AI in Vocational Training: A Qualitative Interview Study of Early-Stage Practitioners in the Real Estate Brokerage Industry in China

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Abstract

This study aims to unveil the individual and sectoral factors influencing the integration and utilization of artificial intelligence (AI) in vocational training among early-stage practitioners in China's real estate brokerage industry. The study involved in-depth interviews with 33 participants, each possessing less than two years of industry experience and demonstrating either experience with or a keen interest in AI applications. Rooted in the transformative potential of AI in vocational training, thematic analysis was employed to reveal the intricate interplay of individual factors—motivation, attitude, self-efficacy, and digital literacy—alongside sectoral elements such as policies, practices, and organizational culture. The findings illuminate the significant impact of these factors on the acceptance and utilization of AI, underscoring the complexity of participant attitudes, shaped by perceived usefulness and ease of use. Diverse levels of self-efficacy and digital literacy among participants regarding AI adoption were also evident. On the sectoral front, policies play a dual role, either providing support or imposing restrictions on AI adoption, while practices and organizational culture wield substantial influence over the opportunities and challenges associated with AI use. These empirical insights and best practices offer stakeholders valuable guidance to enhance employability and productivity in this ever-evolving industry. Importantly, this study advocates for a more inclusive approach in future research, addressing limitations in sample representativeness and recommending the integration of quantitative methodologies. This approach is crucial for fostering a comprehensive understanding of AI utilization in vocational training, ensuring robust insights for future advancements in the industry.

Keywords

artificial intelligence, vocational training, talent development, human capital, digital HRM, real estate brokerage

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Artificial Intelligence (AI) implies the application of machines or systems capable of executing tasks traditionally associated with human intelligence, such as learning, reasoning, decision-making, and problem-solving [Paschen et al., 2019]. Its transformative influence extends across various sectors, including education, healthcare, manufacturing, finance, and entertainment [Cubric, 2020], positioning AI as a key driver of innovation and economic growth in the 21st century [Fukuda, 2020].

Within this vast landscape of potential applications, one particularly promising arena for AI is vocational training [Pedro et al., 2019]. Vocational training is designed to equip learners with specific knowledge, skills, and competencies tailored to particular occupations or professions [Wheelahan, 2015]. Recognized for its pivotal role in enhancing worker employability, productivity, and addressing the ever-changing demands of the labor market [Bridgstock, 2009; Harvey, 2000; T. Wang et al., 2023], vocational training serves as a linchpin for workforce development.

AI, with its capacity for personalized learning experiences, adaptive feedback mechanisms, data analytics, and intelligent tutoring systems [Chassignol et al., 2018; T. Wang et al., 2023], holds the potential to revolutionize vocational training. By providing flexible, accessible, and diverse learning opportunities [Gordon, 2014], AI has the capacity to elevate the quality, relevance, and inclusiveness of vocational training for individuals with diverse backgrounds, expertise levels, and specific needs. This study delves into the transformative role of AI in shaping the future of vocational training, exploring its potential to address the evolving needs of learners in a rapidly changing educational environment.

Despite the promising potential of AI in vocational training, there is a notable dearth of research on its effective implementation across diverse sectors and contexts [Chen et al., 2020]. Existing studies mainly focus on theoretical frameworks and models of AI for learning and development, which highlight the practical use of AI in vocational training across different sectors and contexts, but provide limited empirical evidence or analysis of best practices (e.g., [Bhatt, Muduli, 2022; Seo et al., 2021]). Furthermore, significant gaps persist in empirical studies that address the factors influencing the adoption and integration of AI in different sectors and contexts, especially in emerging markets, such as China.

This research gap becomes particularly apparent within the real estate brokerage industry in China [Zuo, 2021]. Despite China's position as a leading country in AI development and application [Chen et al., 2020; Cubric, 2020; Fukuda, 2020] and recent vocational education reforms aimed at meeting the demands of the digital economy, there is a lack of research on the perspectives and experiences of early-stage practitioners in the real estate brokerage

industry. Early-stage practitioners, often young graduates, are the future workforce in this dynamic and competitive sector. Updating knowledge and skills on a regular basis is crucial for their success in the job market [Adnan et al., 2012; Barwick, Pathak, 2015; Bridgstock, 2009]. Although some research touches on vocational education and training in the Chinese context [Y. Li, Yuan, 2019; Xia et al., 2022], none explicitly investigates the role of AI in vocational training for early-stage practitioners in real estate brokerage.

