

LACK OF HUMAN RESOURCES IN THE MOLD INDUSTRY: STRATEGIC AREAS TO ACT ON

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ABSTRACT

In recent years, the mold industry has increased and nowadays it is considered an important export industry for Portugal. However, despite its new technology and modernization, the employers complain of a lack of human resources in this sector. Some CEO's believe that many young students are not aware of the opportunities in this industry. This research analyses the main reasons for proximity and distance between students' awareness and the reality of the industry and suggests some of the strategic areas on which we can act on in order to solve the problem. These areas are the unawareness of reality and the industry opportunities; the insufficiency of a practical component in teaching; the expected salary of the students leaving the higher education maladjusted to reality; the long and uncertain working hours; and the unawareness of the job profiles and career plans in the industry. This research also tries to achieve some guidelines which can be used for future procedures in mold enterprises, schools or eventually other industries with the same problem.

Keywords: Human Resources, Mold Industry, Good Job, Strategic Areas.

JEL Classification: 013

1. INTRODUCTION

In recent years, the mold industry has grown significantly. The companies' investment in new technology, facilities' modernization and equipment has originated innovative products and processes that combine with a level of quality which is already internationally recognized. The Portuguese mold industry is a structuring sector that leverages the economy and so it must be used by governments to attract foreign investment. In Portugal, important clients can find several services that are useful for the industrialization of their products (Peralta, 2018).

Despite the growth of these companies and the development of production units that offer employees a better workplace combined with equipment that stimulates learning and progress, entrepreneurs in this sector face a great scarcity of human resources. Thus, this research seeks to understand what is driving away human resources (especially young people) from this industry and seeks to identify the strategic axes on which we could act on in order to reverse the current situation of the sector.

In this scenario, the following study can contribute to the research on this field at different levels. First, it contributes to the available literature, deepening the knowledge about the main motivations of students when choosing a course and the expectations they have about their future good job. These conclusions will help to understand the main factors that generate motivation and satisfaction with a certain job and organization, which could

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become clues for companies about how to retain human resources. From a practical point view, the reasons that explain the gap between the students and the mold industry will be evidenced and it is expected that the higher schools will understand their need to adjust their curricular plans and/or create another training offer not only capable of satisfying the needs and practical problems of the mold industry, but also capable of answering to the lack of knowledge of academics and students who, when out of higher education, will integrate the teams of employees in the mold industry. On the other hand, as it's demonstrated, this industry has an important weight in the Portuguese economy, so it is expected that government entities and entrepreneurs become aware of the reasons why that happens and formulate measures to attract and retain their human resources.

Therefore, first, we will analyze the proximity and remoteness factors of young people from the industry, contributing with inputs that could help to solve an eminent sectorial problem. In theoretical terms, this research intends to reach conclusions that serve as a guideline for future procedures, both for educational institutions and the mold industry, in order to guarantee the retention of qualified human resources.

2. PORTUGUESE MOLD INDUSTRY

2.1 Characterization

The Portuguese mold industry was started in Marinha Grande in the 1930s by Aníbal Abrantes, a man who also propelled this industry worldwide (Neto, 2014). Aníbal Abrantes innovated the industry by replacing the existing artisans in the industrialized countries for skilled workers and created a division of labor in his company, which was unknown in the sector (Neto, 2014). At the time, there was no skilled staff available in the market and therefore Aníbal was forced to seek specialized workers from other industries such as cement or ironmongery factories.

Thirty years later, the industry had evolved in such a way that CEO's were already familiar with the international market. According to Neto (2014: 72) "the sector no longer depends on the periodic visits of international buyers and has started to act more aggressively, and it is closer of the customers. In fact, this is still an aspect in which today the Portuguese mold industry wins all its international competition".

Nowadays, in Portugal, the mold sector is made up of approximately 450 companies, with the size of Small and Medium Enterprises (SMEs), which are dedicated to the design, development and production of molds and special tools, and employing around eight thousand workers distributed through a bipolar geographical area located between the regions of Marinha Grande and Oliveira de Azeméis (Cefamol, 2015). The total production value estimated was more than 668 million euros in 2017, which represents a growth of 5,7% compared to the year before (Sousa, 2018). For Cefamol - National Association of Mold Industry - this represents "a high capacity to adapt to the needs of its customers and the evolution of markets and technologies" for Portugal (Cefamol, 2015: 2). The exports in 2014 were destined for 89 different countries, mainly Spain (23%), Germany (22%), France (15%), Czech Republic (7%) and the United Kingdom (4%), profiting around 560 million euros, which reflects the international and global dimension of this industry (Cefamol, 2015).

