Characterization of "tecnologías de la información y comunicación" faculty of "Universidad Tecnológica de la Selva"

Caracterización de la situación de la división de tecnologías de la información y comunicación de la Universidad Tecnológica de la Selva

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Abstract

Currently, national education policies of coverage, quality and relevance impose challenges to higher education institutions. To face them, universities must place the curricular update, student motivation and improvement of the teaching-learning processes as primary focus of attention. To effectively transform these axes, it is necessary to have relevant information that allows to assertively guide decision making. Thus, this project characterizes the Information and Communication Technologies Division of the Universidad Tecnológica de la Selva through the analysis of information obtained from students and population of the area of influence, combined with the review of repositories indicators of official information. In this sense, this paper provides an instrument to evaluate students' expectations and opinions regarding the teaching-learning process and incorporates an instrument aimed at the population of the area of influence to measure their level of knowledge of the University and the general opinion of it. This new aspect is relevant given that the population of the area of influence is the first promoter or detractor of the institution's work due to its coexistence with the university community and it is not usually considered in this type of studies.

Characterization, Expectations, TIC

Resumen

Actualmente, las políticas educativas nacionales de cobertura, calidad y pertinencia imponen desafíos a las instituciones de educación superior. Para afrontarlos, las universidades deben situar la actualización curricular, motivación de estudiante y mejora de los procesos de enseñanza aprendizaje como ejes primordiales de atención. Para transformar efectivamente estos ejes, es necesario contar con información palmaria que permita orientar asertivamente la toma de decisiones. Así, este proyecto caracteriza a la División de Tecnologías de la Información y Comunicación de la Universidad Tecnológica de la Selva, mediante el análisis de información obtenida de estudiantes y población de la zona de influencia aunado a la revisión de indicadores de repositorios de información oficial. En ese sentido, este trabajo aporta un instrumento para evaluar expectativas y opiniones de los estudiantes respecto al proceso enseñanza – aprendizaje e incorpora un instrumento dirigido a la población de la zona de influencia para medir su nivel de conocimiento de la Universidad y su opinión general de ella. Este nuevo aspecto es relevante dado que la población de la zona de influencia es la primera promotora o detractora del trabajo de la institución por su convivencia con la comunidad universitaria y no se considera habitualmente en este tipo de estudios.

Caracterización, Expectativas, TIC

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Introduction

The improvement of educational processes must constitute a permanent action in educational institutions. For its implementation, it is necessary to identify the perceptions of the students regarding their process, as well as the general external perception. This enables adjustments which correspond to the institutional reality and the professional and social expectations of the institutions' graduates.

In that sense, studies related to the type of expectations found in university students allow us to conclude that: meeting the expectations of students and paying attention to the teaching and evaluating methods they prefer play an active role in their learning (Pichardo, García, De la Fuente y Justicia, 2007). Therefore, it is necessary to know the current educational context, the background of the students, their skills, expectations prior to entering the University and their perception at the level of compliance with it, as well as their opinion regarding the educational process (teachers, classes, infrastructure, subjects and teaching-learning process) and the general opinion of society about the impact of the University on its environment.

In the Information and Communication Technologies Division of the Universidad Tecnológica de la Selva, this knowledge of the profile and needs of the students, along with the social context had been carried out empirically, without using any instrument that verified the certainty of the affirmations at the time of characterizing the students and empirically considering their opinions, motivations and interests in their teaching-learning process, as well as the perception of the people in the area of influence of the University. This led to the development of a methodology and instruments for collecting information that allow generating knowledge based on facts, with valid arguments that provide an effective guide to the academy regarding the decision-making process of students and the positioning of the ICT Division in the area of influence. Since it is a study of local characterization, there are no previous experiences in this regard, although it was found that other authors have developed characterization processes analyzing the social characteristics of students (Pedraza, Socarrás, Fragozo & Vergara, 2014; Research Center, 2005).