Within the real estate brokerage industry in China, there is a pressing need for advanced skills and competencies due to the digital transformation and innovation within the real estate market [F. Wang, 2022]. Effective real estate brokers must possess comprehensive knowledge of market trends, laws and regulations; property valuation methods; negotiation techniques; customer service skills; digital technologies [F. Wang, 2023b; Zuo, 2021]. Unfortunately, the current state of vocational training for real estate brokers in China is inadequate. Scarcity of systematic and standardized vocational training programs contributes to low participation rates and a high turnover rate within the profession [KE Holdings Inc., 2020; 2022]. Many real estate brokers lack formal qualifications or certificates for their occupation [KE Holdings Inc., 2022], and they encounter difficulties in updating their skills and competencies due to the rapid changes and challenges in the real estate market [Adnan et al., 2012].

Consequently, this study aims to bridge the existing gaps by conducting a qualitative interview study with early-stage practitioners in the Chinese real estate brokerage industry. The primary objective is to investigate the adoption and utilization of AI for vocational training. Specifically, the research seeks to identify the individual and sectoral factors influencing the acceptance and effective use of AI within this context.

Early-stage practitioners, in the context of this study, are individuals with less than two years of work experience in the real estate brokerage industry, holding a bachelor's degree or higher earned within the past five years. Confronted with challenges, such as intense competition, low entry barriers, rapid market changes, and ongoing digital transformation [Barwick, Pathak, 2015; Hsieh, Moretti, 2003], these practitioners are representative of relevant population. They are chosen due to their likelihood to adopt and use AI for study and work, coupled with a pressing need for vocational training. Moreover, having recently completed formal education and being familiar with the latest technologies, early-stage practitioners have considerable experience in using IT and AI in their learning process.

1. Literature Review

1.1. Vocational Education and Training (VET) and Continuous Vocational Training (CVT)

Vocational Education and Training (VET) refers to formalized education and training programs that individuals undergo at the onset of their careers [Eichhorst et al., 2015; McGrath, 2012]. It typically occurs after completing general education and involves obtaining specific skills and knowledge related to a particular profession [Berk, 2022]. Studies emphasize the fundamental nature of VET as it provides individuals with a baseline understanding of their chosen field [Mikkonen et al., 2017; Relly, 2022]. VET is often associated with academic degrees or certificates and is crucial for preparing individuals for entry into the workforce [McGrath, 2012; Mikkonen et al., 2017; Polesel, 2010].

Continuous Vocational Training (CVT), on the other hand, refers to the ongoing process of learning and skill development that occurs throughout an individual's career [Beer, Mulder, 2020; Jarvis, 2018]. CVT is designed to help individuals keep their skills and knowledge up to date, adapt to changes in their job requirements or career field, and advance in their careers [Beer, Mulder, 2020; Kilpi-Jakonen et al., 2015; Rubenson, Desjardins, 2009; Siegfried, Berger, 2020]. In the face of technology-driven disruptive changes in societal and organizational practices, CVT lacks information on how the impact of technologies on work must be considered from an educational perspective [Beer, Mulder, 2020].

While VET typically occurs at the beginning of an individual's career and provides the foundational skills and knowledge needed for a specific occupation [Berk, 2022; McGrath, 2012; Mikkonen et al., 2017], CVT is an ongoing process that helps individuals maintain and enhance their skills throughout their careers [Beer, Mulder, 2020; Kilpi-Jakonen et al., 2015; Siegfried, Berger, 2020]. Both are crucial for ensuring that individuals are equipped with the skills and knowledge they need to succeed in the workforce [Polesel, 2010; Rubenson, Desjardins, 2009].

My study places a specific focus on early-stage practitioners in the real estate brokerage industry, recognizing them as participants undergoing a transitional phase encompassing both initial and continuous vocational education and training. Having completed their formal education, a form of Initial Vocational Education and Training (IVET) that prepares them for entry into the labor market [Sabates, Salter, Obolenskaya, 2012], these practitioners may also engage in Continuous Vocational Training (CVT). This continuous training is essential for updating and improving practitioners' skills and knowledge, enabling them to effectively navigate the challenges and opportunities inherent in the dynamic labor market [Beer, Mulder, 2020]. Therefore, my study highlights the complementary nature of both types of vocational education and training, emphasizing their significance in meeting the diverse needs and goals of early-stage practitioners in the real estate brokerage industry.

