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Searching For Young Talent: Understanding Industrial Recruitment Practices For Hiring Engineering Degree Apprenticeship Students

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SEARCHING FOR YOUNG TALENT: UNDERSTANDING INDUSTRIAL RECRUITMENT PRACTICES FOR HIRING ENGINEERING DEGREE APPRENTICESHIP STUDENTS

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ABSTRACT

This study aims to investigate industrial companies' recruitment practices and standards for hiring their engineering degree apprentices. We examine (1) how they find their future engineering degree apprentices, (2) their recruitment standards and (3) to what extent organisational characteristics shape their recruitment decisions.

To answer these questions we have carried out an online quantitative study, comprising exclusively closed questions, with the participation of workplace mentors of engineering apprenticeship students (n=70). Subsequently, we have conducted a descriptive statistical data analyse on SPSS.

Our results indicate that industrial companies find their engineering apprentices by means of students' speculative applications or via engineering schools which have already conducted their academic recruitment process. Surprisingly, technical knowledge or transversal competences have a limited influence on their recruitment decisions, but students' motivation and personal attitudes (e.g.: personal engagement, perseverance, adaptability) have a very marked, nearly decisive influence on their hiring choices. In addition, we have identified some slight differences between large international and domestic industrial companies' and SME's recruitment decisions.

Based on our results, we highlight the importance of collaboration between industrial companies and engineering schools in order to develop a more inclusive engineering apprenticeship recruitment process.

INTRODUCTION

Master's degree level apprenticeship programmes in French engineering schools, with the dedicated support of the French government, began in 1992 with the accreditation given by the CTI (Commission des Titres d'Ingénieur / French Engineering Accreditation Body) to just six selected institutions (Rouvrais et al. 2020). During the last decade, we have observed a steadily increasing interest in, and proliferation of, such work-based engineering training programmes, which are becoming more and more attractive to students desiring to engage in engineering studies. In 2021-22, more than 18.2 % of French engineering students were enrolled in one of the more than 280 (master's degree level) apprenticeship programmes proposed by French engineering schools (SIES 2022).

The recruitment of degree apprenticeship engineering students is a two-phase process composed of (1) an initial academic recruitment drive followed by (2) a workplace recruitment as the second phase. The academic recruitment process is mainly based on academic results (theoretical knowledge, technical and transversal competences) taking into consideration students' future career perspectives. After the validation of this first phase, enrolled students apply for apprenticeship positions in industry to find the most suitable workplace to complete their three-year master's degree apprenticeship studies. From the students' point of view, this second phase is widely recognised as a critical stage of the recruitment process (Drewery et al. 2022) as they are expected to find their future workplace on their own within a specified time-limit.

The workplace recruitment phase is also a critical stage from the point of view of their future employers, who naturally want to attract the most talented apprentices to reinforce the human capital of their various organisations. Despite the importance of this recruitment phase, in the academic literature there are few studies focusing on the employers' recruitment strategies and practices for selecting their degree apprentices. As far as we know, no previous research has investigated this question from the standpoint of employees in a French engineering education context. To fill this gap, our study aims to investigate industrial companies' recruitment practices and standards for hiring their degree engineering apprentices.

We propose the following research questions:

RQ1: - How do industrial companies' recruit their engineering degree apprentices?

RQ2: - What are their recruitment criteria and standards?

RQ3: - To what extent do their organisational characteristics shape their recruitment decisions?

