

Professional apprenticeship programs: a study of permanence and success indicators

Marcel Ribeiro Mendonça¹

Maria de Lourdes da Silva Neta²

¹ Teacher of basic, technical and technological education at the Federal Institute of Ceará, Pecém advanced campus. Specialist in Teaching in Vocational and Technological Education (IFCE), Master in Electrical Engineering (UFC/2014). Orcid: <https://orcid.org/0000-0003-0833-7217>.

² Teacher of basic, technical and technological education at the Federal Institute of Ceará, Maranguape campus. Specialization in Distance Learning Planning, Implementation and Management (UFF/2015), PhD in Education (UECE/2018). Orcid: <https://orcid.org/0000-0002-3726-4806>.

Received for publication on: 4.27.2021

Approved on: 8.3.2021

Abstract

Professional apprenticeship programs (Young Apprentice Program), within the scope of the Federal Network of Professional, Scientific and Technological Education, have been implemented with increasing frequency. According to Villar and Mourão (2018), these programs tend to increase employability and the perception of self-efficacy of participating adolescents and young people. In addition, the possibility of omnilateral training provided by federal institutes, pointed out by Mota, Araújo and Santos (2018), and the difficulty of inserting young people into the world of work, studied by Pfaffenseller (2014), make these institutions a strategic element in strengthening the public policy. In the Federal Institute of Education, Science and Technology of Ceará (IFCE), the program has been implemented as of 2017 at the Pecém and Caucaia campuses. However, the literature presents references such as those by Silva, Dias and Póvoas (2017) and Santos, Tavares and Silva (2018) with considerations on the implementation of this program in earlier terms. As a way of contributing to the investigation of the impact of implementing the program, this work presents a study of permanence and success indicators of IFCE students, with emphasis on those who participated in the Young Apprentice program. The permanence and success indicators were evaluated through an electronic form applied to students from two technical courses of the campus. The results show that the implementation of this type of prospect is a relevant instrument for improving the permanence and success indicators in technical courses, especially when the institution itself is positioned as the training entity of the apprenticeship program.

Keywords: Young Apprentice Program; Apprenticeship Law; training for work.

Introduction

Professional apprenticeship is provided for in Decree-Law 5.452/1943 (Consolidation of Labor Laws), and is intended for “methodical technical-professional training, compatible with their physical, moral and psychological development” (BRAZIL, 1943) of adolescents and young people, developed through “theoretical and practical activities, methodically organized in tasks of progressive complexity developed in the work environment” (BRAZIL, 2000). It is understood, therefore, that the methodical and progressively complex training provided for in the legislation refers to the existence of progressiveness in the theoretical and practical contents addressed, in the pedagogical strategies for monitoring and evaluating the student – both in the school environment and at work – and in the adherence of the programs to a pedagogical project that enables going beyond the insertion of the individual in the world of work. It is a technical training that also aims to promote humanized and socially referenced education, providing social, cultural and economic integration, in synergy with the program’s own objectives.

Companies are increasingly seeking to include apprentices in their staff, to the detriment of interns, especially in high school and technical education levels. In addition to the interest of companies in training new talent, this demand arises from the requirement established by Law No. 10.097/2000 (BRAZIL, 2000), which stipulates the hiring of a minimum of 5% of its technical staff as apprentices. On the other hand, Law No. 11.788/2008 (BRASIL, 2008) (Internship Law) establishes a maximum number of interns, which induces the company to seek, first, compliance with the so-called “apprenticeship quota”, and in a second moment proposing the creation of internship vacancies.

Furthermore, the legal relationship between employer and apprentice is mediated by the so-called apprenticeship contracts. These special documents were created by Law No. 10.097/2000 (BRAZIL, 2000), and regulated by decrees 5.598/2005 (BRAZIL, 2005) and 9.579/2018 (BRAZIL, 2018), allowing young people over 14 and under 24 years old to develop, for up to two years, methodical technical-professional training activities compatible with their physical, moral and psychological development. Apprentices, in turn, undertake to perform, with care and diligence, the tasks required for this training and, in addition to having their employment record book signed, have the right to receive a salary proportional to the hours worked, labor rights such as transportation vouchers, FGTS (Government Severance Indemnity Fund for Employees), vacations concurrent with the school periods, working hours adequate to school hours and not exceeding six hours a day or 25 hours a week (BRAZIL, 2018).

The strengthening of state and federal networks of professional and technological education observed since 2008 brought an expansion in the number of enrollments and greater diversity in the offer of courses (GONÇALVES, 2014). Both article 30 of the CLT (Consolidation of Labor Laws) and Decree 9.579/2018 (BRAZIL, 2018)

Currently, IFCE has 35 units installed in all regions of Ceará

regulated the possibility that technical and agrotechnical schools could act as qualification entities for apprentices. However, with the enactment of Law No. 10.097/2000 (BRAZIL, 2000), the CLT itself began to explicit in its article 430 that only “In the event that the National Apprenticeship Services did not offer enough courses or vacancies to meet the demand of the establishments”, technical education schools, non-profit organizations and sports practice entities could act as training entities. Thus, this training possibility ended up not being so widespread in the Federal Network of Professional, Scientific and Technological Education (RFEPCT).

However, it was observed an increase in the participation of RFEPCT institutions as of 2012, when the then Ministry of Labor and Employment published ordinances 723/2012 and 1005/2013 which, among other aspects, regulated the possibility of recognition of high school technical courses as apprenticeship programs for the purpose of complying with the percentages established in the CLT (BRAZIL, 2013). Thus, these institutions were able to have their technical courses recognized as apprenticeship programs, without the need for them to offer specific professional apprenticeship courses.

