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Information Asymmetry and Search Friction in Early-Stage Researchers Recruitment

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ABSTRACT:

Early-stage student researcher's recruitment process includes challenges for both faculty member and student researchers. The theoretical basis of the study draws on concepts in the light of signalling theory and search and matching theory; challenges occurred from information asymmetry and search friction examined in this research. This thesis uses an exploratory mixed method design where Phase 1 involved five semi-structured interviews with 2 active PHD students and 2 active masters students and a faculty member at the University of Vaasa and analysed by content analysis in NVivo, yielding four major categories, namely: fairness of recruitment and the search process, challenges in recruitment, signals and candidate evaluation and time-consuming search. In Phase 2, a quantitative survey was conducted with 100 valid respondents (88 students and 12 professors) from five Finnish universities, which offered the quantitative data on the frequency of the identified perceptions and practices. Qualitative research identifies the challenges in finding research opportunities may not centrally advertised fully and are fragmented and dispersed across informal channels depends on the urgency of the project and ends up with internal hiring. While in quantitative research, students' participants in the ease of finding research positions showed a mean score of 2.77 (N=88). (40.9%) selected the neutral option, 39.7% disagreed regarding how easy it was to discover, and only 19.4% disagreed regarding how easy it was to discover. This indicates that search friction and lack of central listings are major issues in conducting an effective research position search. The finding from interview highlights the that the information asymmetry in candidate evaluation, is research interest and specifically focused on the evaluation of research motivation to complete the research work, that is most central to supervisor selection decisions and least accurately reported by the curriculum vitae, academic transcript, or motivation letter. While survey highlights assessing candidate motivation from application materials, professor respondents (N=12) rated the difficulty with a mean score of 3.67 out of 5. A significant majority (58.3%) rated the difficulty as 4 or higher, with 58.3% giving a score of 5. Only 16.6% felt research motivation assessment was low, suggesting that supervisors generally find it challenging to evaluate motivation from conventional application materials. This supports the qualitative research that motivation is a critical yet less observable quality in candidate assessments. The thesis ends with the recommendations for an AI-enabled platform given four features, the functional needs of which can be described as centralised opportunity feed, verified student competency profiles, AI generated matching and ranking and transparent ranking explanations, directly based on the empirical evidence but interpreted with the theoretical literature.

KEYWORDS: Information Asymmetry, Search Friction, Signalling Theory, Early-stage researcher recruitment, AI-enabled platform, Finnish universities

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1 Introduction

Early-stage researchers face challenges to find the right research opportunities and to build productive relations with the principal investigators and professors in the ever-tightening academic research recruitment environment. Recruitment of research assistantships, pre-doctoral positions, and project-based academic vacancies is usually decentralised, and depends on informal connection sources like faculty networks, departmental websites, supervisor recommendation, and personal referrals, compared to formal labour markets. This discontinuous recruitment system brings about inefficiencies in visibility of opportunities, higher costs of acquiring information by the students and hardship by the professors to evaluate the true research capabilities of the prospective hires. All these difficulties are further augmented by the information asymmetry in that self-reported application documents including CVs and motivation letters might not be a perfect representation of the research potential in a candidate. This thesis explores the search frictions and signalling issues found in academic research recruitment at the early-stage and how these issues impact matching efficiency between research supervisors and students. This research is an empirical study of the information asymmetry and search friction causes challenges in recruitment of early-stage researchers and formulates suggestions of requirements which can enhance transparency, candidate assessment and opportunity access in early research hiring.

1.1 Background

The manner in which organisations locate, attract and retain specialised human capital has entirely transformed due to global information economy. Universities have a particular part in this shift in that they are both suppliers and consumers of research talent, educating graduate researchers and depending upon them to increase institutional output of innovation. The process involved in recruiting student researchers by professors remains largely informal and decentralized, despite the available modern digital recruitment tools in the business community. In search of the right candidates, organisations used to follow less advanced approaches, including newspaper advertising or employee

referrals. Conventional methods of hiring are becoming ineffective as they take a lot of time and do not necessarily yield the best results (Chen, 2022). E-recruitment systems are already steadily growing and surpassing the traditional methods (Enăchescu 2016). Since the AI-enhanced technologies are more efficient and rapid than the traditional screening and evaluation methods, organisations find them attractive (van Esch and Black, 2019) and an essential asset in the modern day war of talents (Leicht-Deobald et al., 2019, p. 381).

Effective use of human capital allocation within organisations is one of the major issues of industrial management. The ability to place qualified personnel in specialised posts has an immediate impact on organisational performance, and innovation potential, as well as competitive advantage in industries (Stei et al., 2023). A major organisational process that has not received enough attention under the umbrella of industrial management is the recruitment of research talent, especially selecting graduate scholars and novice researchers to research projects. Unlike professional networking sites such as LinkedIn which have succeeded in revolutionising labour markets, these platforms are not well suited to the special needs of recruiting scholarly research. These platforms are suited to corporate recruiting and the general professional networking of students, as on LinkedIn, the research related skills, such as knowledge of methodology, past research experience, that make a student eligible to get a research position are not reflected.

Information asymmetry can also be used to understand this issue. Severe information asymmetry characterizes recruiting: applicants use non changing resumes to provide detailed and relevant capabilities, and employers struggle to validate their assertions prior to interviews. Employers are depending more and more on automatic screening to control risk as a result of this uncertainty. Interestingly, the very same asymmetry that this need is meant to correct is made worse. Resumes become less reliable as signals when screening becomes more stringent, which leads to a self-reinforcing cycle of even stricter filtering (Fofanah, 2026).

In information economics, information asymmetry is one of the key concepts that describes a situation where one person in an economic transaction or exchange has more or better information than another party (Akerlof, 1970), later introduced by Spence (1973), signalling theory deals with the decision-making and communication in cases of incomplete or asymmetric information - cases where one side cannot directly perceive attributes of the other side that are pertinent to the value of a transaction. When applied to the recruitment process, the theory explains the investment of candidates in the observable signals (e.g., academic qualifications and application forms) to make their unobservable abilities known to their future employers or supervisors. To be effective, a signal must meet the costly signalling condition: the cost of producing the signal has to be high enough that low-capability candidates will not profitably mimic the signals of high-capability candidates and the receiver is able to make reliable inferences about the quality of the candidates (Spence, 1973; Connelly et al., 2011).

The curriculum vitae has long been the core signalling device used in the employment process based on the belief that creating a good, well documented CV would demonstrate actual competence and work. Nevertheless, with the extensive use of AI-based writing platforms, the cost of effort to generate a refined application document has been significantly decreased. The expensive signalling condition is broken when both high- and low-capability applicants can create professional written materials with little effort, the signal ceases to distinguish between the levels of applicant quality, and the receiver can no longer make credible inferences based on the information in the CVs alone (van Esch and Black, 2019). This reduction of the reliability of CV-based signalling has direct implications for academic research recruitment, in which professors need to determine research applicants possessing research competencies. This causes an information asymmetry which is not favourable to both parties during the hiring process. (Van Esch and Black, 2019). Research positions specifically ESR (Early-stage Researchers), such as Master's students looking for paid thesis positions and junior applicants applying for PhD vacancies are recruited through personal contacts, informal contacts, and the processing of unsolicited applications manually, not using a centralised platform, and with no

centralised and structured platform. This process may lead to systematic biasness on candidates with existing social network. The international students are structurally disadvantaged in these systems of networks since they lack the local networks that are normally used to relay opportunities (Chen, 2022).

The problem manifests itself in the form of a problem of visibility among students. There might not be a centralised repository of the opportunities to have transparent and fair access to research, which is scattered across the departmental email lists, institutional notice boards and unofficial word-of-mouth. It is not until a personal relationship is present that the potential supervisors are usually aware of the actual research competencies of a student which are demonstrated in coursework, project work, and academic success. This problem has a significant context in the broader context of industrial digitalisation. The fourth industrial revolution was the introduction of artificial intelligence and big data as drivers of change in the manner that organisations have handled human capital. Companies that do not embrace digital talent management practices lose a lot of efficiency when compared to the ones that do. The persistence of informal methods of recruitment in the academic environment, in this case, is a significant discrepancy between the technological possibilities and their use in the academic labor market (Schwab, 2016; Zhang and Chen, 2023).

1.2 Research Problem and Purpose

The principal problems that are addressed in this study are the information asymmetry and search friction that are a hindrance to researcher recruitment. This cost of time and resources used by both parties in search of an appropriate candidate is known as the search friction which is also a theory of matching labour market (Diamond, 1982). These inspections can be critical in terms of hiring in academic researcher, where students expend their time in submitting applications to what they may never get, and professors use a lot of time in sorting out resumes. This research explores the extent of the information asymmetry and search friction about recruiting early-stage researchers in academic research based on the case of professors and students at the University of Vaasa.

The study uses the empirical results to derive functional requirements of an AI enabled academic researcher recruitment platform that may have the potential to resolve the identified Challenges. This thesis concentrates on the recruitment of ESR (Early-Stage Researcher) master, doctoral students who are recruited by professors and supervisors of the university to work on research projects, laboratory work, and research activities in their theses. This is not comparable to the recruitment of either academic members of the faculty or administrative staff, which involves institutional hiring processes, academic vetting and scrutinizing, and various labour market forces. A combination of these types of academic recruitment has resulted in a literature that is not easy to transfer to the informal setting of student researcher recruitment, which has in turn received relatively little explicit scholarly consideration.

This study has a dual purpose. First, it empirically studies the nature and degree of information asymmetry and search frictions as perceived by professors and students in the current process of researcher recruitment in the universities specifically for the ESR (Early-stage Researchers) such as master's students looking for paid thesis positions and junior applicants applying for PhD vacancies positions. Second, derive functional requirements of an AI enabled academic researcher recruitment platform that may have the potential to resolve the identified Challenges.

1.3 The Gap This Study Will Address

Although very limited research is present that directly examines the recruitment process of student researchers but a number of relevant literatures on academic careers and research networks identifies and an unequal access to the opportunities in academics as prevalent challenges in research careers (Heffernan, 2020; Wang et al., 2025; Mantai & Marrone, 2023). Studies reviewed in above literature indicate that study opportunities are usually discontinuous and hard to find, which adds to the rising cost of searching and ineffective matching. The analysis of the available literature shows the existence of a specific gap: although the application of digital recruitment platforms to the corporate and technology sector has been thoroughly discussed, the issue of matching student

researchers with academic research opportunities via a dedicated digital intermediary has not been discussed so far on a similar level. Although digital platforms like LinkedIn have been widely adopted for online recruitment and networking, there is limited attention given to platform structures that could help student researchers in the existing literature. Platforms that are currently being used help in broad professional networking but lack any capability of specialized competency profiling and research interest matching (Nikolaou, 2014; Lawson and Tirado, 2023). This study relies on a wider body of literature in the fields of labour economics, recruitment processes and digital platforms. These areas deal with related underlying mechanisms like information asymmetry, search frictions, and matching efficiency, also found in the recruitment of scholars. Thus, some lessons of these research streams offer a valid theoretical help in the analysis of the problem in this thesis. This thesis addresses this gap by examining the inefficiencies faced by the students and professors empirically, particularly those inefficiencies that are arising information asymmetry and search friction. Furthermore, it identifies and builds functional requirements of an AI enabled platform which is designed to mitigate the inefficiencies and help improve the matching process between prospective students and academic supervisors.

1.4 Research Questions

The following research questions are addressed in this thesis in relation to the previously addressed research problem:

- **RQ1:** How do information asymmetry and search frictions make the recruitment of researchers difficult?
- **RQ2** What functional requirements Ai enabled digital platform overcome challenges causes from information asymmetry and search friction in recruitment?

1.5 Research Objectives

To respond to the above research questions, this study aims at the following objectives:

- Explore the current challenges faced by professors and students in the early-stage researcher recruitment process.
- Suggest platform features & recommendations identified through interviews and survey findings about the challenges.
- Assess the views of professors and students regarding the adoption of AI based digital platforms for early-stage researcher recruitment.

2. Literature Review

Two theoretical streams and one empirical stream of research: signalling theory, search and matching theory, and the recent research on algorithmic decision making in recruitment. Each stream of literature is used to highlight the different aspects of the problem. This study applies signalling theory, as developed by Spence (1973), to examine the information asymmetry of existing recruitment practices, particularly the conditions under which the curriculum vitae no longer acts as a signal of research ability with the use of AI writing. Search and matching theory, as developed by Diamond (1982) is applied to analyse the frictions that exist in the matching of professors in need of research support and students looking for research positions, and the structural conditions under which a centralised information system would minimise those frictions. The research on algorithmic decision making in recruitment is analysed to provide the theoretical grounds for the system requirements identified based on the empirical study. The chapter concludes with a synthesis that links all bodies of literature to the empirical research presented in Chapters 3 and 4.

2.1 Early-Stage Recruitment Inefficiencies

2.1.1 Recruitment of Early-Stage Researchers

Recruitment and selection of talent are regarded as the most important activities of Human Resource Management (Ferris & King, 1991) Recruitment is the process involved in search and selection of the right candidates (Newell, 2005) and selection involves the process of picking a single candidate selected among the applicants regarding certain criteria and depending on the fit between the individual and the job (Newell, 2005). Therefore, two HR functions are quite different (Orlitzky, 2008). However, within the academic field, the HR professional is involved in the recruitment and selection process relatively small (Farndale & Hope-Hailey, 2009). Studies on academic applicants evaluation have noted various relevant processes that make both recruiting and selecting opaque endeavours. An example of such opaqueness that can take place in recruitment is the scouting process, where the applicants are actively invited to make an application

by the formal or informal networks that take place in closed but also in some open recruitment" (Van den Brink, 2010, p. 115). The gatekeepers perform scouting practices, a significant part in determining who is granted academic positions and
who are locked out (Husu, 2004), favouring candidates according to one's own interests (Bozionelos, 2005).

