

Retention and Success in Vocational Education: a systematic review

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ABSTRACT – Retention and Success in Vocational Education: a systematic review. The objective of this article is to systematically review the national literature on retention and success in Technical and Vocational Education and Training. The methodological characteristics, the determining factors and the actions developed to promote the retention and success of the students were analyzed. The search comprises articles from 2012 to 2021 in the databases CAPES Periodicals Portal, IEEE Digital Library, Scielo, Science Direct, Scopus and Taylor & Francis. After excluding the studies that did not meet the search criteria, 24 articles remained. The analyses revealed that the topic is still a research gap. From the point of view of educational management, this study reinforces the need to implement policies and programs for retention and success.

Keywords: Vocational and Technological Education. Student Assistance. Educational Management. Public Educational Policies. Scientometrics.

RESUMO – Permanência e Êxito na Educação Profissional: revisão sistemática. O objetivo do artigo é revisar sistematicamente a literatura nacional sobre permanência e êxito na Educação Profissional e Tecnológica. Foram analisadas as características metodológicas, os fatores determinantes e as ações desenvolvidas para promover a permanência e êxito dos estudantes. A busca compreende artigos de 2012 a 2021 nas bases Portal de Periódicos da CAPES, IEEE Digital Library, Scielo, Science Direct, Scopus e Taylor & Francis. Após a exclusão dos trabalhos que não atendiam aos critérios da pesquisa, restaram 24 artigos. As análises evidenciaram que o tema ainda é uma lacuna de pesquisa. Do ponto de vista da gestão educacional, esta pesquisa reforça a necessidade da implantação de políticas e programas de permanência e êxito.

Palavras-chave: Educação Profissional e Tecnológica. Assistência ao Estudante. Gestão Educacional. Políticas Públicas Educacionais. Ciëntometria.

Initial Considerations

The theme of *retention and success* has become a concern for school administrators. Access to education alone does not guarantee the retention and success of students in school, and public policies and effective educational actions are necessary. Only when the drop-out and non-completion rates are effectively fought by educational institutions will it be possible to maximize the results of educational policies for professional and technological education (Silveira; Gonçalves; Maraschin, 2017). Considering that one of the objectives of the Federal Institutes (IFs) is the promotion of social justice and equity (Brasil, 2010), understanding the relationship between the perspective of professional education and the student population targeted by these guidelines is relevant and necessary.

Therefore, there is a need to strengthen the conditions of student access, success and retention in school, as well as the development of strategies for the integration of different educational institutions in society. The definition of a quality school is not limited to a single standard or formula.

With the federal expansion of Technical and Vocational Education and Training (TVET) to the interior of the country (Brasil, 2008), the provision of free public education with access for all overcame the precarious condition of previous historical experiences, especially initiatives linked to the Federal Education system. With this increase in the number of places for TVET and with the offer of a public education that is intended to be omnilateral and universal, from basic education to graduate school, it is essential to investigate how this paradigm shift has occurred in Brazil. The vocational education network historically aimed at the less privileged has undergone a remarkable transformation, becoming a reference of excellence).

For this reason, it was decided to conduct a survey in the literature of reference in studies that address the theme of retention and success in TVET. The objective of this study was to systematically review the literature on retention and success in TVET. The methodological characteristics, determining factors and actions developed to promote the retention and success of the students were analyzed. The present text initially briefly presents reflections on retention and success in TVET and then presents the methodology used to build the research protocol, with the steps for obtaining data from the literature search. The results obtained and the discussion of the retrieved studies regarding the understanding of the subject produced in this field of study are subsequently presented, and the final remarks are presented.

Reflections on retention and success in Technical and Vocational Education and Training

TVET is key to driving innovation, empowering individuals and promoting economic and social advances. Thus, this context directly

influences the training of students for an integrated practice contextualized to the current educational demands (Mota; Araújo; Santos, 2018).

As of 2003, the issue of student retention began to be treated as an object in education and teaching policies, as it was at that time that increased investment and focus on student assistance occurred in Brazil (Stolf, 2014). In this sense, it is essential to include student assistance in the training of students. Managers and the school community should reflect on their practices, conceptions of TVET, retention, success and comprehensive training (Silveira; Maraschin, 2019). According to the sole paragraph of Decree No. 7,234/2010, student assistance must be alert to the needs of students, contributing to their retention and success in the academic environment. Thus, the actions taken by the assistance seek to provide students with equal opportunities. The non-completion of students can be influenced by several factors, including failure/non-completion, difficulty in reconciling work and studies, transportation, access to school and strikes/stoppages, gender issues, factors external to the school and pedagogical practices that disagree with the reality of students, which are also major obstacles to their retention in school (Rezende; Sousa; Assis, 2022; Balta, 2017).