Thus, the Federal Institute of Education, Science and Technology of Ceará (IFCE) was one of the self-managed government authorities created by Law No. 11892/2008, which is responsible for promoting free professional and technological education, through teaching, extension, research and innovation actions. Currently, IFCE has 35 units installed in all regions of Ceará, 33 of which are teaching units – in addition to the Dean’s Office and Polo de Inovação Embrapii (Embrapii Innovation Center), both in Fortaleza. According to the Nilo Peçanha 2020 Platform, base year 2019, IFCE has 55,708 enrollments in 735 courses, 224 of these being technical courses. Of these, 59 are offered integrated to high school, two are in the PROEJA (National Program for the Integration of Professional Education with Basic Education in the Youth and Adult Education) modality, integrated to high school, 56 are concomitant and 107 are subsequent, all of which can be adapted to apprenticeship programs.

One of IFCE’s units is the Pecém Advanced Campus, located in the Pecém Industrial and Port Complex (CIPP)¹, which currently has been considered one of the greatest vectors of industrial and logistical development in the state of Ceará. Since its implementation, more than R\$28 billion has been invested, generating approximately 61 thousand direct and indirect jobs, contributing to about 12% of Ceará’s GDP (ASSOCIATION OF THE INDUSTRIAL AND PORT COMPLEX COMPANIES OF PECÉM, 2020).

As it has been typified by the Ministry of Education as an advanced campus, Pecém has a reduced teaching and technical-administrative staff, when compared to other typologies. And by virtue of Ordinance 1.291/2013/MEC, it must prioritize the development of teaching and extension actions, through the offer of technical courses for professional qualification. In this context, the campus has been responsible for training the population of the cities of Caucaia and São Gonçalo do Amarante,

by offering professional qualification courses in various segments, in addition to subsequent technical courses in industrial automation, electromechanics, chemistry, electrotechnics and occupational safety. And as to enhance the employability of its students and graduates, 2018 saw the beginning of the implementation of the Apprenticeship Program in its technical courses in electromechanics and industrial automation (FEDERAL INSTITUTE OF CEARÁ, 2017). In 2019, the campus had 665 enrollments in professional qualification courses and 429 students enrolled in high school-level technical courses in the subsequent modality (BRAZIL, 2020).

During the implementation of Young Apprentice in the technical courses of the campus, it was observed that the apprentice-students used to obtain a good academic performance in relation to the others. In this context, a student is considered to have a “good academic performance” when they tend to maintain grades in periodic evaluations and satisfactory school attendance, and consequently completing their courses in the regular period. On the other hand, students seeking opportunities in apprenticeship programs linked to other educational institutions tended to request withdrawal from their courses at IFCE, giving priority to the Apprenticeship Program.

In view of this, this investigation is guided by the following questions: What is the impact of professional referral actions developed by Pecém advanced campus on the permanence and success indicators of students? Has the implementation of the Young Apprentice program on campus brought improvements in the permanence and success indicators of students? Is it possible to say that the difficulty of entering the world of work is one of the factors causing dropout in subsequent technical courses of the campus?

It was observed that the apprentice-students used to obtain a good academic performance in relation to the others

Thus, the objective of this paper is to investigate the impact on the permanence and success indicators of students in technical courses to which professional apprenticeship programs were linked at IFCE, Pecém advanced campus. Four groups of subsequent technical courses in electromechanics and industrial automation, which were recognized as apprenticeship programs in 2018, were analyzed.

The first section of the paper reviews the history of professional and technological education (PTE) in Brazil, aiming at contextualizing the changes in PTE regulatory frameworks and the country's political and economic scenario. A synthesis of research is also carried out in order to investigate aspects of the interaction between PTE and the world of work, as well as the implementation of professional apprenticeship programs in Brazilian federal public institutions. Next, the methodological aspects of the research will be presented, which allows observing some permanence and success indicators of students. Therefore, the objectives of the paper are revisited while establishing a comparative analysis of the percentages of completion, retention and dropout of students, considering their experience in the world of work and participation in apprenticeship programs.

Theoretical fundamentals

The relationship between work and education is at the heart of the history of the Federal Institutes of Education, Science and Technology. With the creation of the Schools of Apprentices and Craftsmen on September 23, 1909 by the then president Nilo Peçanha, the aim was “not only to train the children of underprivileged people with the indispensable technical and intellectual preparation, but also to make them acquire work habits that are fruitful, which will distance them from ignorant idleness, a school of vice and crime” (BRASIL, 1909). Revisiting the text of this important milestone in Brazilian education allows us to reflect a little on the purposes, characteristics and objectives of federal institutes as professional and technological education entities specialized in the training and qualification of citizens.

Over the years, the Schools of Apprentices and Craftsmen underwent institutional changes, changing their name to Professional Lyceums in 1937, intended for professional training “in all fields and grades”². As of 1942, they were renamed Industrial Technical Schools and offered professional training at a level equivalent to high school. In 1959, they were transformed into self-managed government authorities and called Federal Technical Schools, gaining didactic and management autonomy, which allowed the intensification of the training process of technical labor, which in turn fostered the acceleration of the industrialization process (BRAZIL, 2017).

As of the 1980s, the discussion on work and education gained more notoriety in Brazil, especially due to the exhaustion of mandatory professionalization, implemented by Law No. 5.692/71, and discussions on education and its aspects introduced in the 1988 Constitution. According to Frigotto and Ciavatta (2006), the legislation in force, until then, had promoted a “pedagogical reductionism”, to cater exclusively to the productive sector. As a result, the school assumed the role as trainer of human capital, with curricula based on pragmatism and the immediacy of specialized training. In the meantime, with the approval of the Law of Guidelines and Bases of National Education (LDB) in 1996, the government advanced with this agenda of profound changes in the professional and technological education system, even though it was criticized by different segments of society.

At the same time, between 1978 and 1994, the Federal Technical Schools were gradually transformed into the Federal Centers for Technological Education (CEFETs) and began to offer training at the higher education level – bachelor’s degree and technologist courses. However, after the approval of Law No. 8.948/1998, the construction of new federal schools was prohibited by the Federal Government, a situation that would only be remedied with the approval of Law No. 12.892/2008, which integrated a good part of the CEFETs to the Federal Agrotechnical Schools, originating the Federal Institutes of Education, Science and Technology (GARCIA; DORSA; OLIVEIRA; CASTILHO, 2011). It should be noted that one of the differential elements of this educational network is the constitution of an institutional identity

strongly linked to the establishment of relationships between science, technology, regional and local development and the world of work (BRAZIL, 2017).