Heirwegh et al. (2024) undertook an empirical investigation of hiring practices at the California Institute of Technology (Caltech) by surveying 26 principal investigators and 63 postdoctoral researchers to better understand how early career researchers are employed. Their results were strongly in favour of informal and networked modes of recruitment. From the principal investigator perspective, active candidate contact was reported to lead to the most successful hires (70 percent of the responses), with another 15 percent sourced by personal recommendation. Recruitment methods that involved structured channels, such as online job boards, social media, and journal postings, each accounted for less than 5 percent of successful hires. From the post-doctoral researcher's point of view, personal recommendations from PhD supervisors or mentors were identified as the most common way of getting into a current position (29 percent), followed by a candidate-initiated phone call or email (19 percent) and application for a posted position (14 percent). Overall, these findings suggest that over 60 percent of successful hires were accomplished through informal or distributed means, personal contacts, direct application, and pre-existing research networks rather than through formalised and public channels of recruitment. Heirwegh et al. (2024) comment that pre-established r relationships provide the greatest advantage to postdoctoral scholars and this study suggests that the same "relationship dependency" is evident at the master's and doctoral level, resulting in a recruitment process in which opportunities are secured via social capital rather than through objective measures of research competency. This reinforces the idea of scouting and opaqueness in academic hiring (Van den Brink, 2010), which suggests a lack of reliance on official digital intermediaries or recruitment boards.

This informality shows the relational dimension of academic cooperation, in which the professors are likely to cooperate with students they know or students who are recommended by close associates (Heirwegh et al., 2024). Although this kind of relational hiring may be suitable in each situation, it brings a situation where merit of research opportunities is shaped and influenced by social proximity instead of academic merit. The process of recruiting early-stage researchers into universities has traditionally been based on informal and decentralised processes. Academic research recruitment remains reliant on personal networks, word-of-mouth referrals, and unsolicited applications received via email or notice boards compared to corporate hiring (Heirwegh et al., 2024).

2.1.2 The Ongoing Use of Informal Methods in Early-Stage Recruitment.

The use of digital technologies and algorithmic systems in recruitment processes has been well documented in the corporate and technology industries (Broecke, 2023; Paramita et al., 2024; Roppelt et al., 2024; Zhang & Chen, 2023), where algorithmic candidate matching and automated screening have replaced manual screening of applications (Roppelt et al., 2024; Vedapradha et al., 2024).The processes by which professors identify and recruit the research students is increasingly being formalised through the institutional hiring procedures and structured job advertisements (Mantai & Marrone, 2023; Heirwegh et al., 2024). Although recruitment for early-stage academic research positions often continues to rely on informal mechanisms such as academic networks, departmental word-of-mouth, supervisor referrals, and unsolicited student approaches, studies suggest that access to these opportunities is not always supported by transparent or universally accessible digital recruitment processes (Heirwegh et al., 2024; Heffernan, 2020). The implication of this informality is that the results of the recruitment are significantly influenced by existing social capital of the individuals involved and not the competencies or academic achievement listed on the resume of the student candidates (Heffernan, 2020; Wang et al., 2025). Students trying to find research opportunities in early stage need to monitor multiple institutional and informal channels to identify relevant openings, because the academic information is often distributed across diverse channels (Mantai & Marrone, 2023; Heffernan, 2020).

2.1.3 Algorithm-Based Decision-Making: Efficiency and Ethical Tensions

With the growing use of algorithmic tools in organisations to aid in the recruitment process, there has been a corresponding literature on the risks and ethical concerns of such systems. Leicht-Deobald et al. (2019) pointed to the presence of a main tension in the use of algorithm-based HR decision-making: as much as the introduction of the technology is advertised as efficient and objective, the possibility of algorithmic bias and the loss of individual integrity in the employment sphere is systematically lowered. They suggested that critical data literacy, ethical consciousness, participatory design practice, and civil society regulation are needed as counter measures to unregulated algorithmic HR systems. Within the framework of the current research, this discussion implies that transparency and equity should become not an incidental feature of any platform that uses algorithmic candidate ranking, but its design must be built with them. The AI enabled platforms are very much capable of analysing and identifying skills patterns of applicants from a large pool of data by the help of machine learning and semantic matching techniques (Broecke, 2023; Li et al., 2025). While many scholars are also argued that if the data already have preexisting biases, then these systems may reproduce those inequalities (Chen, 2023; Albaroudi et al., 2024). That is why there needs to be balance between efficiency gains and ethical safeguards when developing AI enabled platforms for recruitment of student researchers (Paramita et al., 2024).

2.1.4 Existing Digital Tools.

Social networking sites (SNS) are a tool that is becoming significant in universities and individual academics (Lawson & Tirado, 2023). LinkedIn has emerged as amongst the tools most widely used by academics. The market leading professional networking platform, LinkedIn is more focused on employment history, overall skills, recommendations and industry contacts, which are greatly appreciated in the recruitment process and HR practices within the corporate setting. (Hosain, 2021). A study presented at the STI 2023 conference, Lawson and Tirado (2023) argue that's online presence would provide a positive outcome to the active researchers. Communications through SNS would contribute

to the establishment, networking, enable interactions, exchange research deliverables, indicate research interest and expertise. Recruiters extensively utilize SNSs to recruit, advertise vacancies, search, and filter applications, and job seekers utilize SNSs to find vacancies, industry information, and access more comprehensive advice and support not only vacancy notices (Nikolaou, 2014). Since it is not a native research competency and project experience, professors in search of niche academic skills face high transaction costs, browsing through numerous irrelevant profiles in search of a few qualified research applicants. The adoption of social networking sites (SNS) in professional purposes is not common in the academics, even though the digital environment is expanding (Lawson and Tirado, 2023).

2.2 Information Asymmetry

2.2.1 Theoretical Foundation

In information economics, information asymmetry is one of the key concepts that describes a situation where one person in an economic transaction or exchange has more or better information than another party (Akerlof, 1970). It was a concept that grew out of the need to understand inefficiencies in markets in which the quality of goods or actors is not directly observable by all market actors. When there is asymmetric information, the party with the better information might take advantage of that information, whereas the party with the less information is faced with uncertainty when making decisions.

George Akerlof (1970) in The Market for Lemons is the foundational contribution in the theory. Akerlof showed that adverse selection is possible when the buyer and seller have unequal information, such as the buyer having superior information about the quality of the goods. Akerlof showed that this unequal information can cause adverse selection, that is, when lower quality goods or actors are pushed out of the market by higher quality goods or actors. The used car market is an example where buyers were unable to check the quality of the car being sold, and sellers had this information. However, buyers

could not determine the quality of the vehicle they were purchasing and thus only willing to pay an average price, due to uncertainty about the product quality. As a result, the sellers of good quality vehicles pulled out of the market as the prices offered were not commensurate with the value of their products. This led to the market being increasingly seized by low quality products.

Akerlof's research laid the groundwork for the economic theory of market inefficiency based on information asymmetry and the economic impacts of uncertainty and unequal information sharing. Later research built on the theory in fields beyond product markets such as labour economics, finance, insurance, and organisational studies. In the labour market theory, Michael Spence (1973) observed that information asymmetry occurs because employers don't have access to the productivity or capability of job candidates before hiring them. Signalling theory suggest that applicants try to minimise uncertainty by providing observable signals that convey hidden qualities. Spence suggested education as the number one example of a signal as educational attainment may suggest intelligence, discipline or capability that can't be measured directly in the recruitment process. The value of a signal is determined by its credibility and cost of procurement, with the more expensive the signal, the harder it is for lower quality actors to mimic it.
In addition, Connelly et al. (2011) have synthesised and reviewed the signalling theory in relation to management research. Their review showed that signalling theory characterizes behaviour when two sides have access to varying information, with one side, the signaller, making a decision on whether and how to convey observable signals to the other side, the receiver, who then interprets those signals to make decisions. The authors highlighted that there are five properties of the effectiveness of a signal: its observability, cost, credibility, frequency and consistency. Observability, in this context, is a measure of the distance that a signal can be seen by the receiver. Cost is the price it takes for the producer to generate the signal, which is the factor that makes costly signals valuable, low-quality senders cost more to produce. Credibility is the faithfulness of a signal in revealing the quality it carries. Frequency is the degree to which the signal is transmitted

over time and consistency is the degree to which the signals are coherent among channels and audiences.

These five properties can serve as a useful guide to assessing the effectiveness of traditional application materials in the context of recruiting early-stage researchers. CV and academic transcript meet the criterion of observability – they are accessible and visible to supervisors. The credibility as a sign of research motivation is, however, limited because motivation letters are becoming readily available without any research interest. Document evidence is also hard to provide in the case of consistency, since it's hard to assess how well the research interests stated in a motivation letter correspond with the candidate's research activities. There are limitations that make the study of the present investigation of alternative signalling mechanisms for recruitment attractive.

Signalling theory describes how in an organisational setting, information can be asymmetrical, and this asymmetry can be partly overcome by signals that transmit otherwise unobservable between agents, an approach that has been used in strategic management, entrepreneurship and human resource management (Connelly et al., 2024). The basic formalization of this mechanism is offered by Spence (1973), who introduced the idea of signalling as a process that is costly and requires investments that are more difficult for lower-quality candidates than for high-quality. The theoretical framework is applied to the interpretation of competency-related signals in the field of academic research recruitment in the present study. New digital and AI-powered recruitment platforms, however, are likely to lower the cost of creating application signals, potentially compromising the separating function of traditional, expensive signalling mechanisms in recruitment and increasing the likelihood of signal noise in the recruitment evaluation.

2.2.2 CVs as Signals under Information Asymmetry in Recruitment.

Information asymmetry is a concept where one party holds more or superior information than the other and this is unclear in decision making (Connelly et al., 2012; Spence, 1973). In that case of uncertainty, CVs are treated as signals: education, grades, field of study, work experience, volunteering and other documented accomplishments are treated as

proxies to productivity and occupation specific human capital (Da Silva et al., 2020). During employment and selection processes information asymmetry arises because an applicant typically more aware of their capabilities while the employers have to infer the qualities of candidate based on observable signals which could be experience, education or credentials (Bangerter et al., 2011). Regarding academic research recruitment, the curriculum vitae (CV) has traditionally been the most important indicator by which student candidates can convey their research competencies to prospective supervisors. The CV acts as a signal in the sense that its contents such as academic grades, previous research experience, publications, course work, and technical competencies are presumed to reflect the underlying research ability of the candidate credibly. Meanwhile, CVs are fallible and easy to tamper with, and this opens up the possibility of exaggeration and falsification in situations where the cost of verification is minimal (Da Silva et al., 2020), leading to the creation of automated filters and algorithmic screening tools, which in turn raise fairness concerns (Albaroudi et al., 2024).

Spence (1973) describes when the cost of signal production is no longer pegged to some underlying quality, the signal loses its discriminative value and can no longer plausibly differentiate between high and low-capability candidates. The signal ceases to distinguish ability and loses its value once the low-ability workers are able to send the same signal at the same cost. Prior to the introduction of LLMs, more personalized applications were highly indicative of increased effort and effective job completion; once the use of these tools began, the relationship diminishes significantly, with the AI tools effectively replacing the component of writing on their own (Galdin & Silbert, 2025). While Spence (1973) showed that the reliability of a signal rests on its being expensive to generate, Galdin and Silbert (2025) show that generative AI has made talk cheap. They examine online labour markets and demonstrate that when machine produced applications are easy to write, the signal is no longer pegged to the worker's quality. This is a pooling equilibrium whereby high ability applicants are less likely to be employed since they can no longer leverage written signals to differentiate themselves among low ability applicants (Galdin & Silbert, 2025).

2.2.3 Digital CV Screening Accessing Candidate Competency

Fofanah (2026) explains this phenomenon through the lens of information economics, there is extreme information asymmetry in the hiring process: the employer cannot easily authenticate claims of candidates before the interview process, and employees use their static resumes to describe skills that are complex and context dependent. To address this risk, employers are turning to automated filters to deal with risk. To deal with information asymmetry organizations widely adopted the Applicant Tracking System (ATSs) which has enhanced efficiency in recruitment through automated and systematized candidate recruitment selection. Although ATS platforms offer some level of efficiency, their conventional way of filtering candidates with the help of keywords does not offer much effectiveness because this approach fails to provide the context and does not pay enough attention to potential qualified candidates who do not mention the exact keywords (Bevara et al., 2025)

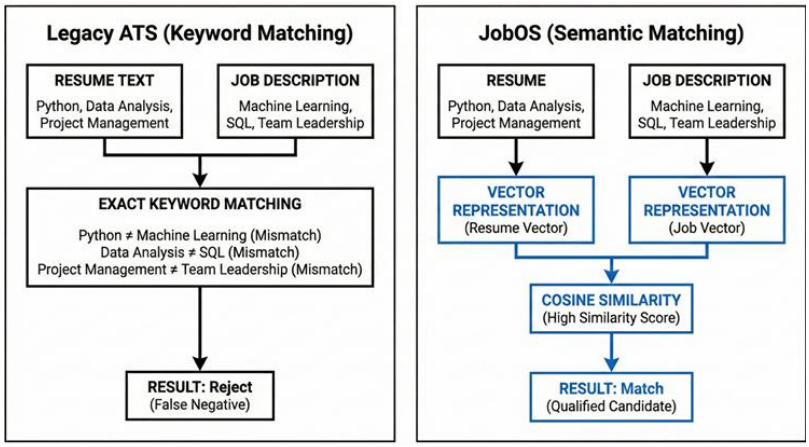

Figure 1 ATS similarity-based retrieval & semantic Matching retrieval (Sourced from Fofanah, 2026)

The use of ATS keyword filters is widespread as they can be used to narrow down the mass of applicants within a short period of time, although studies have continually revealed that they fail to comprehend meaning and miss on large numbers of qualified candidates (Maree et al., 2018). Present developments are shifting toward AI and semantic matching to address these drawbacks to achieve more precise, equitable, and

open automated screening. Ironically, this dependence increases the asymmetry that it is supposed to resolve (Li et al., 2025). The harder screening is, the less credible are resumes as a signal, and further filtering becomes more strictly enforced in a vicious cycle.

