	2.33	1.0247	t= -2.736 df= 89.996 p= .007
		Yes	55	2.78	1.0662	
40. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Collaborative Work	No	163	1.95	.9898	t= -2.315 df= 89.456 p= .023
		Yes	55	2.32	1.0373	
41. Participate in virtual communities to share knowledge, information, content, and resources.	Collaborative Work	No	163	2.30	.9631	t= -2.605 df= 93.336 p= .011
		Yes	55	2.69	.9598	

Table 4.13 Difference between students who are working or not and their development of digital competence

Table 4.13 indicates that it does exist difference between students who work and the ones who do not. Nonetheless, contrast is not as remarkable in comparison with other results of this research project, outcomes show that for those who work some digital competence tend to be more evolved. Then, as we can observe, Collaborative work is the digital competence with more variations found. It has 4 items that show this competence is the one better improved by students who study and work. Moreover, one is from Information management and one from Creating content.

In the same way, we must say that we do expect Collaborative work demonstrates higher variations because when a student works he or she tends to develop many more skills

than the rest who just study. Someone who works and studies learn how to manage time, to do different tasks, to work in teams, and some of them also learn several digital skills because of the demand of their job. For the previously mentioned, outcomes seem to be precise; by way of example, according to the results in item 36 (t= -3.353 df= 109.903 p= .001) students who work tend to be better at *participating in research groups in online space*s rather than the ones who does not, in item number 37 (t= -2.736 df= 89.996 p= .007) students who work or have worked demonstrate be better at interacting and contributing actively in different online forums facing the amount of those who have not work, afterwards more differences are in item number 40 (t= -2.315 df= 89.456 p= .023) and 41 (t= -2.605 df= 93.336 p= .011) indicating that for those students who work seem to be easier to *plan and follow collaborative projects through Web 2.0 resources* and *to participate in virtual communities to share knowledge, information, content, and resources*.

As final point, it is remarkable from Table 4.3 that the number of UQRoo undergraduate English language students who do not work is smaller than the ones who do work, showing students from the major are not in the same conditions and so is the development of their digital competence. In this situation, Gathu (2008) added *"The use of ICT in the workplace leads to improved ICT skills"* (p. 19) and for the means of this question, such assurance is true. In addition to this, Camacho, Gomez and Pintor (2015) proved in their research project that job training in students benefit them in using virtual learning platforms, a fact that was actually noticeable in our results.

4.5.1 Difference in the development of digital competence between students who are presently working and those who are not presented in categories.

To make the results presented above clearer, a general view of the four sections is illustrated in Table 4.14. All the sections are presented and it is evident how Collaborative work is the digital competence with more influence from students who work and study at the same time.

Categories

Digital competence	Presently working	N	Mean	Std. Deviation	t-test results
Information Management	No	163	2.69	.57796	t= -1.593 df= 83.396 p= .115
	Yes	55	2.85	.66321	
Creating Content	No	163	2.36	.64689	t= -1.518 df= 96.326 p= .132
	Yes	55	2.51	.62205	
Communication	No	163	3.24	.56013	t= -.124 df= 90.192 p= .901
	Yes	55	3.25	.58125	
Collaborative Work	No	162	2.37	.74697	t= -2.844 df= 101.503 p= .005
	Yes	55	2.68	.68060	

Table 4.14 Difference showed in categories

As we can see, no other digital competence present chiefly significance as Collaborative work (t= -2.844 df= 101.503 p= .005) the rest do not pass the test. However, in Table 4.13 we observe how one item from Information management and one from Creating content indicates students who work are better at them than the ones who not.

To sum up, results of this research question presents logic information, due to the fact, students who emerged in a working world flourished different skills rather than students who only study and are not forced to learn new things. Notwithstanding, it is very important to mention this scenario is not the same for all the students who work and the ones who do not. This time, the results favored students presently working, but in other bachelor's degree this variable could have no relation with students' development of digital competence.