LITERATURE REVIEW

As reported by several authors (Fabian et al. 2023, Drewery et al. 2022, Protsch 2017) in other countries, the recruitment process of degree apprentices is quite like the regular graduate recruitment process involving a multiple stage selection process. To attract talented apprentices, the most commonly used recruitment method by employers is to post job advisements on their official websites. According to the

findings of Drewery et al. (2022), student applicants seem to be most attracted to organizations where the employers express their commitment to the work-study programme and propose real opportunities. Fabian et al. (2023) analysed apprenticeship job advertisements for IT related industrial sectors in England and Scotland, taking into consideration the salary, required skills, and attributes of employers. Surprisingly, employers appear to look for the same transversal skills (the most appreciated are communication, problem-solving and interpersonal skills) and attributes for apprentice positions as for graduate positions. Other findings show that apprentice job advertisements put emphasis on the proposed training and learning developments but often omit important details concerning the related tasks. Concerning qualification requirements, employers require very similar qualifications for prospective apprentices and candidates from purely academic backgrounds. Also, technical competences are explicitly required in apprentice job advertisements, as well as prior professional experience (manly in lower lever apprenticeship positions).

In their qualitative study, Ruiz and Goastellec (2016) investigated the higher apprenticeship recruitment process from both student and employer standpoints in Switzerland. Their results confirmed that, for the employers, the level of knowledge ("savoir"), the professional experience, and the expertise ("savoir-faire") of student applicants are not considered to be the most important conditions for a successful recruitment - since all these competences are judged to have already been well-evaluated in academia. From the employers' point of view, the cultural capital ("savoir-être") of the student applicants is the most determinant recruitment condition. However, employers put different emphases on the various elements of social capital (ex.: attitude, motivation, interpersonal relationship, personal engagement and agency, anticipatory thinking, reflexivity, autonomy, self-management…) in line with their organisational context. These competences are often related to students' social status and developed in a "hidden curriculum" that could represent a source of social inequality in the recruitment process. A recent longitudinal study by Kergoat (2022) confirmed the presence of social inequalities in the employers' selections by highlighting the importance of social capital and, more specifically, family socialisation (and support) in the recruitment process.

Concerning the influence of organisational characteristics, Protsch (2017) explored the effect of organisational size and private/public sector affiliation on the apprenticeship selection process in Germany. Her findings confirmed that student applicants are more likely to be invited for an interview when applying to larger organisations in the public sector than when applying to small organisations in the private sector. Also, applicants with lower academic ratings tend to have more chance of being selected by larger organisations. These findings indicate that larger organisations apply a more inclusive apprenticeship recruitment strategy.

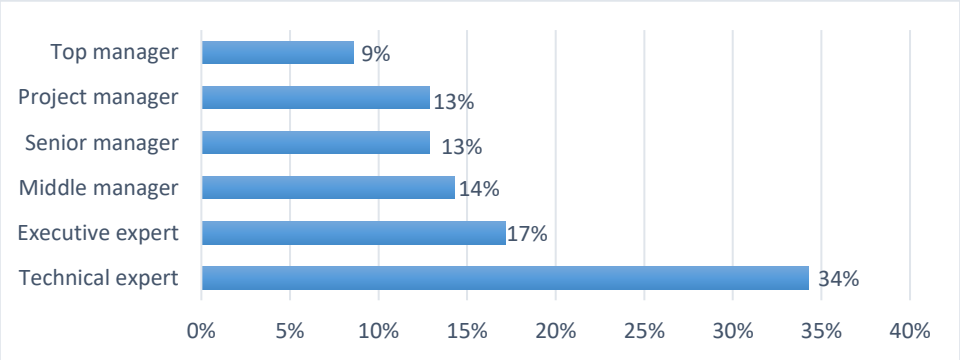
METHODOLOGY

To answer our research questions, we designed an online quantitative survey with exclusively closed questions to facilitate further data analysis. This survey covered workplace mentors of post-graduate engineering apprentice students in industrial companies and included questions focusing on their (1) recruitment process and (2)

recruitment standards. Before launching the online survey, we completed a pre-test process with five experienced workplace mentors who gave us their feedback. This enabled us to improve the survey design, especially regarding the formulation of several answers (adding short complementary explanations to avoid any possible confusion).

