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Expectation and Academic Readiness Profiles in Higher Technical Education

Perfiles de expectativas y preparatividad académica en educación superior técnica

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Abstract

Technical and vocational education and training is an important branch of education, pursued by increasing numbers of young people, and information in this regard is crucial. This research aims to determine student entry profiles based on their initial expectations and skills. A total of 183 newly admitted students of technical degrees at a public university responded to two scales used to measure academic expectations and readiness. This non-experimental, cross-sectional, descriptive research employs cluster analysis to identify four groups with high levels of academic expectations and readiness, but the findings show that effective communication and emotion modulation skills are weaker, as are student participation expectations.

Keywords: technical education, access to education, college students

Resumen

La educación y formación técnica profesional es una modalidad educativa importante, cada vez son más los jóvenes que optan por esta posibilidad y es fundamental disponer de información al respecto. Esta investigación busca identificar el perfil de ingreso considerando las expectativas y capacidades iniciales de los estudiantes. 183 estudiantes de nuevo ingreso a carreras técnicas en una universidad pública respondieron a dos escalas para medir las expectativas y preparatividad académica. En la investigación, de diseño no experimental, transversal, de tipo descriptivo, se identifican a través de un análisis de clúster cuatro grupos que presentan altos niveles en expectativas y preparatividad académica; sin embargo, los resultados evidencian que las capacidades de comunicación efectiva y modulación emocional están más diminuidas, así como las expectativas de participación estudiantil.

Palabras clave: educación técnica, expectativa, acceso a la educación, estudiantes universitarios

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I. Introduction

Technical and vocational education and training (TVET) is aimed at developing skills and abilities for work and has existed in Latin America since 1940. In the context of the 2030 Agenda, in September 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) secured the approval and commitment of 193 countries to guarantee inclusive, equitable, and high-quality education that promotes lifelong learning opportunities for all. In this sense, TVET is acknowledged as an important factor in developing the structure and competitivity of countries' productive sectors and is delivered in a wide variety of ways across different countries in formal and non-formal systems, through programs directed by ministries of education and with participation from business and worker organizations. This form of education can be found at secondary, tertiary, and university levels, and one of the many challenges it poses is how to facilitate the transition from one level of education to the next (Siteal Unesco, 2019).

At the university level, academic expectations play an important role in students' academic success. These expectations can be understood to mean the beliefs, motivations, and feelings associated with higher education by students (Soares et al., 2014). Academic expectations include engagement expectations, that is, expectations relating to what students expect to do or engage in, and which are associated with students' behavioral engagement, academic success, and satisfaction (Almeida et al., 2003). Similarly, critical factors for TVET student satisfaction include perceived service quality, learning outcomes, employability, image, and value (de Oliveira et al., 2020). In addition, TVET students' aspirations and career paths are affected by the connections between education and work and by how well their education aligns with the demands of the productive sector, thus enabling employment opportunities (Valdebenito & Sepúlveda, 2021). This can impact their satisfaction and learning, as one factor that influences TVET students' learning and achievement is the interest they have or acquire in their subjects (Ismail et al., 2019), whereas a lack of expectations or goals, together with ignorance of or a failure to appreciate one's own capabilities, can become limitations to learning (Sevilla-Santo et al., 2021).

Separately, research on TVET has found that the development of generic skills in students in technical degrees in higher education depends in part on students' skills upon entry (Pugh & Lozano-Rodríguez, 2019). The skills students bring with them when entering the program facilitate their adjustment to the university environment; this includes their ability to organize resources, generate appropriate strategies to achieve their goals, and anticipate risks analytically, in addition to their self-efficacy and self-determination. Conde et al. (2017) found that students' planning skills predicted their academic expectations. Furthermore, on account of the shorter duration of technical degree programs compared to traditional higher education, which may result in very little time to develop generic skills, it is all the more important to evaluate these skills to include them in a student entry profile.