According to Cefamol, the main reasons for the growth of the national molds in the international market are the increase of the productive capacities offered to the clients, the based cutting-edge technologies and the qualified human resources capable of responding to demanding customers such as the automotive and packaging industry. The automotive industry has a significant impact in the sector (the relative weight increased from 14% in

1994 to 74% in 2014) and the packaging industry represents 10% of the national mold production (Cefamol, 2015).

2.2 Lack of skilled human resources in the mold industry

Despite all the efforts, the scarcity of human resources is one of the biggest weaknesses that the mold industry now faces. António Gameiro, manager of Moldata (a mold company located in Vieira de Leiria) defends that “although nowadays the industry is easier, many young people are ‘frightened’ with their entrance in the job world. Some of them work some time, we give them training and they end up giving up. In general, the school does not prepare anyone for the industry. Even at the undergraduate level, there are young people who come to work with expectations that do not correspond to reality” (Sousa, 2015: 22). Furthermore, the businessman also says that “the young are showing up, both from the Polytechnic Institute of Leiria and Cenfim, to be trained (training which did not always exist) and this is a sign that molds are becoming a trend again”, emphasizing that “today the image of the industry has improved, and we have more young people taking an interest”. However, he regrets that despite their theoretical preparation, they do not have great technical preparation (Sousa, 2015). The manager also reinforces the effort made by his company to attract human resources: “I highlight that we do not provide an internship just to provide it, and when we admit someone, we provide stability”. He also emphasizes that “we invest on the young and carry out internal training” (Sousa, 2015: 22).

Regarding the kind of professionals that this industry needs, António Gameiro says that mold designers and mold assemblers play essential roles but they lack because they are the most difficult jobs to train for and it takes many years to learn how to perform their tasks perfectly. According to António, this reality “requires that companies invest on employees, who themselves should be persistent, even when in the early years there are no visible results” (Sousa, 2015: 22).

The ex-managers Jorge Castanho, Nuno Oliveira and Abel Oliveira (from the Rapidtool mold company in Marinha Grande), also admit that attracting young people has been one of the difficulties of the sector (Sousa, 2015b). The entrepreneurs explained that “there is a gap in know-how”. That is, they observe that “there are many people with years and years of experience working in the mold industry but passing this know-how is not always easy. On the one hand, it is always more difficult for a person who has many years of experience to transmit his knowledge. On the other hand, it is always difficult for those who know little to learn quickly. There is knowledge that can’t be acquired by being alone in front of the computer” (Sousa, 2015b: 24). In order to solve this situation, entrepreneurs consider that, “fortunately, this problem has been debated with the interaction of Cefamol with schools”. They also noted a greater proactivity of people in wanting to learn and go back to their origins. These managers affirm that “if we do not go back to their origins, in ten to fifteen years, professionals who have 30 or 40 years of experience are going to leave and create a serious problem for the industry” (Sousa, 2015b: 24).

Likewise, Fernando Conde (manager-partner of FozMoldes Group - Marinha Grande), also refers to the difficulties of hiring human resources in the mold industry and also suggests a way to overcome the problem. For him, “the lack of coordination between educational offers and the needs of companies is the main constraint of our activity. There are several courses that schools offer, among other professional outlets, including the mold industry, but why not create a Mold Engineering course? We are providing our training in the company, but it would be easier if it existed a course focused to the mold industry” (Sousa, 2014). According to Carlos Silva, director of the Nucleus of the Center for Professional Training of the Metal and Metallurgical Industry (Cenfim) in Marinha Grande, one of the great challenges facing the future of the mold industry is “the ability that the sector will

have to capture, hire and motivate new professionals. Mainly becoming an attractive sector for young people (...), a work that has to be carried out in articulation with and with the commitment of all” (Barata, 2014: 45-46). In this sense, it is necessary to “endow the workers with the technical knowledge necessary for an adequate insertion in the companies, and Cenfim - concretely the Nucleus of Marinha Grande – has been focused on doing this since 1985. And it will continue to be focused” (Barata, 2014: 45-46).