1.2. Information and Communication Technology (ICT) versus Artificial Intelligence (AI)

Information and Communication Technology (ICT) is a comprehensive term that encompasses all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, as well as other media applications and services[1]. The primary objective of ICT is to enhance access to information and streamline communication, fostering efficiency in interactions, whether human-to-human, human-to-machine, or machine-to-machine [Rouse, 2024]. Artificial intelligence (AI) refers to the simulation of human intelligence in machines, such as learning, reasoning, decision-making, and problem-solving [Paschen et al., 2019].

The fundamental disparity between ICT and AI lies in their scope and functionality. ICT primarily focuses on data transmission and manipulation [Sarkar, 2012], while AI-driven applications delve deeper, expediting problem resolution and elevating IT operations. This distinction renders artificial intelligence software more adept within the IT field [Bjola, 2022]. AI's transformative capabilities extend to various sectors, fostering personalized learning experiences, adaptive feedback mechanisms, data analytics, and intelligent tutoring systems across domains, such as education, healthcare, manufacturing, finance, and entertainment [Chassignol et al., 2018; Wang et al., 2023]. ICT and AI are interrelated and interdependent, as AI relies on ICT infrastructure and data, and ICT benefits from AI innovation and optimization.

Previous studies have explored the role of ICT in education [Fu, 2013; Livingstone, 2015; Zafar, 2019]. However, this paper focuses on AI due to its transformative potential in revolutionizing vocational training. AI offers personalized, adaptive, and intelligent learning solutions tailored for early-stage practitioners in the real estate brokerage industry in China. The deliberate choice to avoid the term ICT stems from its broad and vague nature, which does not adequately capture the nuanced applications and tools driven by AI. It is crucial to distinguish between ICT and AI, recognizing the specific capabilities and functions of each area.

1.3. Benefits and challenges of AI in vocational training

AI offers a transformative potential in vocational training, providing adaptable learning experiences for individuals with diverse backgrounds and needs [Gordon, 2014]. Notably, [Pedro et al., 2019] highlight the ability of AI to support learners facing challenges, such as disabilities, low literacy, or language barriers, by delivering personalized content and assistance. [T. Wang et al., 2023] further emphasize the role of AI in supporting international students through

[1] Wikipedia. (2023, November 9) Information and communications technology.

generative content, chatbots, and analytics, as well as addressing their academic, social, cultural, and emotional needs.

While AI promises benefits, it introduces ethical, social, and technical challenges [Bhatt, Muduli, 2022; Chen et al., 2020; Cubric, 2020; Paschen et al., 2019; Pedro et al., 2019; Seo et al., 2021]. Resolving ethical challenges involves maintaining AI systems and data confidentiality, transparency, accountability, and fairness [Chen et al., 2020; Cubric, 2020; Pedro et al., 2019]. Social challenges include the digital divide, human displacement, impact on values and identities, and the need for digital literacy [Cubric, 2020; Pedro et al., 2019]. Technical challenges are related to usability, functionality, reliability, and validity of AI systems and data [Bhatt, Muduli, 2022; Paschen et al., 2019; Seo et al., 2021]. It is important to regulate and consider these challenges and risks to ensure that AI is used ethically, responsibly, and beneficially in vocational training.

1.4. AI applications and implications in real estate brokerage

The real estate brokerage industry entails facilitating real estate transactions and providing various services, such as market analysis, property valuation, negotiation, contract drafting, and customer service [L. Li, Wang, 2006]. Real estate brokers are the intermediaries who perform these tasks and earn commissions from the transactions [Barwick, Pathak, 2015]. Real estate brokerage is a highly competitive and dynamic industry that requires professional knowledge and skills in various domains, including economics, law, finance, marketing, communication, and technology [Adnan et al., 2012; Bridgstock, 2009].

AI has the potential to significantly elevate the professional expertise and capabilities of real estate brokers by furnishing them with data-driven insights, intelligent tools, and innovative platforms. This technological integration not only improves their efficiency and effectiveness but also enhances their competitiveness in the real estate market [Ullah et al., 2018; F. Wang, 2022]. Real estate brokers can harness AI to analyze market trends, navigate laws and regulations, employ property valuation methods, negotiate effectively, hone customer service skills, and stay abreast of relevant digital technologies [Barwick, Pathak, 2015; Hsieh, Moretti, 2003; Ullah et al., 2018].