4.6 Difference in the development of digital competence between students who have received some training and those who have not

For the purpose of this research question, t-test statistical analysis was implemented to defined whether there is substantial difference or not between the development of digital competence and students who have received some ICT training or not. It is important to mention that, as well as in research question five, most of the results in the table did not pass the first filter *Levene's Test for Equality of Variances* and numbers are taken from the *Equal variances not assumed* Table 4.15 sets out the results.

Item	Digital competence	ICT Trainin	N	Mean	Std. Deviation	t-test
3. Work with shared documents in the cloud (Google Drive, SkyDrive, Dropbox, etc.).	Information Management	No	177	3.01	.9798	t= -4.043 df= 84.098 p< .001
		Yes	41	3.53	.6744	
4. Use and organize information in search managers (Diigo, Pocket, etc.).	Information Management	No	177	1.81	.8989	t= -4.113 df=216 p< .001
		Yes	41	2.46	.9246	
5. Search information in online database (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).	Information Management	No	177	1.87	.9712	t= -3.435 df= 58.655 p= .001
		Yes	41	2.46	1.0024	
6. Use online information programs (Académica, AulaBlog, Maestroteca, etc.).	Information Management	No	177	2.13	.9770	t= -4.146 df= 60.158 p< .001
		Yes	41	2.82	.9722	
7. Use graphic organizers (Mindmap, Mindomo, Bubble.ub, etc.).	Information Management	No	177	2.44	1.0383	t= -2.477 df= 58.798 p= .016
		Yes	41	2.90	1.0678	
8. Identify and verify reliable and appropriate information online.	Information Management	No	177	2.92	.8727	t= -2.068 df= 80.066 p= .042
		Yes	41	3.17	.6286	
10. Create and manage blogs and websites (Blogger, Wordpress, Google Site, Wix, Jimdo, etc.).	Creating Content	No	177	2.21	1.0386	t= -3.322 df= 66.040 p= .001
		Yes	41	2.75	.9160	
11. Design and modify a wiki (Wikispace, Nirewiki, Wikipedia, etc.).	Creating Content	No	177	1.87	.9294	t= -2.430 df= 59.069 p= .018
		Yes	41	2.26	.9493	

12. Design and manage online learning environments (PLE	Creating Content	No	177	1.74	.8727	t= -3.316 df= 55.588 p= .002
		Yes	41	2.29	.9809	
13. Use educational software to create and promote multimedia knowledge (Clic, Anagramarama, Sephonics, etc.)	Creating Content	No	177	1.71	.9055	t= -2.644 df= 55.443 p= .011
		Yes	41	2.17	1.0223	
14. Create and edit images with special software (Coreldraw, Photoshop, Gimp, etc.).	Creating Content	No	177	2.16	.9854	t= -4.168 df= 60.196 p< .001
		Yes	41	2.87	.9797	
15. Use of podcasting and videocasts (YouTube, Flicks, Spotlight, Screencast, etc.).	Creating Content	No	177	2.74	1.0323	t= -3.076 df= 70.004 p= .003
		Yes	41	3.22	.8518	
16. Create digital, original and creative products (Prezi, PowToon, Goanimate, etc.)	Creating Content	No	177	2.50	1.1438	t= -2.287 df= 64.697 p= .026
		Yes	41	2.92	1.0342	
17. Use of interactive graphics for multimedia presentations (Prezi, Glogster, PowToon, etc.).	Creating Content	No	177	2.55	1.0861	t= -3.582 df= 69.048 p= .001
		Yes	41	3.14	.9100	
18. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Creating Content	No	177	1.79	.9572	t= -4.455 df= 216 p< .001
		Yes	41	2.53	1.0024	

Table 4.15 Difference in the development of digital competence between students who have received some training and those who have not