In contrast to the importance of Federal Institutes in training for the world of work, the number of unemployed young people in Brazil is still relatively high. According to IBGE (Brazilian Institute of Geography and Statistics), the unemployment rate among Brazilian young people reached 27.1% in the first quarter of 2020, well above the country's general average of 12.2% (AGÊNCIA BRASIL, 2020). This scenario is aggravated by situations such as lack of experience, low education and poor quality of technical-professional training. Furthermore, the International Labor Organization (ILO) has already pointed out that there is a youth employment crisis, requiring urgent actions to promote greater offer and qualification for young workers (PFAFFENSELLER, 2014).

According to Mota, Araújo and Santos (2018), Federal Institutes provide free technical training that provide their students with knowledge on the scientific and technological bases that underlie modern production, while revealing the power relations ensured by the capitalist mode of production. Offers integrated to high school is a possibility for working class children as it is based on omnilateral education, that is, it enables training the human capacities in their entirety and providing a critical understanding about the reality and the world of work.

In light of the foregoing, with respect to the characteristics and objectives of the Apprenticeship Program, Villar and Mourão (2018, p. 2001), explain that

[...] the characteristics and objectives of the program – aimed at the labor insertion supported by the education-work binomial – relate its results to professional development and to an increase in employability and the perception of self-efficacy of the participating adolescents and young people.

Furthermore, Gonçalves (2014, p. 199) also concludes that

[...] it seems to be possible to affirm that apprenticeship is, and should be, better explored as the ideal insertion in the labor market, whatever the social and economic context. By bringing together the education & work binomials; income & social security and labor protection, theoretical & practical activities, it becomes effective and attractive, arousing more and more interest of international organizations due to laudable initiatives that deserve to be known and replicated.

However, it is important to emphasize that professional apprenticeship is a public policy that should not be developed in isolation, and that its implementation will enable the automatic insertion of young people into the world of work. Silva, Dias and Póvoas (2017, p. 64) affirm:

In most cases, this goal was achieved, as seen in this investigation. But, as for others, it did not mean their employability when at the end of the apprenticeship contract. Other actions are also needed, such as an adequate supply of community public facilities for

the provision of public services in the areas of education, culture, sports, leisure, public safety, health and social assistance, among others. Another aspect that we also cannot ignore – and which may have implications as to a greater or lesser employability of young people in the Brazilian labor market – concerns the current socioeconomic and political situation in the country and the measures that will be adopted to improve it.

Therefore, through apprenticeship programs, the student-apprentice can develop competencies and skills relevant to the functions they perform in the companies they work for. Thus, the PJA's pedagogical proposal considers that the teaching-apprenticeship process is enhanced by collective apprenticeship, by problem-situations, which encourage the student's autonomy. In addition, the student develops know how, teamwork skills, as well as essential behavioral aspects for entering the world of work. Finally, the program has an interdisciplinary approach, with a focus on competencies and a procedural evaluation methodology (PFAFFENSELLER, 2014).

In Brazil, some Federal Institutes have already implemented the Apprenticeship Program. It is worth mentioning a relevant case of the Federal Institute of Brasília (IFB), which implemented the program in 2010, through a Technical Cooperation Agreement with the Ministry of Labor. In the IFB's case, about 60% of apprentice-students managed to be hired or received some kind of proposal after completing the program. Consequently, the implementation of the program provided greater approximation to the world of work, especially with the curricular alignment of professional training with the competencies required for the exercise of the profession (SILVA; DIAS; PÓVOAS, 2017).

About 60% of apprentice students managed to be hired or received some kind of proposal after completing the program

Another relevant experience is the case of the Federal Institute of Rio Grande do Norte (IFRN). Since 2015, the IFRN has regulated the apprenticeship programs, which are presented as one of the possibilities of student professional practice in institutional regulations. In 2018, the IFRN had already referred more than 700 young people to the world of work, about 20% of them through the Apprenticeship Program. But, there is still a lack of studies on the positive and negative implications in relation to school dropout and academic performance of these students (SANTOS, TAVARES; SILVA, 2018).

At IFCE, in addition to the courses at the Pecém advanced campus, the program was also implemented in the technical course in logistics at the Caucaia campus. Due to the proximity of the Caucaia campus to the Pecém Industrial and Port Complex, many of the students in Caucaia used the Pecém campus professional referral programs to gain access to job opportunities in the region. However, as the program was first implemented in 2017, its effectiveness has not yet been properly investigated, which is one of the reasons for choosing this unit of the institution to carry out the research.

Nevertheless, it is important to emphasize that the implementation of the Apprenticeship Program in federal public institutions still faces many challenges.

As the courses are usually offered by System S (Sistema S) entities or by non-profit entities, some of the Regional Superintendencies of Labor and Employment (SRTE) do not recognize the specificity of Federal Institutes as public teaching institutions, sometimes making it difficult to register their courses and programs. It is very common to require documentation unrelated to the nature of Federal Institutes, such as authorizations from the Municipal Council for the Rights of Children and Adolescents (CMDCA), authorization of courses by the State Council of Education and specific class material for the apprenticeship course. In addition, some SRTEs demand the existence of specific apprenticeship classes, a concept that does not exist in public institutions offering technical courses, as they do not restrict student admission to criteria such as a maximum age of 24 years, as it occurs in the PJA.

According to the IFCE (FEDERAL INSTITUTE OF CEARÁ 2017) Strategic Plan for Students' Permanence and Success (PPE), the difficulty of reconciling work and study, mainly due to exhausting working days, is one of the individual factors causing dropout and retention at IFCE. As a result, the lack of updating and flexibility in the curriculum of courses regarding the competencies required by the world of work, as well as the lack of work opportunities in the area of some courses offered by IFCE, also stand out as internal and external factors to the institution, enhancers of the dropout problem.