2.3 Search and Matching Theory

2.3.1 Theoretical Foundations

The contributions of Diamond (1982), Mortensen (1982) and Pissarides (1985) greatly advanced search and matching theory; they were recognized in 2010 with the award of the Nobel Memorial Prize in Economic Sciences. The theory creates a conceptual model of labour markets as decentralised processes where both workers and employers face costs while identifying and matching to each other in appropriate work relationships. With a focus on labour markets, Diamond (1982) shows that search frictions (such as imperfect information and costly search) are characteristics of the labour market that influence the level of unemployment and the wages reached in the equilibrium.

In this context, the relationship of employment is given rise in a stochastic matching process in which both parties make investments to find the “right” match. Equilibrium results thus depend on productivity and preferences as well as on the efficiency of the matchmaking process. This framework offers a theoretical underpinning for the great search costs that are present in the hiring of junior faculty and that are typically experienced by professors and prospective researchers when there is not a centralised and transparent matching mechanism in place.

Search and matching theory in labour economics has illustrated that search frictions in labour markets are always present, as a result of costly and imperfect information (Diamond, 1982; Chade et al., 2017. On the same note, Broecke (2023) underscores the increasing significance of artificial intelligence when it comes to the practice of recruitment especially in enhancing the efficiency of screening candidates and matching them with jobs.

These theoretical findings have been further explored in more recent works where the authors applied their theories to the digitally enabled labour market and suggested that the matching efficiency of algorithmic systems could potentially be enhanced by minimizing search costs and enhancing the alignment of candidates and jobs.

2.3.2 Search Frictions of the Academic Research Recruitment Process.

Search frictions are time, effort and resources that stakeholders spend to locate and consider appropriate matches (Diamond, 1982). Recruitment to early-stage academic research has the features of search friction, especially because of the decentralised vacancy announcement, informal network-based recruiting strategies, and information asymmetry between the job applicant and principal investigator. Search friction is the term that is used to describe the impediments in the effective matching of employers and workers in the presence of mutually beneficial opportunities, usually due to incomplete information, costs of search, and slow vacancy discovery (Mortensen and Pissarides, 1994).

To professors and research supervisors, one of the major points of tension is that there is no centralised and organised system where potential student researchers could be identified and screened (Mantai & Marrone, 2023). Recruitment in academic context is rather shaped by mechanisms that are informal such as personal academic contacts, where candidates mostly depend upon proactive efforts of outreach and institutional connections rather that centralised and structured institutional systems (Heirwegh et al., 2024). Such decentralised processes, as noted in the search and matching literature, minimise matching efficiency through the constrained pool of visible applicants and augmented time and effort in finding appropriate matching applicants (Bartik and Stuart, 2022). Moreover, the screening of unsolicited applications, most of which will not necessarily be a good fit to the exact needs of a research project, puts a significant administrative burden on the system (Professor) but with a very low chance of finding a good match. This is indicative of the more general concept of search frictions as process-resource-intensive mechanisms which limit the speed and quality of matching results.

In the case of students, the most common aspects of search frictions include poor visibility and disintegration of research opportunity space (Bartik & Stuart, 2022). Early-stage research jobs, including research assistantships, pre-doctoral research positions, and project-based research positions, are frequently not posted using standardised or centralised recruitment mechanisms as are formal labour markets. Rather, these opportunities are often distributed via heterogeneous media, such as departmental web pages, supervisor home pages, faculty networks, informal word-of-mouth, and job portals in general (Herschberg et al., 2018). This dissemination of the vacancy in bits augments the price of the information seeking and lowers the possibility that the students would find chances which resonate with their scholarly capabilities, research topics, and professions. Empirical and policy-based studies note that when people cannot access strong informal networks, the costs of search are disproportionally high, and opportunities are less available (OECD, 2023; European Commission, 2022). Consequently, the potentially efficient matches might not take place not because of the lack of compatibility, but because of the informational impediments and limited visibility.

Recent studies also indicate that the digital platforms and algorithmic matching systems are able to reduce such frictions by enhancing information flows, making opportunities more visible and enabling more specific matching of candidates and position (Broecke, 2023). In the academic case, this would mean that the implementation of a two-sided digital solution would probably decrease the cost of search and the administrative overhead, and an increase in the overall efficiency and quality of the matches between the students and the research supervisors/ Professors.

2.3.3 Digital Platforms as Reducing Search Friction

Search and matching theory offer definite guidelines to design interventions that reduce friction. Centralised information systems, as defined by Diamond (1982), are one of the major methods of lowering search costs as platforms that combine supply side and demand side information into a searchable format will save time and effort on the part of

both parties in finding potential matches. Platforms with prediction algorithms to rank the matches by quality of the matches present faster and better matches compared to those platform with undifferentiated search. These results can support the theoretical idea of predictive analytics implementation into the platform design of the research under study (Diamond, 1982; Hamalainen & Petrikaite, 2024). Their results support theoretically the use of predictive analytics in the platform design that is studied within this thesis.

Van Esch and Black (2019) investigated the factors that motivate applicants to use AI-driven recruitment in the corporate environment. Their research found that views of fairness, social media use behaviour, and perceived technological modernity of the recruiting organisation had a significant effect on candidates being willing to use AI-assisted selection tools. Notably, the researchers concluded that applicants that viewed AI recruitment as inequitable or unclear were much less likely to participate, no matter how beneficial the efficiency gains would have been. The implication of this result is direct on the design of any platform-based academic recruitment system: unless professors and students feel that the platform is fair, transparent, and trustworthy, they will not adopt it regardless of the technical capacity of the platform.

The operational advantages of AI-based talent acquisition systems are reported in several industries, and they indicate that it has led to improve time to hire, candidate-position fit, and less administrative workload on hiring managers. These conclusions imply that the friction reducing power of digital matching sites in the corporate setting can be applied to academic research recruitment, as long as the designed platform is tailored to address the particular information demands of the academic talent market (Paramita et al., 2024). These findings suggest that the friction reducing quality of the digital matching platform that is successful in the corporate context (Linkedin) could be transferred to the hiring of academic research in case the platform is designed to meet the informational requirements of the academic talent market.

2.4 Artificial Intelligence in Recruitment

2.4.1 AI in Talent Acquisition

The first to the fourth industrial revolutions have transformed work to technological innovation. The fourth industrial revolution also presented disruptive technologies such as big data and artificial intelligence (Zhang & Chen, 2023). The emergence of data processing and big data analytics and the advancement of artificial intelligence have enhanced the information processing capacity, such as the ability to solve problems and make decisions (Raveendra et al., 2020). AI techniques have revolutionised various industries and processes, including hiring and Artificial intelligence (AI) has found in recruitment in the last few years especially around candidate sourcing, CV screening, and aligning the candidate with job demands (Albaroudi et al., 2024). Current literature demonstrates that AI is the most typical to be used in the initial phases of recruitment, where the high numbers of applications make manual screening inefficient (Leicht-Deobald et al., 2019). AI systems can also help alleviate the administrative load and enhance the efficiency of the processes by automating the routine activities, including filtering of the CVs and the preliminary candidate screening.

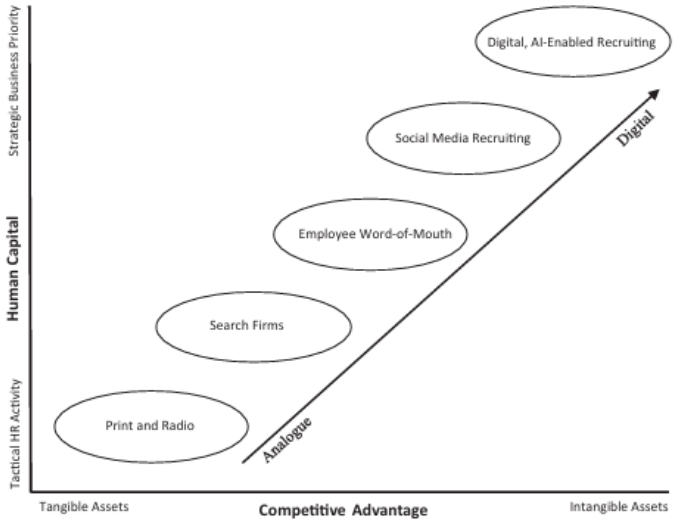

Figure 2 Strategic story of recruiting (van Esch & Black, 2019, p. 730)

The success of AI-based recruitment systems highly relies on the quality and the format of input algorithms information. Algorithms are used to input commands and data to AI. Whereas AI developers think that their algorithmic processes make hiring easier and reduces bias, Miasato and Silva (2019) state that algorithms cannot do away with discrimination on their own.

Specifically, to ensure that the candidates and jobs are accurately matched, both the candidate competencies and job requirements should be well-defined and standardised. At the individual level the competencies can be regarded as skills, knowledge, attitudes and values which result into performance (Le Deist & Winterton, 2005). Algorithms systems can give unreliable or suboptimal matching results without such structured data. The limitation is particularly applicable when it comes to the recruitment of participants in academic research where data are not always structured and represented differently in various forms. Besides technical issues, the effective adoption of AI in the recruitment process is influenced by organisational and behavioural aspects as well. Studies have shown that the credibility of AI based decision making is strongly connected with the transparency and explainability of the processes. Candidates or decision-makers might

be hesitant to follow an algorithmic recommendation without knowing how it is produced, even though it might be accurate (Leicht-Deobald et al., 2019). As a result, information and transparency become important design considerations of AI based recruitment systems.

2.4.2 Natural Language Processing (NLP) in Recruitment

The use of artificial intelligence in talent acquisition and recruitment has grown significantly since the middle of the 2010s due to progress in natural language processing, machine learning, and predictive analytics (Vedapradha et al., 2024). AI-based recruitment applications are already in use in various activities in business recruitment, such as automated resume sorting, applicant ranking, interview, and predicted fit. Van Esch and Black (2019) unrecord the increased use of AI-based recruiting systems in large organisations, with the most mentioned benefits noted as being speed, consistency, and scalability among adopting organisations. The tools are especially appreciated in high turnover recruitment processes, in which the cost of manually screening candidates is prohibitive compared to the worth of individual hiring choices.

A natural language processing is one of the basic technologies of AI-based recruitment systems. The input data is unstructured text sources like CVs, cover letters, or professional profiles, and the application of NLP algorithms allows identifying structured information about it, allowing you to automatically extract such attributes as relevant competencies, qualifications, and experience indicators (Roppelt et al., 2024). In academia, NLP-based extraction would be used on academic records, project reports, and supervisor reports of students to create structured competency profiles, which would yield better information on the ability to conduct research compared to the text used in a self-reported CV. The results of Paramita et al. (2024) support the idea that NLP-based competence extraction generates candidate profiles that have a much higher predictive validity of job performance than CV review does, thus empirically supporting the design of academic talent platform with NLP. Smart-Hiring, Intelligent Resume Matching, and

ResJobFit approaches leverage deep NLP, similarity metrics and graph/embedding models to learn intricate semantic relations and bidirectional job-candidate fit (Khelkhal & Lanasri, 2025).

2.4.3 Predictive Analytics in Recruitment

Predictive analytics can be defined as the application of statistical and machine learning algorithms to make probabilistic estimates of future events through the historical data pattern (Zhang and Chen, 2023). Predictive analytics have been used in human resource management in various types of decisions such as in selection of candidates, retaining employees and predicting performance. Paramita et al. (2024, p. 14) show that predictive models trained with historical hiring and performance data can predict candidate characteristics which predict successful research outcomes with accuracy better than human evaluators who utilize unstructured application review. These results imply that predictive analytics can significantly enhance the quality of matching in academic research recruitment, should there be enough historical information on the results of the research to make the models work.

2.4.4 AI-Assisted Recruitment Ethical considerations

The literature on the ethical aspects of AI-aided recruitment has been growing, with a keen interest in the dangers of algorithmic bias, privacy breaches, and the loss of agency among the candidates. Chen (2023) analysed the problem of AI-based recruitment ethics and discrimination and found that AI systems trained on past hiring data run the risk of reproducing and amplifying the biases present in the past data such as gender, ethnicity, college, and socioeconomic background biases. Chen suggested that algorithmic fairness in hiring needs not just to curb technical bias, but also organisational dedication to transparency, responsibility, and continuous system output monitoring. These ethical issues are especially relevant in the academic research recruitment context, as it has already been demonstrated that the use of informal networks as the form of recruitment already discriminates against students who belong to non-dominant demographic groups, such

as the international students and students of less prestigious institutions. A robotic platform, which mirrors these biases, would recreate and not solve the inequities of the current system.

2.5 Theoretical Framework Synthesis.

The literature review is based on two complementary theoretical theories, which are search and matching theory and signalling theory to explain these challenges, trying to find an appropriate research opportunity and an appropriate candidate for early-stage researchers. Search friction theory helps to understand how the efficiency of matching opportunities is lowered by incomplete information, decentralisation of the vacancy dissemination, and high search costs (Diamond, 1982; Pissarides, 2000). Search and matching theory help to understand the search frictions on the part of students to find an appropriate research opportunity, information asymmetry on the part of professors to assess the skills of a candidate as well as the utilization of informal recruitment processes that made the process less transparent and equal. Not all early-stage research jobs, like research assistantships, pre-doctoral positions, and project-based academic jobs, are recruited via standardised recruitment methods, in contrast to formal labour markets (Herschberg et al., 2018). This leads to inefficiencies of finding opportunities and competencies of candidates.