Item	Digital competence	ICT Trainin	N	Mean	Std. Deviation	t-test
19. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.)	Creating Content	No	177	2.81	.9009	t= -2.168 df= 60.859 p= .034
		Yes	41	3.14	.8821	
20. Know to take online exams to evaluate my own knowledge.	Creating Content	No	177	2.87	.9653	t= -4.328 df= 74.609 p< .001
		Yes	41	3.46	.7449	
21. Manage personal courses in any educative platform online (Moodle, Edmodo, Schoology, etc.)	Creating Content	No	177	2.96	.9994	t= -2.153 df= 68.567 p= .035
		Yes	41	3.29	.8439	
23. Distinguish among different authors' royalties (Copyright, Copyleft, Creative commons, etc.).	Creating Content	No	177	1.92	.8819	t= -2.267 df= 54.228 p= .027
		Yes	41	2.31	1.0354	
25. Participate in discussion forums online or blog, micro-blogs and wikis.	Communication	No	177	2.47	1.0979	t= -3.501 df= 66.584 p= .001
		Yes	41	3.07	.9589	
26. Interact in learning activities done in educative platforms.	Communication	No	177	2.81	.9009	t= -3.627 df= 64.045 p< .001
		Yes	41	3.34	.8249	
28. Able to relate through virtual institutional systems (videoconference and audioconference).	Communication	No	177	2.75	1.0240	t= -2.800 df= 68.035 p= .007
		Yes	41	3.19	.8723	
33. Know how to control the information and data shared with others.	Communication	No	177	3.12	.8636	t= -2.825 df= 70.113 p= .006
		Yes	41	3.48	.7114	

35. Capable to collaborate in professional networks through the use of digital tools.	Collaborative Work	No	177	2.42	1.0035	t= -3.327 df= 65.543 p= .001
		Yes	41	2.95	.8931	
36. Participate in research groups of my major using online spaces.	Collaborative Work	No	176	2.29	.9640	t= -4.277 df= 65.272 p< .001
		Yes	41	2.95	.8646	
37. Interact and contribute actively in different online forums.	Collaborative Work	No	177	2.28	1.0398	t= 5.596 df= 73.721 p< .001
		Yes	41	3.12	.8123	
38. Collaborate online with others to create files or shared presentations (Dropbox, Google Drive, OneDrive, etc.).	Collaborative Work	No	177	2.78	1.1074	t= -5.051 df= 96.966 p< .001
		Yes	41	3.46	.6744	
39. Work with others to design digital content.	Collaborative Work	No	177	2.50	1.0929	t= -4.417 df= 78.394 p< .001
		Yes	41	3.17	.8032	
40. Plan and follow collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.).	Collaborative Work	No	177	1.88	.9550	t= -5.522 df= 60.824 p< .001
		Yes	41	2.78	.9357	
41. Participate in virtual communities to share knowledge, information, content, and resources.	Collaborative Work	No	177	2.25	.9521	t= -5.244 df= 67.307 p< .001
		Yes	41	3.02	.8212	
43. Create collaborative communities or thematic social networks (NING, ZYNCKO, SPRUZ).	Collaborative Work	No	177	1.45	.7379	t= -3.047 df= 48.729 p= .004
		Yes	41	2.00	1.0954	

Table 4.16 Difference in the development of digital competence between students who have received some training and those who have not (Continued)

Table 4.15 presents the 31 items in where differences between variables were found. Actually, the outcomes were more than the expected, but in all of them we can notice how it does exist difference between students who have received some ICT training or not and their development of digital competence. Further, differences are distributed in the following way according to the items: Information management has six; then, Creating content 13; following, Communication 4; and finally, Collaborative work 8. As it is stated, the digital competence where this difference is more evident is Creating Content.

Furthermore, in the results above we can observe how those who do have received ICT training are the ones who have better developed certain items from a specific digital competence. For instance, in Creating content, item number 18 ($t= -4.455$ $df= 216$ $p< .001$) indicates that students with ICT training are better at *planning and following collaborative projects through Web 2.0 resources (Teambox, Basecamp, Do.com, etc.)* than those who have not received any training. This clarification is true with all the 33 items in Table 4.14; students with ICT training background have evolved their digital competence more. Notwithstanding, the amount of students who has technological background is smaller in comparison to the ones who have not received that training. Moreover, it is important that with these results the interest of giving ICT training to students increase, similarly to Morffe (2010) students improve attitudes and dexterity in regard to implications, advantages and instrumental management of ICT, as well as, to build knowledge of higher level and practical usefulness for their professional development.