To mitigate dropouts, the PPE proposes, among other factors, the revision of the pedagogical projects of the courses, in order to seek: Coherence between the profile of the graduate and the curriculum of the courses with the demands of the world of work; the structuring of systems, methodologies and systematics that bring the institution and the world of work closer together; and the systematization of the dialogue with partner companies and entities to expand internship vacancies and work opportunities for students, always reconciling working hours and those of the course.

Methodology

Based on the guiding questions of the paper, it was proposed, a priori, a case study methodology in five stages, which would allow to assess whether in fact the apprentice-students were more likely to complete their courses when compared to students who were not apprentices. The investigation is configured as a "single case study", due to its specific instance of research, in this case, the group of apprentice-students. According to Yin (2015, p. 17), "The case study is an empirical investigation that investigates a contemporary phenomenon (the 'case') in depth and in its real world context, especially when the boundaries between the phenomenon and context are not clearly evident".

First, everyday practice – as well as the observation that a large number of students admitted in professional apprenticeship programs through the IFCE completed their courses on a regular period – provided for the conception of the hypothesis that these students could present permanence and success indicators greater than other students.

In a second stage, it was collected bibliographic and documental information that allowed synthesize the legal and regulatory aspects of the Young Apprentice Program, as well as to qualitatively observe how it had been approached in the literature.

In the third stage, the quantitative approach of existing data in the IFCE academic information management system (Q-Acadêmico) was used to identify general student information, such as age group and total number of students per course.

In the fourth stage, an electronic form was applied to these students, using the Google Forms tool, with ten multiple-choice questions, in order to identify how many and which students participated (before, during or after the course) in professional apprenticeship programs.

Finally, in the fifth stage, a qualitative analysis of the information was carried out, comparing the permanence and success indicators of apprentice students to other students in subsequent technical courses of the campus, IFCE and the Federal Network.

The subjects consulted were students admitted in the second semester of 2017 and the first semester of 2018 in subsequent technical courses in Electromechanics and Industrial Automation. The ages of the students from these courses range from 18 to 50 years, part of them coming from public schools in the region covered by the Pecém Industrial and Port Complex, in the municipalities of Caucaia and São Gonçalo do Amarante. As they were the first courses of the campus, they were the first linked to the Young Apprentice program and they have already been completed by students. In all, 150 students make up the universe of the research.

Box 1 shows the questions presented in the aforementioned electronic form. It should be noted that, in relation to the student's work status, three questions were asked to indicate their status before, during and after the course.

Box 1 - Questions on the form submitted to students

Question	Answer items
Status in relation to the course	I completed all courses; I'm still attending one or more subjects; I dropped out or withdrawn my enrollment.
Course	Electromechanics Technical Course; Industrial Automation Technical Course.
Academic semester of admission	2017.2; 2018.1
Training institution (if you have participated in PJA)	IFCE Pecem Advanced Campus; IEP; SENAI; CIEE; Fundação Bradesco; IDESQ Caucaia; ISBET Caucaia; Other (indicate).
Work status before, during and after admission at IFCE (three questions)	Unemployed; Intern; Young Apprentice; Permanent, temporary or intermittent employee (formal contract – signed employment booklet); Informal worker; Entrepreneur or MEI; Temporary civil servant; Permanent civil servant.

During the course, were there any internship, apprenticeship or job opportunities?	Yes; No.
If you haven't completed your course, what was the reason? (In this question, the respondent can select more than one answer)	Difficulties in daily commuting to campus; I got a job or work with working hours incompatible with the course; I had difficulty following the contents being taught; Family problems (pregnancy, illness, death of a family member or other issues); I didn't have the financial conditions to stay enrolled in the course; The course did not live up to my expectations; Others (indicate).

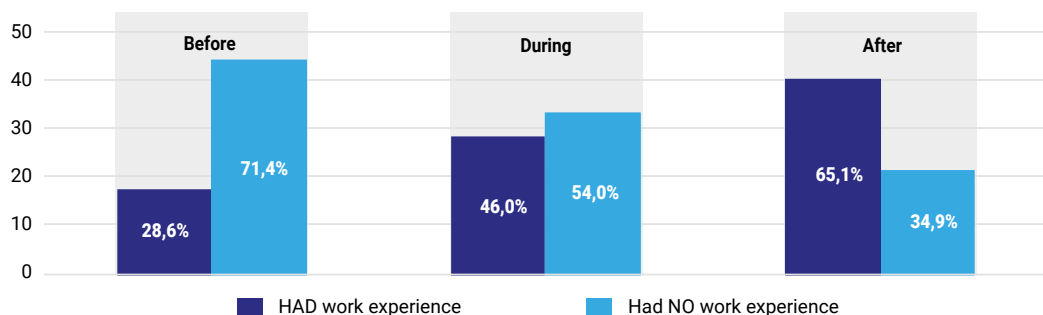
Source: Prepared by the authors.

Thus, the research followed the guidelines established by Resolution 510/2016 of the National Health Council, as the form requested the respondent's consent and clarified the exclusively scientific purpose of the research. In addition, the form was sent, individually, to each student, so that the answers did not allow the identification of the respondent, thus being supported by art. 1 of the aforementioned resolution. Afterwards, it was also verified if there was an occurrence of duplicate answers and if the questions were prepared as multiple choice, mostly with a single answer, in order to allow subsequent tabulation – answer counting and crossing of collected data. The only question that allowed more than one answer asked about the difficulties faced by students if they had not completed the course.

Results and discussion

Among the 150 students consulted, the research had the participation of 63 one of them, corresponding to 42% of the possible answers. Graph 1 shows the age profile of students at the beginning of the course, based on data extracted from the Q-Acadêmico system. The total and per course quantitative were segmented into the age groups indicated in the caption.