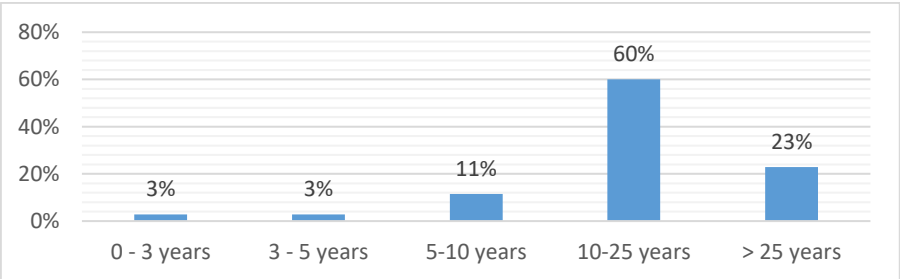
In accordance with our initial research design, we disseminated the online survey via email. In our covering message, the workplace mentors received detailed information about the survey objectives, the applied confidentiality policy, and the use of data exclusively for academic and research purposes, all before the start of the survey. However, several mentors contacted us saying that they would have liked to respond to the survey questions, but that they were unable to do so online because of the high security requirements of their organisations. Finally, due to this unexpected constraint, we sent out a paper version of the quantitative survey. We obtained a relatively high survey response rate of 52.63% (we invited 133 mentors and received 70 fully completed responses) with 57 responses online (81.43%) and 13 responses in paper format (18.57%).

Fig. 1: Distribution of the surveyed workplace mentors by their current position



Our sample is composed of 12.86 % female and 87.14 % male mentors of apprentice engineering students. As shown in Fig. 1, we observed that the highest participation was by technical experts, who composed 34.29% of our sample. A majority of the mentors (60.00%) surveyed in our sample have considerable professional experience of between 10-25 years, as indicated in Fig. 2 below. It is interesting to notice that almost a quarter of them (22.86%) have more than 25 years of professional experience, being mostly at the end of their career.

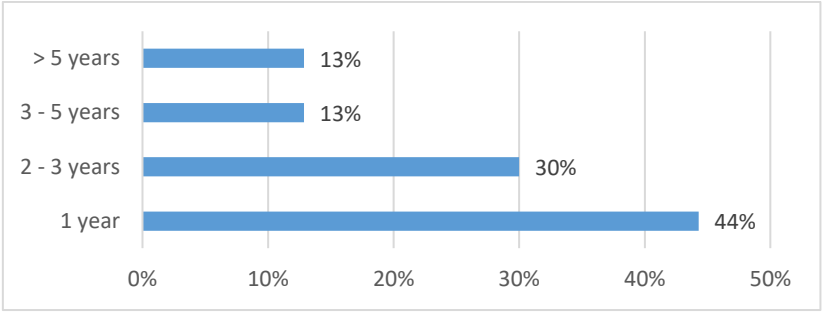
Fig. 2: Distribution of the surveyed workplace mentors by their professional experience



Concerning the surveyed mentors' experience in mentoring engineering degree apprentice students, our sample is composed of mainly experienced mentors

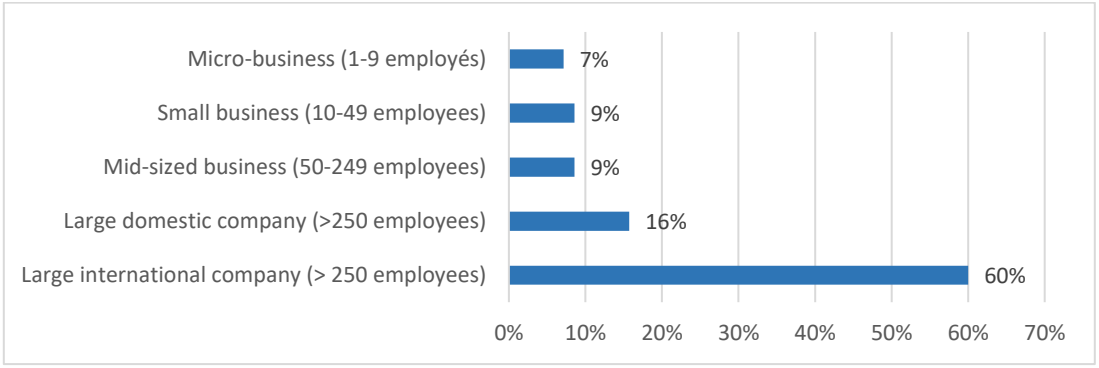
(55.71%). As illustrated in Fig. 3, more than quarter of them (25.71%) have mentored three or more engineering students during their professional career, indicating a significant level of motivation and experience in workplace training.