While in other investigations they have carried out the characterization through academic performance (Carreño, Mici & Urzua, 2016), emotional maturity (Saavedra, & Reynaldos, 2006), scientific talent (Paba, 2011), success (Olivo, 2017), perfectionism (González, Gómez & Conejeros-Solar, 2017), socioeconomic characteristics (Bahamón and Reyes, 2012), and repetition factors (González and Ramos, 2010).

These studies have mostly been used to identify characteristics of some students or to find correlations between different characteristics (successful students versus academic performance, emotional maturity versus academic performance). There are other investigations which analyze different study dimensions, such as academic potentials and talents (García-Cepero et al, 2012), composition of cultural and social capital (Díaz and Galán, 2015), biographical and sociodemographic aspects, life projects, educational and professional profile, skills and use of free time (Suárez and Jiménez, 2013).

All this work clearly shows the different angles from which the teaching-learning process can be characterized to improve it; however, we must also consider that at present, attitudes, aptitudes, profiles, skills, and ways of communication of new generations evolve rapidly (Villena and Rivas, 2019), which undoubtedly implies that their usefulness is also subject to the relevant update of these characterizations. On the other hand (Parasuman et al, 1998; Yanhong and Kaye, 1999; Riddings et al, 2000; Sander et al, 2000; De la Fuente et al, 2002; Hativa and Birenbaum, 2000), collecting data instruments have been developed and used widely in various studies for the characterization of students in order to improve teaching-learning processes (cited by Pichardo et al, 2007). In this paper, in addition to an instrument to assess the expectations and opinions of students regarding the teaching-learning process, an instrument aimed at the general population of the area of influence has been incorporated to measure their level of knowledge of the University, as well as their general opinion.

This new aspect is important because the population in the area of influence of the institution is the first promoter or detractor of the institution's work, since they continuously live with students and graduates.

This is indicated by Trelles Rodríguez (2013) who states that "where the academy participates, society must also participate because, otherwise, it becomes an elitist concept and a concept of cognitive capital that is paternally transferred to an ignorant public," (cited by Rosenberger, 2019).

Finally, this research provides information to teachers regarding students enrolled in the Information and Communication Technologies (ICT) Division, presenting new elements to be considered as to how they need to be trained according to current and social needs of the context in which they are immersed. It also helps to identify the areas of opportunity in the institution to improve the educational process, the recruitment of students and the training of teaching staff, which will result in actions and proposals for the improvement of procedures and infrastructure at an institutional level.

Methodology

For the present research, a mixed method was chosen, beginning as exploratory and analytical descriptive, with information tools that are listed in Table 1.

Instrumento: Encuesta de opinión y expectativas de estudiantes
Descripción: 56 preguntas acerca de sus razones de ingreso a la Universidad, evaluación general y expectativa previa al ingreso y realidad respecto a los docentes, instalaciones, clases, tarea integradora, estadía, actitud de sus compañeros de clase.
Características de las respuestas: Respuestas de opción múltiple con número variable de respuestas (preguntas de elección única o múltiple) Respuestas con escala de Likert de 5 escalas Respuestas abiertas
Aplicado a: Estudiantes activos de los cuatrimestres septiembre – diciembre de 2018 y enero – abril de 2019 de primer, tercero, séptimo y noveno cuatrimestre
Instrumento: Encuesta de percepción externa
Descripción: 14 preguntas respecto al nivel de relación directa con la Universidad, opinión de su entorno y opinión respecto a la calidad e importancia en la zona de influencia y nivel de conocimiento de la institución.
Características de las respuestas: Respuestas de opción múltiple con número variable de respuestas (preguntas de elección única o múltiple) Respuestas con escala nominal Respuestas abiertas Respuestas dicotómicas
Aplicado a: Población de Ocosingo Edades de entre 13 y 52 años, mayormente con escolaridad Bachillerato 60%, aunque el 20% no tiene estudios. 53% de hombres y 47% de mujeres.