Graph 1 - Student age profile per course

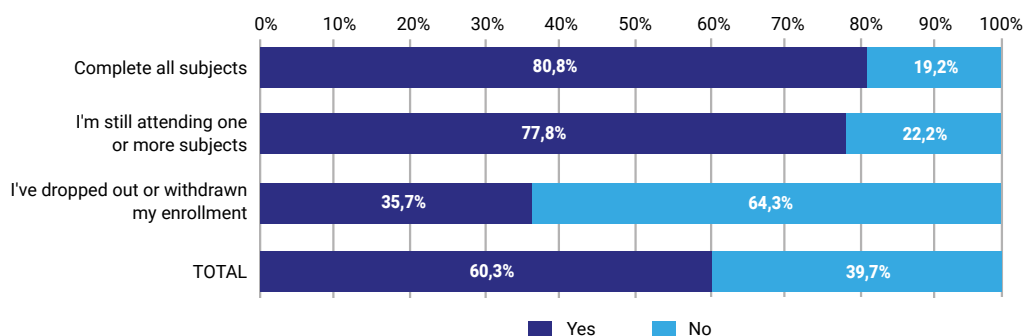


Source: Prepared by the authors.

Unlike non-profit institutions and System S entities, RFEPCT institutions do not restrict access to their courses to students of specific age groups. Therefore, not all students admitted in the investigated courses can, in fact, act as apprentices. It was found that 48.7% of students were admitted at the age of 22 years old or less, which is the group whose age is more appropriate to be admitted in the institution, considering the maximum limit of 24 years old established by Law 10.097/2000 and two-year duration of the investigated courses.

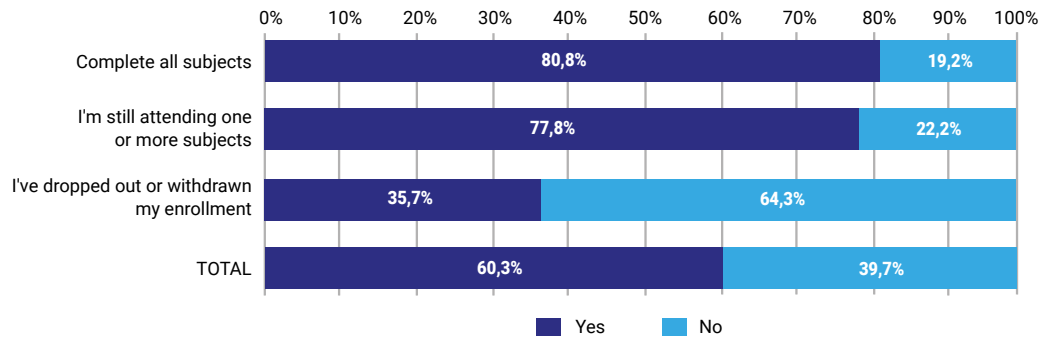
Graph 2 shows the number of students who responded to the research and who, at some point in the course (before, during or after), had contact with experiences in the world of work, whether in apprenticeship programs or not. For the purposes of these analyses, it was considered that the student has some experience in the world of work when they have worked in a profession as self-employed, formally or informally employed, or participated in internship or professional apprenticeship programs.

Graph 2 - Quantitative of students who have had some type of experience in the world of work (before, during or after the course)



Source: Prepared by the authors.

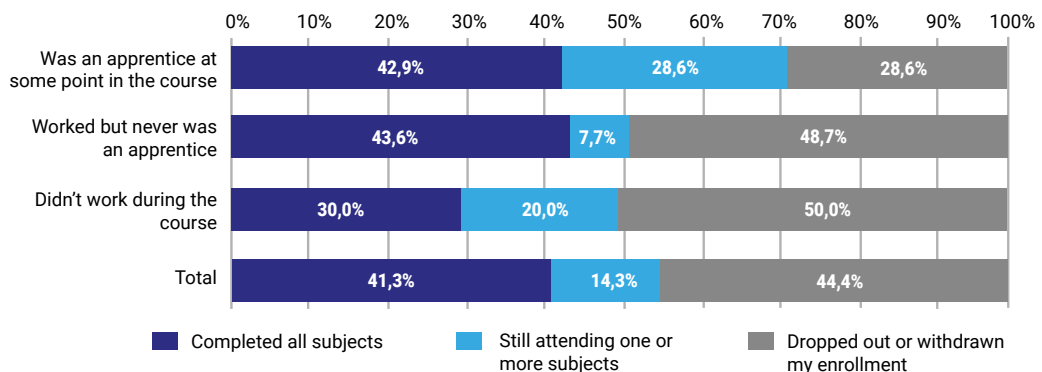
It is possible to observe a considerable increase in the total number of students who had some type of experience in the world of work between the beginning of the course, when 28.6% declared having had some type of experience, and after completion, when 65.1% stated that they have gained experience. This indicator demonstrates that the increase in access to professional education enables a growth in the insertion of young people into opportunities in the world of work, which will tend to increase as this offer method is expanded in the Brazilian educational system. Similarly, Graph 3 shows the percentage of students who have had some type of experience in the world of work, whether in apprenticeship programs or not, at some point in the course, based on their final status.

Graph 3 - Final status of students in relation to internship/apprenticeship/job opportunities

Source: Prepared by the authors.

It can be seen that, among students who completed all subjects, 80.8% had some type of experience in the world of work, while this percentage drops to 35.7% among students who dropped out or withdrawn their enrollment. Therefore, this indicator suggests that students who, throughout the course, have some kind of opportunity in the world of work tend to complete the course, even outside its regular period, in synergy with the findings of Villar and Mourão (2018) about the positive impacts of the program on the employability of students.

Graph 4 shows a comparison between the student's final status when evaluated: If they were an apprentice at some point in the course, if they had experiences in the world of work, but never as an apprentice, or if they never had experiences throughout the course.