Moreover, AI introduces intelligent tools like chatbots, virtual assistants, recommender systems, and blockchains, thereby revolutionizing communication, collaboration, decision-making, and transaction processes with customers and partners.

For instance, AI-powered chatbots employ natural language generation and understanding techniques to deliver instant and personalized responses, qualify leads using conversational marketing and sales strategies [Abdulla et al., 2022; Chao et al., 2021], and en-

sure seamless communication [Sidlauskiene et al., 2023]. Virtual assistants equipped with speech recognition and synthesis technologies help brokers perform various tasks, for instance, scheduling appointments, managing documents, sending reminders, or providing information [Maedche et al., 2019]. They also assume roles as personal coaches, mentors, and advisors through motivational interviewing and goal-setting methods [Khandelwal, Upadhyay, 2021; Maedche et al., 2019]. Recommender systems optimize the matching process between buyers and sellers by using multi-criteria decision-making and optimization techniques [Adomavicius et al., 2010; Karabadji et al., 2018], collaborative filtering and content-based filtering algorithms [Jung et al., 2004; Thannimalai, Zhang, 2021], and offer customized suggestions to customers based on their preferences, needs, and budget [Zhang et al., 2021]. Additionally, AI-powered blockchain platforms can facilitate secure, transparent, and efficient transactions between parties [F. Wang, 2023a] through cryptography and consensus mechanisms [McKinsey, 2022], as well as reduce costs, mitigate risks, and streamline processes by utilizing smart contracts and distributed ledger technologies [Charles et al., 2023; Sharma et al., 2023; F. Wang, 2023a]. Furthermore, AI empowers real estate brokers through smart platforms, both online and offline, offering comprehensive and customized services and solutions, as exemplified by KE Holdings Inc. [2020, 2022] and Zuo [2021].

Extending beyond vocational training, AI poses specific challenges for real estate brokers [Ullah et al., 2018; F. Wang, 2022; 2023b]. Firstly, AI creates new demands for real estate brokers, who have to acquire and update their knowledge and skills in various domains [Adnan et al., 2012; Bridgstock, 2009]. Secondly, real estate brokers are now expected to deliver high-quality, personalized, and timely services, leveraging AI capabilities in the process [Paschen et al., 2019; Ullah et al., 2018; F. Wang, 2022]. Moreover, ethical, social, and technical norms and regulations govern AI use in real estate brokerage, imposing new standards [Chen et al., 2020; Cubric, 2020; Pedro et al., 2019]. These challenges and risks require real estate brokers to adopt a lifelong learning attitude and a digital citizenship mindset to cope with the ever-evolving and complex real estate market.

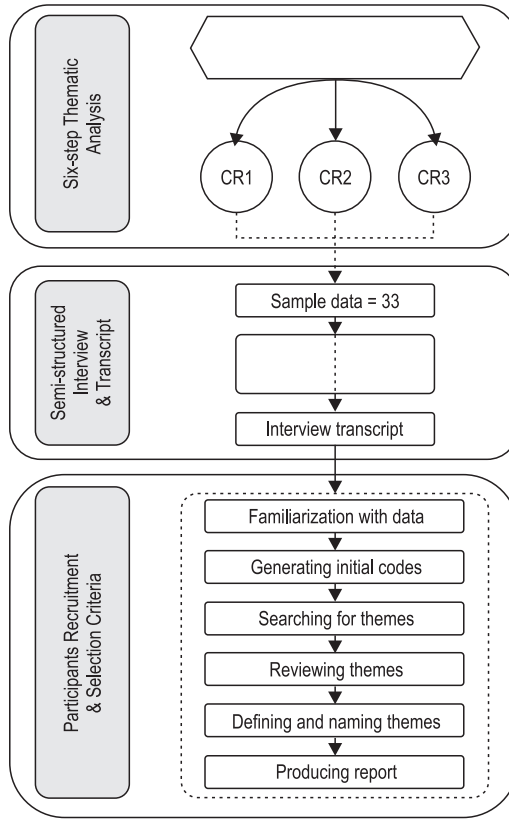
2. Methods

The study adopted a qualitative approach and conducted semi-structured in-depth interviews with 33 participants, who met the following criteria: 1) had completed their formal education within the last five years, 2) had less than two years of experience within the real estate brokerage industry, and 3) possessed either experience or interest in AI usage within this industry. The participants were recruited through multiple online job portals that targeted

young graduates seeking employment or career development opportunities in the real estate brokerage industry in Shanghai, China. The study used purposive sampling to select the participants based on their diversity and relevance to the research question.