Fig. 3: Distribution of the surveyed workplace mentors by their mentoring experience



Regarding the surveyed mentors' organisations, three quarters of the surveyed mentors (75.71%) are employed in either large domestic companies (15.71%), or mainly international (60.00%) industrial companies, with more than 250 employees (See Fig. 3). We can observe a relatively small proportion of surveyed mentors who are from medium-sized (8.57%) and small (8.57%) industrial companies.

Fig. 4: Distribution of the surveyed employers by their organisation size



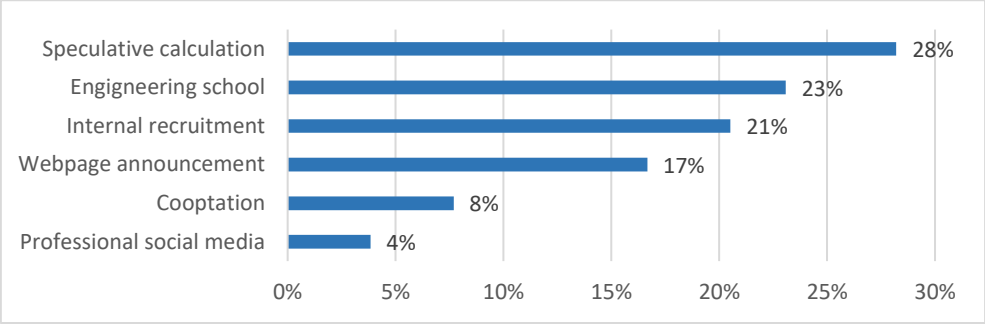
In our initial research design, we had planned to complete advanced statistical analyses on collected data. Finally, we opted to analyse our data with descriptive statistical analyses because of our limited sample size (n=70) in this preliminary study.

RESULTS AND DISCUSSION

To answer our first research question (RQ1), we investigated workplace mentors asking how they recruited their engineering apprentices. Our results indicate (Cf. Fig. 5) that most of the engineering apprentices were recruited on the basis of students' speculative applications (28.21%) or via their engineering schools (23.08%), something that didn't confirm the results of previous studies (Fabian et al. 2023, Drewery et al. 2022). The recruitment via engineering schools indicates a closer relationship between engineering schools and certain industrial companies, as well as a potential coordination between the academic and corporate recruitment process. As expected, internal recruitment (20.51%) is an important recruitment tool that could be considered as an opportunity for future promotion. The fourth significant engineering apprenticeship recruitment source is via job advertisements posted on