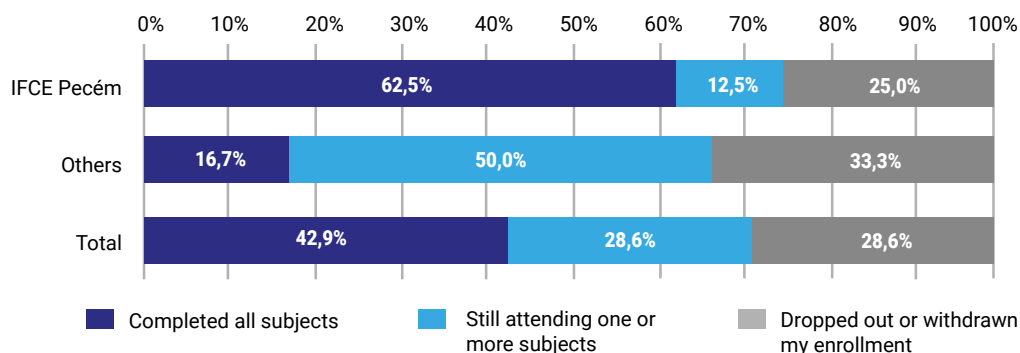
Graph 4 - Current academic status of students in relation to their experience in the world of work

Source: Prepared by the authors.

In this case, it is also observed that apprentice students, at some point in the course, tend to have a lower dropout percentage, although they tend to stay in the

course for longer than the regular period, that is, they have a higher probability of retention. However, when detailing the information about the institution of origin of the students who at some point during the course were apprentices, it is possible to observe the pattern shown in Graph 5.

Graph 5 - Final status of the student in relation to the training institution in an apprenticeship program



Source: Prepared by the authors.

The analysis of Graph 5 is quite relevant for the research, as it suggests that apprentice students, at some point in the course, and whose apprenticeship contract was intermediated by the campus itself, tend to complete the course in the regular time. On the other hand, students participating in apprenticeship programs with intermediation from other institutions tend to stay retained for a longer period in the technical course. One of the hypotheses for this finding is that, as students enrolled at other institutions need to develop the theoretical part of the course at the other institution, there may be time clashes between technical and apprenticeship courses. Thus, the student prioritizes apprenticeship, generating retention in the technical course.

In fact, it is observed that, similarly to what was found by Silva, Dias and Póvoas (2017), even among students benefiting from the implementation of the apprenticeship program, course completion percentages do not reach its total. This situation makes it evident that, in addition to implementing the program, it is necessary to develop actions in other areas, such as health, culture, sports, leisure, public safety and social assistance, aiming at reducing school dropout rates.

When a student is approved in the selection process for an apprenticeship program, it is often observed that they prioritize the apprenticeship program over the technical course, as it offers an income and an opportunity for permanent admission in the company. In addition, attendance at the apprenticeship course is mandatory, so that the student can carry out practical activities in the company. Therefore, students finally choose withdrawing their enrollment in the technical course during the period

of the apprenticeship contract, which is usually one year, and returns to the course after its completion, if not hired by the company after the end of the program at the other institution.

Another risk for the student who chooses to interrupt the technical course at the expense of an apprenticeship program is the fact that it is common for companies not to contract the student at the end of the apprenticeship period. This situation occurs precisely because many companies tend to prefer people with technical or higher education. Thus, the program, which should function as an instrument to facilitate student access to the world of work, ends up being distorted, functioning as a mechanism for strict compliance with the legislation in force and for reducing labor expenses and labor charges.

Finally, Table 1 presents a comparison between the final status in the course of the research respondents and the indicators of completion-cycle, dropout-cycle and retention-cycle of subsequent technical courses at IFCE and throughout the Federal Network of Professional, Scientific and Technological Education available on the Nilo Peçanha 2020 Platform (Base Year 2019). These indicators refer, respectively, to the percentage of enrollments with status completed, dropped out or retained throughout an enrollment³ cycle in a course, considering the start date and the expected completion date for that enrollment.

Table 1 - Comparison between the final status of research respondents

Information	IFCE Pecém (Research)	IFCE (PNP 2020)	Federal Network (PNP 2020)
Percentage of students who have completed the course (completion-cycle rate)	41.27 %	31.17 %	37.57 %
Percentage of students who dropped out or withdrawn their enrollment (dropout-cycle)	44.44 %	54.14 %	50.07 %
Percentage of students who are still attending a subject (retention-cycle)	14.29 %	14.69 %	12.36 %
Total	100.00 %	100.00 %	100.00 %

Source: Prepared by the authors, with data from the Nilo Peçanha Platform (2020).⁴

It is possible to see that 41.27% of the students who participated in the research completed all the subjects of the course, therefore they are considered successful former students; 14.29% are still attending one or more subjects; 44.44% dropped out or withdrawn their enrollments, that is, they are considered unsuccessful former students. The analysis shows that students in these courses tend to show better permanence and success indicators when compared to other courses from the IFCE and the Federal Network. Therefore, it can be considered that professional referral actions, especially through the apprenticeship program, are widespread within the Pecém campus, as it can be said that these activities have had a positive impact on the unit's indicators.

Similar to what was found by Silva, Dias and Póvoas (2017) at IFB and by Santos, Tavares and Silva (2018) at IFRN, the implementation of the apprenticeship program proved to be an important strategy for bringing the institution closer to the world of work, through the socioeconomic inclusion of apprentice-students. The methodology presented in this work can even be replicated by other institutions, aiming at understanding the implications, positive or negative, of the implementation of the program on the academic performance and school dropout of apprentice-students.

Final considerations

The results presented in this work show that professional apprenticeship programs, when associated with the technical courses offered in the subsequent manner, tend to help improve the permanence and success indicators of the students. The analysis of specific indicators, such as those related to the percentage of graduates based on the educational institution, also demonstrates the importance of technical schools, in particular RFEPC institutions, seeking to implement professional apprenticeship programs in their technical courses.