Signalling theory explains how individuals or organisations convey information about their underlying quality or ability through observable signals when true characteristics are not fully visible. In contexts of information asymmetry, these signals help others make decisions, even though they may be imperfect or costly to verify. (Spence, 1973) The signalling theory helps to understand the challenges encountered by professors during the process of candidate evaluation through CVs, motivation letters, and academic records are all signals of research capability, but these signals can be incomplete, inflated, or hard to check, especially with the growing popularity of AI-assisted writing tools (Galdin & Silbert, 2025). This brings about an information asymmetry in which the professors have no means of seeing the actual competencies of the student applicants.

Search frictions make it more expensive and uncertain to students seeking appropriate opportunities and information asymmetry make it more difficult and time intensive for professors to evaluate the quality of candidates. Herschberg et al. (2018) also demonstrate that the academic hiring process tends to be based on supervisor bias and informal hiring through networks, which supports both search frictions and signal issues. To address this, the study will provide practical AI enabled platform recommendations based on expert insights of professor and students derived from interview and survey to enhance the efficiency of the recruitment process.

This research employs empirical evidence to define system requirements to enhance transparency, candidate evaluation, and visibility of opportunities with the help of applications of artificial intelligence, including natural language processing (NLP), predictive analytics for intelligent candidate matching, and structured competency verified profiles which can help in decision-support mechanisms and can be used to help professors reduce their manual screening efforts, allowing students to find information at one place.

The theoretical framework, as depicted in the figure 3 below, indicates that the search frictions and signalling problems, affect the early-stage academic recruitment process and how applications of artificial intelligence determine the outcome of recruitment in terms of intelligent matching, transparency to access the research opportunities.

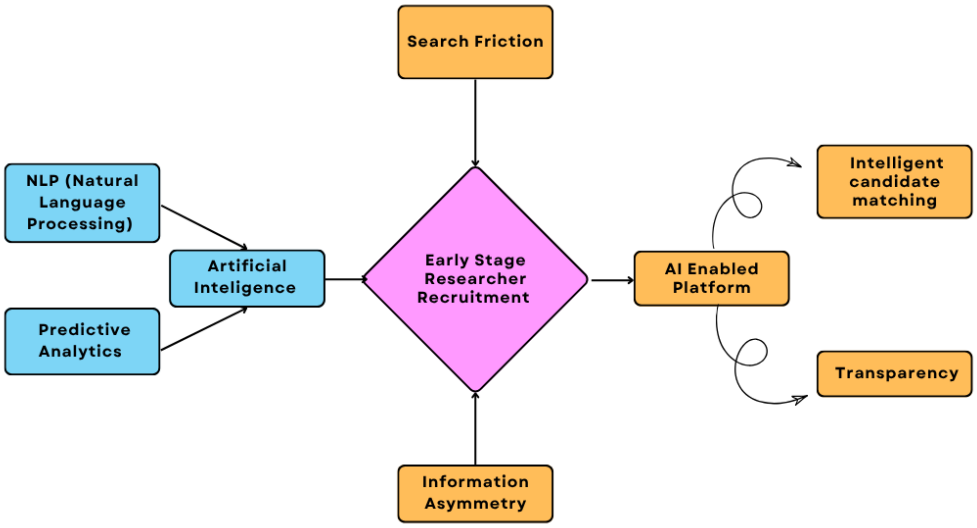

Figure 3 Theoretical Framework (Created by Author using Canva)

3. Methodology

This thesis is exploratory mixed methods design research that explores the recruitment issues of early-stage researchers in Finland (Creswell, 2021). Through purposive sampling, interviews with students with relevant expereince (Oranga & Matere, 2023) and survay participants were recruited through convenience sampling via academic and student networks within Finnish universities (Etikan et al., 2016).

3.1 Research Design

This study uses an exploratory mixed methods design which involves both qualitative and quantitative methods. The qualitative phase involved exploring participant experiences and perceptions of early-stage researcher recruitment, and the quantitative survey phase to testing for the presence of categories identified during the qualitative phase across a wider group of participants (Creswell, 2021).

3.2 Sampling

Purposive sampling was used during Phase 1. Purposive sampling is a non-probability sampling technique in which sampling is done based on the characteristics directly related with the research aims and not by random (Etikan et al., 2016). Participants were selected to represent five parties from the University of Vaasa, based on their close experience with early-stage researcher recruitment. The interview sample consisted of one academic supervisor who has experience in the assessment of research candidates, one master's degree student who had successfully gained a research position, one master's degree student seeking a research position and two master's degree graduates with doctoral positions at Finnish universities. Appendix 2 describes the role of each interview participant in this thesis, and in Appendix 3 all the interview questions are listed.

Phase 2, the survey opted a convenience sampling a form of non-probability, sent via departmental email lists, post-graduation student networks and LinkedIn academic

groups. The survey was voluntary, and 88 students and 12 academic supervisors share their views. As questionnaires were not sent to individual participants and their identity was not formally confirmed. The description of the survey sample is thus based on university students and academics in Finland, not on specific named institutions.

3.3 Data collection

Data collection process involved two phases, following the two stages of overall research strategy.

In phase 1, five semi-structured interviews were conducted with University of Vaasa participants using Microsoft teams. The selection of the interview participants is based on the experience relevant to recruitment of the early-stage researchers. To understand the in depth knowledge and experience of individual this approach is most used in research (Alsaawi, 2024). Interviews were conducted in English according to a protocol that covered four categories: participants experience with traditional application materials; their opinions on what those materials can and cannot convey about research ability; instances of information asymmetry during recruitment; and their opinions on what other mechanisms would enhance efficiency and transparency. Informed consent was obtained before the interviews were taped and then transcribed for analysis.

In phase 2, developed a survey questionnaire based on the categories identified in the Phase 1 interviews through content analysis. Items were designed as statements and rated on a five-point Likert scale from strongly disagree to strongly agree. The items were developed in two versions (one for students and one for faculty members), allowing for a direct comparison of their views. The survey was sent out to University of Vaasa students and faculty members, also shared on LinkedIn research community and 101 people responded.

3.4 Data Analysis

In Phase 1, Interview Analysis, Qualitative content analysis was used to analyse the interview data. By identifying, coding and categorising patterns in the data, researchers can systematically analyse textual data using this method (Elo & Kyngäs, 2008). It is appropriate for studies focused on gaining insight into the experience and perspective of the participants and requires a rigorous, step-by-step approach of analysis (Hsieh & Shannon, 2005).

With the participants' permission, the transcription tool in Microsoft Teams was used to transcribe the interviews. This did help to make the recording of the participants' responses more efficient and accurate. Transcripts were then reviewed with the original audio recordings to identify any inaccuracies or misinterpretations. The transcripts were then checked with the participants to verify accuracy and interpretation of the discussion that took place after this.

The data analysis was carried out in three steps. Data analysis is a procedure that is structured and is used to achieve meaningful results that are consistent with the theoretical basis of the study as stated by Sutton and Austin (2015). In the first step, open coding was conducted. The complete transcriptions of the interviews were read thoroughly, and meaningful text passages were selected and coded descriptively. According to Elo & Kyngäs (2008), Coding is the organization of data into meaningful groups for facilitating interpretation and understanding. At this point, codes identified directly from the participants' responses were developed and information that was not relevant to the study purpose was excluded.

The second step was to classify the related codes into categories and subcategories, which was achieved with NVivo software. NVivo was used systematically to manage coded data and to identify any repeated patterns or categories among the interviews. Reflective notes, interpretations, and summaries of participants' responses were also noted in memos during the coding process. The memos were directly attached to

relevant nodes in NVivo. The third step involved the categories being reviewed at a higher level and four main analytical categories were found that constituted the most important and recurring patterns related to the research questions. The four categories are the basis for the findings presented in Chapter 5 and the coding structure is given in Appendix 3.

In Phase 2, Survey Analysis, the data in the survey were exported out of the Google forms and analysed in Microsoft Excel. Each Likert-scale item was analyzed using descriptive statistics such as means, standard deviations and frequency distributions on the entire valid sample of 100 respondents. The participants responses were categorized into student (n=88) and professor (n=12) so that there could be a comparison of the perceptions between these two groups Likert-scale questions were considered interval level data to compute means, which is the standard practice in social science research based on surveys (Bryman, 2016). Inferential statistical tests were not performed due to the small sample size of the professors, which did not allow to make statistically sound comparisons between the groups. This analysis was thus descriptive and exploratory in nature as is the general exploratory design of the study. The responses of the students and supervisors were compared to determine differences in perception about the visibility of research motivation, search friction of finding and applying the positions, and sufficiency of conventional application materials.

3.5 Data validity and Reliability

To establish the rigour of the qualitative phase, credibility, dependability, confirmability and transferability criteria suggested by Lincoln and Guba (1985) were chosen. The reported findings were supported by first-hand accounts by the participants. The reliability was achieved by the use of a systematic interview protocol. In the case of the quantitative phase, the credibility of the survey instrument was backed up by deriving items directly based on the empirically based qualitative categories. It is necessary to note that the sample of interviews was selected using one university, which can be regarded as a narrow institutional point of view.

3.6 Limitations and Ethical Considerations

There are a number of limitations to this study. The qualitative interview stage only took place at the University of Vaasa with a sample of five participants, which was not very diverse in terms of the institutions. The sample of 12 respondents in the professor survey reduces the statistical strength of findings related to supervisors. The limitations of the research are that it is constrained by the Finnish context of higher education and might not be applicable to other systems. The cross-sectional time frame implies that the results are a snapshot of the situation at the moment. In terms of ethical issues, informed consent was ensured and all participants were fully informed about the objectives of the research. Anonymity was ensured during the process, the participants of the interviews were identified by their roles, not by their names, and the survey results were anonymous. All the data were kept safely in line with the data management principles of the University of Vaasa and the demands of the General Data Protection Regulation.

4. Findings

In this chapter, the empirical results of the research are given in two consecutive sections based on the two stages of the research design. In Section 4.1, the results of the qualitative interview phase are presented, and it is structured around the four main categories that were identified during the Content analysis in NVivo. The results of the survey stage are provided in section 4.2 and were filled in by 100 valid participants 88 students and 12 academic supervisors in five Finnish universities. The findings collectively answer both of the research questions RQ1, which is about how information asymmetry and search friction hinder the recruitment of researchers at early stages; and RQ2, which is about what features a digital platform needs to realise in order to lower the administrative load of professors and increase research opportunity visibility among students.

4.1 Phase 1: Qualitative Findings

Four main categories emerged from a content analysis of five semi-structured interviews at the University of Vaasa each of which captured a different aspect of the information asymmetry and search friction issue in early-stage researcher recruitment.

4.1.1 Category 1: Fair Hiring and Search Practices

The former category was how the participants think the recruitment process is fair and accessible and what the avenues are used to identify and fill vacancies. In this regard, the emerging information from student and the supervisor account, the search process was described as mix of formal application recruitment and being reliant on personal relationships/ Networking.

This is illustrated by a Professor in the following way “Suppose I have position, I will try to hire those who are known/ referred and I would prefer to meet in person, so I get to know capability of the student” (Professor).

According to one Master's student "I have almost spent 1 year to show my interest in research positions and doing best in his course to get noticed by professor and I got an internal email for the master's thesis position" (Master student success case)

This highlights that research opportunities may not centrally advertised fully and are fragmented and dispersed across informal channels.

While a PhD student's said, "I have applied from University portal and the got the position as my recruitment process was smooth"

Whereas on the other hand the Professor said "I personally go for referral sometimes we don't have enough time to go through the long recruitment process, so hire internally"

Depends on the urgency of the project and according to that recruitment process begins with internal hiring which cannot be fair for those students who are not part of the same networking group, on the other hand PHD students have smooth process of recruitment.

4.1.2 Category 2: Challenges in Recruitment

The second category focused on the barriers that the participants saw as challenging in the recruitment process.

This is illustrated by a Professor in the following way "I do receive email from students, but I hardly reply as mostly are not relevant to my interest or sometime if I don't have any open positions, I simply reply no vacant position at the moment" (Professor)

Where a master's student said "I have updated my LinkedIn after getting paid thesis position and students are messaging for asking for research positions" (Master student success case)

The scattered information of vacant positions and informal hiring became the source of tension in unsolicited outreach as the supervisor said that most of the emails received from students are not specific enough regarding their current research interest.
Professor further added “We need students who plug and play as research job is quite different from corporate work, we don’t have enough time to teach students”. (Professor)

Where a master’s student said, “I have 2 publications as it’s my second master’s here in Finland and because of my previous experience, I got this thesis position” (Success case)

On the other hand, a PHD student said “I have previous experience in research as since my bachelor's degree I am working on research articles, and I have enough information regarding research methods and how research work” (Success Case)

Student who processes some sort of previous publications and research experience received the chance to present themselves and got the research position as professor also believes that student should know what to do from very first day.

4.1.3 Category 3: Signals and Candidate Evaluation

The third category was the procedures by which supervisors assess applicants and the sufficiency of the cues that can be obtained using traditional application materials. The CV-based signals considered by the supervisor as the most informative were found to be previous experience and previous publications.

This is illustrated by a Professor in the following way “I mostly access student’s capabilities through a meeting but as a professor we got trained because of experience to know the student’s capabilities through CV” (Professor).

Where a Professor further illustrated, “I have seen many resumes so polished, but when I meet the candidate, they don’t even know what is the different between qualitative and quantitative.” (Professor)

The most substantively important information in this category was the motivation. Every respondent cited the evaluation of motivation of a candidate to do research as a key issue, all cited traditional application documents as CV, academic transcript, and motivation letter as insufficient tools to express or measure this trait in a credible manner.

According to a Professor “It is hard to know based on a CV or a motivation letter whether a student truly wants to conduct research or he/she applies based on instrumental motives”. (Professor)

Where a PhD student said, “Motivation is the most important thing that is checked by professor in interview as in my interview they asked me if I will work for unpaid PhD position and my answer was Yes” (PhD student success case)

Student participants reported mutual challenge: building materials that convincingly convey the real motivating force of the research was reported as a consistent challenge.