Given this reality, the president of the city-hall of Leiria, Raul Castro, is developing, together with Ministry of Labour and the Ministry of Foreign Affairs and in partnership with the Leiria Business Association (NERLEI) and the Polytechnic Institute of Leiria, a pilot project in order to capture foreign human resources (Sousa, 2018). In fact, some local companies like Socem have made partnerships with China to overcome the low demography in Portugal and the lack of human resources in its’ mold industry. The manager of Socem believes that China is a market that will become a leader in the production of electric cars in the next few years (Sousa, 2019).

3. THE STUDENT AS A FUTURE HUMAN RESOURCE

3.1 Factors for choosing a course

The choice and decision-making related to higher education have gained more and more importance because it has become very competitive and market-oriented (Sabir, Ahmad, Ashraf & Ahmad, 2013). Therefore, the choice is influenced by different factors that can have a significant impact on decision making.

The study of Robinson and Bornholt (2007) concludes that choosing a university is directly related to the student’s family background, university policies and values, institution standards and assessments, and university staff expertise. Beekhoven, De Jong and Van Hout (2002) argue that the social and financial background of students also determine the choice of both the course and the university. Hanssen and Mathisen (2018) also confirmed some of the factors mentioned by those authors and they added some other aspects taken into account when choosing a university: the distance between the students’ home and the university, the possibility to engage in outdoor activities where the university is located, and, finally, the quality of the studies offered by the institution.

Regarding the context of choosing a course Foskett, Roberts and Maringe (2006) also mention the reputation of the course, the rate of employability, the satisfaction of graduates, the quality of teaching, and the teaching approach. Similarly, the tuition price may also lead to a change in course selection (Durkin, McKenna & Cummins, 2012), as well as the requirements for enrolling the course, its’ teaching method, the staff and the opinion of students who are already enrolled in it (Robinson & Bornholt, 2007).

In addition to these factors, the choice of the course may also be influenced by personal characteristics of the students such as goals, interests, values and needs, academic, social and physical characteristics of the institution’s environment (Ford, Joseph & Joseph, 1999). Sometimes, the choice also depends on the attitudes of parents and other unexpected social factors such as inability to meet the course requirements, attain better grades or other work alternatives. In the study developed by Sabir *et al.* (2013) the variables considered to analyze the factors that influence the choice of course were: the student’s interest in the subjects, the university’s reputation, the course’s reputation, the employment perspective, their teachers’ and parents’ advice, the professional orientation given by a psychologist, how easy the course is and if they have friends enrolling (or already enrolled) in it. Freitas, Sousa and Júnior (2012) also emphasize that the process of professional choice in adolescence

may be influenced by aspects such as: labor market, family, aptitude, but also by trends in fashion, the media and advertising.

3.2 The “Good Job”

The must-have characteristics of a good job have become important in the sense that they can lead to higher motivation and consequent employee retention. For Herzberg, F., Mausner and Snyderman (1959), job satisfaction is related to motivational factors (such as goal achievement, recognition, the work itself, responsibility, promotion and growth) and hygiene factors (such as salary, company policy and good relationship with colleagues and bosses). Contrary to motivational factors that increase job satisfaction (but do not decrease dissatisfaction), the lack of hygienic factors will cause job dissatisfaction.

In their systematic review, Borralha, Jesus, Pinto and Viseu (2016) indicate that the factors which contribute to greater satisfaction are: greater autonomy and independence, greater power of decision making, flexible schedules, and better working and training conditions. Contributing to dissatisfaction there are factors such as wages and reduced benefits. Hackman and Oldham (1976) also identify five key features of a job that will lead to high levels of satisfaction. These are the identity of the task and its significance, the variety of skills, autonomy and feedback. Also, Warr (2007) concludes that some characteristics of a job will contribute to the satisfaction of the employers, such as: the opportunity for personal control (autonomy, self-determination), the opportunity to use their competences (job search, workload, work-family conflict situation), variety (of work content and location), clarity of the surrounding environment (i.e., in relation to the future and the behaviors required), the contact with others (quantity and quality of interactions), level of income, physical security (absence of danger, good working conditions), valued social position (the status in society and the importance of the task), leadership support (support management), career prospects (job security, opportunity for promotion) and equity (fairness in their working relationships and the morality of the employer with society). Recently, Dalkrani and Dimitriadis (2018: 21) also add that “job characteristics such as objectives, instructions, etc., are the most important factor in employee satisfaction, followed by work conditions and social aspects of the job”. In addition, Santos, Gonçalves and Gomes (2009: 53) refer “the importance of organizations implementing a culture of support, particularly in ensuring the well-being of its employees” and Dalkrani and Dimitriadis (2018: 21) confirm the “positive relationship of ‘Job Characteristics’, ‘Work Environment’ and ‘Social Aspects of job’ with the ‘organizational commitment’ ”.