When students enter a school institution, they carry numerous expectations regarding the school and different expectations in society. According to the OECD (1998), school failure can be identified in three stages: it begins when the student performs below average and needs to redo a school year; the second moment occurs in the period in which he ends up dropping out of the school system before completing compulsory education; and, finally, when this failure is reflected in professional life owing to a lack of basic information that should have been given at school. However, students feel cheated in their social and knowledge aspirations due to the negative attitudes of the School, which frustrates the student in his anxieties (Bourdieu; Champagne, 1998). Therefore, access to education does not ensure the retention of students in the institution, and it is necessary to create a bond for these individuals to overcome this vision of dropout.

School retention is a principle of education, guaranteed in article 206 of the Federal Constitution of 1988 and ratified in article 3 of the Law of Directives and the Base of National Education - LDB 9394/96. The primary focus of this study is TVET, in which high dropout rates are found. Data on the academic efficiency index of the Federal Institutes on the Nilo Peçanha Platform (Brasil, 2020b) indicate that the *dropout rates in the cycle* were 50.31% in 2017, 49.4% in 2018 and 43.17% in 2019 for all courses offered. Currently, school failure is a challenge for the quality of education and imposes individual, family and social difficulties (Pezzi, 2017). On the basis of this preliminary analysis, the relevance of exploring in depth how academic research on the retention and success of students in TVETs is being developed. Next, the methodological procedures of the research will be explored.

Methodological Procedures

To meet the objective of this study, we reviewed the literature via a systematic literature review (SRL). We sought to understand the current situation of scientific publication with a focus on the retention and success of TVET in Brazil. The inclusion and exclusion criteria were followed to assist in the selection of data related to the proposed objective (Kitchenham; Charters, 2007).

This review was structured and conducted with the support of *Parsifal*¹, a free tool that aims to assist researchers in conducting SRL.

The period considered for the RSL was from January 2012 to December 2021, allowing an analysis of current and relevant publications, constituting the state of the art on the subject. The search for studies was performed in April and May 2022, and the analysis was conducted from May to September of the same year. As the study was conducted in the first half of 2022, publications related to that year were not considered in the systematic review. 11,892/2008, which provides for the constitution of the Federal Institutes of Education, Science and Technology and the reorganization of the Federal Network of Technological Education (Brasil, 2008). Two years later, Decree No. 7,234/2010 established that student assistance must be attentive to the needs of students, helping their retention and success in the academic environment. Thus, the actions conducted with assistance seek to provide students with equal opportunities to stay in school (Brasil, 2010).

The literature search was conducted in six databases with the keywords *vocational education* OR *technical education* OR *technical schools* OR *Instituto Federal* AND *Retention* OR (success). In *IEEE Digital Library*, *Scielo*, *Science Direct*, *Scopus*, *Taylor & Francis Online* and *CAPES Periodicals Portal*, the search strings *Professional Education* OR *Technical Education* OR *vocational education* OR *Technical Schools* OR *Federal Institute* AND *Retention* OR *Success* were used. The search was performed considering title, abstract and keywords, answering the following questions: (Q1) What are the methodological characteristics of the studies? (Q2) What are the factors associated with the retention and success of students in TVETs? (Q3) What actions were developed for the students' retention and success in TVET?

To prepare the questions and structure the search in the selected digital libraries, the criteria *Population*, *Intervention*, *Comparison*, *Outcome* and *Context* (PICOC) (Kitchenham; Charters, 2007) were used as follows:

(P) *Population*: Primary peer-reviewed scientific articles addressing retention and success in TVET;

(I) *Intervention*: Bibliometric research in the context of TVET in Brazil;

(C) *Comparison*: This does not apply because the objective is not to make a comparison but to characterize it;

(O) *Output*: Construction of a base of variables or factors, retention actions and results identified in the articles surveyed in the literature; and

