

## Design and validation of an instrument to assess the quality of life of university students in the state of Sonora

### Diseño y validación de un instrumento para evaluar la calidad de vida de estudiantes universitarios del estado de Sonora

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#### Abstract

The design and validation of an instrument to assess the quality of life of university students in the state of Sonora is shown. Made up of 32 items, on a Likert scale, divided into three dimensions: Quality of student life, university identity and academic performance, which was validated with a sample of 531 randomly selected subjects. With a non-probabilistic sample, since the information is collected at the convenience of the study based on previously established selection parameters, of a quantitative type, with a non-experimental design and descriptive scope. Validity was carried out through three types of: content, criteria and construct. Where the first refers to the development of the instrument capable of measuring the quality of university life, to develop a focus group of specialist teachers in the area of research, experts in the subject to assign and request their validation with respect to the clarity of content, making reference to the accuracy of each item. For construct validity, an exploratory factor analysis type evaluation was used, with simple Varimax rotation, with the KMO Test. The general Cronbach's  $\alpha$  value was 0.957, validating the internal consistency of the instrument.

#### Resumen

Se muestra el diseño y validación de un instrumento para evaluar la calidad de vida de estudiantes universitarios del estado de Sonora. Conformado por 32 ítems, por una escala de Likert, dividido en tres dimensiones: Calidad de vida estudiantil, identidad universitaria y desempeño académico, el cual fue validado con una muestra de 531 sujetos, seleccionados de forma aleatoria. Con una muestra no probabilística ya que la información es recabada a conveniencia del estudio en base a los parámetros de selección previamente establecidos, de tipo cuantitativo, con diseño no experimental y alcance descriptivo. La validez se realizó mediante tres tipos de: contenido, criterio y constructo. Donde la primera hace referencia al desarrollo del instrumento capaz de medir la calidad de vida universitaria, para desarrollar un grupo focal de docentes especialistas en el área de investigación expertos en el tema para asignar y solicitar su validación con respecto a la claridad de contenido, haciendo referencia a la exactitud de cada uno del ítem. Para la validez de constructo se utilizó una evaluación de tipo análisis factorial exploratorio, con rotación simple Varimax, con la Prueba de KMO. El valor del  $\alpha$  de Cronbach general fue de 0,957 validando la consistencia interna del instrumento.

#### Validation, Probabilistics, Validity

#### Validación, Probabilístico, Validez

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## Introduction

This paper designs and validates an instrument to evaluate the quality of work life of university students, addressing the issue of quality of life. According to Carrera Calderón & Bonilla (2022), it is very important to know the student's current situation for their formative process. The QOL is a conceptualization that has to do with different areas of daily life in individuals, oriented to the evaluation of people in terms of their health, material things they possess, economic situation they present and feeling of the same in relation to the environment in which they develop (Agramón et. al, 2019).

Quality of life is the perception based on the person's feelings about the opportunities presented by the environment where he/she develops in order to satisfy his/her own needs, whether personal and/or work-related, in addition to considering financial variables (Félix & Acosta, 2019).

Having said the above, the most important factors in the quality of life of university students are: having a comfortable place to live, daily food, good health, the possibility of recreation and pleasant educational conditions (Hernández, et. al, 2017).

Nowadays the concept of quality of life is more used as an indicator of human welfare, this relationship is due to the influence it has on the health of the individual and the achievement of good functioning that allows to continue with the realization of all those activities necessary in life and that may somehow affect their state of well-being (Pacheco, et. al, 2014).

For this reason, the purpose of this research is the design and validation of an instrument to evaluate the quality of work life of university students in the state of Sonora through a descriptive statistical analysis that allows the detection of areas of opportunity that can be used as mechanisms and/or tools for improvement, considering critical success factors (Gastelum et al., 2023).

Factors that can be determinants of quality of life are health, economy, love, emotional stability, body image and social relationships (Medina et al., 2022).

According to the World Health Organization (2017) quality of life is defined as the perception that each individual has of their own position in life in a context of culture and value systems in which they live and also in relation to their goals, expectations, standards and concerns considering health a fundamental pillar, as part of sports management (Carrión, 2023).

In this sense the evaluation of the quality of life is vital in the different stages of life, since it is considered an integral indicator of health promotion and support (Veramendi, et. al, 2020), with this contributes to the knowledge of the educational area (Ponce & Arriga, 2021).