4.6.1 Difference in the development of digital competence between students who have received some training and those who have not (in categories)

In addition to the information above, we would like to add the outcomes in a more general view. In Table 4.16 is stated the relation found between each of the four digital competence and students who have been part of some ICT training and those who have not.

Categories					
Section	ICT training	N	Mean	Std. Deviation	t-test
Information Management	No	177	2.66	.58179	t= -3.857 df= 59.067 p< .001
	Yes	41	3.06	.59432	
Creating Content	No	177	2.31	.62144	t= -4.708 df= 62.469 p< .001
	Yes	41	2.79	.58748	
Communication	No	177	3.19	.57409	t= -3.567 df= 73.168 p= .001
	Yes	41	3.48	.45194	
Collaborative Work	No	176	2.32	.72176	t= -6.165 df= 71.848 p< .001
	Yes	41	2.97	.58067	

Table 4.16 Difference in the development of digital competence between students who have received some training and those who have not in categories

In all honesty, we never imagine finding such results. If fact, we just expected to find differences in Creating content (digital competence with the highest number of differences) and Information management because following our logic it should be easier for students with some ICT background to design, generate or discover new information through the use of applications not everybody knows how to use. All the same, it was good to discover that students with ICT training can show difference in better development in all the four digital competence (IM, CC, COM, and CW). This means that by providing such training to our students their digital competence can be improved.

CHAPTER 5 CONCLUSIONS

As it was mentioned at the beginning of this thesis, its main objective was to determine the digital competence undergraduate English language bachelor's students at Universidad de Quintana Roo have developed. The following chapter is made up of four sections:

- Section 5.1: this presents a summary about the major findings and conclusions about the discoveries done through the results of six research questions. After the analysis, chiefly data was recovered to explain the problematic presented in this thesis.
- Section 5.2: this section presents the limitations found during the entire process of this project, which could alter the results of this investigation.
- Section 5.3: in this section some recommendations are made for future research projects related to the topic in order to be avoided for future research projects.
- Section 5.4: lastly, in this section emphasis is done to pedagogical implications, here teachers and decision makers of our University can find important information to reflect about the topic.

According to the data collected through the questionnaire, undergraduate English language students from the 2nd to 10 semester at UQROO reported having their digital competence developed; nonetheless, ones are more evolved than others. Therefore, the most developed digital competence is Communication and the least developed is Creating Content. Basically, students are good at using communicative applications and social networks for simple things, but they apply such knowledge to their learning process. Within the Communication digital competence, students show be good mostly at using popular networks as Facebook, Twitter or Tumblr and instant messaging applications like WhatsApp, Messenger or Imo.

Additionally, they also have the ability to e-mail their teachers or classmates to communicate, to control personal information shared, to communicate through different digital graphical tools, and to carry out video conferences. While it is true that *"advanced digital competence does not automatically follow from the ability to use ICT tools"* (Ala-Mutka, Punie, and Redekter, 2008, p.3) we should not underestimate the use these students

give to their well- developed Communication digital competence for their learning process. It is outstanding how simple networks as Facebook could help students to arrange a team work without the necessity of physical meetings.

As English language students, we can confirm this fact; it is totally true and possible. However, we should not let students remain at a level of conformity or simple users. Furthermore, it becomes important to say, that the second and third most developed digital competence are Information management and Collaborative work, this is to indicate that there can be a balance in students' digital competence knowledge, but they need to be reinforced as well as the least developed digital competence Creating Content.

In like manner, it was not a surprise to find out undergraduate English language students have Communication as the most developed digital competence and Creating Content as the least developed than the other three members of the competence analyzed in this project, this results is similar to the one López (2014) presented in her project, results showed students most frequent Web 2.0 resources used are video storage sites, social networks, instant messaging services, wikis and blogs and the least frequent are the ones related to share content and manage information in a collaborative way; nevertheless, those results are from students from other bachelor's degrees studying at UQRoo for that reason we can notice variation on them and the ones presented in this thesis.