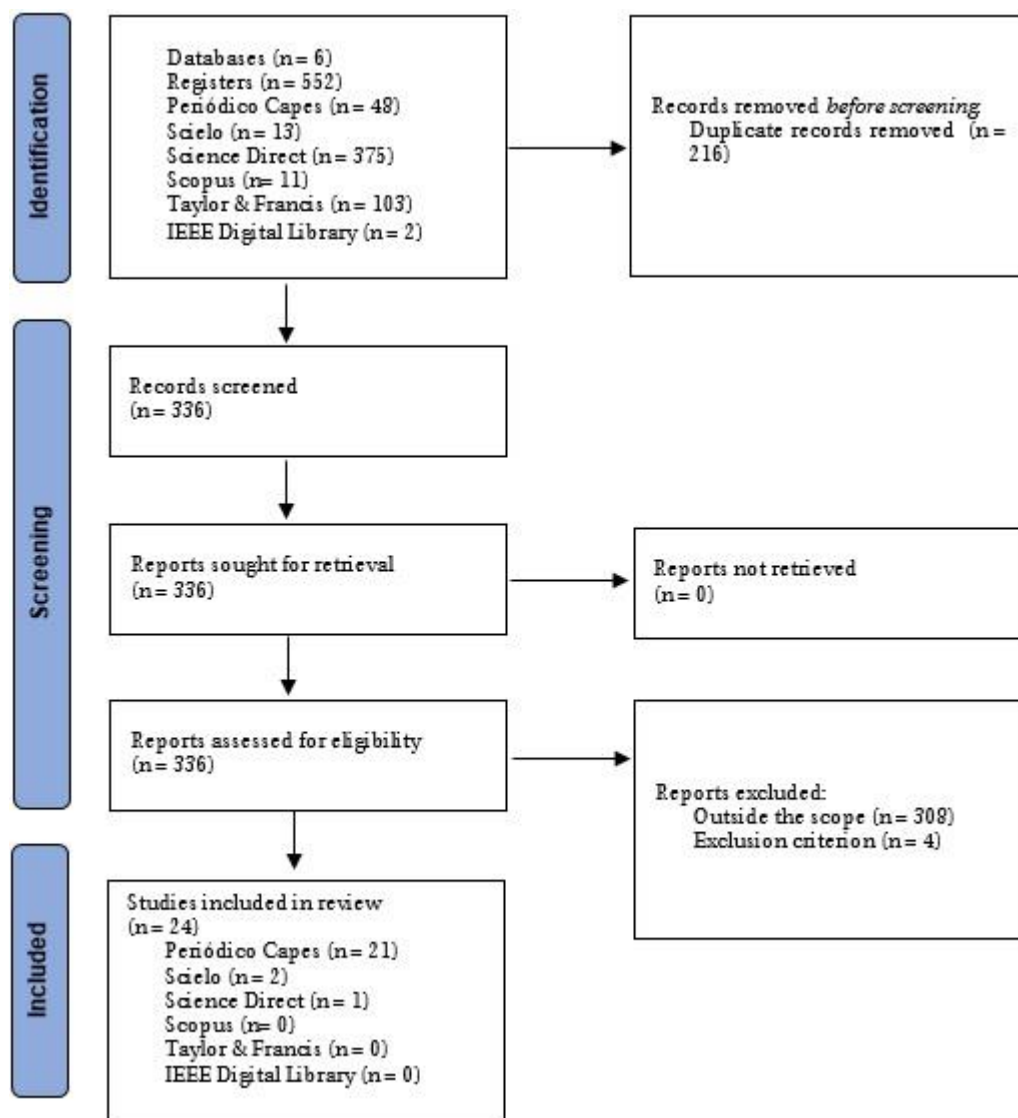
(C) *Context*: Brazil.

The final searches returned 552 texts (Figure 1). The following inclusion criterion was used: *CI1*. Publications within the scope of the study; and *CI2*. In Portuguese or English. The exclusion criterion was *EC1*. Context other than Brazil; *EC2*. Publication before 2012; *EC3*. Studies published in 2022; *EC4*. Studies that were not peer-reviewed; *EC5*. Gray literature (books, book chapters, technical reports, theses, dissertations, undergraduate thesis, monographs, editorials, reviews, among others); *EC6*. Duplicate publications; *EC7*. Publications that are not within the scope of the study; *EC8*. Articles that were not available; and *EC9*. *Short paper* with four pages or fewer.

Regarding the preliminary selection procedure, the first filter involved the automated removal of duplicate studies (*EC6*). The second filter was applied on the basis of the reading of the title and abstract. In these two stages, studies in the context of TVET that addressed retention and success were considered. Disagreements were discussed among the study authors to evaluate the inclusion of the article. For each study, one of the inclusion or exclusion criteria was presented.

After the filter, which constituted the final selection procedure, the remaining articles of the preliminary selection were read completely. Thus, this phase aimed to perform a more detailed analysis of the studies, identifying and extracting data according to the inclusion and exclusion criteria. Figure 1 shows the selection process of the retrieved articles and the final sample in each database via Prisma 2020 flow diagram.

Figure 1 – Steps for selection – Prisma 2020



Source: Authors (2022).

After applying the inclusion and exclusion criteria for the selection of studies, a total of 552 articles were initially found, but when the first filter was applied, 216 duplicate studies were removed, leaving 336 articles, of which 308 were rejected because they were not within the scope of the study. When performing the 2nd filter, 28 articles remained, and when performing the 3rd filter, we obtained a total of 24 selected articles, which constituted the analyzed sample.

After planning and selecting the articles, the data extraction process was performed by fully reading each of the selected studies. For extraction, the strategy of providing a set of possible responses was adopted. Fernandez, Insfran and Abrahão (2011) stated that this strategy ensures the application of the same data extraction criteria for all selected studies, in addition to facilitating classification.