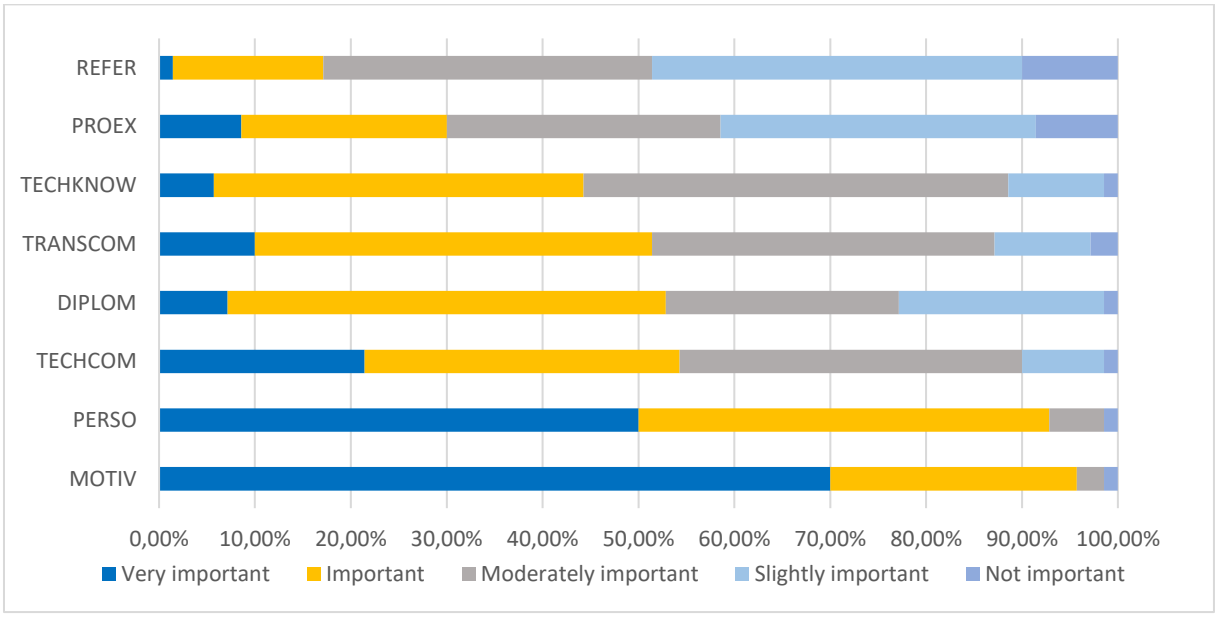
official websites (16.67%). Surprisingly, professional social media (such as LinkedIn) are used relatively sparingly (3.85%).

Fig. 5: Recruitment sources of engineering apprentices



Our results concerning the selection criteria and standards (RQ2), in line with the previous results of Ruiz and Goastellec (2016), highlight a very strong importance given to students' motivation (MOTIV = 92.00%) and personality (PERSO= 86.86%) as illustrated in Fig. 6. Significantly lower importance (on average around 63%) was given to their technical (TECHKNOW) and theoretical competences (TECHCOM), professional experience (EXPRO), graduate diploma (DIPLOM), or transversal competences (TRANSCOM). This could indicate an awareness and recognition by mentors of the quality of the academic selection that engineering apprentices have undergone prior to their workplace recruitment process. At present, the academic and workplace recruitment processes are separate and without any official link. However, engineering apprentice students looking for their placement after the validation of the academic recruitment process could be an indicator of a high level of their technical, theoretical and transversal competences.

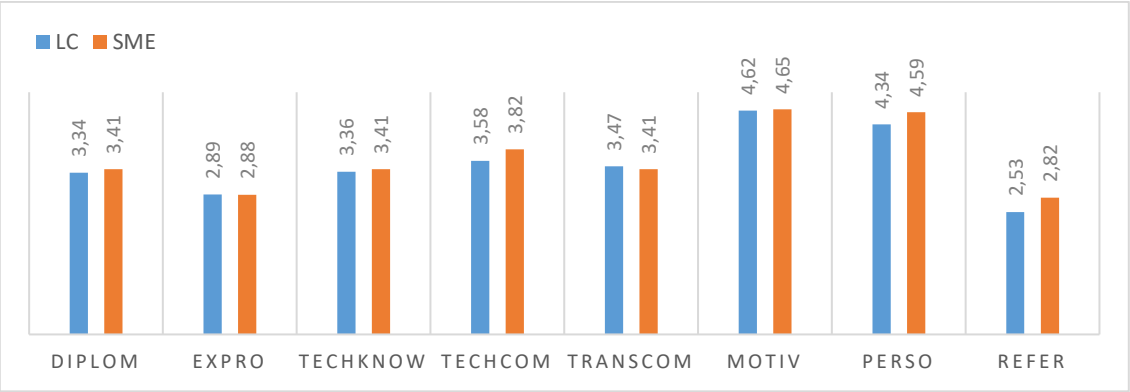
Fig. 6: Recruitment criteria of engineering apprentices