The research also demonstrated that students who worked during the course but were never apprentices tend to have higher percentages of dropout or withdrawal, perhaps indicating that it is a timely moment for educational institutions to take on the role of seeking to integrate young people into the world of work in a correct and articulated way with the school. It is evident, therefore, that the difficulty of insertion in the world of work is one of the factors causing dropout in the courses investigated, since by not having their labor insertion made possible by training itineraries that bring the student closer to the school, they tend to seek alternatives of income generation that, in turn, cause the premature start in the work activities and hinder, consequently, the completion of the course in the institution.

Within the scope of the IFCE, especially within Pecém advanced campus, the research evidences the need for the institution to more effectively appropriate programs and strategies that provide professional referral of graduates, especially through internship and professional apprenticeship programs. This guideline is also in line with the guidelines of the IFCE's Strategic Plan for Permanence and Success (PPE), since integration with the world of work and professional practice appear in it as factors that encourage the improvement of these indicators. It was also found that the implementation of the Young Apprentice Program allowed the campus to present higher completion rates and lower retention rates than the average of the IFCE and the Federal Network in subsequent technical courses. Therefore, the initiative to strengthen the professional guidance of students leads to improvements in the permanence and success indicators. Thus, the need to expand the program to other courses of the campus is justified, as good results were shown in the implementation of the program in the first technical courses studied.

As a proposal for a future paper, it is suggested to carry out a mapping of the RFEPCT institutions that already offer apprenticeship programs, so that it is possible to identify and investigate how they impact the permanence and success indicators of these institutions.

Notes

¹ Pecém is the name of one of the districts of the city of São Gonçalo do Amarante, in the State of Ceará. CIPP, however, is a perimeter located in the border region between two municipalities, with approximately 53% of its total area located in Caucaia and 47% in São Gonçalo do Amarante. Pecém advanced campus is installed in the portion corresponding to the municipality of Caucaia, about 50 km from Fortaleza. However, the Port of Pecém is located in the district of Pecém.

² Law No. 378/1937 created a new organization for the then Ministry of Education and Public Health. It appears that what was then called “fields” and “degrees” refer to what is currently established in Law No. 9.394/96 (LDB) as the “technological axes” and “levels and modalities” of the PTE.

³ Ordinance 25/2015/SETEC-MEC establishes that the “Enrollment Cycle involves the offer of a course with a defined course load, with the same start and end date, aiming at comprising a set of student enrollments in SISTEC (National Information System for Professional and Technological Education) aimed at obtaining the same certification or diploma”. Thus, it is translated as the set of enrollments in the same course, course load and start and end dates provided for in the SISTEC system, which is used to monitor the entire Brazilian PTE.

⁴ Data extracted on March 21, 2021, using panel “5.4. Academic Efficacy”, with filtered data for technical courses and methods of subsequent offer.

References

AGÊNCIA BRASIL. **IBGE**: taxa de desemprego de jovens atinge 27,1% no primeiro trimestre. Brasília, DF: Agência Brasil, 15 maio 2020. Available at: <https://agenciabrasil.ebc.com.br/economia/noticia/2020-05/ibge-taxa-de-desemprego-de-jovens-atinge-271-no-primeiro-trimestre>. Accessed on: 21 set. 2020.

ASSOCIAÇÃO DAS EMPRESAS DO COMPLEXO INDUSTRIAL E PORTUÁRIO DO PECÉM. **A nova ordem industrial e logística do Ceará**. [Ceará]: AECIPP, [2020]. Available at: <http://www.aecipp.com.br/pt-br/cipp>. Accessed on: 14 jul. 2020.

BRASIL. **Decreto nº 5.598, de 1º de dezembro de 2005**. Regulamenta a contratação de aprendizes e dá outras providências. Brasília, DF: Presidência da República, Casa Civil, 2005. Available at: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2005/decreto/d5598.htm. Accessed on: 23 out. 2020.

BRASIL. **Decreto nº 7.566, de 23 de setembro de 1909**. Cria nas capitais dos Estados as Escolas de Aprendizes Artífices para o ensino profissional primário e gratuito. Brasília, DF: Câmara dos Deputados, 1909. Available at: <https://www2.camara.leg.br/legin/fed/decret/1900-1909/decreto-7566-23-setembro-1909-525411-publicacaooriginal-1-pe.html>. Accessed on: 23 out. 2020.

BRASIL. **Decreto nº 9.579, de 22 de novembro de 2018**. Consolida atos normativos editados pelo Poder Executivo federal que dispõem sobre a temática do lactente, da criança e do adolescente e do aprendiz, e sobre o Conselho Nacional dos Direitos da Criança e do Adolescente, o Fundo Nacional para a Criança e o Adolescente e os programas federais da criança e do adolescente, e dá outras providências. Brasília, DF: Presidência da República, Casa Civil, 2018. Available at: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/decreto/D9579.htm. Accessed on: 23 out. 2020.

BRASIL. **Decreto-Lei nº 5.452, de 1º de maio de 1943**. Aprova a Consolidação das Leis do Trabalho (CLT). Brasília, DF: Presidência da República, Casa Civil, 1943. Available at: http://www.planalto.gov.br/ccivil_03/decreto-lei/del5452.htm. Accessed on: 23 out. 2020.

BRASIL. **Lei nº 10.097, de 19 de dezembro de 2000**. Altera dispositivos da Consolidação das Leis do Trabalho – CLT, aprovada pelo Decreto-Lei no 5.452, de 1º de maio de 1943. Brasília, DF: Presidência da República, Casa Civil, 1943. Available at: http://www.planalto.gov.br/ccivil_03/leis/l10097.htm. Accessed on: 23 out. 2020.