3.3 Personal Values and Organization

Personal values are stable beliefs that influence individual behavior (Meglino & Ravlin, 1998; Hitlin & Piliavin, 2004). Thus, in the work context, values translate as beliefs about how work should be done and how to deal with different situations (Buchanan & Huczynski, 2010). Groddeck (2011) suggests that values can improve organizational control and guidance throughout more ethical decision-making. Also, Kelly, Kocourek and Samuelson (2005) point out the importance of considering personal values because their study states that the company’s reputation and the relationship between employees and the retention rate are strongly influenced by them. In the same way, Sullivan, Sullivan and Buffton (2001) emphasize that organizational values can help to create “win-win” outcomes, improve employee engagement, enhance management changes and achieve organizational goals.

The most expressed organizational values in the literature are customer focus, quality, creativity, innovation, integrity, respect, justice, ethical responsibility, return on assets, technology use and global citizenship. Regarding the identification of personal values,

Schwartz (1994) proposed the Human Value Core Theory in which values are classified in terms of the motivational goals. Those are: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. These items are altered by gender and age, therefore reflecting systematic changes in the perceived meaning of the values (Borg, 2019).

4. METHODOLOGY

According to a few of the previous references, we identified a common problem in the mold industry: the scarcity of skilled human resources. After framing the problem, we proceeded to a more in-depth reading of the related literature. The research conducted allowed us to find literature about several centers of knowledge on the topic they answer the needs of this industry, allowed us to enumerate the points of proximity and distance between schools and mold companies, the factors that determine the choice of the course and what is valued in a job.

In order to better understand the expectations and attitudes towards the labor market in the mold industry, surveys were applied to young students who enrolled in courses related to the area but study at different levels of education (level IV, V and VI). The selected sample was of convenience. The last stage of the investigation consisted on the analysis and treatment of data gathered by the questionnaire and the drawing of conclusions.

5. MAIN FINDINGS

5.1 Sample

A total of 66 trainees from the Nucleus of Marinha Grande of Cenfim answered the survey (from the 1st and 2nd year of the course of Design and Mechanical Constructions (19), Industrial Maintenance (15), CNC Machining and Programming (32)). They were between 15 and 24 years old. Most of the respondents came from Leiria (40) and Marinha Grande was the second municipality most pointed by the trainees (10). However, there are some students from more distant municipalities, such as Alcobaça, Batalha, Pombal, Bombarral, Coimbra and even Lisbon. It is also verified that some students were born abroad (France, Switzerland, Ukraine).

From the School of Technology and Management of the Polytechnic Institute of Leiria, 22 students from the Higher Technical and Professional Students (TESP) of Mold Design (11) and Automatic Fabrication (11) courses were interviewed, and all of them were between 18 and 34 years of age. Most students reported having permanent residence in Leiria (10). There are also several students from other municipalities closest to the school (which also matches the most dynamic zone of the mold industry). However, it has also been found that some of them come from distant localities, such as Ferreira do Zêzere, Sertão, Marvão and Mêda, regions that do not have a traditional connection to this industry. Furthermore, the survey reveals the attractiveness of students from different socio-economic realities.

Finally, 53 students of the Mechanical Engineering degree of the Higher School of Technology and Management of the Polytechnic Institute of Leiria were surveyed, of which 30 were enrolled in the 1st year of the course, one in the 2nd year and 21 in the 3rd year. This group of students was mostly male (86.8%) and aged between 18 and 39 years. Regarding the municipality of permanent residence, we verified that 26 students were from the municipality of Leiria. The other students resided in the circumferential counties of

Leiria, which match the zones of greater dynamics of the mold industry. However, there were students from Lourinhã (1) and Madeira island (1).