The Fourth Industrial Revolution requires a combination of technical and soft skills in the workforce (Saari et al., 2021). Research on TVET (Mahfud et al., 2017) has stressed the importance of soft skills such as communication, courtesy, honesty, responsibility, cooperation, discipline, a focus on getting work done, confidence, and initiative. Similarly, Fawaz-Yissi and Vallejos-Cartes (2020) also identify key factors for future trends in education, including the use of ICT and greater development of soft skills for employability.

A student's skills at the time of entry, or student readiness, will enable development of the necessary competencies for academic success and subsequent employment. In addition, students' first-year performance is significantly correlated with initial work experience outcomes (Lagos et al., 2018), and students are able to shape their own career paths based on their individual profiles (Rasul et al., 2021). Some studies have shown differences in

employment readiness in students in technical education, which may be associated with their thinking, teamwork and leadership, problem-solving, and communication skills (Ismail et al., 2018).

It follows from the above that both the academic expectations and skills, or readiness, of TVET students are linked to their subsequent academic development, and due to the short duration of these programs, it is imperative to gain insight into these characteristics upon student entry into TVET in order to better guide and optimize the teaching-learning process. This research aims to characterize the TVET student entry profile based on students' various expectations and initial skills or readiness.

II. Method

This quantitative research followed a non-experimental, cross-sectional, descriptive design. The variables employed were students' academic expectations and academic readiness.

The population was made up of all students entering a technical degree at a public university. The non-probability, convenience sample included 183 first-year students from a Chilean public university, of whom 57 (31.2%) were male and 126 (68.8%) were female. All were enrolled in technical degrees at the university at the time of the research; the mean age was 26.9 years, with a minimum of 17 years and a maximum of 54 years.

The instrument used to measure academic expectations was Pérez et al.'s (2015) Spanish adaptation of the Academic Engagement Questionnaire, specifically form A (CIA-A), by Almeida et al. (2003). The questionnaire comprises 35 items about situations and behaviors that students may expect to find in a university setting, rated on a Likert scale from 1 (*almost never*) to 5 (*almost always*). The questionnaire evaluates factors relating to vocational engagement, institutional engagement, social engagement, use of resources, and student participation.

In addition, we used the Academic Readiness Scale designed and adapted by Baeza-Rivera et al. (2016) for higher education, which includes 67 items rated on a Likert scale from 1 (*disagree*) to 5 (*agree*), which inquire about students' attitudes and behaviors to identify a set of student skills or a level of readiness prior to entering higher education. The scale identifies seven factors: personal self-determination, sociability, emotion modulation, academic self-efficacy, analytical anticipation, effective communication, and academic goal orientation (*prospectiva académica*).

To begin the process, an invitation was sent through the university's online platform. This was displayed automatically to all first-year students in technical degrees on accessing the university's website and was available throughout March 2022. It invited students to participate on a voluntary and anonymous basis and included an informed consent form that took into account the relevant ethical guidelines and safeguards established by the university. The consent form described the objectives and essential aspects of the research, assuring participants that the information would be used confidentially (solely for research purposes) and that there were no risks involved in participating and they were free to withdraw from the study at any time, among other details. Students who consented then proceeded to the questionnaire, where they were asked to provide basic sociodemographic details and rate the items for academic expectations and readiness.

The data analysis process and general structure for the presentation of results were similar to those described by Suárez-Cretton and Castro-Méndez (2022). The SPSS software package (version 25 for Windows) was used to clean the data and reverse-score items where appropriate. Next, reliability indices were calculated for the expectations and academic readiness scales, using Cronbach's alpha to examine their internal consistency.

Descriptive statistics were obtained for the data, including the mean, standard deviation, and percentiles for each of the variables. Compliance with normality assumptions was tested (using values of skewness/kurtosis) and clusters were analyzed using Ward's method of centroid-based clustering, yielding four clusters of different sizes. Levene's test was used to analyze the homogeneity of variances for the variables and multiple comparisons were performed to determine possible differences in profiles. Subsequently, one-way ANOVA analyses were performed for each cluster and for each variable and the Scheffé test was used as a post hoc test of comparisons where it was possible to assume homogeneity of variances. All comparisons performed assumed a signficance level of 0.05. In cases where Levene's test did not allow an assumption of homogeneity of variance, the Games-Howell test was used. Lastly, we identified two groups: one with high academic expectations and another with low expectations, for which the corresponding readiness profile was constructed.