As shown in Figure 1, data collection and analysis followed the thematic analysis method, which involved familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing a final report [Braun, Clarke, 2006]. The interview questions were semi-structured with the following main topics: 1) the participants' background information; 2) perceptions and experiences of continuing vocational training and skills upgrading for real estate brokerage; 3) perceptions and experiences of using AI for learning or working in the real estate brokerage industry; 4) suggestions and recommendations for improving the implementation of AI in continuing vocational training and skills upgrading for real estate brokerage. The interviews were conducted face-to-face or online in Mandarin Chinese, depending on the participants' preferences and availability. With the par-

Figure 1. **Research flowchart for integrating qualitative interview approach with six-step thematic analysis. Source: author**



ticipants' consent, the interviews were audio-recorded and lasted from 35 to 60 minutes. The recordings were transcribed and coded manually using a word processor. To identify the themes, the six-step process of familiarization, generation, searching, reviewing, defining, and naming was followed [Braun, Clarke, 2006], and a thematic map was utilized to illustrate and summarize the relationships between the themes and corresponding variables.

Table 1 shows the number and percentage of the respondents by their year of birth, gender, education level, job tenure, and whether they are in their first full-time job after graduation. The majority of the respondents were born between 1995 and 2000 (61%), were male (64%), and had a bachelor's degree (52%). The most common job tenure was between one and two years (39%), and most of the respondents were in their first full-time job after graduation (76%).

Table 1. **Descriptive statistics**

Variables	N	%
Year of Birth		
1990–1994	12	36
1995–2000	20	61
2000–2005	1	3
Gender		
Male	21	64
Female	12	36
Level of Education		
Bachelor's degree	17	52
Master's degree	16	48
Job Tenure		
Less than 3 months	5	15
3 months to 6 months	11	33
6 months to 1 year	4	12
1 year and 2 years	13	39
First Full-time Job after Graduation		
Yes	25	76
No	8	24
Total	33	100

3. Results and findings

This section presents and discusses the results and findings of the thematic analysis of the in-depth interviews with 33 early-stage practitioners, who participated or intended to participate in vocatio-

nal training for real estate brokerage in China. The thematic analysis revealed two main themes that emerged from the data: 1) individual factors influencing the acceptance and use of AI for vocational training; 2) sectoral factors affecting the adoption and integration of AI for vocational training. The following subsections describe each theme in detail and provide illustrative quotes from the participants.

Theme I: Individual factors influencing the acceptance and use of AI for vocational training

The first theme identifies the individual factors influencing the acceptance and utilization of AI for vocational training among early-stage practitioners in the Chinese real estate brokerage industry. A comprehensive exploration of various individual factors, including motivation, attitude, self-efficacy, and digital literacy, was conducted and systematically categorized. These identified factors serve as crucial indicators, shedding light on the participants' potential prospects in terms of both their willingness and ability to engage with AI for vocational training within this industry.

Motivation, as described by Vansteenkiste et al. [2006], is the driving force behind engaging in a particular behavior of activity. The participants highlighted that their motivation to use AI for vocational training came mostly from extrinsic sources, which means that they were motivated by external rewards or outcomes, such as career advancement, income increase, or social recognition. Moreover, their motivation was also influenced by their perception of the usefulness and ease of use of AI-based education systems. For example:

> I think AI can help me learn more skills and competencies that employers and clients in the real estate brokerage industry need and value, anytime, anywhere. I want to use AI for vocational training because I believe it will improve my career prospects and income level.

> I want to use AI for my vocational training and job skills enhancement because I feel it is useful and easy to use. I think most of the time AI can provide me with personalized, adaptive and intelligent learning solutions that can enhance my learning and experience.

Attitude refers to the positive or negative evaluation or feeling that a person has towards a certain behavior or activity [Bagozzi, 1992]. The participants exhibited diverse attitudes towards using AI for vocational training. Some held positive attitudes, indicating that they liked, appreciated, or supported the use of AI for learning or working in the real estate brokerage industry. On the other hand, some participants expressed negative attitudes, exhibiting concerns, fears, or opposition toward AI usage. Additionally, some

participants had neutral or ambivalent attitudes, displaying a lack of preference or mixed feelings regarding AI utilization. Here are some examples:

> Trying to learn from different avenues is something I've been exploring, and that includes learning through AI, which I think is interesting and rewarding. I am more than okay with using AI for job-related training because I see it as a trend and opportunity for society to grow.