In this sense, the United Nations (UN) as an international organization establishes that the concept of QOL is directly linked to sustainability, since it has to do with economic issues such as work, remuneration and equality, but also with the availability of possessions and services such as public spaces, educational institutions, among others. With the objective of channeling these elements, the UN in its Habitat version founded the indicator in a multidimensional way with the purpose of measuring the VC in the areas and it is known as Urban Prosperity Index (Escobar, 2018).

Currently there are no instruments with specific validity and reliability for university students; since, if they exist in a general way in other areas managed to know the level of quality of work life of students, but there is not one in particular that has the variables of student quality of life, University Identity and academic performance, which is the proposal of the present research, to design and validate an instrument according to these variables.

In this little studied line of research there are undoubtedly some instruments that are validated and are good to know certain related information, but there is not one specifically designed in terms of the mentioned indicators, to know the level of quality of life in the respective situations of university students in the state of Sonora.

The design and validation of this instrument provides the opportunity to evaluate and know the existing levels of quality of life in university students in the state of Sonora, since it analyzes in a specific way the satisfaction that the members have with life, their happiness, stress, or important affectations and this information has the capacity to analyze and obtain results that allow detecting areas of opportunity to improve professional and personal development.

## Methodology

### *Methodology*

A Design and validation of an instrument to evaluate the quality of life of university students in the state of Sonora was carried out, quantitative type, with non-experimental design and descriptive scope, since, according to Hernandez et al., 2014, it seeks to specify the properties, characteristics and profiles of people or groups, which is subjected to analysis. Espinoza 2019 states that it is of utmost importance to be able to measure a research methodology in order to have better results.

### *Participants*

The subject of study for this research is constituted by 531 students, randomly selected with those who showed acceptance to answer the instrument, where a population of 34,176 enrolled in 2022 was considered. The university is a study, taking as a basis for the application to undergraduate students, with a confidence level of 95.5% (Stevenson, 1981).

It is a non-probabilistic sample since the information is collected at the convenience of the study based on the previously established selection parameters; 54% are female, 40% are male and 6% are non-binary. Marital status 83% were single and 17% married. In terms of age, 8% were under 18 years of age, 43% between 18 and 20 years of age, 37% between 21 and 23 years of age, 9% between 24 and 26 years of age and 3% over 27 years of age.

### *Procedure*

The procedure was carried out in the following phases (Soriano, 2014).

### *Phase 1. Objectives, theory and construct*

An investigation of the existing scientific literature was carried out, with the aim of learning about the research that has already been carried out, and to be able to consider relevant information.

Once the bibliographic citations were analyzed, a description of the operationalization of the variables was elaborated, under an exhaustive review of the theory (Arias, 2022).

Once the previous topics had been studied, we proceeded to the elaboration of the instrument and selection of the elements it contains, composed of initial instructions, sociodemographic information, three perspectives, a comment section to select according to four classifications and finally a section for a free-text comment, where an instrument of 32 items was obtained.

### *Phase 2. Selected validation and expert judgment*

Validity of the instrument: after the design, the validity was carried out by means of three types, content, criterion and construct, where the validation of the content data was obtained with respect to clarity (in each item), pertinence (in the placement of the dimension) and, finally, the relevance of this to highlight the information obtained.

Reliability of the instrument: in order to measure the reliability of the instrument, it was measured using Cronbach's Alpha coefficient and a confidence level of 95.5% was obtained, considered excellent.

### *Phase 3. Pilot test*

Application of the instrument: it was applied to students of the universities of the State of Sonora where quantitative data were obtained for their interpretation and achievement of the objectives of this study.

Conducting the focus group. The focus group is of utmost importance to validate the contents of this instrument, since it is a technique that presents great versatility (Bonilla & Escobar, 2017). The focus group is made up of 7 experts in the design and validation of instruments in the educational sector. In a study conducted by Pacheco & Salazar (2020) in relation to focus groups concluded that the average number of participants in order to have greater benefits is between six to ten participants. Campas et al. (2021) affirms that in order to validate an instrument it is vital to define the type of experts to invite in order to obtain better results within the process (Campas et al. 2022).