Table 1 Characteristics of data collection instruments

To collect the information, the following samples were determined (see Table 2):

Instrument	Population	Sample size
Encuesta de opinión y expectativas de estudiantes	Matrícula Sep.-Dic 2018 (405) Matrícula Ene-Abr 2019 (377)	198 191
Encuesta de percepción externa	41,878 (INEGI, 2010)	381

Table 2 Samples for the application of collection instruments

For the calculation of the sample, we considered a confidence level of 95%, a margin of error of 5%, and a level of heterogeneity of 50%.

In the case of the students, there was a refining of duplicate records of the students enrolled; they answered the survey in both quarters with a final sample of 304 students.

For the design of the student survey, elements identified as relevant to the teaching-learning process with respect to various components were considered: infrastructure, classes, teachers and subjects.

Within the subjects, we considered a subdivision, evaluating separately the integrative task and the stays, two components of the educational model that allow the student to relate subjects to each other and to put into practice their knowledge in the university and the work environment.

Information regarding school and place of origin, gender, age and quarter course was also requested. The application of the survey was developed in computer labs on the online platform, through the support of tutors and accompanied by teachers who developed the research, in order to contextualize and clear doubts.

In the case of the external perception survey, it was designed to collect information regarding the level of knowledge of the ICT division, as well as its positioning and influence within Ocosingo. We also inquired about the contact between the university community and the population in general.

The application of the survey was carried out with students trained and sent to points of concentration (central parks, municipal markets, streets of the city center, among others) to choose random people and perform the survey. In the questionnaire, additional information was required regarding age, sex, occupation and level of education. Prior to the application of the surveys, validation and reliability tests were performed with students, teachers and individuals. After collecting the information regarding the understanding of the instruments, corrections were made in their drafting. Once the information was collected, in both cases, the coding was implemented, and the results were generated by coding quantitative data to qualitative data. From there, the information of the students and the opinions of the people outside the University were generated.

Results

Students

The survey applied to students was organized in 3 sections: the first one, inquires about place of origin, type of high school and the reasons why they decided to enroll to the ICT Division. In this regard, the following results were obtained:

63.49% of the students of the ICT Division come from Ocosingo, Yajalón and Chilón, municipalities, which are within a 60 km radius of Ocosingo, so they are part of the University's area of influence. The rest of the students is distributed in 46 different municipalities with percentages between 1% and 3%.

40.8% comes from the Colegio de Bachilleres (Colleges and EMSAD), 24.7% of Bachilleratos Tecnológicos (CECYTE, CBTA, CETIS, CBTIS), 19.7% of Bachillerato General and 2.3% of technical professional training (CONALEP). The rest did not specify their previous school. Students entering the ICT Division knew about the university mainly via 3 ways: friends, which corresponds to 41.12%; social networks, with 28.29%; and visits to the school, with 18.42%. The other means used by the institution do not represent high values in the recruitment of students.

Of these students, 60.53% decided to study a university degree to acquire new knowledge, 43.75% because they expect to get a good job and 43.09% for the university degree.

Regarding the choice of university, 3 main reasons were identified: 52.96% know people who studied here and recommended it; 42.76% chose it for having an affordable cost; and 32.24% chose it for being a prestigious institution. Finally, among the reasons that led them to study ICT, 63.49% indicated that they like technology, 51.97% because they consider it a profession with many work opportunities and 25.33% because of the specialties taught.

In the second block of the survey, it was requested to evaluate different components of the educational process (see Table 3). To assign ratings in a range of 0 to 10, the following scale was generated:

– Excellent [10]
– Good [7.6 - 9.9]
– Regular [5.1 - 7.4]
– Bad [2.5 - 4.9]
– Extremely Bad [0 - 2.4].