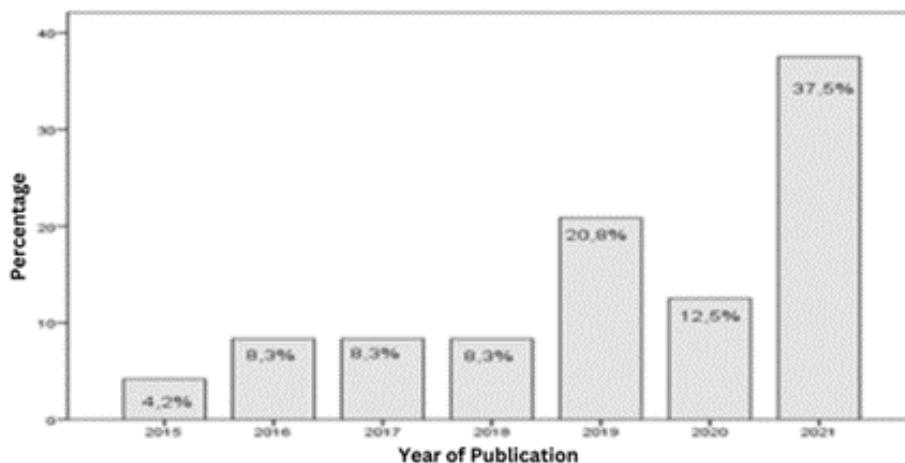
On the basis of the objective and protocol of this review, the following data were extracted from each article approved by the final selection process (3rd filter): publication vehicle, year of publication, study institution, research approach, study type, main method of data analysis, main research technique, main data collection technique, which factors are associated with student retention and success, what actions were developed to promote retention, in which region of the country it was performed and the modality of the technical courses studied.

To assess the methodological quality of the articles, the risk of bias was used in the qualitative studies included in the checklist called *the Critical Appraisal Skills Program* (CASP). Each study was scored according to three categories: a) low quality (one star; 0–3 points); b) moderate quality (two stars; 4–7 points); and c) high quality (three stars; 8–10 points) (CASP, 2018). Quantitative studies were evaluated via the 27-item Downs and Black scale (Dixon et al., 2006), which we adapted for studies in the field of social sciences and humanities, and each item was evaluated on a scale (0–10 points) (Muthuri et al., 2014). Thus, a quality score was calculated for each study, which was expressed as a percentage relative to the maximum possible score. In summary, studies with scores $\geq 70\%$ are considered to have a low risk of bias (Downs; Black, 1998).

Results and Discussion

In response to research question Q1, what are the methodological characteristics of the studies? Figure 2 shows the time evolution of the studies. The years 2019 and 2021 stood out. The years 2015, 2016, 2017, 2018 and 2020 had the lowest number of articles.

Figure 2 – Temporal view of the articles selected in the RSL



Source: Authors (2022).

The main publication vehicle on the subject was the journal *Cadernos Cajuína*, with 12.5% of the results found. The journals *Holos*, *Revista Brasileira de Educação e Saúde* and *Revista Brasileira da Educação Profissional e Tecnológica* had the same percentage (8.3%) of published articles, representing the main discussion forum on the subject.

Table 1 shows the educational institutions that provide TVET and that were mentioned in the sample. The most mentioned organization was the Federal Institute of Santa Catarina. The Federal Institutes are the personification of a vanguard project that conceives of education as an instrument of social transformation (Pacheco, 2015). The Federal Institutes provide free technical training that allows their students to understand the scientific and technological bases that underlie modern production while revealing the power relations ensured by the capitalist mode of production (Mota; Araújo; Santos, 2018). The integrated offer of secondary education is a possibility for the children of the working class because it is based on omnilateral education; that is, it allows for the formation of all human capabilities and a critical understanding of the reality and world of work.