Regarding the influence of organisational characteristics on the mentors' recruitment decisions (RQ3), our findings didn't confirm the results of Protsch (2017) as we

observed only relatively slight differences between large national and international industrial organisations and SME's.

Fig. 7: Recruitment criteria of engineering apprentices by organisational types



Workplace mentors' in large domestic and international industrial companies put less emphasis on references (-6%), personality (-5%) and technical competences (-5%). Between experienced and inexperienced mentors there are only relatively slight significant differences concerning motivation, as experienced mentors gave somewhat more weight to candidates' motivations (+3%). Surprisingly, mentors with more than 10 years of professional experiences gave more weight to theoretical knowledge (+ 6.8%) and references (+6%) and less to professional experience (-6%).

CONCLUSION

In this study we investigated industrial recruitment practices and standards for hiring engineering degree apprentices. Contrary to our expectations, our results indicate a relatively weak role of professional social media and co-optation in the recruitment process. A majority of engineering apprentices are recruited via students' speculative applications and with the help of their engineering schools. For industrial companies, the two most relevant recruitment criteria for their apprentice selection procedures are students' motivation and personality, with the other criteria lagging far behind. Surprisingly, we did not find significant differences between large and small industrial companies, or between experienced and inexperienced apprentice mentors in their recruitment decisions.

The evidence from this study suggests the need for more collaboration between engineering schools and industrial organisations in recruitment processes for degree apprenticeship engineering students (for example, with greater participation of representatives of industry in the academic recruitment process - allowing students to choose their degree apprenticeship partnerships at this early stage). Currently, the academic and workplace recruitment processes are quite separate, with only relatively limited formal connections between them. After the validation of the academic recruitment (conditional admission in their engineering school), students are left alone to find their workplace with a relatively tight deadline to meet. However, family support and students' social origin are key determinants of students' success, and these factors generate significant inequalities in the selection process (Kergoat 2022). Consequently, workplace apprentice selection is significantly influenced by students' social status via their cultural and social capital. This is more particularly

true in the French engineering education context, where the engineering profession has historically enjoyed a high social status and prestige. Also, engineering studies are mainly considered as a privilege reserved for the most gifted students with outstanding academic results, implying a complex and highly selective recruitment process (Gille et al. 2022). This persistent reputation related to an image of excellence (Moulignier et al. 2019) could discourage talented students from lower social backgrounds from applying for degree apprenticeships in engineering schools. To develop a more balanced recruitment process, it would be valuable to propose an individualised support framework for all students from lower social origins, right from the start of the degree apprenticeship selection process, based on a close collaboration between industry and academia. This would not only make the entire recruitment process more inclusive, thus attracting a more diverse student population, but also could facilitate the influx of new talent in French engineering education.

We are aware of the most important limitation of our study, namely that our findings are based on a limited number of responses - precluding the generalisation of our results. Also, we have investigated workplace mentors of engineering degree apprentices in only one French engineering school and in a limited number of apprenticeship programmes that cannot be considered as representative of degree apprenticeship mentors at a national level.

To further our research, we intend to extend our investigations with the aim of obtaining a higher number of responses, thus allowing us to carry out advanced statistical analyses on our results. Also, it would be interesting to investigate apprenticeship mentors from engineering schools not only at the national, but also at the European level. Finally, we plan to complete our quantitative study with a qualitative study to allow a better understanding of our degree apprenticeship mentors' perceptions, as well as students' perceptions, of their recruitment processes.

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