The reason is simple, students do not feel forced to create, design or innovate with the use of ICT during big part of their formation as future English language teachers at UQRoo, but until certain semesters (data which will be described further in this section). As a matter of fact, students are not really emerged in the necessity to create, so they do not develop the Creating Content digital competence as they should.

Moreover, according to results obtained, we could notice the difference among students' semester and the development of their digital competence. It does exist such variation, undergraduate English language students' digital competence do not progress at the same level nor at the same time. Through students' answers and the results obtained from it, we could notice that students from the first semesters have their digital competence less evolved than the ones from the last semesters. To be more specific, students from 2nd, 4th and 6th semester seem to have their digital competence less develop than the students from 8th or

10th semester.

Likewise, 2nd semester students are the ones who showed to be less digital competent. We think that it is the consequence that their subjects are not technological demanding, they do not use platforms or forums to share information or give opinions, they are starting to learn how to use web pages for academic purposes, and they have not had previously ICT training in the high school they come from.

To continue, 4th semester students demonstrated a little bit more of advanced rather than the 2nd semester students, but this variation was minimal. This means that in fourth semester students still not improving their digital competence in this bachelor's degree, the justification can be the similar to one given for 2nd semester, subjects do not required to much use of ICT and teacher do not always ask students to use new technological resources as a pedagogical tool. Nevertheless, we could notice as students that in this semester some English teachers from the Language Center (CEI) of the university try to introduce new ways of teaching; for example, incorporating activities in Facebook, creating WhatsApp groups or encouraging students to use e-mails as the most used tools for this "new ways of teaching", after seeing our results it can be affirmed, and it is more than evident, that the way of teaching to students needs to go to another level.

Additionally, 6th semester students showed that is from this semester when students start to develop more and more their digital competence. The best explanation for such contrast is that in this semester students' curriculum chart ask for a subject called *Tecnología Educativa*. This subject demands students to do a lot of new activities which include ICT skills, they have to learn many things related to new online resources on their own and with the teacher's guidance, as some of the demands of the socio-constructivism by Vygotsky (1925- 1934).

Also, 8th semester students are the ones who showed the highest difference among all the semesters. Results presented that students from this semester are the ones who have developed their digital competence most over the rest four semesters. Perhaps, this is because they have gone through 6th and 7th semester subjects which require the use of platforms, forums, or any other web side. Besides, in 8th semester students have subjects that demand for more skills, to illustrate: *Comparative Analysis English-Spanish* this subject encourages

students to investigate, select, and share and know information related to copyright aspects and the subject of *Creation of Didactic Material* which demands students to Develop their creativeness in the designing of new activities based on ICT.

Finally, 10th semester students demonstrated to be the ones who know how to use technology, but they do not care about its proper use, perhaps because they are in senior year and they have other priorities and other demands in their subjects. For that reason, we believe they appeared as the second most developed semester among the 5 analyzed. Afterwards, many of the students from this semester are actually teaching in different schools, limitations in technology in any public kindergarten, primary school, high school or even at university is huge, so students do not waste their time planning classes where technology is required. Also, the majority of the students from this semester do not have many subjects; they just have from one to three.

In general, it is a chiefly difference among the students of the five semesters of the English language bachelor's degree at UQRoo; then, we should not generalize students and state that per semester all students have developed their digital competence at the same level because we already proved the opposite. Hibberson, Barrett and Davies stated (2015) "*students involved don't need to be technology experts; communications skills, flexibility and an eagerness to learn and share are much more important"* (par. 12), as a result it is important to encourage students to enhance their technological skills.

Following, to support what was mentioned above, another conclusion made under the influence of our results is that students who have been studied for more years at UQRoo do show a positive contrast in their development of digital competence facing the ones who have less years study at the University. In simple words, the more years at UQRoo, the most developed are undergraduate English language students' digital competence.

