

# Well-Being and Self-Esteem in Professional Training and Its Relation to Complex Thinking

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**Abstract**—The relationship between mental health and well-being is of utmost importance, as confirmed by the COVID-19 pandemic, as a global circumstance that disrupted people's daily lives, their ties, their dynamics in general, positioning "total isolation" as a survival strategy, leading in many cases to loneliness not only at a physical level but also at an emotional level with a direct impact on self-esteem, differentiated by age, physical, social and economic condition, among others. Self-esteem as an element favoring well-being, allows the adequate use of personal coping strategies in crisis circumstances. This article shows the results of a study that looks to argue a possible relationship between student well-being, perceived achievement of complex thinking and self-esteem in a population of students from a technological university in western Mexico. Methodologically, a multivariate descriptive statistical analysis was conducted to demonstrate the relationship between the indicators, integrating the gender variable. In conclusion, it is possible to point out that there is statistically relevant information to argue the relationship between the perception of self-esteem as a transcendent indicator in the acquisition and development of educational competencies.

**Keywords**—professional education, educational innovation, future of education, complex thinking, self-esteem

## I. INTRODUCTION

After the COVID-19 pandemic, mental health problems gained importance and can be perceived as a sequel or side effect of isolation, loneliness and uncertainty experienced for a prolonged period of time after infection, death, and changes in the forms and rituals of farewell to the loss of loved ones. In this sense, wellbeing is relevant, considering that even when COVID-19 management and control schemes are being perfected, emotional experiences do not necessarily disappear with medical technology, as they require a process of individual accompaniment [1].

Well-being is necessary in all areas of life, for example, in university settings. After returning to normal school life, students come back to the classroom with a series of psycho-emotional affects that diminish their ability for enjoyment, delight in life and learning [2]. Understanding

and promoting wellbeing in educational institutions in this new normality contributes to the accompaniment and comprehensive professional training of students.

One of the key elements in well-being is self-esteem, understood as the capacity for acceptance, recognition, and positive self-concept that each person has of him/herself [3]. If this element is related to the impacts of COVID-19, it is possible that self-esteem has diminished, and this has repercussions on the physical and mental health of the students.

In this sense, the present article aims to reflect on the relevance of self-esteem in the search for student well-being, paying special attention to how competencies such as complex thinking can influence this psycho-emotional element. For this study, rather than evaluating the competency as such, it has been decided to do so from its perception of achievement, considering that this allows us to appreciate elements associated with the individual self-concept of the students. Methodologically, a descriptive statistical analysis was performed.

## II. LITERATURE REVIEW

According to the World Health Organization, health is defined as a state of complete physical, mental, and social well-being, which is linked to the social environment and prevailing cultural constructs [4]. This implies that there are two perspectives of well-being: collective and individual. To study them, the former considers elements such as contribution, acceptance, and integration [5]; while the latter is usually analyzed from the subjectivity of the individual about his or her experience in specific domains of his or her daily life and its relationship with his or her behavior and decision-making [6].

### A. Student Welfare

Although the concept of well-being is of increasing interest for its study and analysis, this work faces the challenge that it is fluctuating, so it is considered necessary to frame well-being in terms of the experiences and behaviors of people according to their role in specific contexts [7]. Well-being in people in school contexts with the role of students has been analyzed from different approaches, models, and theories [8, 9], but it is since the COVID-19 pandemic that a greater understanding of

well-being and the influence that social distancing had on it has become even more necessary [10].

The results of studies of student well-being during the COVID-19 pandemic, regardless of their context, show that in general, negative psychological effects derived from the measures implemented based on social distancing can be seen [11]. In the case of higher education students, more research is suggested in this regard since it is considered that this group was subject to particular situations that could have deepened the negative impact of the pandemic, such as greater pressure on studies, less social support, governmental and institutional restrictions, fully online classes, cancellation of academic exchanges, adjustments in thesis planning, new forms of evaluation, no extracurricular and sports activities, disappearance of job opportunities, among others [12, 13].