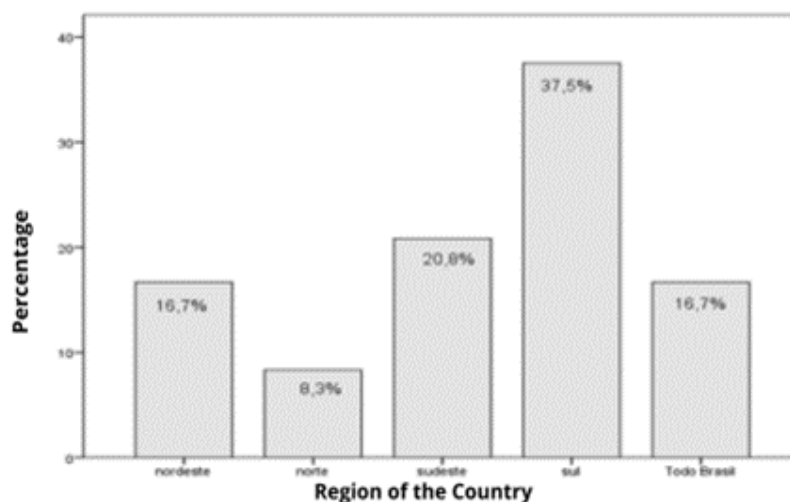
Table 1 – Study Institution

INSTITUTION	FREQUENCY	PERCENTAGE
Federal Institute of Rio de Janeiro	1	4,2
Paulo Petrola State School of Vocational Education	1	4,2
Federal Institute of Rio Grande do Norte	1	4,2
Federal Institute of the South-Rio Grande do Sul (IFSul)	1	4,2
Farroupilha Federal Institute	1	4,2
Federal Institute of Ceará	2	8,3
Federal Institute of Minas Gerais	2	8,3
Federal Institute of Rio Grande do Sul	2	8,3
Federal Institute of Rondônia	2	8,3
Federal Institute of São Paulo	2	8,3
Federal Institute of Santa Catarina	4	16,7
Unidentified	5	20,8
Total	24	100,0

Source: Authors (2022).

The federal institutes of Rondônia, Minas Gerais, São Paulo, Ceará and Rio Grande do Sul were research loci in two articles each, with 8.3% of the findings. The Federal Institute of Santa Catarina stood out for having the largest number of studies related to the research scope, with 16.7% of the texts. The other organizations had only one study. Finally, a total of five studies did not identify the institution in the studies studied.

Figure 3 depicts the geographical regions of the institutions that conducted the most studies related to the scope of this study. This sample does not necessarily reflect Brazilian diversity, only the *locus* found in the Brazilian scientific production on the subject. It is possible to verify a higher incidence of studies in the South Region, with 37.5%, than in the other regions. The Center-West region did not appear in the study sample. There is a regional division in the areas of courses offered due to the policies of expansion and internalization of the Federal Universities and Federal Institutes (Barbosa; Campos; Firmino, 2015). Thus, in the North, Northeast and Central-West Regions, the open courses are aimed at teaching education programs, whereas in the Southeast Region, the courses focus on science and technology, and in the South Region, the courses are focused on engineering. That is, on the richest axis of the country, the courses are geared toward production, and in the less productive regions, the courses are focused on teaching education.

Figure 3 – Regions of the country where the survey was conducted

Source: Authors (2022).

Table 2 shows the distribution of the modalities of the technical courses presented in the selected articles. When this distribution is analyzed, there is a greater concentration in the integrated technical and secondary education, with 45.8% of the courses. This result is coherent from a normative point of view, considering the repeal of Decree n.º 2.208/97 and the approval of Decree n.º 5.5154/2004, it is understood that one of the purposes of the Federal Network TVET would be the priority offered by the integrated technical and secondary (Brazil, 2008). The 2019 School Census of Basic Education, conducted by the National Institute for Educational Studies and Research Anísio Teixeira (INEP), presented data that show the growth in enrollments in TVET, the form integrated with secondary education, which increased by 38.6 thousand (6.6%) students, and the subsequent form, taken after completion of the secondary school, with 68 thousand more enrollments (7.6%) in the year (Brazil, 2020a).

Table 2 – Which modality is studied in TVET

WHICH MODALITY OF THE TECHNICAL COURSES STUDIED	FREQUENCY	PERCENTAGE	ACCUMULATIVE PERCENTAGE
Integrated technical and secondary	11	45,8	83,3
Indefinite	7	29,2	37,5
All Modalities	2	8,3	100,0
Subsequent	1	4,2	91,7
Integrated technical and secondary, Subsequent	1	4,2	87,5
FIC	1	4,2	8,3
Concomitant	1	4,2	4,2
Total	24	100,0	

Source: Authors (2022).

Table 3 presents the evaluation of the methodological quality and risk of bias of the SLR studies using the CASP and Downs and Black techniques.