Then, results demonstrated that there is no influence between student's gender and their digital competence. It was proved that at least in this bachelor's degree being a woman or a man does not effect on your digital development. Plus, with all honesty, we do expected to find discrepancy, but none was significant. To conclude, we did discover differences between students who work and who have received some ICT training towards their digital competence, in both groups showed a higher level of development leading us to

conclude that work does influence in improving students digital competence, as ICT training does.

5.2 Limitations

Nothing in this life is perfect, neither was our investigation. Through the road, we came across two main limitations. The hardest and the most important one was timing. While applying the questionnaire, we did not have problems with teachers in charge of the subjects to get their permission to take 10 to 15 minutes of their class; nonetheless, some of them gave us the last 10 minutes of their class, so this desperate students because the only thing they wanted to do was to leave the classroom.

Furthermore, that leads us to one more limitation: students' attitude. We could notice how little collaborative they are, and without any data we dare to say that the older the students, the least they want to collaborate in this kind of research. Probably, teachers and decision makers need to do something to increase the investigation culture at our University.

5.3 Recommendations for future research

This piece of research, surveyed 218 students and with their answers six research questions were analyzed. Notwithstanding, there are gaps which should be fulfilled, for example: to determine whether students' age and level of English influence in the development of their digital competence. It would be interesting to know at what age students stop developing their digital competence or in which level of English their digital competence are more evolved, and then make a deeper comparison with Ávila's (2017) investigation because she surveyed CEI students and our participants were English language bachelor's degree, perhaps those results can give us more information of what to do for future generations in both cases.

Moreover, for future research, these findings could pave the way on the development of descriptive studies related to Digital Competence in undergraduate English language students. Also, other types of studies can be carried out based on experimental research, action research or any qualitative designs.

In terms of instrument application, we would definitely recommend to do the possible

and the impossible to get teachers' permission to apply any instrument at the beginning of the class, in this way, students' answers will be more sincere and students will feel more comfortable, and this could influence on having better results.

Additionally, one last recommendation for future research is to add some other digital competence that could be relevant for students from this bachelor's degree. We only analyzed four digital competence: Information management, Creating Content, Communication, and Collaborative work. Nevertheless, more of them can be added such as Problem Solving, Sharing Content or other ones that previous empirical evidence has shown important to be analyzed.

5.4 Pedagogical implications

As it was stated in the rationale of this project, we wanted that our results have some implications over teachers and decision makers of the university, at least and to begin, to the ones from our department División de Ciencias politicas y Humanidades (DCPH). We believe that outcomes not only helped us to know students' level of digital competence development, but also they showed up the necessity of preparing as our teachers as well.

First of all, teachers can be benefit of the information taken from the results to make some changes to teaching. Likewise, we cannot ask students to have high developed digital competence if their teachers do not have a high level either. They must be well-prepared before they ask students to use any technological resource. Also they should try to reduce the use of simple networks and go further in the use of ICT to improve college education quality. Then, teachers should be trained to learn new ways of teaching like new activities or innovative material, and students could learn as well new ways of learning.

Second, for the purpose of enhancing English language bachelor's degree, a revision of the curriculum design must be done to make some arrangements to the program to promote the development of digital competence in the different subjects that are part of the undergraduate English language students' formation. We know this curriculum chart has recently been modified, but our proposal is accompanied of more research and then the consideration of these modifications for new generations.

Finally, it is important to remember, that this thesis is part of the results from a macro research project, which objective is to find out information of students' digital competence

from others degrees at UQRoo. Then, any change for any bachelor's degree of our university will for sure take time; however, the first step has been done to measure the problem and to start finding solutions. In like manner, the education students get from UQRoo should be more capable in technological branches which let them being distinguished from the rest.

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APPENDIX

Questionnaire

Cuestionario de Competencias Digitales del Estudiantado Universitario

Estimado/a estudiante:

El propósito de este cuestionario es conocer el desarrollo de **competencias digitales** de los estudiantes de la Universidad de Quintana Roo con fines de su mejora continua. Se entiende como competencia digital "El conjunto de capacidades para gestionar información, crear contenidos y comunicarse, de manera crítica, mediante la autogestión y trabajo colaborativo para compartir el conocimiento distribuido" (definición propia, 2016). Es importante señalar que la información obtenida es confidencial, anónima y será tratada con objetividad.