One student of masters illustrates in the following way “Motivation letters are formulaic and that there is no other way to tell the supervisor whether the motivation is genuine.” (Gap case)

4.1.4 Category 4: Time Consuming Search

The fourth category was the time aspect of search friction to both students and professors in their interviews.

One Master’s student said, “I am actively searching for research positions, and I have applied on university job portal and reach out professors through email but no luck” (Gap case).

Whereas a Professor illustrated in the following way, “When I have position open and we follow formal recruitment channel for processing I received a lot of resumes and initial screening without assistance is itself a task” (Professor).

The supervisor explained the administrative aspect of recruitment such as going through the screening of 100’s of applications, and initial screening without systematic assistance, as a repetitive time burden that vies with the main research work.

4.2 Phase 2: Quantitative Findings

The survey was filled out by 100 valid respondents, including 88 students and 12 academic supervisors from five Finnish universities as depicts in figure 4.

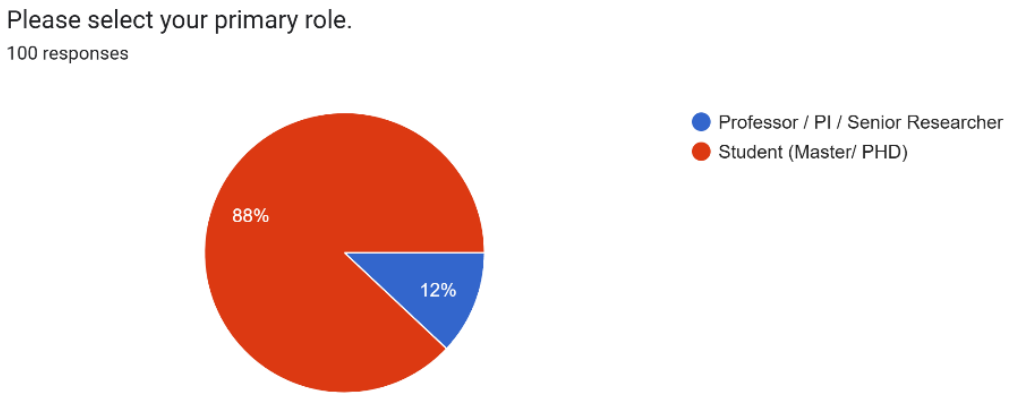

Figure 4 Total Number of responses of Survey

4.2.1 Data of Participant

Among the 88 student respondents, 44.3% indicated that they are actively seeking a research position, 21.6% had searched a position but not found it, 20.1% had found a position previously, and 11% had not yet sought a position, depicts in figure 5.

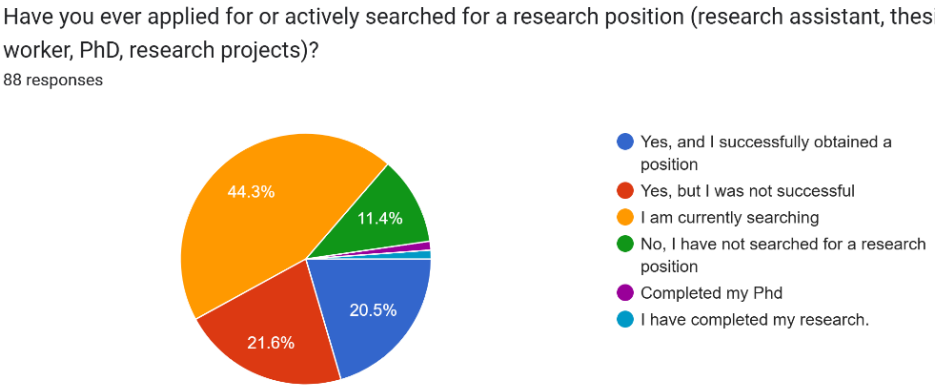

Figure 5 Data of Student participants

4.2.2 Opportunity Visibility

Students who were asked how easy it is to find available research positions at their university rated the ease of locating the available research positions with a mean score of 2.77 on a five-point Likert scale (N=88) which implies that most students find it hard to identify available research positions. In particular, 39.8% of students gave this item a rating of 2 or less, and only 19.3% a rating of 4 or more can see in figure 6.

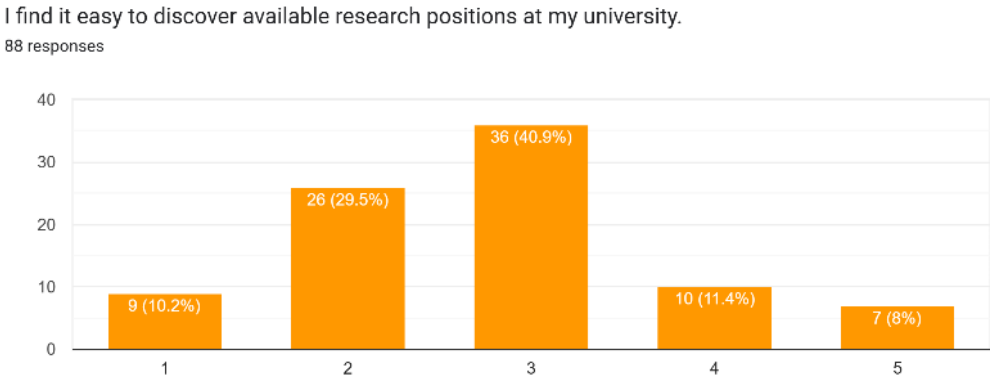

Figure 6 Students' opinions of how simple it is to find open research positions

The question that included the option that the students had missed a research opportunity because they had never heard of it elicited the mean value of 3.01 (N=88), with 39% of the respondents choosing 4 or above - meaning that a significant percentage of the respondents believed that they have lost opportunities because of structural invisibility, not a lack of, illustrates in figure 7.

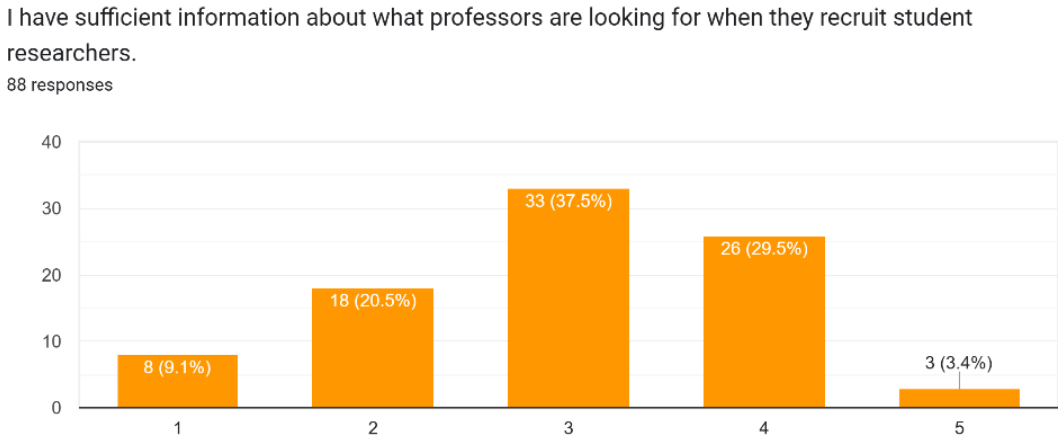

Figure 7 Students' opinion of sufficient information of requirements

The question that included the option that the students had missed a research opportunity because they had never heard of it elicited the mean value of 3.01 (N=88), with 39% of the respondents choosing 4 or above - meaning that a significant percentage of the respondents believed that they have lost opportunities because of structural invisibility, not a lack of qualification can see in figure 8.

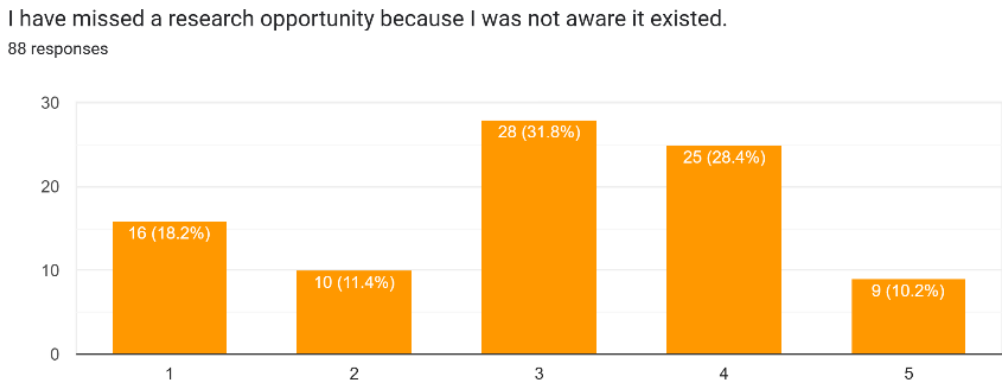

Figure 8 Students' opinion on missed Research Opportunities

Regarding time investment, 43.2% of respondent students indicated that they spent between three and five hours a week actively seeking research positions and 26% of the respondents indicated that they spent over five hours a week. The percentage of those who spent less than one hour a week was only 3% which shows that a large amount of time is spent on the process due to search friction, depicts in figure 9

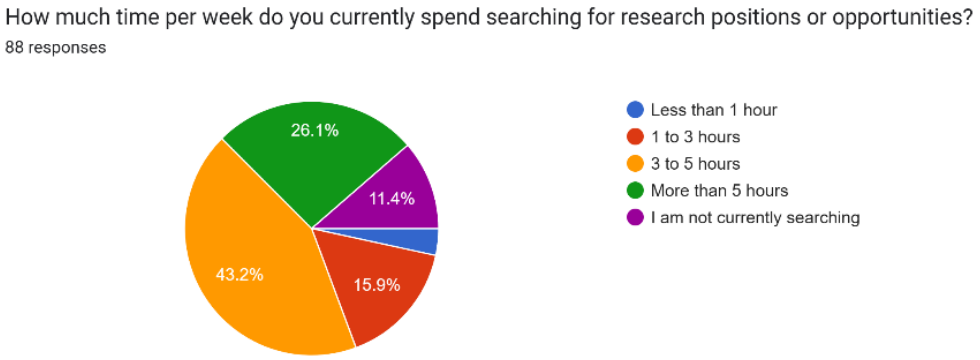

Figure 9 Students Spending time for searching opportunities

4.2.3 Information Asymmetry in the Evaluation of Candidates

The quality of information received by professors on student CVs and application materials resulted in a mean of 2.58 (N=12) the lowest of any professor facing item in the survey. This item was rated 5 by only one professor and 1 by three, depicts in figure 10

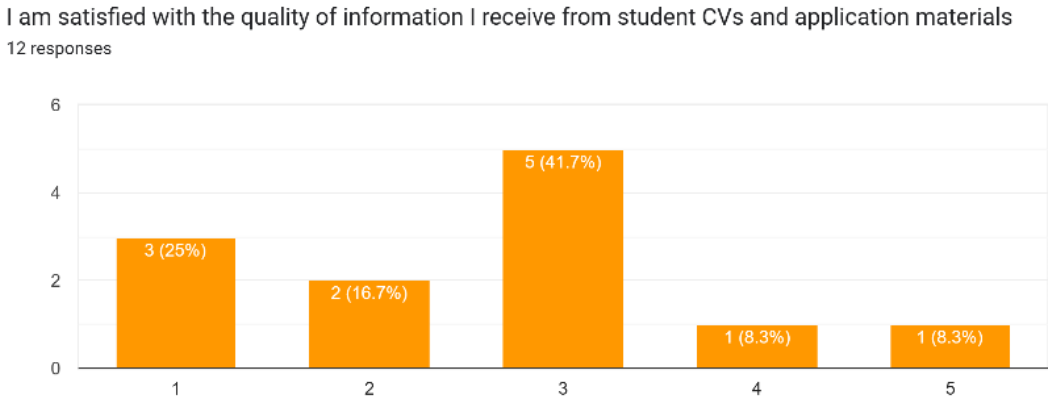

Figure 10 Professor Satisfied with Students Application Material

The scale that directly measured the challenge in assessing the motivation of the candidate based on the application materials yielded a mean of 3.67 (N=12). As per survey many professors find it difficult to access the motivation of the student through the application material, depicts in figure 11.

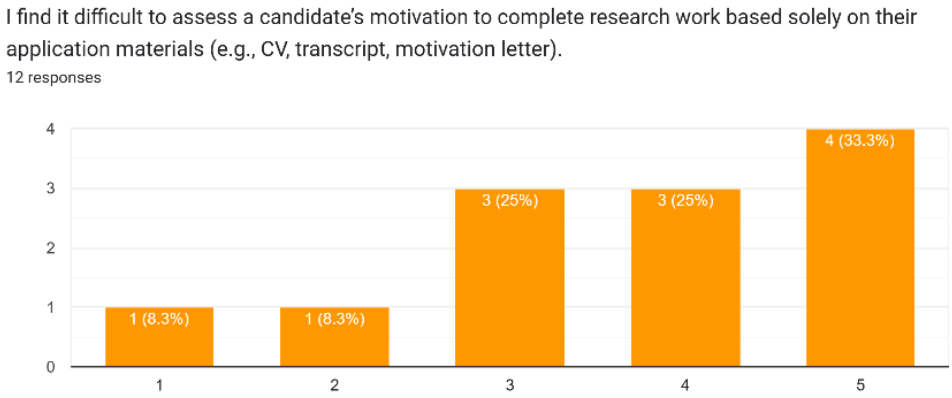

Figure 11 Professor access Students Motivation through Application Material

67% rated 4 or more the question about missed candidates because they were not aware of positions available created a mean of 3.83 (N=12). This result suggests that the information gap of scattered information will result in many good candidates unable to join that research group Depicted in figure 12

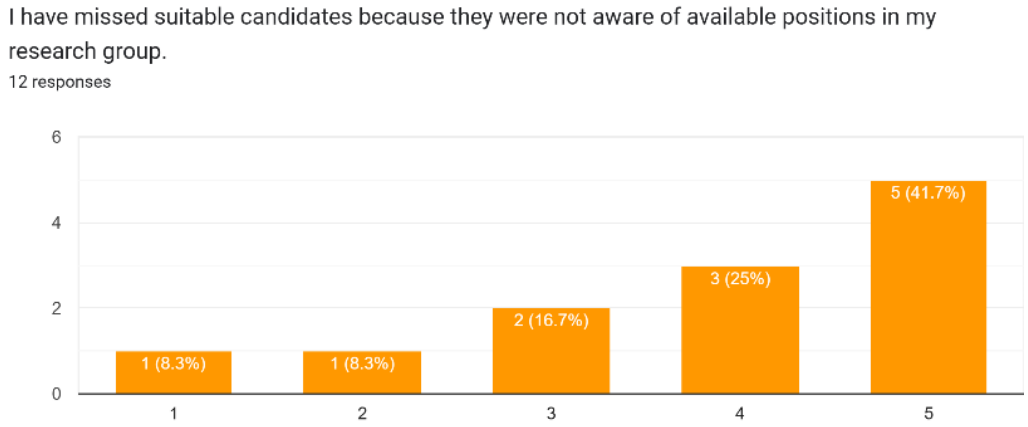

Figure 12 Professors' perspective on missed suitable Candidates

The proportion of students who rated 4 or higher on the question whether access relies more on personal ties than academic qualifications (mean 3.00, N=88), aligns with qualitative descriptions that found informal networks to be a key factor in access the research position depicts in figure 13.