#### *Phase 4. Validation*

Analysis and interpretation of the results: the qualitative and quantitative data obtained were processed in order to obtain a report of the results.

### **Results and discussion**

The design and validation of the instrument for the collection of specific data with the objective of analyzing and knowing the standard of living of university students in the state of Sonora was elaborated, which begins with the objective of the survey and instructions for answering each of the questions, once completed it was submitted to the Institutional Research Ethics Committee of the University under study where the research protocol was reviewed, including the informed consent.

The design of this instrument was developed by the authors and is based on the information gathered in this research.

These elements provide the opportunity to know all those factors that in some way have an impact on the quality of life present in university students in order to carry out corrective measures capable of creating improvements in the institutions and student development.

After the objective and instructions, the instrument begins with questions of nominal variable type which show the qualities of the students analyzed, such as sociodemographic data, i.e., educational program, sex, type of student, age and marital status.

It is made up of 32 questions which are divided into three dimensions:

Quality of student life, which is made up of 10 questions; then the second variable, university identity, made up of 10 questions; and finally the third variable, academic performance, which, unlike the previous ones, is made up of 12 questions.

For the selection of the answers, each of the questions can be answered according to the case on a Likert scale with values from 1 to 5, these categories were grouped as follows.

Scale 1: Strongly Disagree

Scale 2: Disagree

Scale 3: Neutral

Scale 4: Agree

Scale 5: Strongly Agree

### **Validity and reliability of the instrument**

Validity was carried out by means of three types: content, criterion and construct. The first refers to the development of an instrument capable of measuring three dimensions: quality of student life, university identity and academic performance.

The design and validation of an instrument is a basis on which to base a defined structure as a research tool (Sann et al., 2023).

Once the instrument was designed, a focus group was held with a group of seven teachers specialized in the area of research, experts in the subject, to assign and request its validation with respect to the clarity of content, referring to the accuracy of each item, the relevance it has in terms of its placement in the dimension and finally its relevance to highlight the information obtained.

The criterion validity was determined by comparing the proposed scale of the quality of life in university students exclusively from the state of Sonora with other instruments that measure the quality of student life in the same way.

For construct validity, an exploratory factor analysis type evaluation was used, with simple Varimax rotation, with the KMO and Bartlett's Test, since it is a data analysis technique to analyze and validate a test or other types of tests that evaluate dimensional constructs (López & Gutiérrez, 2019).

<b>Kaiser-Meyer-Olkin measure of sampling adequacy</b>		<b>.958</b>
Bartlett's test for sphericity	Approx. chi-square	9872.158
	gl	496
	Sig.	.000

**Table 1** Factor analysis KMO and Bartlett's test

In Table 1, the Kaiser-Meyer-Olkin test for the scale administered to the 531 subjects shows a value close to 1, making a factor analysis feasible. In addition to this, Bartlett's test of sphericity shows a significance level of less than .05, which also confirms that a factor analysis is feasible.

To carry out this analysis, first of all, the Kaiser method (Kaiser, 1958) is used, which determines as many factors as self-values greater than 1 using the SPSS version 26 statistical package, derived from the results obtained, two items were eliminated from the instrument.

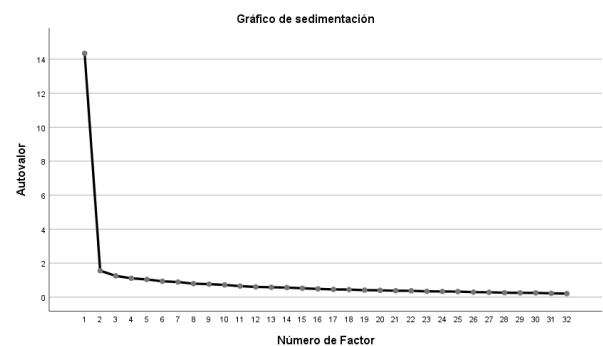
Table 2 shows the total number of questions that remained after the validation of the principal component analysis, with a % variance of 78,206. According to Moliner et al., (2017) the design, validation and exploratory factor analysis gives a research a support for future research in the field of academic productivity.