Instrucciones:

Lea la oración y marque con una el número del **1 al 4** que más se aplique a su experiencia en cada una de las situaciones descritas. Por favor, revise la forma de responder ejemplificada en la tabla de abajo y sólo informe lo que realmente experimente acerca de las competencias digitales. Se proporcionan los ejemplos en algunos reactivos y no necesariamente tienen que saber utilizar todos.

Ejemplo de la escala:
1 = Competencia no desarrollada todavía.
2 = Competencia poco desarrollada.
3 = Competencia medianamente desarrollada.
4 = Competencia totalmente desarrollada.

Sección I. Gestión de la información	1	2	3	4
1. Puedo utilizar diferentes navegadores (Explorer, Mozilla, Opera) y motores de búsqueda (Google, Yahoo, Bing) en la internet para gestionar informacion académica.				
2. Puedo utilizar marcadores sociales (*tags y hashtags*) para organizar y compartir información en Twitter, Instagram y Facebook.				
3. Puedo trabajar con documentos compartidos en la *nube* (Google Drive, SkyDrive, Dropbox, etc.).				

4. Sé utilizar gestores de búsqueda y organizar los contenidos incluidos en ellos (Diigo, Pocket, etc.).				
5. Puedo hacer búsquedas en bases de datos en línea (Proquest, EBSCO, Elsevier, Emerald, DOAJ, etc.).				
6. Puedo utilizar programas de formación en línea (Académica, AulaBlog, Maestroteca, Coursera, etc.).				
7. Sé organizar, analizar y sintetizar la información mediante mapas conceptuales, utilizando algún organizador gráfico (Mindmap, Mindomo, Bubble.us, etc.).				
8. Puedo identificar y verificar si la información que he obtenido en la red es válida, fiable y apropiada.				
9. A nivel general, puedo encontrar lo que busco en la red de una manera ágil y con los resultados esperados.				

Sección II. Creación de contenidos digitales para la docencia	**1**	**2**	**3**	**4**
10. Puedo crear/gestionar blogs y páginas web (*Blogger, Wordpress*, *Google Site*, *Wix*, *Jimdo*, etc.) para mis cursos.				
11. Puedo diseñar y modificar un Wiki (*Wikispace, Nirewiki*, *Wikipedia*, etc.).				
12. Puedo diseñar y gestionar entornos personales de aprendizaje en línea (PLE, por sus siglas en inglés).				
13. Sé utilizar software educativo (*Clic*, *Anagramarama, Sephonics*, etc.) para llevar a cabo actividades educativas multimedia y promover aprendizajes en los estudiantes.				
14. Puedo crear y editar con software especializado para diseñar imágenes digitales (*Coreldraw*, PhotoShop, Gimp, etc.).				
15. Puedo hacer uso de *podcasting* y *videocasts* (*YouTube*, *Flicks*, *Spotlight*, *Screencast*, etc.) para mi docencia.				
16. Puedo generar productos digitales de mi propia autoría, originales y de carácter creativo a través de software y/o recursos diversos (*Prezi*, *PowToon*, *Goanimate*, etc.).				
17. Puedo usar gráficos interactivos para la elaboración de presentaciones multimedia (Prezi, Glogster, Pow Toon, etc.).				
18. Sé diseñar actividades de aprendizaje mediante el uso de recursos Web 2.0 (Webquest, GoAnimate, Wikis, etc.).				
19. Sé editar diferentes tipos de archivos para mis clases con aplicaciones o recursos en línea, (fotografías, vídeos, audios, textos) creados por mí o por otras personas.				
20. Sé tomar exámenes generados en línea para evaluar mi propio aprendizaje.				
21. Puedo gestionar mis cursos, como estudiante, en alguna plataforma educativa en línea (Moodle, Edmodo, Schoology, etc.).				
22. Sé citar referencias de recursos en línea con el formato adoptado en mi disciplina (APA, MLA, Harvard, etc.,				
23. Sé distinguir entre los diferentes derechos de autoría como *Copyright*, *Copyleft* y/o *Creative Commons*.				
24. A nivel general, puedo crear contenidos digitales y multimedia de una manera ágil con los resultados esperados.				