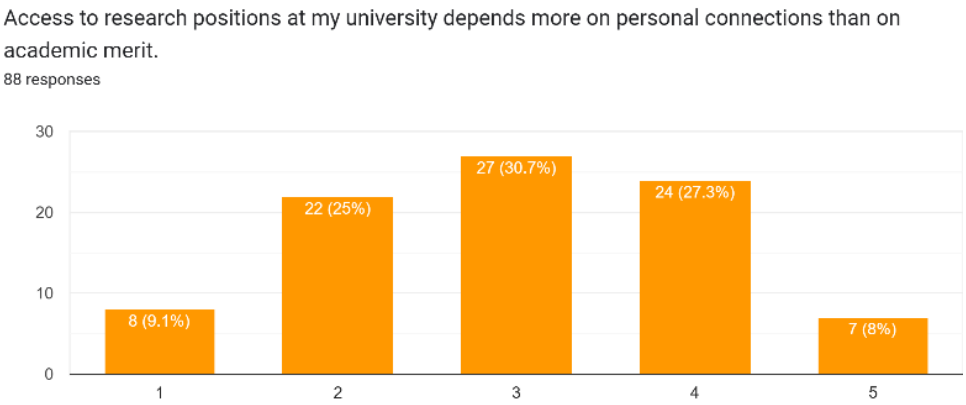

Figure 13 . Students' opinion on networking and personal connection

4.2.4 Recruitment as an Administrative Burden

Another study amongst professors showed that 58% of professors spent three to five hours per month on administrative issues involving the recruitment of student researchers illustrated in figure 14.

Figure 14 Professors' perspective on administrative tasks burden

Twelve professor respondents indicated that 33% of unsolicited student emails concern their ongoing research or funding, and 66.7% of them indicated less than 10% of the emails are relevant to their work, as illustrated in figure 15.

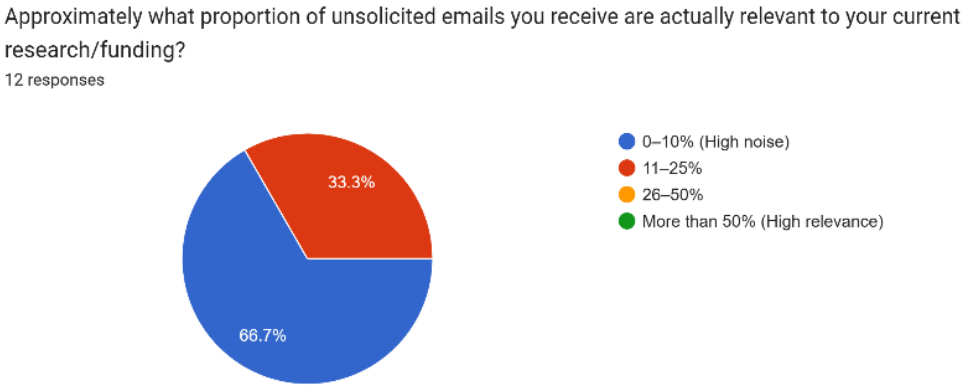

Figure 15 Professors' perspective on unsolicited emails

67% of professors (mean 3.83, N=12) rated the recruitment process time-consuming and it's the extra administrative work away from the research depicted in figure 16.

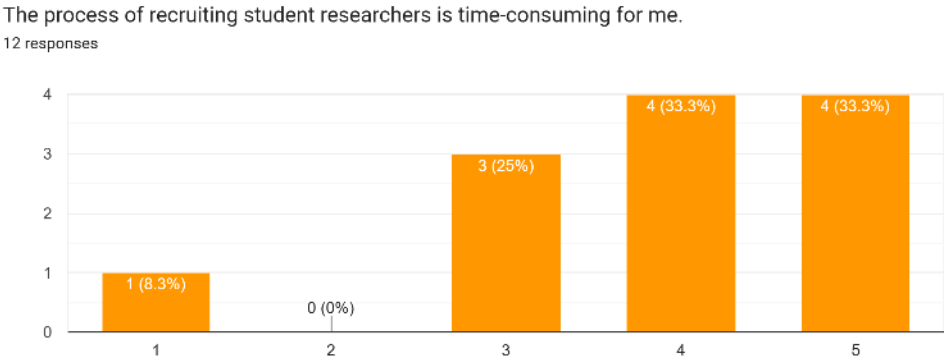

Figure 16 Professors' perspective on student recruitment Process time

When requested to specify their greatest challenge, the most prevalent answers where information is too distributed to platforms (4 professors), hard to check technical skills (3 professors), and timing (3 professors) of funding and student availability, illustrated in figure in 17.

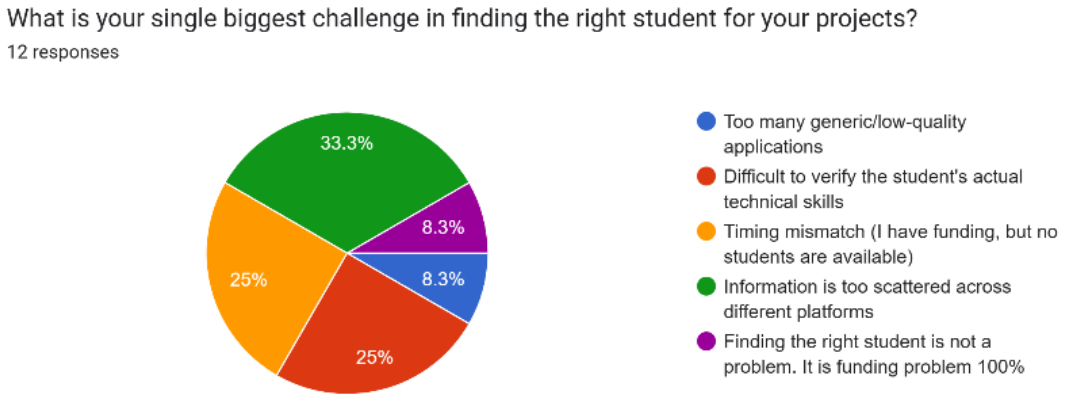

Figure 17 Professor Challenge on Finding right student

4.2.4 Platform Adoption and AI-Enabled Matching

Among professors had a mean of 3.83 (N=12) with 75 percent of the responses being 4 and higher had a significant desire to implement a committed Ai enabled digital platform, depicts in figure 18.

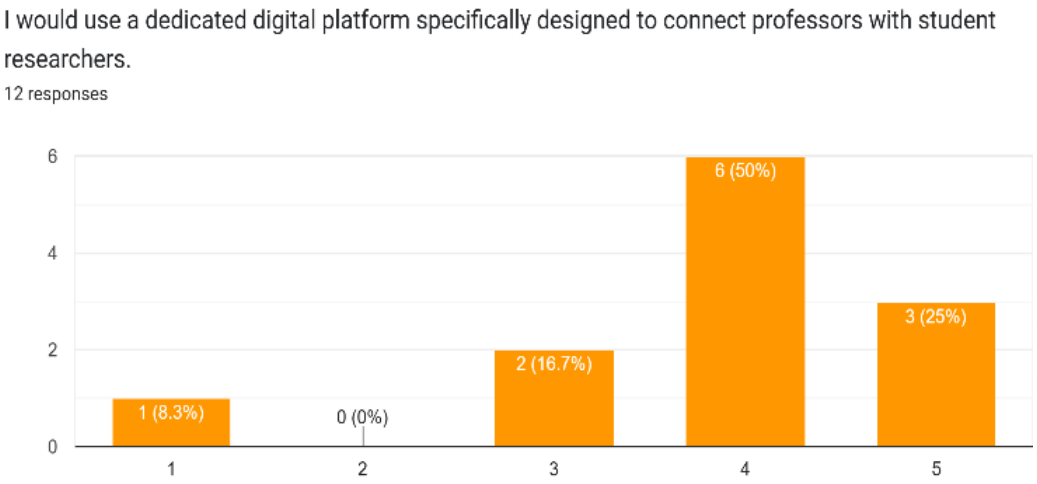

Figure 18 Professor Preceptive on AI enabled Platform for Researcher recruitment

Professor survey with a mean of 4.00 (N=12) and 83 percent rating of 4 or higher for an AI candidate ranking tool by research projects and requirements of the research would save time for them illustrating in figure 19.

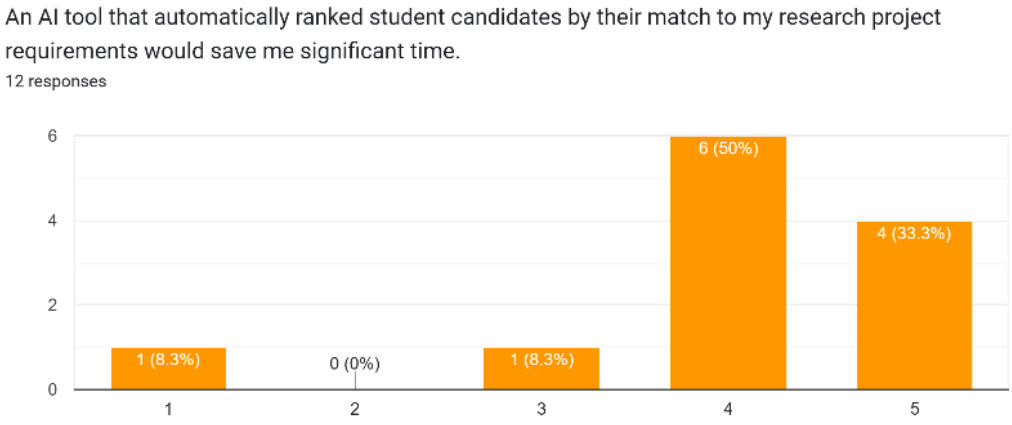

Figure 19 Professor Preceptive on AI enabled Student Ranking tool

The question on whether verified profiles would be more helpful than traditional CVs responded by professors, resulted in a mean of 3.75 (N=12), and 77% of the responses were 4 and above. Illustrates in figure 20.

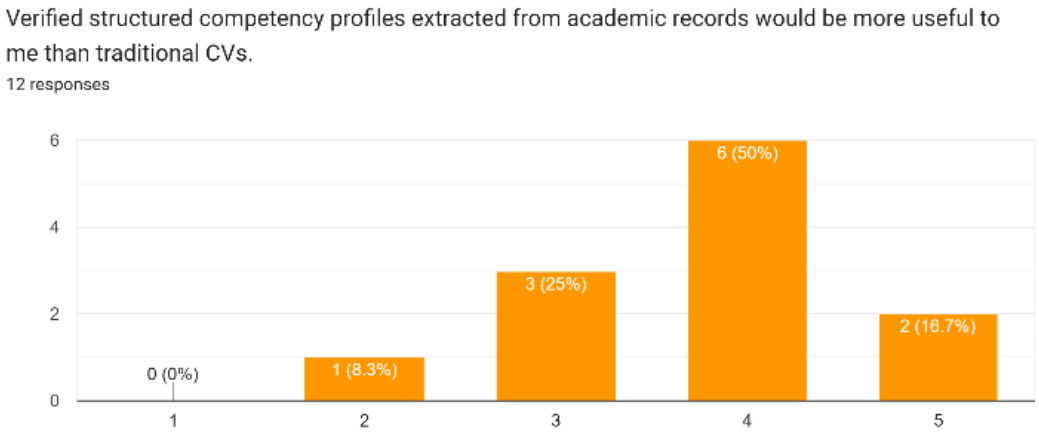

Figure 20 Professor perspective on verified profiles of student then cv

Fear of bias in algorithms was relatively low with a mean score of 2.67 (N=12) with 42% scoring 2 or lower. as professors believes that Ai based recruitment will not bias, depicted

in figure 21.

