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**Technological Specialization Courses in  
Higher Education: Reflecting on  
Students' Motivations and Expectations**

**Catarina Doutor  
Research Fellow  
University of Algarve  
Portugal**

**Carlos Miguel Ribeiro  
Professor  
University of Algarve  
Portugal**

**Antonio Fragoso  
Professor  
University of Algarve  
Portugal**

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Athens Institute for Education and Research  
8 Valaoritou Street, Kolonaki, 10671 Athens, Greece  
Tel: + 30 210 3634210 Fax: + 30 210 3634209 Email: info@atiner.gr  
URL: [www.atiner.gr](http://www.atiner.gr)

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## **Technological Specialization Courses in Higher Education: Reflecting on Students' Motivations and Expectations**

**Catarina Doutor**  
**Research Fellow**  
**University of Algarve**  
**Portugal**

**Carlos Miguel Ribeiro**  
**Professor**  
**University of Algarve**  
**Portugal**

**Antonio Fragoso**  
**Professor**  
**University of Algarve**  
**Portugal**

### **Abstract**

In order to attract new students to higher education giving them a professional qualification, Portuguese Government created Technological Specialization Courses (TSC). TSC are post- secondary courses that aim prepare students for entry into the labour market, or to continue studies in higher education. This paper describes part of an ongoing study on non-traditional students in higher education in Portugal. Its purpose is to present the first results on TSC students at the University of Algarve. As it is a recent learning context in HE we want to deeply understand student's situation at all levels (considering students, staff and management), in order to improve the existing programmes and identify key-areas to develop new proposals.

**Keywords:** Technological Specialization Courses, student's motivations and expectations.

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## Introduction

Following the international tendency, the last decades brought to Portuguese Higher Education Institutions (HEI) a large amount of students. Such an increase had at least two “opposed” stages: one linked with the population growth and the improvement of the economical situation of families (during the 90’s) and the other linked with the opening of HEI to receive the so called non-traditional students. The non-traditional students’ concept is used to describe different group of students that are under-represented in HE, being their participation constrained by structural factors. These students are “students whose family has not been to university before, students from low-income families, students from (particular) minority ethnic groups, mature age students and students with disabilities.” (RHANLE, 2009, p. 3). In our research project we included mature students; African students; students with special needs and student attending the TSC.

Mature students represent a group that has been relatively widely studied (e.g., Gonçalves et al., 2011). On the contrary we found limited literature on TSC students. Although there are some international research focusing on what could be somehow considered similar (e.g., Bandias, Fuller & Pfitzner, 2011; Fuller & Macfadyen, 2012; Gendron, 2006), the Portuguese context presents considerable differences regarding this body of research. Although there is some national studies on this issue (e.g., Costa, Simões, Pereira & Pombo, 2009) our research aims and focus are different.

In order to contribute to a broader understanding of these students’ motivations, aims, expectations and demands a research project is being developed involving two Portuguese HEI, aiming to identify and reflect upon how such dimensions interrelate and impact both on student and Institutional level. Our research questions are therefore the following:

*What are the typical profiles of the students who enrolled TSC?  
What are the main motivations and aims for students to access HE  
and TSC? What are the students’ expectations regarding HE, TSC,  
their colleagues and professors?*

## Some Theoretical Notes

TSC courses allow students to get a specialisation which, combined with academic knowledge, tries to provide the necessary competences demanded by employers (e.g., McLaughlin & Mills, 2011). Such post-secondary education is expected to allow students acquire the knowledge and abilities in a way that would allow them to move between different working sectors (e.g., Leitch, 2006; Bradley, 2008). But in order for such acquisition to be fruitful, those professional and post-secondary courses need *status* and academic content (Fuller & Macfadyen, 2012). In our particular case this might explain why TSC that happen in HE context became so popular. A second explanation related to

the fact that once students finish their courses they can rethink their possible future pathways. The most common are to continue their studies to HE or to make the transition to the labour market (Coimbra, Parada & Imaginário, 2001). If students want to proceed to a first degree in HE, it is possible to obtain ECTS accreditation, from their TSC course to some of HE courses. Therefore one can say that TSC also relates to learning that occurs in preparation for vocation, in anticipation of career change, for re-entry into the workforce or as part of ongoing professional development (Guenther, 2011, p. 205).

Research shows that students at classical post-secondary courses usually reveal academic difficulties at the beginning of their training (Bandias, Fuller & Pfitzer, 2011) which becomes a visible constrain. These perceived difficulties lead students to enter TSC courses, as they were not able to access HE courses (Jäppinen, 2010). On the other hand, these difficulties should also contribute for rethinking the training itself, leading to a reflection on its effective utility (Ribeiro & Carrillo, 2011).