> I don't really think that the current level of technological development can provide specific vocational advancement skills, and I always think that AI is unsafe and risky. I worry about losing my privacy or security when using AI, and I'm even more afraid that AI will replace me in my job because that's entirely possible.

> I have just graduated and worked in the industry, and most of the training and learning methods in school are traditional, although sometimes online… In my opinion, AI can be helpful and convenient as a good supplement to human-centered education and training, but it is not a substitute because it is not human and has various problems and is not reliable at times.

Self-efficacy is defined as an individual's belief or confidence in their ability to successfully accomplish a specific behavior or task [Lunenburg, 2011]. The participants displayed varying levels of self-efficacy in utilizing AI for vocational training and skills upgrading. Some participants demonstrated high self-efficacy, indicating their confidence in effectively and efficiently utilizing AI for learning and working. In contrast, others expressed low self-efficacy, questioning their knowledge, abilities, and competencies in effectively using AI for vocational training and skills upgrading. For instance:

> If the AI operation interface is concise and easy enough and the company can set clear and targeted training content, I think our self-efficacy will be high. Our young generation has adapted to digital life, and I am confident that operating a vocational training system, or any platforms based on artificial intelligence can help us solve work-related problems and apply them to our work.

> To be honest, I can't imagine what it would be like to use AI to train me for work, but I don't think I can use it well, just like sometimes I can't find the program function I need, which makes me very anxious. When I first joined the company (during the pandemic period), HR asked me to try to use the internal online training platform. Although I simply watched the pre-recorded video, I could

> not fully understand it, let alone apply the knowledge and skills in it to my work.

Digital literacy refers to the ability to effectively and critically use digital technologies for various purposes, such as communication, information, learning, and problem solving [Bawden, 2008; Falloon, 2020]. The participants exhibited different levels of digital literacy in using AI for vocational training and skills upgrading. Some participants demonstrated high digital literacy, indicating their proficiency and comfort in using digital technologies to access, evaluate, and utilize AI-based training and educational systems. Conversely, others displayed lower levels of digital literacy, reflecting their limited familiarity and confidence in using AI technologies. For example:

> I am comfortable and confident with digital technologies, so I believe that I am fully equipped with digital literacy... It is easy to access and interact with AI-based educational systems via a variety of devices and platforms... I can evaluate and choose the learning material or resources they provide in terms of quality and relevancy.

> It's hard for me to determine if I'm "digitally literate" because I'm not familiar with this kind of platforms or AI technologies and techniques. This may be related to my professional background, as I specialized in humanities and arts before I started working... and I've only been in the industry for a few months... so it's difficult for me to judge the quality and relevance of AI training information or resources.

Theme II: Sectoral factors affecting the adoption and integration of AI for vocational training

While interviews of individuals may sometimes overlook certain nuances, our findings underscore their crucial importance, prompting an exploration into macro-level factors, which is the second theme of this study. The real estate brokerage industry significantly shapes the landscape of AI utilization in vocational training, where industry factors exert far-reaching influence within the professional environment. Participants consistently emphasized distinctive features, including policy, practices, and organizational culture, as influential determinants that wielded a substantial impact on the opportunities and challenges encountered in the integration of AI into vocational training within the industry.

Policies encompass the rules, regulations, and guidelines that govern the development and operation of the industry [National Association of REALTORS®, 2012]. The participants claimed that the policies of the real estate brokerage industry impact their adoption and integration of AI for vocational training in two ways: either by

providing support or incentives or by imposing restrictions or barriers. For example:

> I have been working in the industry for nearly two years after finishing graduate school. According to the real estate brokerage industry policy, I am now qualified to take the real estate broker qualification examination. Some professional allowances are available after obtaining this professional qualification… The company has set up a training platform and transferred a large number of offline training resources to the online platform. Some functions can be used for virtual interaction and in-depth learning. Likewise, the company will reimburse us for the cost of taking the exam and issue a stipend upon successful qualification.