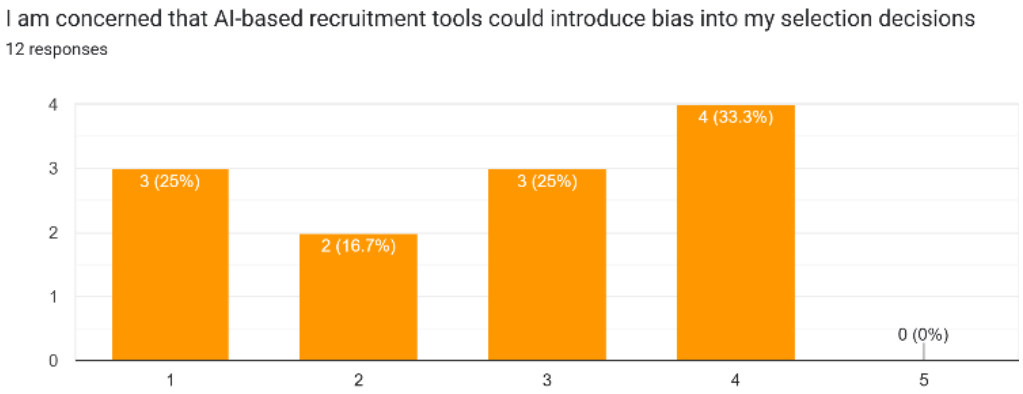

Figure 21 Professor perspective on AI for selection Decision

The most frequently used platform features among students were a centralised feed of positions available, AI-generated matching of student's profile with positions, and a verified academic profile that professors can see. Verified student profiles, transparency on candidate ranking, and AI-generated ranked shortlists were the most important features by professors, illustrated on figure 22.

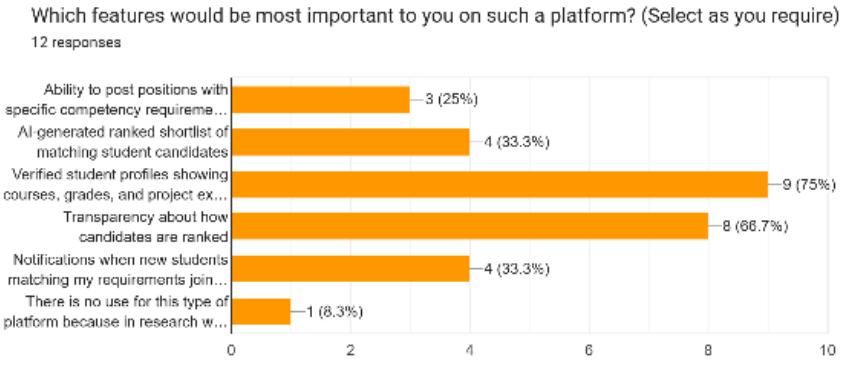

Figure 22 Most important platform features among Professors

In figure 23, the platform features students rated top 3 are, the 58% goes with the centralized Feed for all available positions, 60.2% rates Ai generated matching students verified profile to professors, and 72.7% verified student academic profiles visible to professors

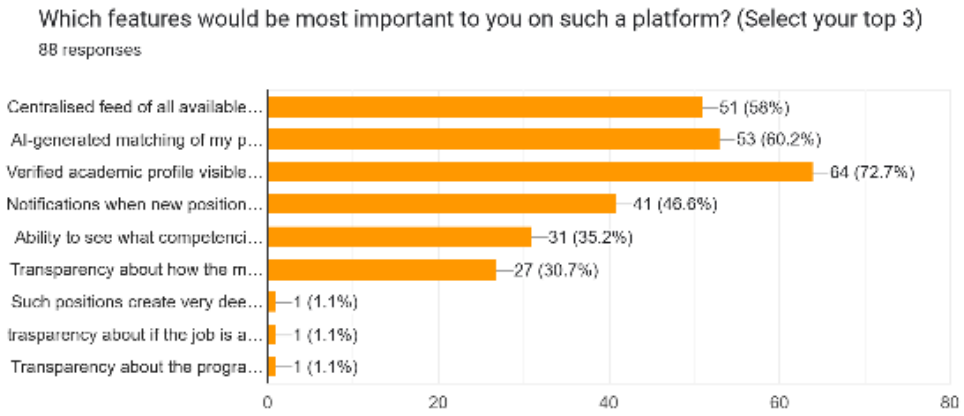

Figure 23 Most important platform features among students

4.3 Summary of Findings

The results of the two phases are drawn to a similar set of conclusions. The existing early-stage The existing early stage researcher recruitment procedure can be described as having search friction due to a lack of a centralised matching mechanism as vacancy position are either filling by formal and informal hiring which include university own job portal, networking with existing students and peer referrals as it gives the sense they have prior research experience to start work from day one. Information asymmetry in resume while sharing true self information about past experiences and research work and most importantly research motivation of the student to complete the 4 years long degree commitment. This motivation aspect of the supervisor selection that is central to research job, which is not well represented in traditional application materials. Students and professors equally spend unequal time in a haphazard process that creates less flow of information, missed matches and unequal access of scattered research positions. In survey, to mitigate these issues a perception of an AI enabled digital platform tools features was asked, Both groups demonstrate a significant willingness to use a committed Ai enabled digital

platform, with professors expressing especially great support of AI-assisted ranking of candidates where all students access the research positions in one place with transparency.

Table 1 Key survey results summarised (N = 100)

Survey Item	Group	Mean	N	High (4-5)
I find it easy to discover available research positions	Students	2.77	88	19%
I have sufficient information about professor requirements	Students	2.98	88	33%
I have missed an opportunity due to lack of awareness	Students	3.01	88	39%
Access depends more on connections than academic merit	Students	3.00	88	35%
AI matching tool would save me significant time	Students	3.40	88	45%
I would use a dedicated platform	Students	3.52	88	53%
Platform would give more equal access	Students	3.47	88	52%
Satisfied with CV and application material quality	Professors	2.58	12	17%
Concerned about AI bias in selection	Professors	2.67	12	33%
Difficult to assess candidate motivation from materials	Professors	3.67	12	58%
Trust AI to assess student competencies reliably	Professors	3.75	12	75%
Verified profiles more useful than traditional CVs	Professors	3.75	12	67%
Difficult to identify suitable student researchers	Professors	3.83	12	75%
Recruitment process is time-consuming	Professors	3.83	12	67%
Missed candidates unaware of available positions	Professors	3.83	12	67%
Would use a dedicated platform	Professors	3.83	12	75%
AI ranking tool would save me significant time	Professors	4.00	12	83%

4.4 Recommendations for AI enabled Digital Platform Requirements

This chapter puts into context the empirical results in Chapter 4(Findings) concerning the theoretical background as laid down in the literature review and draws practical platform recommendations based on the interpretation. The results of the survey indicated perceptions and preferences of features to include in a potential AI-based digital platform solution that would alleviate information asymmetry and search friction in early-stage researcher recruitment. The four functional recommendations of requirements that are presented below are based on the empirical evidence.

4.4.1 Recommendation 1: Centralised Research Opportunity Feed

The most repeatedly important feature among the respondents of the student population was a centralised feed of all available research positions, indicating that 40 per cent of students rated the discoverability of research positions at 2 or below on a five-point scale (mean 2.77). This finding relates to the qualitative category of search friction, and opportunity visibility where the participants shares that they find it difficult to find the research position lack of a centralized platform for listing jobs which is challenging for conducting search efficiently. A centralized opportunity unified publicly accessible register of research assistant, thesis worker and doctoral positions, which will be updated with each new position. A detailed description of the project, skills/qualifications required, funding availability and application process can be included in each listing as structural lack of such a mechanism has been noted in the literature of search and matching as one of the reasons for the friction in labour markets (Diamond, 1982, Pissarides, 2000).

4.4.2 Recommendation 2: Verified Student Competency Profiles

Satisfaction with information received from student CVs and application materials produced yielded a mean of only 2.58 among the professor respondents, the lowest item among all the professor facing items, and 67% reported that they were at 2 or below in terms of satisfaction. This research is in line with theoretical reasoning regarding the lack of an adequate signalling instrument, as conventional materials are too cheap to be

credible, and cannot communicate research motivation, an unobserved quality (Spence, 1973; Connelly et al., 2011). Meanwhile, CVs are fallible and easy to tamper with, and this opens up the possibility of exaggeration and falsification in situations where the cost of verification is minimal (Da Silva et al., 2020). Verified academic profile systems in which student competencies, such as course information, research projects, academic performance etc., are verified in an authenticated way against the institutions' student information systems instead of relying on self-reported data. However, verified profiles are more difficult to falsify than a self-fabricated CV, and thus have greater discriminatory value as signals (Connelly et al., 2011).

4.4.3 Recommendation 3: AI-Generated Candidate Matching and Ranking

The most consistent result from the professor survey was support for an AI tool that automatically ranks student candidates based on their match with research project requirements with a mean of 4.00 and 83% of professors rating this 4 or higher. Survey gives an empirical basis for recommending that AI-powered matching can be a core component of any platform that tries to overcome the challenges of search friction and information asymmetry in recruitment. As the input data is unstructured text sources like CVs, cover letter, the application of NLP to automatically extract attributes relevant to research position such as, qualifications, and experience indicators (Roppelt et al., 2024). The results of Paramita et al. (2024) support the idea that NLP-based competence extraction generates candidate profiles that have a much higher predictive validity of job performance than CV. This concept is supported by recent literature: Hämäläinen and Petrikaitė (2024) find that algorithmic matching decrease search costs and optimize matching accuracy in labour markets by allowing for more precise matching of candidates and positions.

4.4.4 Recommendation 4: Transparent Ranking System

The most frequently chosen feature by professor respondents was transparency regarding the ranking of candidates, and it was used several times in the student preferences.

52% Student ratings on dedicated platform states that the implementation of any platform should include a clear explanation system that notifies the students about the reason of matching with the positions, as well as a notification system informing students about the availability of positions that match their profile. The recommendation provides solutions to the timing mismatch that three out of 12 professor respondents cited as their top recruitment hurdle (identified in the qualitative results), while 35% students rated access of opportunities are more depended on personal connection then academic merit. Transparent ranking through AI can help the candidates to match with jobs accurately, both the candidate competencies and job requirements can be well defined and standardised where competencies can be regarded as skills, knowledge, attitudes and values which result into performance (Le Deist & Winterton, 2005).

5. Discussion

The discussion is designed based on the research questions that are guiding the study. The qualitative and quantitative evidence can be interpreted information asymmetry and search friction to answer RQ1: How do information asymmetry and search friction make the recruitment of researchers difficult? And RQ2: What functional requirements Ai enabled digital platform overcome challenges causes from information asymmetry and search friction in recruitment Section 5.1 speculates on the wider implications of the results.

The results of two phases of our research findings indicate challenges in information visibility and researcher supervisor matching, affirm that there is search friction in the early-stage researcher recruitment in the Finnish universities, without an investment of time by both parties, which is also evident in the empirical data in various aspects. On the student side, 44% of the surveyed students said that they are actively searching, to no avail, and 22% had previously searched without success. Most active searchers - 69% - said they spent three hours or longer each week on search-related activity, and 26% said they spent over five hours per week. These numbers indicate a significant and repeat time cost of a process. The qualitative results supply the mechanism: advertisements of all research positions are not regularly posted, and the main source that students have is unsolicited email outreach, which is characterised by extremely low response and a high level of uncertainty.

Twelve professor respondents indicated that 33% of unsolicited student emails concern their ongoing research or funding, and 66.7% of them indicated less than 10% of the emails are relevant to their work. 33.3% professors said information is too scattered across different platform, 66.6% of professors rated the process of recruitment as time consuming, and 66.7% said they had missed good candidates who had just not realized there was a position because position was internally posted and they are not the part of that networking group. The findings suggest significant inefficiencies in recruitment

process are faced by both professors and students due to high information noise, search effort and limited visibility of relevant matches.

The results show that the CV-based signals in the initial stage of recruiting researchers is an information asymmetry that does not lend itself to a solution by traditional application materials. The survey results indicated that the average rating of professors about the quality of information with traditional application materials was 2.58. This was the least favourable average score of the issues assessed by supervisors. The results indicate that CVs and motivation letters may not be enough to evaluate important research characteristics, like research motivation and sustained interest in research. These documents may not fully convey a candidate's eagerness, enthusiasm, or interest in research activities, and may only offer a snapshot of their academic qualifications and accomplishments. The item that directly deals with the problem of judging the motivation based on application materials generated a mean of 3.67 among professors, and 58% of them rated this at 4 or higher.

The qualitative results are additional texture. Both students and the supervisor revealed that the motivation letter is a formulaic tool, the contents of which do not give a sufficient ground to make a credible inference. Students explained the process of motivation letter writing as a presentation and not honest self-disclosure, whereas the supervisor remarked that it is impossible to distinguish between honest and strategic discourse of research interest using a document by itself. This reliance on each other is in line with the theoretical state of a failed signalling equilibrium of an instrument surviving institutionally even after having lost the ability to credibly transmit the information that it claims to convey (Bangerter et al., 2012).

5.1 Broader Implications

The results of this study could have implications beyond the context of the Finnish university. These ideas of information asymmetry and search difficulties can help to understand the problems that can arise in the academic recruitment process in the absence of

formal channels and when the students and supervisors are not easily known to one another. Similar issues can be encountered in other European Higher education systems, like ambiguous recruitment information, inadequate communication of the research motivation, reliance on academic networks.

The survey also indicates that professors might be slightly more open to AI-powered recruitment tools than students. This may be because supervisors have more applications to review that can be generated through AI, professor have to go through more time to find a good match. This indicates that AI-powered platforms may be more likely to be adopted if they allow supervisors to save time on screening and enhance the match process.

It is important to note that the low rank of concern for algorithmic bias among participants does not indicate that concerns about algorithmic bias are not a reality. The use of AI for recruitment practices has been found to mirror existing inequalities in previous studies if training data or selection criteria are biased. Therefore, any upcoming platform that utilizes AI for hiring processes should have transparency features, multiple data sources and periodic audits to guarantee that it delivers equitable and fair results.

6. Conclusion

This thesis explored how information gaps and difficulties in finding suitable matches affect the recruitment of early-stage researchers in Finnish universities. The study also examined whether a digital platform could help improve visibility and communication between students and academic supervisors during the recruitment process. The research was motivated by the observation that current recruitment practices for research assistant, thesis, and doctoral positions often rely on informal networks and traditional application materials such as CVs and motivation letters. These materials may not effectively communicate important qualities such as research motivation, interest, and long-term suitability for research work. The study used an exploratory mixed methods design. In Phase 1, five semi-structured interviews were conducted at the University of Vaasa. The interview data were analysed using content analysis in NVivo, which identified four main categories: fairness and visibility in recruitment, challenges in the recruitment process, candidate signalling and assessment, and difficulties in discovering suitable opportunities. In Phase 2, survey was conducted responded by 100 participants from Finnish universities student and academic networks. The survey was used to examine whether the categories identified in the interviews were reflected across a broader group of participants.