Aspecto	Calificación	Categoría
Estadías	8.81	Bueno
Docentes	8.59	Bueno
Duración de los estudios	8.44	Bueno
Asignatura	8.34	Bueno
Eventos	8.28	Bueno
Empleo en estadía	8.26	Bueno
Varios títulos universitarios	8.24	Bueno
Modelo práctico	8.08	Bueno
Tareas integradoras	8.02	Bueno
Instalaciones	7.83	Bueno
Atención al estudiante	7.80	Bueno
Horario	7.76	Bueno
Programa de estudios	7.66	Bueno
Compañerismo entre alumnos	7.45	Bueno
Equipamiento	7.34	Regular
Visitas guiadas	6.10	Regular
Transporte	6.02	Regular
Cafetería	5.41	Regular
Internet	4.67	Malo
Promedio General	7.53	

Table 3 Qualifications obtained in the components of the teaching - learning process

The highest score corresponds to stays with 8.81 and the lowest to the internet, with 4.67. A general average of 7.53 was obtained. The third block of questions is related to the expectations-reality of the students in 5 components of the teaching-learning process: the classes, the teachers, the integrative task, the stays and their classmates.

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In each aspect, the differences obtained at the two extremes are presented: higher, where reality exceeds expectations and lower, where reality is exceeded by the expectations (see Tables 4 to 8). For the results, the following scale was considered:

- Meets the expectation   [0 – 1]
- Exceeds the expectation   [> 1]
- Does not meet the expectation   [< 0]

The tables show the results of Expectations (E), Reality (R), Difference between expectation and reality (D) and Level of Compliance (LC).

Clases			
Resultados Bajos			
Criterio: Profundizan en los temas			
E	R	D	NC
7.39	7.39	0.00	Cumple la expectativa
Criterio: Se desarrollan en laboratorios y talleres			
E	R	D	NC
7.43	7.49	0.06	Cumple la expectativa
Resultados Altos			
Criterio: Están integradas con las otras asignaturas			
E	R	D	NC
6.87	8.27	1.39	Supera la expectativa
Criterio: Involucran hacer muchas tareas			
E	R	D	NC
7.21	8.69	1.48	Supera la expectativa

Tabla 4 Expectativa – Realidad respecto a Clases

In general, with respect to the classes, the expectations of the students have been covered, being in the limit the strength of the subjects and the application of knowledge in laboratories and workshops. Overall, expectations were exceeded by 8.5%.

Docentes			
Resultados Bajos			
Criterio: Están actualizados			
E	R	D	NC
7.75	7.69	-0.1	No se cumple la expectativa
Criterio: Te explican cómo aplicar los conocimientos en la vida real			
E	R	D	NC
7.67	7.91	0.24	Cumple la expectativa
Resultados Altos			
Criterio: Me impulsan a ser mejor			
E	R	D	NC
7.67	8.25	0.59	Cumple la expectativa
Criterio: Son responsables y comprometidos			
E	R	D	NC
7.73	8.36	0.63	Cumple la expectativa

Tabla 5 Expectativa – Realidad respecto a Docentes

Regarding teachers, the results indicate that expectations regarding their professional update have not been met. In general, expectations were exceeded by 5.6%.

Tarea integradora			
Resultados Bajos			
Criterio: Se evalúa de manera justa			
E	R	D	NC
7.39	7.37	-0.02	No cumple la expectativa
Criterio: Es difícil y no es realizable en el tiempo que te indican			
E	R	D	NC
6.54	6.69	0.14	Cumple la expectativa
Resultados Altos			
Criterio: Me ayuda a comprender la aplicación de los conocimientos en situaciones reales			
E	R	D	NC
6.98	8.12	1.13	Supera la expectativa
Criterio: Permite aplicar los conocimientos de varias asignaturas			
E	R	D	NC
7.06	8.31	1.24	Supera la expectativa

Tabla 6 Expectativa – Realidad respecto a Tarea integradora

In relation to the integrative task, in general, the expectation is exceeded by 9.1% and corresponds to the highest value of all the components assessed.