Table 3 – Evaluation of the methodological quality of the included studies (n=24)²

Study (year)	Conflict of Interest was reported?	Has ethical approval been reported?	Downs & Black checklist											Total (0–10)	Score (%)	
			Section A					Section B		Section C						
			01	02	03	07	10	11	12	16	18	20				
QUANTITATIVE (n = 3)																
01 Falco; Oliveira (2021).	No	Yes	1	1	1	1	0	1	1	0	1	1	8/10	80%		
02 Oliveira; Oliveira (2019).	No	No	1	1	1	1	0	1	1	0	1	1	8/10	80%		
03 Franzin; Almeida (2015).	No	No	1	1	1	1	0	0	0	0	1	1	6/10	60%		
MISTO (n=1)																
04 Siebert et al. (2021). **	No	No	1	1	1	1	0	1	1	0	1	1	8/10	80%		
Study (year)	Conflict of Interest was reported?	Has ethical approval been reported?	CASP checklist											Total (0–10)	Score (star)	
			Section A					Section B		Section C			Total (0–10)			Score (star)
			01	02	03	04	05	06	07	08	09	10				
QUALITATIVO (n=20)																
05 Zibenberg; Gil (2018).	No	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes		8/10	☆☆☆		

Retention and Success in Vocational Education							
06	Costa; Silva (2021).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes	9/10 ☆☆☆
07	Júnior; Silva; Marques (2017).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes *	9/10 ☆☆☆
08	Lorenzet et al. (2021).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes	9/10 ☆☆☆
09	Karasinski (2019).	No	No	Yes Yes Yes Yes Yes	Yes No	No Yes	8/10 ☆☆☆
10	Costa et al. (2020).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes *	9/10 ☆☆☆
11	Galasso; Santos (2021).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes *	9/10 ☆☆☆
12	Marinho; França (2020).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
13	Moreira; Lambert; Castro (2018).	No	No	Yes Yes Yes Yes Yes	No No	No Yes *	8/10 ☆☆☆
14	Mendonça; Granddaughter (2021).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes	9/10 ☆☆☆
15	Sales; Vasconcelos (2016).	No	No	Yes Yes No Yes Yes	Yes No	No Yes	7/10 ☆☆
16	Silveira et al. (2017).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes *	9/10 ☆☆☆
17	Oliveira (2021).	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes	9/10 ☆☆☆
18	Vilaronga et al. (2021).	No	No	Yes Yes Yes Yes Yes	No No	Yes Yes	9/10 ☆☆☆
19	Prado; Leite (2019).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes	10/10 ☆☆☆
20	Ramos Neto (2019).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
21	Chaves et al. (2020).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
22	Silveira (2019).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
23	Spricigo; Silva (2016).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
24	Prada; Costa; Bertollo-Nardi (2021).	No	Yes	Yes Yes Yes Yes Yes	Yes Yes	Yes Yes *	10/10 ☆☆☆
MISTO ($n=1$)							
25	Siebert et al. (2021). **	No	No	Yes Yes Yes Yes Yes	Yes No	Yes Yes	9/10 ☆☆☆

Source: The authors (2024).

The second guiding question (*Q2*) is as follows: What are the factors associated with the retention and success of students in Federal Institutes? Chart 1 shows the main factors classified into the social, economic, cultural, individual, internal and external dimensions of the educational institution.

Chart 1 – Retention/success factors

FACTORS THAT AFFECT THE RETENTION AND SUCCESS OF STUDENTS		
FACTORS	VARIABLES	AUTHORS
Social	Diversity/socioeconomic Historical, social, cultural and political construction Inequality relations Economic crisis National and international context	Gomes (2012)
Economic	Socioeconomic family income Individual performance Academic success	Rezende and Candian (2012) Couri (2010) Alves e Soares (2007)
Cultural	Ability to teach Professional education Different economic, social and cultural contexts.	Machado (2008)
Individuals	Experience Low motivation in educational and vocational terms;	Peron, Bezerra and Pereira (2019)
Internal to the institution	Teaching and learning process Physical structure/facilities and equipment Teacher–student relationship Governability of the institution.	Falco e Oliveira (2021)
External to the institution	Family Incompatibility with working hours Financial difficulties.	Falco e Oliveira (2021)

Source: Authors (2022).

Given the responses presented in Chart 1 concerning the factors of retention and success, it is possible to classify the factors and dimensions that are interrelated with the student's school life. Thus, we identified factors that influence the retention and success of students, the most frequent being related to the social, economic, cultural, individual, external and internal dimensions of the institution. It is necessary to analyze dropout as a complex network that involves the issues of retention and success, which can interrupt the student's journey in his school journey (Costa; Silva, 2021). Dropout can contribute to the maintenance of the *status quo* and social inequality, thus making the enjoyment of the right that allows for social mobility and advancement, which is education, more distant. Thus, these factors are similar, which demonstrates a problem present at the national level. Therefore, in addition to local strategies, it is necessary to think of strategies that include educational and social public policies that address the entire Federal Network.

Next, the guiding question (Q3) is as follows: What actions were developed for the retention and success of students in TVET? For this question, Chart 2 summarizes the results found in the actions developed in the institutions in the context of the research and study.