The results substantiate that early-stage recruitment of researchers in Finnish universities is marked by search friction due to lack of centralised, coordinated matching mechanism. Students spend relatively large time on search- activity- 69% of students spend three or more hours a week and professors are concurrently overwhelmed by large volumes of low-relevance contacts. The information asymmetry is also localized in terms of motivation of the research: professors expressed an average satisfaction of 2.58 on the quality of application material, and half of them had problems with evaluating motivation based on the materials they used independently. The empirical results recognise four functional requirements of Ai enabled platform a centralised opportunity feed to cover the structural position invisibility; verified student competency profiles to cover the insufficiency of self-reported materials as credible signals; AI-generated candidate

matching and ranking - supported by 83% of professors as the most important feature; a transparent ranking explanation system to maintain the trust and agency of both sides.

6.1 Theoretical Contributions

The research builds on the literature of the signalling theory by offering empirical support that the failure of CV-based signalling in academic recruitment is localised to a particular quality (research motivation) whose characteristics render it inaccessible to credible modelling using any low-cost documentary tool. This observation sharpens theoretical knowledge of the areas of signal degradation most prone to occur and the design of signalling mechanisms in other motivation-sensitive selection interactions. The research shows that the framework of escalation dynamics provided by Bangerter et al. (2012) can be applied to academic recruitment and that the motivation letter can be viewed as an instrument that has already passed the stage of a broken signalling equilibrium - continuing to exist institutionally even after losing the ability to convey information that it claims to transmit in a credible manner.

6.2 Practical Contributions

The main practical contribution of the study is the requirements of Ai enabled platform to increase efficacy in early-stage recruitment - a five-feature digital platform, the requirements of which are based on empirical evidence and theoretical analysis, but not on the assumptions of a general adoption of technology. The platform specification gives a practical and tangible beginning point to institutional or entrepreneurial growth of a recruitment tool to meet the recorded demands of both students and professors in the Finnish higher education environment. The methodological contribution of the study is also to show how a mixed methods method, where the qualitative interview categories are directly used to construct the survey instruments, can be valuable in studying phenomena that are not yet well understood to the point that a purely quantitative approach to measurement would be suitable.

6.3 Limitations

There are a number of limitations of this study. This qualitative interview was done in one institution and consisting of five interviewees, constrained the institutional diversity and qualitative data volume. The sample of 12 respondent professors constrain the statistical strength of findings about the supervisor. The research is limited with the Finnish context of higher education and might not be applicable to other national systems. The cross-sectional nature captures the situation at one point in time and fails to consider how the process of recruitment or perception-related with the platform can evolve in response to the increased use of AI tools in higher education.

6.4 Future Research Directions.

The findings and limitations of this study suggest several directions of future research. A more extensive qualitative investigation of supervisors and students in various Finnish universities would help to gain a more profound perspective of information asymmetry and search friction dynamics. Evidence regarding the experience of friction as a process over time would be obtained by conducting a longitudinal study of the experiences of search among students during the enrolment period. Future studies ought to focus more closely on the equity concerns of AI-based matching of academic recruitment, specifically, whether algorithmic systems trained on past data replicate or decrease the access inequities that disadvantage international students. Lastly, the theoretical construct, formulated herein, might be used fruitfully to participants of researcher recruitment in other national settings and would allow conducting comparative studies of how various institutional structures create various friction and asymmetry profile.

6.5 Concluding Remarks

Recruitment of early-stage researchers is important for supporting future academic research and for the development of the next generation of researchers. This research indicates that there exist several problems in the existing recruitment process of

universities in Finland, seen from the perspective of the students and professors. Students, especially international students, had problems finding opportunities and the expectations for recruitment. In addition, professors mentioned that they were also hindered in obtaining information from the conventional application documents particularly in assessing a candidate's research motivation and long-term research commitment.

The results also indicate that an Ai enabled digital platform can be useful for enhancing the visibility and communication of the recruitment process and overcome the challenges. Some of the challenges participants reported can be mitigated by features like opportunity listings, verified academic profiles, AI-powered matching, ranking explanations, and motivation portfolios. The survey results also revealed the relatively positive attitudes about the potential use of AI-assisted recruitment support, among professors. In general, this research could be used to understand the recruitment problem for researcher in early career in the light of information visibility, communication and reviewing of the researcher's profile. The results could also offer practical guidance for future initiatives to make academic recruitment processes more transparent and accessible.

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Appendix

Appendix 1 NVivo Data Structures

Table 2 Content Analysis in NVivo

Sr.	codes	Files	References
1	Fairness of recruitment	3	7
1.1	Search process	5	20
1.1.1	LinkedIn	1	1
1.2	AI-enabled Platform	3	4
1.2.1	ATS	1	2
2	Challenges in recruitment	3	6
2.1	Communication skills	1	1
2.2	competition	1	1
2.3	funding	2	2
2.4	Grades	1	2
2.5	Initial Contact	1	1
2.6	Job Fairs	1	1
2.7	Last Degree Gap	1	1
3	Research Methods knowledge	1	1
3.1	Signals and Candidate Evaluation	2	16
3.1.1	Previous Experience	2	2
3.1.2	Previous Publication	1	2
3.1.3	Project researcher positions less information	1	1
3.1.4	Motivation	3	3
3.2	Niche Fragmentation	1	1
3.3	Relevant Field	1	2
4	Time-consuming search	1	2

Appendix 2. List of Interviewees

Table 3 List of Interviewees

Interviewee	Particpants Current Situation	Role In Thesis
Active Masters Student	Active student secure master's thesis position	Success Case
Active Master Student	Active student looking for research positions	Gap Case
PHD Student	Got research position after masters	Success Case
PHD Student	Got research position after 2 years of masters	Gap case
Assistant Professor	Professor Prespective	Supervisor

Background Information:

Interview type: Semi structured Interview

Number of Intervieews: 5

University: University of Vaasa

Duration of the interview:

- Active Masters Student Success Case: 33 minutes
- Active Master Student Gap Case: 39 minutes
- PHD Student Success Case: 25 minutes
- PHD Student Gap case: 30 minutes
- Assistant Professor Supervisor: 37 minutes

Appendix 3. List of Interview questions By Category

Success Case (7 questions)

Q1. Tell me about your academic background and the research position you obtained after your degree.

Q2. How did you find out about and secure your research position walk me through the process.

Q3. What channels or sources did you use and which were most useful?

Q4. How did you present your skills to the professor who hired you, and do you feel you were accurately evaluated?

Q5. How much information did you have about the position and what was expected before applying?

Q6. Looking back, do you feel the process was equally accessible to all students or did some have advantages?

Q7. If a dedicated platform existed centralising research positions and student profiles, would it have helped you and what would matter most to you?

Gap Case (7 questions)

Q1. Tell me about your studies and your interest in finding a research position.

Q2. What steps have you taken so far and what has been your experience?

Q3. Where do you look for research opportunities and do you feel you have a complete picture of what is available?

Q4. How do you present your skills to professors and do you feel your actual capability is visible to them?

Q5. How well do you understand what professors are looking for in student researchers?

Q6. Do you feel research opportunities are equally accessible to all students or do some have advantages?

Q7. If a dedicated platform existed centralising research positions and student profiles, would you use it and what would matter most to you?

Supervisors (7 questions)

Q1. Walk me through the process how you find students for search positions?

Q2. How often you receive cold emails, and you read them and then reply to all those students and ever hire a student from those cold emails?

Q3. What is the biggest challenge that you ever find for finding the right Student for your project

Q4. How do you find the true skills of students and do you feel students' actual capability is visible to you by resume?

Q5. What is most important thing you look while recruiting a researcher?

Q6. Do you feel research opportunities are equally accessible to all students or do some have advantages?

Q7. If a dedicated Ai enabled platform existed centralising research positions and verified student profiles, would you use it and what would matter most to you?

Appendix 4: Survey Instrument Overview

Table 4 Survey Distribution and Sample Composition

Detail	Description
Survey platform	Google Forms
Distribution method	Distributed throughout Finnish institutions using Linkedin, departmental email lists, and student networks
Primary confirmed distribution channel	University of Vaasa student and staff networks
Survey period	23 April 2026 — 1 May 2026
Total responses received	101
Responses excluded (no consent)	1
Valid responses used in analysis	100
Student respondents (Master's/PhD)	88
Professor/PI/Senior Researcher respondents	12
International students in sample	43% of student respondents

Appendix 5: Survey Questions

After section 1

Section 2 of 5

Role

Please select the category that best describes your current role. This will direct you to the specific questions relevant to your experience in the academic research ecosystem

Please select your primary role.

*

After section 2

Section 3 of 5

Professor's Perspective: Current Recruitment Practices & Challenges of Student Researchers

This section focuses on the challenges faced by faculty members and principal investigators (PIs) when recruiting students for research projects.

University Name

*

Department / Research Group

*

Section A: Current Recruitment Process

Description (optional)

Which channels do you currently use to find student researchers, PhDs, and research projects? (Select all that apply)

*

Other:

How many student researchers (research assistants, thesis workers, or similar) have you recruited in the past two years?

*

Approximately what proportion of unsolicited emails you receive are actually **relevant to your current** research/funding?

*

Approximately how many hours per month do you spend on administrative tasks related to recruiting student researchers?

*

Section B – Current Challenges in Finding Student Researcher

Please rate your agreement with each statement on a scale from 1 to 5.

What is your single biggest challenge in **finding the right student** for your projects?

*

Other:

I find it difficult to identify suitable student researchers for my research projects.

*

Strongly disagree

1

2

3

4

5

Strongly agree

I find it difficult to assess a candidate's motivation to complete research work based solely on their application materials (e.g., CV, transcript, motivation letter).

*

Strongly disagree

1

2

3

4

5

Strongly agree

The process of recruiting student researchers is time-consuming for me.

*

Strongly disagree

1

2

3

4

5

Strongly agree

I have missed suitable candidates because they were not aware of available positions in my research group.

Strongly disagree

1

2

3

4

5

Strongly Agree

I am satisfied with the quality of information I receive from student CVs and application materials

*

Strongly disagree

1

2

3

4

5

Strongly agree

SECTION C - Perceptions of AI-Assisted Recruitment Tools

Please rate your agreement with each statement on a scale from 1 to 5.

An AI tool that automatically ranked student candidates by their match to my research project requirements would save me significant time.

Strongly disagree

1
2
3
4
5

Strongly Agree

I would trust an AI system to produce reliable assessments of student research competencies.

Strongly disagree

1
2
3
4
5

Strongly Agree

Verified structured competency profiles extracted from academic records would be more useful to me than traditional CVs.

*

Strongly disagree

1
2
3
4
5

Strongly Agree

I am concerned that AI-based recruitment tools could introduce bias into my selection decisions

*

Strongly disagree

1
2
3
4
5

Strongly Agree

I would use a dedicated digital platform specifically designed to connect professors with student researchers.

Strongly disagree

1

2
3
4
5

Strongly Agree

Which features would be most important to you on such a platform? (Select as you require)

Other:

Is there anything else you would like to share about your experience of finding research positions or about what a dedicated platform should do?

*

After section 3

Section 4 of 5

Student Perspective

This section collects data on the the views and challenges of students applying to researcher positions.

University / Institution

*

Field of Study / Major

*

What is your current status?

*

Are you an international student (did you complete your previous education outside Finland)?

*

Other:

Have you ever applied for or actively searched for a research position (research assistant, thesis worker, PhD, research projects)?

*

Other:

SECTION A — Current Challenges in Finding Research Positions

Please rate your agreement with each statement on a scale from 1 to 5.

I find it easy to discover available research positions at my university.

*

Strongly disagree

1
2
3

4
5

Strongly Agree

I have sufficient information about what professors are looking for when they recruit student researchers.

Strongly disagree

1
2
3
4
5

Strongly Agree

I have missed a research opportunity because I was not aware it existed.
*

Strongly disagree

1
2
3
4
5

Strongly Agree

Access to research positions at my university depends more on personal connections than on academic merit.
*

Strongly disagree

1
2
3
4
5

Strongly Agree

As an international student, I face greater difficulty accessing research opportunities than domestic students.
*

My motivation to research work is not clearly visible to professors through my current application materials (e.g., CV, transcript, motivation letter).
*

How much time per week do you currently spend searching for research positions or opportunities?

Which channels do you use to find research positions? (Select all that apply)

Question Type

Other:

SECTION B - Perceptions of AI-Assisted Recruitment Tools

Please rate your agreement with each statement on a scale from 1 to 5.

An AI tool that automatically matched my academic profile to suitable research positions would save me significant time

*

Strongly disagree

1
2
3
4
5

Strongly Agree

I would trust an AI system to accurately represent my research competencies to professors.

*

Strongly disagree

1
2
3
4
5

Strongly Agree

AI tools that extract competency profiles from academic records are more reliable than traditional CVs for showing research capability.

*

Strongly disagree

1
2
3
4
5

Strongly Agree

AI tools that predict which research positions best match my skills and interests would be useful to me.

*

Strongly disagree

1
2

3
4
5

Strongly Agree

I would use a dedicated digital platform specifically designed to connect students with research positions at universities.

*

Strongly disagree

1
2
3
4
5

Strongly Agree

A dedicated academic platform would give me more equal access to research opportunities than the current informal system

Strongly disagree

1
2
3
4
5

Strongly Agree

Which features would be most important to you on such a platform? (Select your top 3)

*

Other:

Is there anything else you would like to share about your experience of finding research positions or about what a dedicated platform should do?

*

After section 4

Section 5 of 5

Thank You for your valuable time!