### B. Self-Esteem and Student Well-Being

Well-being is related to various indicators, depending on the model from which it is approached, but there is one indicator that is presented in a generalized manner: self-esteem [14]. The importance of self-esteem lies in the fact that it is a subjective rationality of experience that is shaped by the individual's feelings about him/herself based on self-perception and self-evaluation [15, 16]. In the context of the COVID-19 pandemic, self-esteem is relevant to understanding student well-being as it has been widely shown to be a protective factor for psychological problems and diminished mental health, as well as being associated with academic achievement [13, 17, 18]. Research such as that of Farahani *et al.* [19] presents alternative approaches such as the fact that self-esteem is related to regular physical exercise, where practice increases satisfaction, produces significant relaxation, joy, and satisfaction compared to performing high-intensity exercise. As previously discussed, Ramos-Olivera confirms the existence of individual self-esteem and Collective Self-Esteem (CSE), which are important for a person's identity and for a group's well-being.

### C. Complex Thinking and Self-Esteem

Self-esteem is literally defined by the value that people place on themselves; therefore, it refers to the evaluative component of self-knowledge [7]. High self-esteem is related to a very favorable overall evaluation of oneself. Low self-esteem, by definition, refers to an unfavorable definition of oneself [19]. Meanwhile, complex thinking, according to Lipman [20] arises from the fusion between critical thinking and creative thinking, therefore, it is based on both rationality and creativity, resulting in multiple solutions. According to Baena-Rojas *et al.* [21], complex thinking brings together, from a systemic approach, the different interactions between objects, people, and the environment at a holistic level, which successively effects knowledge. Therefore, to speak of a relationship of complex thinking and self-esteem has implications in the knowledge of each individual, as a result of his or her intervention with other people, the environment and the artifacts with which he or she interacts. It is worth mentioning that Ramírez-Montoya *et*

*al.* [22], consider that complex thinking corresponds to a macro competence with subcompetences of critical, systemic, scientific, and innovative thinking. Therefore, the favorable or unfavorable perception of self-esteem (self-knowledge) of individuals could be disaggregated for each type of thinking.

## III. MATERIALS AND METHODS

### A. Participants and Procedure

The sample was formed under a scheme of convenience, with a total of 57 students from a technological university located in the western region of Mexico, whose educational model has included the development of competencies. The sample includes 21 men and 36 women, all students from different disciplinary areas and progressing in their professional training. The study was conducted in August 2022, two questionnaires were applied through Google Forms, under the modality of self-administration with freedom to take part, i.e., on a voluntary basis. (See Table I)

TABLE I. PARTICIPANT DATA BY GENDER

Men		Women		Total	
<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
21	37%	36	63%	57	100%

Source: Own creation.

### B. Instrument and Data Analysis

Two instruments were used for this study:

1. The eComplexity instrument has the aim of measuring the perception of the level of proficiency that the participants have regarding the complexity reasoning competence and its subcompetences. It is an instrument that has been confirmed both theoretically and statistically, as well as by a team of experts in the field [23]. The instrument consists of 25 items divided into four subcompetencies: Systemic thinking, Scientific thinking, Critical thinking, and Innovative or creative thinking. Each item is answered on a 5-level Likert scale.

2. To identify the level of self-esteem, that is, to evaluate the students' perception of satisfaction with themselves and their abilities, the Rossemberg Self-Esteem Scale was used. It is an instrument composed of ten items with a dichotomous or ordinal response pattern; given that it has qualitative utility through the affirmation of a quantity of variable that one item owns in relation to another. The scale is evaluated in three levels: High, Medium, and Low Self-Esteem. High self-esteem is considered normal self-esteem; medium self-esteem is perceived as lacking self-esteem problems; however, it needs to be improved; as for low self-esteem, there are significant self-esteem problems. The self-confidence dimension focuses on issues related to perceiving oneself or feeling competent in different life situations, while the self-deprecation dimension uses pejorative concepts associated with self-sympathy [24].

A multivariate descriptive analysis was carried out by means of computer software R [25] and Rstudio [26].