III. Results

The instruments employed demonstrated adequate internal consistency, with the following Cronbach's alpha values. For the academic expectations scale, the values were as follows: vocational engagement .89, institutional engagement .87, social engagement .82, use of resources .82, and student participation .82. For the academic readiness scale, the following values were obtained: personal self-determination .89, sociability .78, emotion modulation .76, academic self-efficacy .63, analytical anticipation .75, effective communication .70, and academic goal orientation .80. These calculations were performed using all the items in each scale. It was therefore not necessary to eliminate any items in this process.

First, a cluster analysis was performed using Ward's method (centroid-based clustering) to determine academic expectations profiles. This produced four clusters, each characterized by different combinations across the four variables examined. The ANOVA test revealed significant between-group differences in all variables relating to academic expectations and academic readiness. The Scheffé and Games-Howell multiple comparison tests found the between-group differences shown in tables 1 and 2:

Table 1. Descriptive statistics for the four clusters for academic expectations

Ward's Method		IV	II	IS	UR	PE
1	Mean	4.42	4.15	4.31	4.51	4.00
	SD	.36	.47	.45	.38	.60
	N	58	58	58	58	58
2	Mean	4.27	3.52	3.85	3.88	1.57
	SD	.44	.67	.59	.61	.56
	N	42	42	42	42	42
3	Mean	3.77	3.43	3.40	3.38	2.70
	SD	.43	.52	.49	.52	.52
	N	56	56	56	56	56
4	Mean	2.81	2.05	2.52	2.64	1.45
	SD	.47	.50	.62	.68	.46
	N	27	27	27	27	27
Total	Mean	3.95	3.47	3.66	3.74	2.67
	SD	.68	.86	.79	.83	1.16
	N	183	183	183	183	183

Note: IV: vocational engagement; II: institutional engagement; IS: social engagement; UR: use of resources; PE: student participation.

Four groups or clusters can be observed in Table 1. Group 1 is the largest (N = 58) and exhibits the highest values across all variables for academic expectations and is made up of 74.1% women, of whom 34.5% are aged between 17 and 20 years. Group 4 is the smallest,

at 15% of the total (N = 27), and shows the lowest values; women make up 66.7% of this group, with 40.7% of women in the group aged between 17 and 20 years. Groups 2 and 3 exhibit intermediate values, with group 2 scoring highest in vocational engagement, social engagement, and use of resources; the group comprises 81% women, 35.7% of whom are aged between 33 and 54 years. Group 3 is notable for a greater score in student participation than group 2 and is made up of 55.4% women, of whom 53.6% are aged between 20 and 33 years. Overall, high scores are observed across all expectations, with the exception of student participation, which shows a mean below the desired value.

Table 2. Descriptive statistics for the four clusters for academic readiness

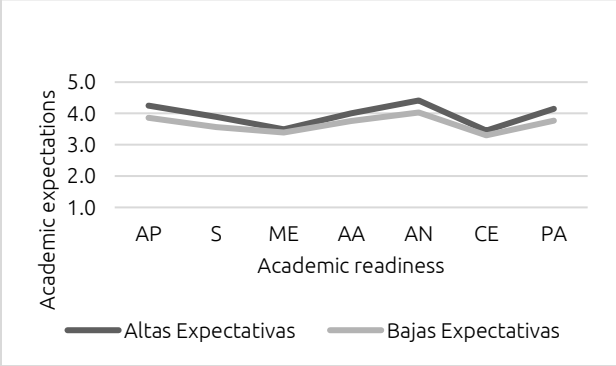
Ward's Method		AP	S	ME	AA	AN	CE	PA
1	Mean	4.70	4.37	4.11	4.27	4.79	3.79	4.65
	SD	.25	.46	.49	.26	.20	.67	.24
	N	47	47	47	47	47	47	47
2	Mean	4.30	3.94	2.84	3.86	4.46	2.72	4.16
	SD	.38	.50	.46	.22	.34	.40	.36
	N	47	47	47	47	47	47	47
3	Mean	3.99	3.62	3.63	3.96	4.19	3.74	3.90
	SD	.42	.53	.46	.26	.44	.48	.44
	N	69	69	69	69	69	69	69
4	Mean	3.06	2.83	2.80	3.30	3.34	3.00	2.96
	SD	.60	.47	.67	.50	.70	.29	.48
	N	20	20	20	20	20	20	20
Total	Mean	4.15	3.81	3.46	3.94	4.32	3.41	4.06
	SD	.62	.67	.71	.39	.58	.68	.61
	N	183	183	183	183	183	183	183