Sección III. Comunicación	1	2	3	4
25. Puedo participar en foros de discusión en línea o en blogs, micro-blogs y wikis.				
26. Sé interactuar en actividades de aprendizaje realizadas en plataformas educativas.				
27. Sé comunicarme con otras personas por medio de redes sociales (Facebook, Twitter, Tumblr, etc.).				
28. Puedo relacionarme a través de sistemas institucionales remotos/virtuales de comunicación (por video conferencia y audio conferencia).				
29. Puedo comunicarme con mis compañeros de clase y maestros a través del correo electrónico.				
30. Sé establecer comunicación a través de videoconferencias basadas en web para sesiones en tiempo real (*Skype*, *FaceTime*, *Hangouts*, etc.).				
31. Puedo relacionarme con mis contactos a través de mensajería instantánea (*Whatsapp*, *Telegram*, *Messenger*, *Imo*, etc.).				
32. Puedo expresarme adecuadamente con el apoyo de diferentes medios digitales (esquemas gráficos, mapas mentales o conceptuales, diagramas, etc.) cuando expongo mis ideas a los demás.				
33. Sé controlar el tipo de información y datos que comunico en mi interacción en la red con otros usuarios.				
34. A nivel general, me comunico en la red de una manera ágil y con los resultados esperados.				

Sección IV. Trabajo colaborativo	1	2	3	4
35. Puedo colaborar en redes profesionales mediante el uso de herramientas digitales.				
36. Puedo participar en grupos de investigación sobre mi carrera a través de espacios en línea.				
37. Sé interactuar y contribuir activamente en diferentes foros en línea.				
38. Puedo colaborar con otros en línea para crear un documento o una presentación compartida. (Dropbox, *Google Drive*, *OneDrive*, etc.).				
39. Puedo colaborar con terceras personas en el diseño de los contenidos digitales a los cuales accedo y almaceno en mis dispositivos.				
40. Sé planificar y dar seguimiento a proyectos de carácter colaborativo mediante recursos web 2.0 (*Teambox*, *Basecamp*, *Do.com*, *Google Calendar*, *Google Task*, *Buzznet* y otras).				
41. Puedo participar en comunidades virtuales en las que se comparten y transfieren conocimientos, información, contenidos y/o recursos.				
42. Puedo subir y compartir elementos multimedia de mi propiedad en algún espacio disponible en la red				
43. Sé crear comunidades de colaboración o redes sociales temáticas (NING, ZYNCKO, SPRUZ).				
44. A nivel general, trabajo de forma activa y colaborativa en la red.				

Sección V. Datos Demográficos
1. Género: Hombre_____Mujer_____
2. Matrícula Licenciatura Semestre
3. Unidad académica a la que pertenece tu programa delicenciatura Unidad Chetumal_____Unidad Cancún_____Unidad Playa del Carmen_____Unidad Cozumel_____
4. División a la que pertenece tu programa delicenciatura DCSEA_____DCS_____DCI____DCPH____DDS DPlayadel Carmen_____DCancún_____
5. Tiempo que llevas estudiando en esta universidad:_____años y _____meses.
6. ¿Se encuentra trabajando actualmente? Sí_____No _____
7. Asignaturas en las que utilizas las TIC
8. ¿Desde dónde accede mayormente a internet? Casa_____Trabajo_____Sitios públicos_____
9. ¿En qué dispositivos utiliza más el internet? (Marque sólo una opción, por favor). Computadora de escritorio_____Laptop_____Teléfono inteligente_____Tablet_____Otro _____
10. ¿Ha tomado cursos o talleres sobre competencias digitales en los últimos dos años? Sí_____No _____