BRASIL. **Lei nº 11.788, de 25 de setembro, 2008**. Dispõe sobre o estágio de estudantes; altera a redação do art. 428 da Consolidação das Leis do Trabalho – CLT, aprovada pelo Decreto-Lei no 5.452, de 1º de maio de 1943, e a Lei no 9.394, de 20 de dezembro de 1996; revoga as Leis nos 6.494, de 7 de dezembro de 1977, e 8.859, de 23 de março de 1994, o parágrafo único do art. 82 da Lei no 9.394, de 20 de dezembro de 1996, e o art. 6º da Medida Provisória no 2.164-41, de 24 de agosto de 2001; e dá outras providências. Brasília, DF: Presidência da República, Casa Civil, 2008. Available at: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/l11788.htm. Accessed on: 23 out. 2020.

BRASIL. Ministério da Educação. **Plataforma Nilo Peçanha 2020**. [Brasília, DF], 2020. Ano base 2019. Available at: <http://plataformanilopecanha.mec.gov.br/2020.html>. Accessed on: 9 ago. 2020.

BRASIL. Ministério da Educação. Rede Federal de Educação Profissional, Científica e Tecnológica. **Centenário da Rede Federal de Educação Profissional, Científica e Tecnológica**. 16 jan 2017. Available at: <http://portal.mec.gov.br/formacao/190-secretarias-112877938/setec-1749372213/13175-centenario-da-rede-federal-de-educacao-profissional-e-tecnologica>. Accessed on: 21 set. 2020.

BRASIL. Ministério do Trabalho e do Emprego. **Portaria nº 1.005, de 1º de julho de 2013**. Altera a Portaria MTE nº 723, de 23 de abril de 2012. Diário Oficial da União, Brasília, DF, Ano CL, Nº 125, 02 jul 2013. Available at: <https://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?jornal=1&pagina=54&data=02/07/2013>. Accessed on: 11 nov. 2021.

FRIGOTTO, Gaudêncio; CIAVATTA, Maria (org.). **A formação do cidadão produtivo: a cultura de mercado no ensino médio técnico**. Brasília, DF: INEP, 2006.

GARCIA, Adilso de Campos; DORSA, Arlinda Cantero; OLIVEIRA, Edilene Maria de; CASTILHO, Maria Augusta de; Educação profissional no Brasil: origem e trajetória. **Revista Vozes dos Vales**, Minas Gerais, ano VII, n. 13, p. 1-18, maio 2018. Available at: <http://site.ufvjm.edu.br/revistamultidisciplinar/files/2018/05/Edilene1502.pdf>. Accessed on: 21 set. 2020.

GONCALVES, Ana Lucia Alencastro. Aprendizagem profissional: trabalho e desenvolvimento social e econômico. **Estudos Avançados**, São Paulo, v. 28, n. 81, p. 191-200, 2014. Available at: <https://doi.org/10.1590/S0103-40142014000200013>. Accessed on: 26 jul. 2020.

INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA DO CEARÁ. Campus de Fortaleza. **Estudo de potencialidades para implantação de novos cursos**. Fortaleza: IFCE, 2018. Available at: https://ifce.edu.br/fortaleza/portal-do-aluno/documentos/estudo_potencialidades_campus_fortaleza_2020.pdf/@@download/file/Estudo%20de%20potencialidades%20para%20implantac%CC%A7a%CC%83o%20de%20novos%20cursos.pdf. Accessed on: 15 maio 2020.

INSTITUTO FEDERAL DO CEARÁ. **Plano estratégico para permanência e êxito dos estudantes do IFCE: 2017-2024**. Fortaleza: IFCE, 2017. Disponível em: <https://ifce.edu.br/proen/ensino/plano-de-permanencia-e-exito.pdf>. Accessed on: 22 set. 2020.

MOTA, Karla Rodrigues; ARAÚJO, Cláudia Helena dos Santos, SANTOS, Bruno Gonçalves dos. A formação para o trabalho: o papel dos Institutos Federais na produção dos novos intelectuais. **Holos**, [s. l.], ano 34, v. 2, 2018.

PAFFENSELLER, Carina. **A formação de jovens para o mundo do trabalho a partir da Lei da Aprendizagem**. 2014. Dissertação (Mestrado em Educação) – Programa de Pós-Graduação em Educação, Faculdade de Educação, Universidade Federal do Rio Grande do Sul, Porto Alegre, 2014.

SANTOS, Fábio Alexandre Araújo dos; TAVARES, Andreza Maria Batista do Nascimento; SILVA, Ronni do Nascimento. O Programa de aprendizagem como prática profissional discente no IFRN: conceitos e estrutura. In: Congresso Nacional de Educação, 5., 2018, Olinda. **Anais** [...], Olinda: [s. n.], 2018. Available at: https://editorarealize.com.br/editora/anais/conedu/2018/TRABALHO_EV117_MD4_SA2_ID5028_06092018170658.pdf. Accessed on: 22 set. 2020.

SAVIANI, Dermeval. Trabalho e educação: fundamentos ontológicos e históricos. **Revista Brasileira de Educação**, São Paulo, v. 12, n. 34, p. 152-165, 2007.

SILVA, Priscila de Fátima; DIAS, Paulo Coelho; PÓVOAS, Francisco. O impacto socioeconômico da implementação do programa jovem aprendiz a partir da inclusão laboral dos jovens aprendizes atendidos pelo Instituto Federal de Brasília – *campus* Estrutural. **Revista da UIIPS**, v. 5, n. 3, p. 54-65, 2017. Disponível em: <https://revistas.rcaap.pt/uiips/article/view/14525/10910>. Acesso em: 26 jul. 2020.

VILLAR, Maria da Conceição Oliveira; MOURÃO, Luciana. Avaliação do Programa Jovem Aprendiz a partir de um estudo quase-experimental. **Trends Psychology**, Ribeirão Preto, v. 26, n. 4, p. 1999-2014, 2018. Available at: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S2358-18832018000401999&lng=en&nrm=iso. Accessed on: 26 jul. 2020.

YIN, Robert. K. **Estudo de caso**: planejamento e métodos. 5. ed. Porto Alegre: Bookman, 2015.