Estadía			
Resultados Bajos			
Criterio: Me permite aplicar mis conocimientos en un entorno laboral			
E	R	D	NC
7.42	7.81	0.38	Cumple la expectativa
Criterio: Me ofrece oportunidades de empleo			
E	R	D	NC
7.74	8.23	0.48	Cumple la expectativa
Resultados Altos			
Criterio: Me ayuda a interactuar con profesionistas de mi área			
E	R	D	NC
7.45	8.09	0.64	Cumple la expectativa
Criterio: Es útil para titularse			
E	R	D	NC
7.93	8.62	0.68	Cumple la expectativa

Tabla 7 Expectativa – Realidad respecto a Tarea integradora

Stays do not have values below zero in all aspects evaluated, so, in general, they meet expectations; however, neither has exceeded expectations. In general, expectations are exceeded by 7.6%.

Actitud Del Estudiante Resultados Bajos			
Criterio: Respetan a todos sus compañeros			
E	R	D	NC
7.45	7.23	-0.22	No cumple las expectativas
Criterio: Tienen un proyecto de vida			
E	R	D	NC
7.66	7.56	-0.09	No cumple las expectativas
Resultados Altos			
Criterio: Están comprometidos con su educación			
E	R	D	NC
7.70	7.64	-0.06	No cumple las expectativas
Criterio: Buscan aclarar sus dudas			
E	R	D	NC
7.17	7.30	0.13	Cumple las expectativas
Criterio: Son solidarios			
E	R	D	NC
6.73	6.96	0.22	Cumple las expectativas

Tabla 8 Expectativa – Realidad respecto a Actitud del Estudiante

The student attitude is the component with lower levels of compliance with expectations, and despite meeting expectations in general, this compliance is only exceeded by 0.2%.

External Perception

The first section of the survey collected general information from the profile of the people who answered the questionnaire. In that sense, in relation to the age of the respondents, 83.91% are in a range between 15 and 25 years, with 18, 19 and 20 being the most frequent ages with values of 17.24%, 16.09% and 10.2%, respectively.

Most respondents have high school studies, with 60%; 20% correspond to bachelor's degree and 15% have middle school studies. These data are related to the age range of respondents who participated.

In a second section, we asked if they know people who work or study at the university to identify the impact of the information provided by members of the university community. In this way, we found that 51% of respondents know someone who works at the university, 34% of them are their friends, 45% their acquaintances, 10% neighbors and 7% relatives.

On the other hand, 86% of respondents know someone who studies at the university, of these, 40% are friends, 26% relatives, 22% acquaintances and 11% neighbors.

The level of no familiarity with the ICT division is high, since 42% know it a little and 30% do not know it and its references, therefore, answers are oriented to what identifies the University as a whole. Only 13% know the ICT Division.

According to respondents, only 11% consider that they have contributed to the development of Ocosingo, while 33% consider that they have contributed something, 26% think that they have contributed a little and 20% nothing. So, in general, no contribution is recognized in the Ocosingo development of the ICT Division.

In relation to quality, 72% of the public opinion considers that the ICT division is of quality, while 25% does not consider it that way and 3% did not provide an opinion in this regard. 67% of respondents do not know the educative offer of the ICT Division, while 33% do.

Most respondents, 79%, consider the University as the "University of Ocosingo"; 14% of the respondents do not consider it that way and 7% did not give an opinion on this.

Regarding the importance of the ICT Division for Ocosingo, 45% consider it to be very important, while 39% somewhat value it, 8% little and 1% consider it as not important. Finally, in general, they assign a rating of 7.86 to the ICT division.

Acknowledgments

Conclusions

In a national context, there is low interest in Information and Communication Technologies as a career choice. According to ANUIES (2019), 6.04% of the national enrollment studies majors related to this area and in Chiapas, this percentage is reduced to 5.9%.