Chart 2 – Developed Actions

ACTIONS	RESEARCH <i>LOCUS</i>	REFERENCES
Institutional Development Plan	Federal Network	Zanin (2019)
PNAES	Federal Network	Brasil (2010)
Institutional Strategic Plan for Retention and Success	Federal Network	Oliveira and Oliveira (2019)
Public policy for social inclusion	Federal Network	Galasso e Santos (2021)
Institutional Policies	Federal Network	Galasso e Santos (2021)
Pedagogical Practice	Federal Network	Sales and Vasconcelos (2016)
Teacher training	Federal Network	Tardif (2002), Saviani (2011)
Informative works on actions developed in the institution	Federal Network	Oliveira and Oliveira (2019)

Source: Authors (2022).

Chart 2 refers to the references of the actions found. Thus, in some studies, institutional actions and strategies were identified to combat school dropout, with the goal of increasing the completion rates of courses. In summary, to alleviate this problem, there is a need for institutional work aimed at the axes of retention and success, with the guidance of a plan of actions/goals/strategies involving all educational agents. The history of TVET is marked by the absence of actions to promote school success (Zanin, 2019). Therefore, there is the challenge of institutionalizing actions of retention and success within the scope of school management.

We emphasize that the dropout problem is not only Brazilian; the decrease in the high rates of early school leaving stands out as one of the main challenges faced by educational systems in Europe (European Commission, 2011; Salva-Mut et al., 2014). There is a set of recommendations related to professional education programs, covering aspects such as offers, curricula, entry requirements, connections with job opportunities, internships and evaluations of what is offered. These recommendations indicate that updating educational programs and reassessing existing ones would be quite beneficial (Cerdeña-Navarro; Sureda-Negre; Comas-Forgas, 2017).

The Federal Network seeks to comply with the public policy of social inclusion, comply with legislation, respect the quota system in its selection processes, ensuring that 50% of vacancies are reserved for students graduating from public schools, 45% for open competition and 5% for candidates with disabilities (Galasso; Santos, 2021). Consequently, significant pedagogical practice stems from the demand for critical reflection on the world of work, the social relationships that are formed in production, the precariousness of jobs, the exploitation of the young workforce and the creation of underemployment (Sales; Vasconcelos, 2016).

Notably, to reduce dropout rates in TVET, it is important to review and adapt class schedules so that they are more flexible for stu-

dents, the distance traveled to attend school, disciplinary systems that are not punitive, the proportions of student-teachers, and the creation of management teams that develop strategic plans to prevent dropout (Cerdeira-Navarro; Sureda-Negre; Comas-Forgas, 2017). The performance of teachers affects the retention of students in technical-level TVET (Souza; Cardoso; Sousa, 2023). In this sense, it is necessary to rethink the training of teachers, starting from the day-to-day, from a particular context of action (Tardif, 2002). It is unlikely to address the issue of teacher training without addressing, at the same time, the issue of teaching conditions because these aspects go together (Saviani, 2011). There is also a need to disseminate the factors that cause truancy and the ways to address it, as this may contribute to improving the evidence of school retention and success (Oliveira; Oliveira, 2019).

The following institutional strategies were identified in the studies to ensure the retention and success of students: the Institutional Strategic Plan for Retention and Success; Institutional Policies; Public and Inclusive Policies for Education; and the National Student Assistance Program, (*Programa Nacional de Assistência Estudantil* - PNAES), among others. Greater investment in vocational education programs is directly related to a significant increase in secondary school completion rates by students, whereas lower investments tend to increase the chances of dropout (Arum, 1998).

The Brazilian Federal Court of Accounts, through Decision 506/2013, recommended that various institutions offer TVETs the development of actions and strategies to combat school dropout, with the goal of increasing the completion rates of courses. As a result, the Federal Institutes prepared strategic plans for retention and success aimed at mitigating school dropout and, consequently, expanding retention and success in these institutions (Brasil, 2013). Another issue raised by the aforementioned decision was with respect to the PNAES, i.e., the monitoring and need to adapt this program for the retention and success of students, especially those at risk of dropping out of courses (Brasil, 2013).

Reducing school dropout rates is a challenge faced by the education sector globally (Mduma; Kalegele; Machuve, 2019). We can learn from some strategies used in an international context. With the evolution of information and communication technologies, several strategies can be used as support, such as the development of predictive models of dropout (Tete et al., 2022; Tan; Shao, 2015). Georgia State University has a system that performs a kind of *chatbot nudging* (nudging) academic and administrative information and reminders for students and family members (GSU, 2017).

In addition to the prediction models, there is evidence of student support strategies such as peer tutoring in addition to traditional ones. The MAAPS (*Monitoring Advising Analytics to Promote Success*) project is a study conducted at several American universities. The experiment focused on low-income students who were the first in their

family to attend a university degree. The study was conducted at 11 U.S. universities that are part of a network called *the University Innovation Alliance*, under the leadership of Georgia State University, with a strategy of peer tutoring and interventions with topics in addition to support in the discipline. (Alamuddin; Rossman; Kurzweil, 2018) . In the same vein, and in the American context, the effect of tutoring on the retention and completion of the course was tested through tutoring to support students in the development of skills such as time management, the definition of objectives and study routines. Student participation in tutoring has a positive effect on the retention and completion of a course (Bettinger; Baker, 2014).