> In my daily work scenario, I need to use virtual reality (VR) operations frequently; for example, I need to go to the field to scan, model, and upload every corner of a house via electronic devices to digital operating platforms and internal sales training systems, and to train my colleagues and make presentations to clients, but for now I can only do so much. There are policies that prohibit or regulate the use of certain types of AI-based services or training systems by real estate broker as this may pose an ethical or legal risk.

Practices are the routines, habits, and standards that shape the behavior and performance [Feldman, Pentland, 2003]. The practices, according to the participants, influenced their adoption and integration of AI for vocational training by either offering opportunities or creating difficulties. Here are a few examples:

> There are some practices that I think are driving the use of digital technology in the real estate brokerage industry, such as online platforms, smart devices, virtual reality, etc. These practices make it easier and more convenient for me to interact with AI-based operating and training systems… My work makes me have to learn about new housing information every day, and I need to learn and master all relevant information quickly. I think this provides me with more opportunities and possibilities, in a sense.

> I need to communicate with a large number of visitors every day… Most of the customers who come to me for consultation are older and not used to using smart devices, so I prefer to maintain customer relationships in more traditional ways, such as face-to-face visits, regular return visits, or telephone communication… As a newcomer to the industry, I prefer face-to-face training, where I can feel the emotion and interaction, but if let AI train me, I can't feel that… The transition from virtual to real life is challenging for me.

Organizational culture refers to the values, beliefs, and attitudes that influence the identity and image of the participants' companies [Ravasi, Schultz, 2006]. The participants stated that the organizational culture influenced their adoption and integration of AI for vocational training by generating positive or negative perceptions, as well as creating pressure or resistance. Here are some examples:

> The company I work for is quite large and covers a lot of businesses, such as house leasing, house buying and selling, etc., and we are encouraged to acquire as many skills as possible in different businesses, but this takes a lot of time and experience… Both the management and the team I work with are encouraging us to adopt innovative ways to improve our performance as much as possible… The company provides a very good digital training platform for this, but I'm not sure if this is backed by AI, which has really improved our competitiveness in the industry.

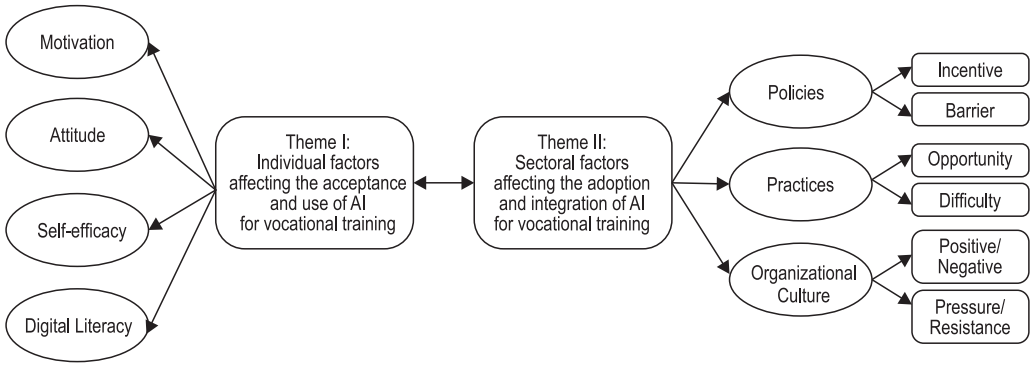
> The company's training department rarely trains us in job-related skills, but I do get regular weekly learning tasks pushed through our e-work system. This is lazy, irresponsible, and insensitive, and I think it would be worse if we had an AI-based training system.

> My department was established during the COVID-19 pandemic, and we were mainly communicating with prospective customers through online channels, and it was very stressful for us during that time when many people were isolated at home and could not communicate face-to-face… The entire company required me to master more AI skills, such as traffic analysis and virtual reality applications, which will also enhance the service experience for online customers… My supervisor was very satisfied with my performance and that of my team and even asked me to help run the company's online training platform as an expert.

> The company has fewer than 500 employees, which is a small to medium-sized company in Shanghai… We are still using traditional training methods, and some of our younger colleagues came up with developing a digital e-training platform, but the company's management thought it was a pipe dream because they thought it would require a lot of investment in R&D and that it was not advanced enough for our industry.