The motivational aspects are an essential element of the learning process. Various studies have explored the reasons why adults participate in adult education (e.g., Kim, Hagedorn, Collins Williamson & Chapman, 2004). But even so, Pires (2009) mentioned the lack of research focusing on adult motivation and expectations regarding learning, education and training. In fact, their motives, interests and needs have a fundamental role in their participation in education and training courses, and thus, a better and deeper understanding of such factors should assume a core element for research – leading to improve such education and training.

The motivational aspects can be perceived from very different perspectives and points of views. Carré (2000) developed a model of motivation for adult education and training considering intrinsic (epistemic, socio-emotional and hedonic) and extrinsic (satisfaction on learning and economic benefits, prescriptive, derivate, identity, vocational, professional-operational, personal-operational) motives. The intrinsic motives consider learning processes as the source of satisfaction, such as epistemic (learning for its own sake), socio-emotional (interpersonal relationships) and hedonic motives (pleasure from the space and materials available in the educational settings). On the other hand, the extrinsic motives are linked with the satisfaction obtained from learning or training process (economic benefits), prescriptive (the learning activity was prescribed by someone else), derivate (participation is a way to avoid situations perceived as unpleasant), identity (demand for skills or symbolic recognition of one's identity), vocational (demand for skills or symbolic recognition needed to obtain or preserve a job), professional-operational (acquire professional skills) and personal-operational (acquire skills for activities outside of the workplace). Coffield et al. (2008) highlight also as one core motivational aspects the students' desire to learn new skills that would allow them to improve future job prospects.

In that sense the notion of lifelong learning cannot be separated from motivations of individuals (e.g., intentions, expectations, benefits), however

only can be improved if linked with structural and institutional conditions (Pires, 2009). Thus it is of the utmost importance to understand these motivations as well as students' expectations in every stage of transitions and in particular, within TSC courses.

Cook and Leckey (1999) state that student's expectations of teaching and learning environment at HE reflect their secondary school experiences. In the particular case of TSC courses in HEI, students' expectations can be somehow mixed with the perceptions they might have of traditional HE courses (and knowledge from other's perspectives and experiences – Lortie, 1975). Such vision and recognized difficulties in some aspects of their academic knowledge are, in some way, linked with intrinsic motivational aspects as well as personal-operational motives – as TSC are both vocational and a path to enter HE bachelor courses.

The transition process between two different school contexts is always a benchmark in students' experiences, and thus all the aspects involved should be taken into consideration: professors (Fernández & Figueiras, 2011), courses curricula or resources.

## **Context and Method**

This paper is part of a broader research project focusing non-traditional students in higher education<sup>1</sup> that aims to understand students' motivations, expectations and barriers to participation, involving the perspectives of students, staff and university management. We intend to produce recommendations to steer institutional changes in order to improve students' academic success. In this paper we will be focusing on students attending TSC in the University of Algarve, revealing some preliminary on students' motivations and expectations at the beginning of their courses.

This notion of TSC has different names and interpretations in different countries, and in some cases, those differences are linked with the aims associated to such kind of education and the contexts in which such training occurs. In Portugal, these TSC in HEI<sup>2</sup> started in 2006 and the students share the same spaces with the remaining HE students. TSC curriculum structure includes three components: general /scientific, technological, and work context. Most TSC have 80 ECTS and last for one and a half years. The first year is focus on the general, scientific and technological aspects and takes place at universities and there follows one semester of internships in institutions who work in the specific area of the TSC. Concerning to internship, the HEI is responsible for the protocols that ensure training within other

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<sup>1</sup>Project “Non-traditional students in higher education: research to steer institutional change” PTDC/IVC-PEC/4886/2012, funded by the Portuguese Foundation for Science and Technology (FCT).

<sup>2</sup>They can also be offered by other institutions such as secondary schools, professional schools, and institute of employment, amongst others.

entities (CEDEFOP, 2010). TSC provide a diploma in Technological Specialisation, allowing also students' the possibility to access HE.

Nowadays (DGES, 2014) the number of registered TSC students has risen to 623, the large majority in Public Polytechnic Institutions (411 students). Our research project involves a total of 116 students attending TSC in the University of Algarve.

Data gathering include surveys (at different moments of the learning processes) and in-deep interviews to students, professors and management. It also includes a focus-group discussion involving students, professors and responsible for the academic management. As we are in the beginning of the research, in this paper we will analyse and discuss the results of a questionnaire applied to students. The questionnaire was answered during students' classes in order to get the biggest possible number of answers. Our questionnaire concerned various dimensions of transitions (e.g., motivations, expectations), but also aspects related with perspectives on present and future involvement in TSC.