In Denmark, strategies to strengthen the relationship between students and school stand out, including interaction with the school environment, support offered to the student, connection with teachers and appreciation of the teaching career (Andersen et al., 2018). . Another interesting example is Dutch community technical schools, which are characterized by a combination of three main activities: collaboration with external organizations, parental involvement and the promotion of extracurricular activities (Devos, 2010). This community educational model was more effective than traditional schools in combating truancy.

Final Considerations

The present systematic review made it possible to understand, through the recent literature, the retention and success of TVETs on the basis of Brazilian research publications. According to studies of the analyzed sample, the subject still needs to be better addressed. Another point that stands out refers to the modalities of the technical courses, and it is possible to observe that they are distributed throughout the national territory. However, it was clear that the data for the subsequent technical courses are less researched than those for the other modalities presented.

Regarding geographic regions, the Midwest region was not mentioned in any text. Although this result does not reflect Brazilian diversity, it confirms the statement by Barbosa, Campos and Firmino (2015) that there are regional discrepancies. This study indicates that there are gaps in the literature with respect to the rights of access, retention and success and that there is a need to implement Retention and Success Programs, which are specific Public Policies on the subject, among other initiatives in all Federal Institutes of Brazil. that aim to guarantee to all who join the Federal Network not only access education but also retention and success.

Access and retention in the educational system are obstacles that both students and educational institutions in Brazil must overcome to succeed in the chosen course (Ribeiro, 2020). After all, it is not enough just to enter the desired education; it is crucial to ensure, through public policies and organizational strategies, that students remain on the academic path until they complete the course. This in-

volves integrated and complementary initiatives aimed at reducing socioeconomic inequalities. In this context, Souza, Cardoso and Sousa (2023) present that TVET faces a major challenge, as it is necessary to offer young people an integrated curriculum and pedagogical strategies that promote a critical reading of reality. This approach should allow for the development of full citizenship, enabling them to interpret the world and act in an analytical manner.

As mentioned by Antunes (2018), student assistance aims to increase the conditions that allow students to remain in federal public education. To this end, initiatives are implemented in areas such as food, housing, transportation and digital inclusion, among others. Therefore, actions are recommended that promote retention and success in institutions in an effective and meaningful way so that TVET continues with the mission of training students (professionals) prepared for the job market from an omnilateral perspective. Education is a key factor for participation in the labor market and society (Schuller, 2018).

Despite all the care taken in the SLR protocol, there may be bias in the choice of bases and in the inclusion and exclusion criteria. Other choices could include studies not captured in our method. In this sense, we suggest, for future studies, the expansion of the databases and the insertion of studies in a broader, international context. Some of the analyzed studies do not explicitly present some methodological, contextual and teaching modality variables; in addition, few inferential quantitative studies on the subject exist, and the quantitative studies found were merely descriptive. We therefore suggest quantitative studies that deepen the analysis of dropout factors for a predictive and proactive analysis by managers³.

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Notes

¹ Available at: <https://parsif.al/signup/>. Acesso em: 11 jan. 2023.

² Note: Downs and Black checklist - Section A assesses reporting: 01 (is the hypothesis/objective of the study clearly described?), 02 (are the outcomes to be measured clearly described in the introduction or methods section?), 03 (are the characteristics of the study participants clearly described?), 07 (does the study provide estimates of the random variability of the data of the main findings?), and 10 (are 95% confidence intervals and/or p-values reported for the main results, except when the $p < 0.001$?); Section B assesses external validity: 11 (was the sample representative in relation to the population from which they were recruited?) and 12 (was the sample containing the participants selected in such a way that it was representative in relation to the entire population from which they were recruited?); and Section C assesses internal validity: 16 (were any of the study results based on 'data dredging' and was this reported transparently?), 18 (were the statistical tests used to assess the main results appropriate?), and 20 (were the measures of the main results accurate?). Questions 04, 05, 06, 08, 09, 13, 14, 15, 17, 19, and all of Section D were not suitable for studies in the field of Social Sciences and Humanities, so they were disregarded in this evaluation. CASP, Critical Appraisal Skills Programme Qualitative Research Checklist. The qualitative studies were classified as low (one star: 0-3 points),

medium (two stars: 4-7 points) and high quality (three stars: 8-10 points). * Question 10 of the CASP (what is the value of the research?) was answered. ** The data contained in rows 04 and 25 refers to the same study, evaluated from both perspectives, as it is a mixed study: Downs and Black and CASP.

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