Figure 2 summarized the identified individual and sectoral factors in shaping the use of AI within this context. Motivation, attitude, self-efficacy, and digital literacy were identified as key individual factors that influenced participants' acceptance and use of AI. The extrinsic motivation, perception of usefulness and ease of use, varying

Figure 2. **Summarized individual and sectoral factors that influence the adoption and integration of AI. Source: author**



levels of self-efficacy, and digital literacy skills played crucial roles in determining the willingness and ability to embrace AI for vocational training. Sectoral factors, including policies, practices, and organizational culture, were found to exert significant influence on the adoption and integration of AI in vocational training. Policies played a dual role, either providing support and incentives or imposing restrictions and barriers. Introduction of standardized vocational training programs and favorable policies can facilitate the effective integration of AI in the real estate brokerage industry. Furthermore, practices and organizational culture within the industry were found to shape opportunities and challenges associated with AI adoption. Creating a supportive environment that encourages innovation, offers diverse learning opportunities, and aligns with the digital transformation of the industry is crucial for successful AI integration.

4. Limitations and direction for future research

This study has several limitations that necessitate thoughtful consideration in interpreting and generalizing its findings.

Firstly, the carefully selected sample size, while purposive, raises concerns regarding its representativeness of young practitioners within the real estate brokerage industry in China. Caution is advised when extending findings to a broader population of real estate practitioners. Future studies should adopt a more inclusive approach, encompassing cross-generational populations. For instance, exploring the experiences of long-standing professionals undergoing training in AI technologies could yield insights into challenges faced by established practitioners.

Secondly, a notable limitation stems from the qualitative nature of the study, which may not fully capture the quantitative dimensions of AI utilization. To address this gap, future research should follow quantitative methodologies, conducting larger-scale surveys or experiments. Such an approach would enhance the generalizabi-

lity of the study and unveil nuanced insights into adoption patterns among real estate practitioners.

Thirdly, the reliance on self-reported perceptions introduces the potential for bias and subjectivity. To mitigate these concerns, future research should consider integrating more objective measures or triangulating data sources, ensuring a more robust and unbiased analysis.

Moreover, while this study focuses specifically on AI, future investigations could extend to comparative analysis of respondents' attitudes toward AI and Information and Communication Technology (ICT). Such a comparative lens would provide valuable insights into the unique challenges and opportunities posed by AI technologies compared to more traditional ICT solutions.

To sum up, addressing the above limitations necessitates future research incorporating larger-scale quantitative studies, exploring additional influencing factors, conducting comparative analyses, and considering alternative target groups. These refinements aim to contribute to advancing knowledge and practical implications in this evolving domain.

5. Conclusions

In this study, the primary objective was to identify the individual and sectoral factors influencing the integration and utilization of Artificial Intelligence (AI) for vocational training among early-stage practitioners in the real estate brokerage industry of China. Employing a qualitative approach, semi-structured in-depth interviews were conducted with 33 participants, all of whom completed their formal education within the past five years and demonstrated interest or experience in AI within the real estate brokerage context. Thematic analysis was systematically applied to extract, analyze, and present recurring themes and patterns identified within the collected data.

The study makes a significant contribution to the evolving body of knowledge on leveraging the potential of AI for vocational training. By offering empirical evidence and best practices for AI integration across diverse sectors and contexts, it not only expands our understanding of the role of AI in enhancing professional knowledge and skills but also addresses the unique challenges within the real estate brokerage industry. This sector, characterized by its competitiveness and constant demand for learning and development, benefits from the insights provided, along with strategies to navigate ethical, social, and technical challenges associated with AI in vocational training.

In essence, this research illuminates the intricate interplay of individual and sectoral dynamics that influence the acceptance and utilization of AI for vocational training and skills enhancement within the Chinese real estate brokerage industry. The factors identi-

fied, particularly those on the supply side, underscore the pressing need for more diverse and targeted options in crucial areas, such as public policy on vocational training, business policy, and the development of AI-enabled systems. Stakeholders, including educators, policymakers, and industry professionals, can leverage these findings to make informed decisions and formulate strategies that effectively harness AI for vocational training. The goal is to enhance the employability and productivity of early-stage practitioners, aligning them with the demands of a rapidly evolving industry.

Looking forward, further research directions the long-term effects of AI adoption on vocational training outcomes. Additionally, exploring the scalability and sustainability of AI-based vocational training initiatives, not only within the real estate brokerage industry but also across other sectors, is crucial for understanding the broader implications of AI integration in professional development. Such future investigations will contribute to a more comprehensive understanding of the transformative potential of AI in vocational training and its lasting impact on the workforce.

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