## Preliminary Results and Discussion

### *Student's Social-Demographic Background*

The students attending TSC at the University of Algarve are mainly male (60,3 %). Such fact was already expected, considering the fact that the TSC offer is largely focus on more technological areas. Female students tend to choose courses with different theme, as we can see by the following table. This distribution is coherent with Santos (2010) statement that male preferences go to more technological courses.

**Table 1.** *Technological Specialization Courses (TSC) in Relation to Gender*

TSC Courses	Gender		Total (%)
	Male (%)	Female (%)	
Management and entertainment for tourism	4,3	12,1	16,4
Accounting	4,3	11,2	15,5
Electrical and Industrial Automation Installations	9,5	---	9,5
Solar Installations	2,6	---	2,6
Food Safety and Hygiene	8,6	9,5	18,1
Food technology	4,3	4,3	8,6
Automotive Maintenance Technology	6,0	---	6,0
Telecommunications and networks	15,5	1,7	17,2
Creation and maintenance of green spaces	5,2	0,9	6,0
<b>Total</b>	<b>60,3</b>	<b>39,7</b>	<b>100</b>

About 93.3% of students are aged between 17 and 31, being the subset of [17; 21] the most representative with 68.1% of students. This is justified mostly

with the TSC main aims, and linked with Carré's (2000) intrinsic and extrinsic motivations. The age level of the students is also reflected upon their marital stage. 93.1% are single, 6.1% have their own family (5.2% are married and 0.9% live with their partners) and 0.9% are divorced. 6% of respondents have children – all from amongst the non-single. Although the large majority of students have Portuguese nationality (91.4%), there are students from other nationalities (e.g., Ukrainian (2.6%), Brazilian (1.7%), Cape Verdean, British, Irish, Moldovan and German (0.9% each)).

Regarding their social-demographic background we have to stress that the educational path of these student's parents reflect the general educational reality in Portugal (Santos, 2010). Considering the validated answers we can perceive that the great majority has very low educational levels (up to 9<sup>th</sup> grade) – 64.7% of the fathers and 53.4% of the mothers. All the parents are able to read and write; and the percentage of parents with a PhD do not differ from men and woman (table 2). It is also important to note that 20.7% of fathers and 33.6% of mothers completed secondary school (12 years of schooling), and thus, these students would have the opportunity to get a higher level of education as the majority of their parents.

**Table 2.** *Education Level of TSC Students*

<b>Educational level</b>	<b>Father (%)</b>	<b>Father (%)</b>	<b>Mother (%)</b>	<b>Mother (%)</b>
Cannot read or write	---	---	---	---
Can read without schooling	---	---	---	---
Up to 4 <sup>th</sup> grade	21,6	64,7	15,5	53,4
Up to 6 <sup>th</sup> grade	12,1		8,6	
Up to 9 <sup>th</sup> grade	31		29,3	
Up to 12 <sup>th</sup> grade (or equivalent)	20,7	20,7	33,6	33,6
Bachelor (1 <sup>st</sup> cycle)	0,9	11,2	0,9	11,3
Degree	6		6,9	
1 year specialization course	0,9		0,9	
Master (2 <sup>nd</sup> cycle)	1,7		0,9	
PhD	1,7		1,7	
No answer	3,4	3,4	1,7	1,7
<b>Total</b>	100		100	

The educational level of student's parents is related with their family incomes. More than half of families (61.2%) earn less than 1000€ for month (around two minimum wages in Portugal) and 18.1% earn between 1001€ and 1500€. Such results are similar to the ones we obtained in a past research on mature students (Gonçalves et al., 2011).

Also students' working condition seems relevant. The majority are full-time students (50.9%), being 24.1% unemployed (and thus also full-time students, but within a different category – being part of the 15.3% of the



unemployed Portuguese population – Eurostat), part-time job (14,7%) and full time jobs (9,5%).

Concerning students who work and study at the same time, there are no significant difference between female (11,2%) and male (13%). Such a “double work” makes it difficult to conciliate their academic, family and professional responsibilities. Amongst those with a part-time or full time job, their main occupations concerns services and sales (13.8%), technical and professionals (5.2%) and administrative (2.6%).