IV. RESULT AND DISCUSSION

To obtain the results, it was necessary to calculate the arithmetic mean and the total standard deviation for each of the items that evaluate the complex thinking competency as well as its subcompetencies (Table II). In this sense, the perception of achievement of the (general) competency of complex thinking yielded an arithmetic mean of 3.90 with a deviation (s) of 0.91. Making an analysis by gender with respect to the perception of the competence of complex thinking, a mean of 3.95 was obtained with a deviation (s) of 0.92, while men present a lower mean of the competence with respect to the results obtained by women (3.80), with a deviation (s) of 0.89. At the subcompetency level, Table I reflects that both men and women present a predominance in critical thinking (means of 4.00 and 4.11, respectively). Similarly, in second place, the subcompetency with the highest perception in both genders is identified in systems thinking (men 3.92 and women 4.04). On the other hand, the values obtained with the lowest scores are shown in the perception of the subcompetence of scientific thinking (men 3.59 and women 3.69).

TABLE II. MEANS AND STANDARD DEVIATION OF THE COMPLEX THINKING COMPETENCY AND ITS SUBCOMPETENCIES AMONG MEN AND WOMEN

	Men		Women		Total	
	Media	Sd	Media	Sd	Media	Sd
Complex Thinking Competency	3.80	0.89	3.95	0.92	3.90	0.91
Scientific Thinking Subcompetency	3.59	0.89	3.75	1.00	3.69	0.96
Critical Thinking Subcompetency	4.00	0.80	4.11	0.83	4.07	0.86
Innovative Thinking Subcompetency	3.72	0.87	3.94	0.89	3.86	0.89
Systemic Thinking Subcompetency	3.92	0.93	4.04	0.88	4.00	0.90

Source: Own creation.

Table III shows the t-test performed. This analysis is intended to illustrate whether the difference in the mean values in the students' perception are significant. The results show that in none of the subcompetencies of complex thinking the differences are significant. This may be due to the size of the sample.

TABLE III. RESULTS OF SIGNIFICANT DIFFERENCES BETWEEN MEN AND WOMEN IN THE PERCEPTION OF ACHIEVEMENT OF COMPLEX THINKING SUBCOMPETENCES (T STUDENT)

	t	df	p-value
Scientific Thinking	-0.38	26.74	0.69
Media	-1.19	24.31	0.21
High	-1.41	23.99	0.16
Total	-0.59	22.43	0.56

Source: Own creation.

Table IV presents the results obtained from the Rosseberg instrument (which measured self-esteem), given its qualitative characteristics, the results are

arranged in three levels (i.e., low, medium, and high self-esteem), Table II shows a frequency analysis and percentages of students for each level of self-esteem and by gender. There can be seen that 67% of the students have high self-esteem, 28% have medium self-esteem and 5% have low self-esteem, respectively.

TABLE IV. MATRIX OF TOTAL EMPATHY RESULTS AND BY GENDER

Self-esteem	Men		Women		Total	
	Total	%Men	Total	%Women	Total	%
Low	1	5	2	6	3	5
Media	6	29	10	28	16	28
High	14	67	24	67	38	67
Total	21	100	36	100	57	100

Source: Own creation.

Thirdly, Fig. 1, under the Sankey Diagram, shows the link between the perception of the development of complex thinking competence, the level of self-esteem, and the gender of the students. There it is highlighted how the perception of the development of highly complex thinking is mainly present in those who show high self-esteem, especially women. It also highlights how the low perception of the development of complex thinking competence occurs in people with low self-esteem, predominantly in men.

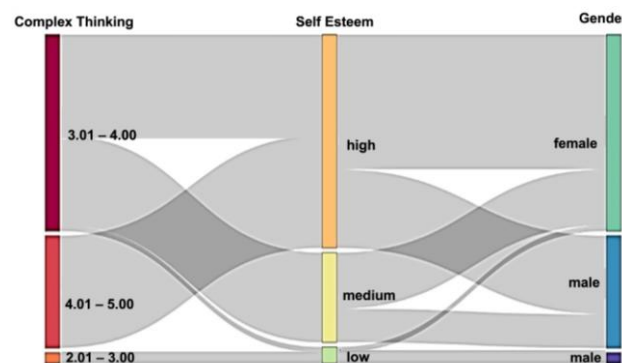


Figure 1. Sankey diagram for complex thinking self-esteem and gender.