5.2 Proximity and remoteness factors

5.2.1 Cenfim Students

At Cenfim, the courses related to molds have a capacity to mainly attract male students, although some females are already attending it. They are young people who come from families that do not have, in the overwhelming majority, qualifications at the higher level - and those who have completed secondary education are even fewer - and whose members are employed and who carry out operational professions. Among their families, there is an expressive number of parents who, at some point in their life, have worked in the mold industry.

When they arrive at Cenfim, most of the students have already failed some school years, so when they enter the course related to the mold industry it is already their first option and they know exactly what they want. For those who have turned to this course as a second option, what led them to choose mold-related studies was their high employability, the fact that they consist on a quick way to obtain equivalence to secondary education, the fact that the school is close to where they live or because it was a recommendation made by their family.

At this stage, family was the way through which the students came to know about this course, particularly through parents who work/have worked on molds and recommend the course to their children. It can also be a quick way of entering the labor market, without great expenses or even without any amount of investment taken from the family budget.

Once attending the course, the trainees prefer the practical courses and are also happy about the fact that they have internships in companies. The internship experience is almost always good, precisely because it is practical and because trainees perform tasks as if they were real employees of the company. "The dream companies" pointed out by the trainees are often located in their region, close to their homes and in which they recognize good working conditions. In many cases, these "dream companies" are those in which they have carried out their internships and from where they have good memories of work and integration.

Most trainees will certainly want to work in the industry after school. They intend to perform tasks as a CNC machining and programming technician, stand apprentice, or mold designer, and few seek to be engineers. The security provided by stable well-paid employment and the predictability of the tasks to be performed are more often idealized by these young adults than the features that involve challenge.

5.2.2 Higher Technical and Professional Students

At the level of the Higher Technical and Professional Course related to molds, it is verified, as it happened in the case of Cenfim, that there is a much greater capacity of attraction of male than female students. The families of these students still lack higher education, with most of the parents only finishing the 3rd cycle of basic education and performing operational jobs nowadays. In comparison with the students interviewed at Cenfim, it is noticed that the percentage of TESP students from the Polytechnic of Leiria whose parents are connected to the mold industry is much smaller. Unlike what happened with Cenfim students, most TESP students never failed before choosing this course, which was otherwise their first choice.

These students hear about the course mainly through the Internet, not because they have a mother or father working in the industry and that influences them in this decision-making process. The most common motivations for choosing the course are the greater

guarantee of employment provided by the program and also the possibility it gives them to continue to the higher education or Mechanical Engineering course. The internship seems to be one of the weaknesses of this course. In March 2016, when the surveys were carried out, only about half of the respondents reported that they visited one mold company after starting the course, and the other half had never even been in a mold company. Only two students said they had experience in the industry.

At this stage only half of the students have already decided that when, they finish their studies, they want to work in the mold industry. Among those who have already decided what they want to do in the mold industry, mechanical/automotive engineering is one of the most mentioned jobs. Good remuneration is the most valued factor by these students, followed by the guarantee of employment. The stability of routines and work schedules is also more valued than the challenging tasks faced every day. On the other hand, for these students, leading and projecting is more valued than performing, which points out the fact that they want to achieve leadership positions and work less in practical areas. None of the students mentioned wealth as the most identifiable value, and security was the most mentioned among them, which emphasizes their desire for stability in employment. Most of these students do not indicate any “dream company” and the one who points out a concrete name of a company demonstrates total ignorance about its activity. As for future prospects, half of these students wants to pursue studies, but there is a large number who does not know if they will do so.

5.2.3 Undergraduate Students

In the mechanical engineering degree course, the majority of students continue to be male, having very diversified ages between 18 and 39 years. The majority of their parents have the 3rd cycle of basic education and practice professions of a more practical/operational nature, not being, in most cases, in the mold industry.