Note: AP: personal self-determination; S: sociability; ME: emotion modulation; AA: academic self-efficacy; AN: analytical anticipation; CE: effective communication; PA: academic goal orientation.

Table 2 shows four groups or clusters. Group 1 exhibits the highest values across all variables for academic readiness and is made up of 74.5% women, 40.4% of whom are aged between 33 and 54 years. Group 4 is the smallest (N = 20) and exhibits the lowest values; this group comprises 70% women, 50% of whom are between 17 and 20 years of age. Groups 2 and 3 exhibit intermediate values, with group 2 (made up of 85.1% women, 44.7% of whom aged between 17 and 20 years) scoring highest in personal self-determination, sociability, analytical anticipation, and academic goal orientation. Group 3 is the largest (N = 69) and is made up of 53.6% women, 31.9% of whom aged between 25 and 33 years; this group scores more highly than group 2 in emotion modulation and effective communication. Overall, the analysis reveals medium to high scores in readiness across all dimensions, although lower scores are observed in emotion modulation and effective communication.

Next, a general readiness profile was obtained for high and low expectation levels (Figure 1).

Figure 1. Academic readiness by academic expectation level



Note: AP: personal self-determination; S: sociability; ME: emotion modulation; AA: academic self-efficacy; AN: analytical anticipation; CE: effective communication; PA: academic goal orientation.

Translation:

Altas expectativas	High expectations
Bajas expectativas	Low expectations

Figure 1 shows that, in general, all students exhibit a good level of readiness, above the desired mean value for the scale (3.0); those with greater expectation levels show a greater level of readiness across all variables than those with lower expectations. In both cases, the lowest level of readiness was observed in emotion modulation and effective communication. Table 3 provides insight into the characteristics of these two groups.

Table 3. Expectation level and sociodemographic characteristics

	N	Male	Female	17-20 years	20-25 years	25-33 years	33-54 years
High expectations	140 (76.5%)	40 (70.2%)	100 (79.4%)	41 (75.9%)	28 (66.7%)	36 (81.8%)	35 (81.4%)
Low expectations	43 (23.5%)	17 (29.8%)	26 (20.6%)	13 (24.1%)	14 (33.3%)	8 (18.2%)	8 (18.6%)
	183 (100%)	57	126	54	42	44	43

The lowest expectation level was observed among students aged between 17 and 25 years, who also exhibit the lowest level of readiness upon entry into technical and vocational education.

IV. Discussion

This research aimed to identify the entry profile of students of technical and vocational education and training (TVET) based on their various expectations and initial capabilities or readiness. The results showed high levels of all types of expectations, with the exception of student participation, which is below the desired mean value. This supports students' academic success, given that expectations influence adaptation and persistence in universities (Gomes & Soares, 2013) and are associated with the quality of academic experiences (Soares et al., 2014). The cluster analysis identified four groups: one with high expectations across all dimensions (the largest group), another with low expectations (the smallest), and two groups with intermediate scores. In all but the group with the highest scores, student participation expectation was below the desired mean value, meaning that the majority of students did not expect to participate in student associations, take on representative roles, or attend student meetings. This is one factor that may diminish

learning because a lack of student expectations or goals of this kind could become limitations for learning (Sevilla-Santo et al., 2021); this lesser degree of behavioral engagement may be associated with a perception of lower service quality and value (de Oliveira et al., 2020) and lower student satisfaction (Almeida et al., 2003).