During the period of university education, young people consolidate their image in a coherent and consistent way with themselves, in a process of affirmation of cognitive skills specific to the professional area in which they are inserted, where the social, academic, and work environment (close), generate performance spaces with an expansion of social roles. The results gathered from this work on the perception of achievement on the general competence of complex thinking as a global self-assessment capacity obtained through this research, shows at first the need to identify gender differences in self-perception, because although the arithmetic mean yields at 3.90 and a deviation (s) of 0.91, men show a lower overall mean. This shows that although most men perceive themselves as competent in terms of complex thinking, comprehensiveness and systemic vision is lower in relation to the perception of women.

In the case of the subcompetencies that encompass complex thinking (Scientific Thinking, Critical Thinking, Innovative Thinking, and Systemic Thinking) in both

genders there is a similarity in the results of the subcompetencies of critical thinking, with a slight (0.11) increase in women, which indicates that the ability to reason, question and deconstruct is perceived positively in both genders. In order of perception of achievement with the highest score after critical thinking, systemic thinking is located with the same projection as critical thinking; that is, women obtain a 0.10 higher score than men; systemic thinking assigns the global vision of circumstances and phenomena, which allows having an integrated and global vision that contributes to the solution of problems. On the other hand, it is necessary to note that scientific thinking obtains the lowest result related to the perception of achievement, which opens an area of opportunity considering the importance of training professionals with the ability to systematize processes, experiences, and learning.

In relation to self-esteem, the perception of self-esteem can be associated with a self-concept that allows the identification of three levels of self-perception: 1) high self-esteem; 2) medium self-esteem; and 3) low self-esteem. With the data obtained, it can be said that the majority of students who participated in the study (67%) have high self-esteem, which indicates the possibility of greater stability, which can be extended to the students who obtain a medium score (28%), which, although it can be strengthened, the score obtained can facilitate a better transit during university life, permeating the different dimensions of self-esteem. It is the same case for those who obtained a low score (5%); that is, the diminished self-perception and self-concept affect the general life performance of these students.

#### V. CONCLUSION

The present study envisioned the reflection on the relevance of self-esteem in the search for student well-being, focusing its efforts on the identification of how the competencies of complex thinking can influence the lives of students from the psycho-emotional sphere. As can be seen in the results, the purpose is fulfilled, opening the debate for new reflection. This study has been conducted with a limited population, yet the results are considered valuable, since they identify potential areas for future research both in the educational and professional spheres, as well as in spaces that foster the wellbeing and emotional development of students and young people as a whole.

The contribution of this study lies in the focus on two variables: self-esteem as a transcendent indicator in the acquisition and development of educational competencies. With all this, the results contribute to the deepening of the subject, as well as to the generation of educational policies focused on the understanding and development of the self-esteem of the students, as a transverse and transcendent element in the development of professional competencies.

#### CONFLICT OF INTEREST

The authors declare no conflict of interest.

#### AUTHOR CONTRIBUTIONS

Conceptualization: M.C.A, L.G.M., and S.N.L.; methodology: L.G.M. and M.C.A.; software: S.N.L.; validation: M.C.A, L.G.M., and S.N.L.; formal analysis: M.C.A, L.G.M., and S.N.L.; investigation: M.C.A.; resources: L.G.M.; data curation: M.C.A, L.G.M., and S.N.L.; writing—original draft preparation: M.C.A.; writing—review and editing: L.G.M., S.N.L., and M.C.A.; visualization: L.G.M., S.N.L., and M.C.A.; supervision: L.G.M., S.N.L., and M.C.A.; project administration: L.G.M. and M.C.A.; funding acquisition: L.G.M.; all authors have read and agreed to the published version of the manuscript.

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