Good wage and safe employment are the most valued factors for these students, followed by the challenge of facing different tasks every day. The possibility of traveling and designing are also important for these students, who are less interested in performing. Knowledge and versatility are the values that the students most identify with at this level of education. The average remuneration that these students believe they will receive in their first job is around 880 euros, for a daily workday of around eight hours. These expectations of income for a relatively short period of work - in the face of the portrayal of the profession reported by employers - may be a factor of estrangement from the sector, which, as some entrepreneurs have pointed out, do not reward the novices who do not show great experience at an early stage

6. DISCUSSION

Having started with the problem initially evidenced (the difficulty in capturing and retaining human resources in the mold industry), analyzing the facts evidenced by the entrepreneurs and analyzing the results that convey the expectations of students and trainees in relation to the mold industry, it is possible to suggest the following main strategic axes to act on: 1) the unawareness of reality and the industry opportunities; 2) the insufficiency of a practical component in teaching; 3) the expected salary of the students leaving the higher education maladjusted to reality; 4) the long and uncertain working hours; and 5) the unawareness of the job profiles and career plans in the industry.

Thus, in axis 1 - ignorance about the reality and industry opportunities -, it is suggested that we work on two areas: primary and secondary students and students of higher education. In

basic and secondary school education we suggest: a) meetings with secondary school teachers and psychologists; b) lectures given to the parents associations on industry opportunities; c) playful events about mold technology in a school context, involving students and families, and implementation of entrepreneurship educational training projects that also promote creativity and entrepreneurship as Imaginário, Cristo, Jesus and Morais (2016) refer, d) creation of communication spots for the industry's dissemination in social networks through student associations. For the case of higher education students, we suggest: a) creation of short-term internships in the companies integrated throughout the TESP and undergraduate courses (Mechanics and EGI); b) intensification of study visits and, c) intensification of the participation of managers and industry entrepreneurs in classes given during the courses.

In axis 2 - insufficiency of a practical component in education – it is recommended: a) to create short-term internships in the integrated companies throughout the TESP and undergraduate courses (Mechanics and EGI); b) intensification of study visits; c) intensification of the participation of cadres and industry entrepreneurs in classes given during the courses and d) creation of cases studies based on the reality of the industry and insertion of those cases in the learning methodologies of the curricular units of the courses (case-based learning).

In Axis 3 - student salary expectation - we suggest: a) the study and proposal of incentive models that promote motivation (a possible topic of a future dissertation/project, work with HR Departments) and b) the promotion of a good practices sharing session between entrepreneurs and on specific benefits.

In Axis 4 - long and uncertain working hours - it is advised to: a) develop studies that allow us to deepen the causes behind the peaks of work in the industry (possible topic of a future dissertation/project); b) propose measures of improvement to minimize the existence of these peaks and, c) study and propose incentive models that promote motivation (possible subject of a future dissertation/project, work with HR Departments).

Finally, in Axis 5 - concerning the lack of knowledge on job profiles and career plans in the industry - it is advisable to develop studies that may result in the definition of job profiles with associated qualifications and career paths in this industry.

7. CONCLUSION

The mold industry is currently one of the leading export industries, having a remarkable growth mark year after year. Despite the various interactions between the companies and the academy in order to create a skilled workforce for this sector, the truth is that the scarcity of human resources is strongly felt in this industry. In order to understand the points of distance and proximity between the various types of students and the industry, this research allow us to uncover the main axes that require action in order to overcome the problem of scarcity.

We conclude that there are differences between the various types of students. Students with professional education are looking for courses related to the sector with a view to ensuring employability and, simultaneously, equivalence to the 12th grade. Many of these students have relatives that, in some stage of their lives, have already had contact with the sector and we believe that they advise and influence the choice of school and professional destination of these students. The students enrolled in higher education in the TESP course need to lack knowledge about the sector, once they had not yet had contact with companies in the sector while attending the course. This type of student values employability and a good remuneration in their professional future, and also enhances the stability of routines and work schedules, more than the challenging tasks faced every day. The students of this

degree point out the security and the well-paying job as the factors that most value a day in their profession. The possibility of traveling and designing are also important. From the data collected it was verified that none of these students had graduated from a mold company and only 14 had visited a company (n = 53).

Thus, given the information collected and settling the points that keep young people away from the industry, it is imperative to work on five axes that deserve special attention: 1) ignorance of the reality and the industry opportunities; 2) insufficiency of the practical component in teaching; 3) maladjusted salary expectation of the students leaving the higher education; 4) long and uncertain working hours; and 5) unawareness of the job profiles available in the industry's career plan.

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