### *Academic Paths*

TSC courses are available for students with different educational backgrounds and, thus, different academic paths and experiences – to understand the meanings of this diversity is therefore important. Almost half of TSC students finished secondary education (12<sup>th</sup> grade–40.5%), and thus they were in conditions to apply to a degree in HE, but for some reason they have chosen to enrol a TSC<sup>1</sup>. 34.5% had a level 4 professional qualification and 20.7% had an incomplete secondary education. Curiously there are also some students with a diploma in Technological Specialization (2.6%) and even students’ holdings a HE bachelor diploma (1.7%, probably seeking a way to enter the labour market).

To better understand their academic path we also gathered information concerning the kind of institutions they got such education from as well as the main training areas and grades they got. 81% of students studied in a public secondary school (most of them with paths designed specifically for students to enter HE); 7.8% studied at professional schools (more specialised in preparing students for a certain profession/job), and 3.4% came from the Institute of Employment – although 24.1% of the students were unemployed. As considered by Pereira (2009), our students had a diversified educational path for entering the TSC (e.g., informatics (18%); science and technology (10.3%), programming (7.8%), secretarial (5.2%), humanities (4.3%)), being obviously such paths defined by the “traditional” secondary schools offer. We have to stress that 11.2% of students did not answer such question. In terms of their grades in the core disciplines of the curriculums<sup>2</sup>, before being a TSC student, we note, on Table 3, that the most problematic domain is mathematics<sup>3</sup>. Also Portuguese and English seems somehow problematic as the grades they got are very low (almost half below 12/ 20). Such fact is probably one of the reasons why some of them did not enter HE directly and chosen to become a TSC student).

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<sup>1</sup>This is going to be an aspect we will be focusing on further, as it seems an important issue that the HEI have to deal with, and needs further research.

<sup>2</sup>Although the curriculums are somehow different, in the different possible paths, the core courses are the same – possibly having different contents.

<sup>3</sup>Being such consistent with the identified difficulties of Portuguese students at national and international tests (e.g. Gave, 2010; OECD, 2010).

**Table 3.** *Grades of Disciplines before Entering TSC*

	<b>Portuguese (%)</b>	<b>Mathematics (%)</b>	<b>English (%)</b>	<b>ICT (%)</b>
<10	1,7	16,4	3,4	---
10-12	37,9	26,7	24,1	8,6
13-15	46,6	25,9	26,7	24,1
16-18	10,3	22,4	24,1	31,9
19-20	---	1,7	6,9	12,1
Not apply	3,4	6,9	14,7	23,3
<b>Total</b>	100	100	100	100

Thinking on the relationships between the context and the school results, we analysed the relationships between the parents' educational level and students' academic results before entering TSC. We used Pearson chi-square correlation (Pestana & Gageiro, 2003) for doing so. The results show a statistically significant relationship between the education level of students' fathers and the grades in English ( $p < 0,05$ ), meaning that students get superior level of education than their parents. This reinforces the idea that the parents' educational level has a strong influence in the academic paths of their children (Alves, Centeno & Novo, 2010).

When looking at school experiences it is also important to consider the time students might be away from formal education. In our pool, 28.4% of students interrupted their formal education (which obviously includes mainly the older students – older than 21 years old). The majority of students (17%) went back to education after a period of 1 to 5 years, a group of 4.3% mentioned less 1 year away from school; 2.6% of students returns to study after a period of 6 to 10 years and 4.3% is studying again after spending more than 10 years apart from formal education (these are, obviously, included in the age group 29 to 58 years old).

### *Motivations*

Students' motivations to enrol TSC courses are very important if we want to adjust academic courses and enterprises requirements with students' desires. The three main motives expressed by students for attending TSC courses are: the possibility to access HE (46,6%); to deepen their knowledge (44%); and the acquisition of professional skills (37,9%). One of the reasons explaining their first motivational reason can be the fact that the TSC courses represent an alternative way to enter HE (e.g., Jäppinen, 2010). At the same time, HEI gives equivalences from some of the courses they have in the TSC, to similar courses at HE. Also to "deepen their knowledge" can be linked with the main motivation: students might want to feel greater confidence to enter later on a bachelor programme.

At Table 4 we present all the motivations given students for attending the TSC courses. These motives are consistent with Carré's (2000) model, who concluded that there are extrinsic motives for learning, such as professional-operational (acquire professional skills), vocational (demand for

skills or symbolic recognition needed to obtain or preserve a job) and personal-operational (acquire skills for activities outside of the workplace). In fact, these expectations reinforce the idea that students perceive TSC to have an important role in employability and valorization of professional skills (e.g., Santos, 2010; Pereira, 2009).