Academic readiness upon entry to the degree program exhibited medium-to-high scores in all the dimensions explored, although lower levels were observed in emotion modulation and effective communication. In general, possessing these skills upon entry equips students to develop the necessary generic skills and would facilitate their adaptation to the university environment (Pugh & Lozano-Rodríguez, 2019); in particular, support should be made available for students to develop soft skills, such as effective communication, which exhibit lower levels in this study and are indispensable today in the labor market of the Fourth Industrial Revolution (Fawaz-Yissi & Vallejos-Cartes, 2020; Mahfud et al., 2017; Saari et al., 2021).

Echoing the results of this research, Ismail et al. (2018) also identified differences in readiness in communication skills among students in technical education. Our cluster analysis showed four groups, the first with a high skill level and comprising mostly older women. A small group (10.9% of the total) showed lower social, emotion modulation, and academic goal orientation skills and may have greater difficulty adapting to their course of study. Two intermediate groups were also found: the largest (37.7% of the total) shows a balanced profile of medium-to-high levels across all skills, while scores across skills for the remaining group were dissimilar and unbalanced, with low emotion modulation and low effective communication.

A general student readiness profile was obtained based on student expectations. Both high-expectation students and those with lower expectations exhibit adequate skill levels (above the desired mean) to pursue higher technical education. This profile is reflective of students with clear objectives, strong self-confidence, and a firm belief that they can achieve their academic goals. This is realistic given the link between feelings of self-efficacy and academic and personal success (Cervantes et al., 2018) and it constitutes a powerful resource for coping with adversity (León et al., 2019). Likewise, students perceive themselves as capable of organizing themselves and employing the necessary strategies and resources to that end.

They display a willingness and a positive attitude toward working and sharing with others, which enables them to engage in collaborative and team efforts, but recognize deficiencies in communicating effectively or using social skills involving oral or written expression, and in managing their own emotional responses, which may be rooted in sociocultural characteristics (Salazar et al., 2020). This lessens their chances of success not just in the immediate present but also in their future working life, given the evidence (from various areas of scientific literature) of the relevance of social skills in enabling individuals to function successfully in society (Huambachano & Huaire, 2018). Despite this, they tend to take a cautious, receptive, and thoughtful approach to the emerging risks in interpersonal relations or academic matters, and when faced with obstacles, they persist and strive to overcome them.

Students with higher expectations obtained higher academic readiness scores. These make up 76.5% of the total and are for the most part older students, over 25 years of age. In this research, older students exhibited higher scores in academic goal orientation, which is associated with a better use of strategies and resources to achieve academic goals. This follows the same direction as findings by Ferraz et al. (2022), who reported that older students of technical and vocational education used more cognitive strategies (sequences of procedures or activities that optimize the acquisition, storage, and use of knowledge) and fewer dysfunctional metacognitive strategies (such as becoming distracted while the

teacher is explaining a technique, or ignoring teacher directions) than younger students.

V. Conclusions

This research adds to knowledge on the profiles of students entering technical and vocational education – an essential consideration given the often shorter duration of these degrees – in order to guide potential interventions at the beginning of these programs and thus improve the teaching process. Many students have adequate academic expectations and skills to successfully pursue technical degrees in a university setting but demonstrate certain limitations due to poorer emotion modulation and effective communication skills. Developing student participation expectations and behaviors could serve as an intervention strategy for improving these skills, given the short duration of technical degree programs. Future lines of research may explore this relationship further. That said, the use of convenience sampling in this study poses some limitations and makes it difficult to generalize the results beyond this sample.

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Contribution of each author

Nelson Castro: conceptualization (60%), methodology (80%), formal analysis (50%), writing original draft (50%).
Ximena Suárez-Cretton: conceptualization (40%), formal analysis (50%), writing original draft (50%).
Nicolás Pareja Arellano: methodology (20%), data curation.

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