Factor	Autovalores iniciales			Sumas de cargas al cuadrado de la extracción			Sumas de cargas al cuadrado de la rotación		
	Total	% de varianza	% acumulado	Total	% de varianza	% acumulado	Total	% de varianza	% acumulado
1	14.343	44.821	44.821	5.044	15.764	15.764	5.562	17.382	17.382
2	1.554	4.857	49.678	9.933	31.041	46.805	4.124	12.886	30.268
3	1.250	3.905	53.583	1.002	3.133	49.937	3.277	10.239	40.508
4	1.110	3.488	57.051	.858	2.058	51.994	2.619	8.185	48.652
5	1.039	3.248	60.298	.574	1.795	53.788	1.631	5.096	53.788
6	.933	2.917	63.215						
7	.888	2.776	65.991						
8	.792	2.475	68.467						
9	.762	2.380	70.848						
10	.717	2.242	73.088						
11	.647	2.023	75.112						
12	.602	1.880	76.991						
13	.578	1.807	78.798						
14	.561	1.754	80.553						
15	.521	1.628	82.181						
16	.485	1.516	83.697						
17	.454	1.419	85.116						
18	.441	1.380	86.496						
19	.412	1.289	87.785						
20	.399	1.246	89.031						
21	.378	1.181	90.212						
22	.372	1.164	91.376						
23	.340	1.052	92.438						
24	.333	1.040	93.478						
25	.325	1.016	94.494						
26	.293	.915	95.409						
27	.283	.885	96.294						
28	.258	.807	97.101						
29	.251	.784	97.885						
30	.248	.776	98.661						
31	.222	.692	99.353						
32	.207	.647	100.000						

Método de extracción: máxima varianza.

**Table 2** Total variance explained with the Extraction method: principal component analysis

Figure 1 shows the sedimentation by number of components, since the Kaiser-Meyer-Olkin and Bartlett test was performed, another test is performed to ensure that it is feasible to perform a factor analysis with the existing sample of subjects; where the results show how the confirmatory factor analysis has corroborated the hypothesis that the scale was unidimensional.



**Figure 1** Sedimentation graph

<b>Chi-square</b>	<b>gl</b>	<b>Sig.</b>
1098.733	346	.000

**Table 3** Goodness-of-fit test

Table 3 shows a bilateral significance of .000. This figure is a probability and signifies the good relationship between the variables of the instrument.

Cronbach's alpha	N of items
.957	32

**Table 4** Cronbach's alpha coefficient of the instrument to measure the quality of life of university students

Source: Own elaboration

Table 4 shows the result Cronbach's Alpha Coefficient, according to George and Mallery (2003),  $\alpha \geq .90$  is excellent.

Variable	Cronbach's alpha
Quality of student life	.853
University Identity	.891
Academic performance	.929

**Table 5** Cronbach's alpha coefficient by variable

Rodríguez & Reguant (2020) mention that it is essential to conduct research with an acceptable level of rigor. Cronbach's alpha is useful to determine internal consistency (Oviedo & Campo, 2005). As shown in Table 5, where an analysis of the Cronbach's alpha coefficient by variable was performed.

In general, a high Cronbach's Alpha Coefficient is obtained in all variables and in general, as a fundamental element for the design and validation of an instrument (Domínguez & Merino, 2015). This type of research is a reference (Ortega et al., 2023) to promote self-knowledge.

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### Conclusions

This research met the objective of Design and validation of an instrument to evaluate the quality of life of university students in the state of Sonora, where 83.09% of the level of quality of life in students was obtained as a general result, applied to 531 subjects, since the sample used must be defined (Creswell, 2012).

The strengths of the study are centered on the best evaluated results: I am proud of the work I do as a student with an average of 4.34, I have the opportunities to improve my skills within my educational program 4.35, I consider that I have the support of my professors to solve doubts and/or problems that arise 4.36 and I am clear about my responsibilities at the University 4.42.

Regarding the areas of opportunity found in the study is the item my work at the university allows me to maintain a balance between my student and personal life responsibilities with a mean of 3.8 and I have enough time to do my current semester assignments within each day with a mean of 3.7.

Another research by Veramendi, Portocarero & Espinoza (2020) found that there is a good quality of life of students, in general, an average value of lifestyles of 81.5 was obtained. A study by Lara et al., (2015) found that 84.1% were satisfied with their studies, it is appreciated that having favorable aspects of the university environment have a positive impact on the perception of the quality of life of students; In addition that with these results can be promoted theses at different levels (Washko, S. (2023).

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