**Table 4.** *Reasons for Attending the TSC*

	%
Possibility to access the HE	46,6
Deepening of knowledge	44
Acquisition of professional skills	37,9
Area of interest	32,8
Career opportunities	30,2
Team work	25,9
Professional activity	25,9
Participation in activities of TSC	19,8

#### *Expectations*

We wanted to examine students' expectations concerning a specific TSC programme, and the benefits of participating and completing it. Their main three reasons concern: development of skills (35.3%); career progression (32.8%); and getting professional experience (31.9%). These expectations are connected and consistent with their main motivations. Students' are concerned with their professional future, so they expect to acquire skills, knowledge and competences in TSC courses that would allow them to enter HE and/or the labour market. To both aims it is important to learn new skills to improve future job prospects (e.g., Coffield et al., 2008). Beyond the possible professional benefits, students' value also the social relationships between colleagues and professional growing: creation of new friendships (31%); personal fulfilment (30.2%); and professional autonomy (23.3%). They also mentioned personal fulfilment, which means that TSC can give them satisfaction and pleasure.

With the aim of better understanding the possible relationships between students' motives to enrol TSC and their expectations regarding the completion of TSC, we analysed the reasons that have a dependency relationship with statistical significance ( $p$ -value < 0,05). The results revealed that there was a significant relationship between the variable of acquisition of professional skills with personal fulfilment, professional autonomy, development of skills and progression of career. These results are perceptible considering the acquisition of professional skills as a continuous process to access a demanding and competitive labour market allowing students to be better prepared to move between possible different labour sectors, as required from most of actual employers (e.g., Leitch, 2006; Bradley, 2008).

Although one of the main motivations to access TSC courses concerns the possibility of entering HE, the results reveal that there is no significant correlation between this reason and the expectations identified by students (and

thus this seem to us one important aspects to focus on deeper in the development of the project). On the other side, the variable concerning “to deepen knowledge” has a dependency relationship with statistical significance with the following expectations: personal fulfilment; professional autonomy; develop of skills; acquisition of professional experience and, progression of career. Such significant dependency can be related with the fact that students perceive TSC as something that can help their career progress. In general, students’ motivations and expectations reveal their aim to acquire knowledge and skills they think they will use in labour market (in an immediate or long term period).

But expectations are not only restricted to “good” perceptions. In order to be able to improve training it is important to know the most difficult areas for students (Ribeiro & Carrillo, 2011). The three more important difficulties identified by students are: the number of hours of the TSC (15.5%); mathematics (9.5%); and to understand courses contents (6%). As main reasons for such expected difficulties, students mentioned the number of hours of the TSC courses (1500 hours). The identification of mathematics as an expected difficult discipline is not a surprise - having in consideration their grades at secondary (see Table 3). Analysing the set of the second most relevant difficulties, students identify the courses in general (8.6%), the number of hours of TSC (6%) and specifically the course of chemistry (4.3%). And finally, the third set of aspects of difficulties pointed out by students concern: professors (6%); hard works to make (5.2%); and the number of hours of TSC (4.3%). The fact that students perceive professors as one of the difficulties is an interest result to be deepen in the future, and crossed with the reaming social actors’ perceptions.

Another dimension to take into account when thinking in expectation concerns students’ perceptions of the role of professors. Students perceive professors role, mainly as: to arouse the interest in practical components (59.5%); to transfer scientific knowledge (55.2%) and to be available to support students (54.3%).

Finally, it is also important to highlight the positive aspects of TSC. In such field, students referred the acquisition of knowledge (19.8%), the training in the workplace (13.8%) and the development of professional skills (10.3%).

### **Some Final Comments**

These preliminary results give us an overview on who these TSC students are, their perceptions and perceived difficulties they expect to encounter in their training; as well as their motivations to access such kind of courses.

The fact that most of the students access TSC courses directly after secondary school (having finished it or not) and being conscientious of their own difficulties in some core disciplines (e.g., Mathematics, Physics, English) makes it a core aspect to take into consideration for their training. Thus it should be one aspect to be taken into consideration while thinking and

preparing the different courses in order to allow students' to have an effective and fruitful learning – taking also in consideration the different possible paths after finishing each TSC course.

The motivational results are coherent with the ones presented by Coimbra, Parada and Imaginário (2001), but in our case TSC students attribute more importance to deepen their knowledge than to aspects more directly linked with the transition to labour market. Also the first main motive for accessing TSC courses can be linked with the fact that they were not able to enter HE and thus, such courses are perceived as a jumping platform for such entrance. Once more such fact must be taken into account from the HEI when designing the courses, also because although such fact is one of the main reasons students presented for entering TSC courses it reveals no correlation with their main expectations. Thus, further research is needed to better understand such fact, and taking into account not only the students' perspectives but also the other academic elements involved in the training and designing the courses (e.g., professors, programme directors).

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