On the other hand, according to the Survey on Public Perception of Science and Technology (INEGI, 2017), of the people studying between 18 and 29 years of age, only 35.3% is interested in studying engineering. This means that 4 out of 10 students choose a career related to engineering and a third of those students choose majors from the Information and Communication Technologies division.

Of the students

In relation to the profile of students enrolling to the institution, the number of men is significantly greater. Most of them come from high school and technological high schools in the area of influence. They seek to expand their knowledge and better employment opportunities, as well as an affordable cost that can help them access options for their professional training.

It is relevant to highlight that, according to the results, the students arrive mainly on the recommendation of family and friends who have studied or work here, and place the university as a good option to acquire knowledge and find work.

It can also be said that the knowledge of the existence and recognition of the University is limited to the area of influence and in the rest of the state we are very little known.

Regarding the teaching-learning process, the stays process is the most valued, as well as the duration of the studies, which is contradictorily criticized for their level of intensity when they assess the number of tasks as excessive.

In the negative points, the first aspect mentioned is the internet, which is not open for students; the second is the cafeteria for the quality and little variety of food; and the third is transportation, which is not valued for its cost but criticized for the quantity of buses available to transport students during high demand hours.

In addition to the infrastructure, guided visits were evaluated negatively due to the low frequency with which they are carried out, the limited number of students that can be sent, and the expense that it implies for the students to cover study trips.

Another negative aspect is reflected in the criteria for evaluating integrative tasks that sometimes benefit students who do not actively participate in the performance of the same or affect active participants due to the lack of commitment from their peers. Regarding its level of complexity, the experience in its development has shown that it is possible to do them in the established times, but that they require the constant organization of the students to fulfill them in time and form.

It is necessary to emphasize in this evaluation that the lowest values, which do not meet students' expectations, are their perception of lack of commitment and respect of their own classmates.

However, in general, it is possible to assert that the expectations of the students regarding classes, teachers, subjects, integrative tasks and stays are fulfilled, although the general qualification barely exceeds 7.5

Of external perception

The population that participated in the survey is mostly between 15 and 25 years old, 60% have a high school degree.

51% said they know people who work in the institution and 86% know someone who studies there.

However, only 13% know the ICT Division and 42% know it little. In addition, only 33% of respondents know its educative offer.

Despite that, according to 72%, their educational services are of good quality.

Regarding the interaction of the ICT Division with the area of influence, 20% of the interviewees said that it has not contributed to the development of Ocosingo, but 79% considers the institution as the "University of Ocosingo".

Finally, 45% of the respondents affirms that the ICT Division is important for the municipality.

In general, the rating obtained in relation to external perception, on a scale of 0 to 10, is 7.86.

Proposals for action based on the results obtained

As part of the future work of this research, it is necessary to develop actions that allow addressing the external weaknesses of the ICT Division and strengthen the teaching-learning process, in addition to attending to the observations made by the students in this research.

In this sense, some suggestions made to the members of the academy and the administration about the results obtained in this work are presented in this section.

Regarding the teaching-learning process

It is essential to maintain the institutional infrastructure, update the equipment and improve the quality of internet, transport and cafeteria services.

It is necessary to develop an internal plan to strengthen the university identity, promote fellowship, respect and guide students towards the development of a life project.

Since students requested teachers' update, it is proposed to give teachers online professional update courses so that each one can be updated in their area of specialty at low costs and generate agreements that promote teaching stays in companies.

Teachers are required to strengthen the topics developed in the subjects and to design an organized strategy for the assignment of tasks.

It is necessary to maintain and strengthen the integration of subjects in the integrative tasks and implement a review to make their evaluations fairer.

Regarding the area of influence

Develop events, projects, dissemination activities and technological development that expand the link of the general population and companies and organizations located in the area of influence.

Strengthen the development of ICT training and application projects inside and outside the area of influence, where they can be used to make organizations more efficient or their advantages can be demonstrated.

Broadly spread the projects and activities developed in the ICT Division within the area of influence.

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