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Preparing Property Graduates for the Digital Age: Challenges and Strategies from the Perspective of Australian Property Educators

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Abstract: The work readiness of property graduates is the subject of global discourse and is an increasingly critical gap as employers demand professionals with competencies in their fundamental roles and digital technologies. Although these issues have been explored from the perspectives of students, graduates, and employers, the insights of property academics remain unexplored. As such, this study delved into the challenges encountered by property academics in Australia concerning the training of property graduates for the digital age, as well as the efficacy of strategies used to achieve this. The opinions of 22 property academics were gathered through an online questionnaire survey and analysed through mean scores, relative importance index (RII), and exploratory factor analysis (EFA). The profile of respondents suggests that approximately half of them have no more than five years of industry experience, and only 54.5% currently engage with the industry. The most significant challenges include limited funding to procure bespoke software and insufficient time to achieve digital competency. Furthermore, academics cited limited support from the universities as a key challenge, but rated curriculum rigidity as non-pertinent. Regarding strategies, retraining academics for digital proficiency, increased technical support from universities, adopting active learning, and revising curricula to incorporate digital technology are critical. Collaboration with industry partners and increased funding for software procurement also emerged as key external factors. Variations in these perceptions also suggest that older academics are less receptive towards retraining, academics with more industry experience believe that a restructuring of the curricula is required, and smaller institutions require more funding and industry support. The core themes of the proposed strategies also indicate that holistic curricula integration is required to incorporate the perspectives of all stakeholders. Practically, these findings underscore the pivotal role of academics in bridging the skills gap and the interconnected roles of graduates, universities, and industry partners.

Keywords: property academics; PropTech; property graduates; work readiness; challenges; strategies; Australia

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1. Introduction

The property sector has long been a critical driver of economic growth due to its intricate links to the broader economy, as well as the dual function of the asset class as a provider of shelter and enabler of economic activity [1,2]. This dynamic sector's success depends on several stakeholders, institutional frameworks, and informal norms [3]. In particular, the three-way relationship between education providers, graduates, and

employers is fundamental. Education providers aim to equip graduates with the skills required by prospective employers, which constantly need to be updated to match client demands and the evolving technological landscape [4,5].

Despite the relevance of the property sector to the success of the broader economy, the extant literature has documented significant gaps between the training offered by education providers and the skills demanded by the industry [5–7]. Several studies have highlighted the need for more robust collaboration between major property sector stakeholders to ensure its ongoing success and retain its position as a pillar of the economy [7–10]. Employers now expect more rounded graduates with a better appreciation of industry standards and many interpersonal skills, a significant variation from past decades when the biggest concern was academic excellence [11]. This divide between academia and the industry has been reported across many countries, indicating the significance of the issue on a global scale: in the USA [12,13], in the UK [4,14], in Australia [5,15–17], in China [18], and in Nigeria [19].

The property sector is Australia's most significant industry, contributing 13% to the economy and providing more jobs than the mining and manufacturing industries combined, having a total of 1.4 million jobs in 2022 [20]. Notwithstanding the high level of student satisfaction with the quality of property education in Australia [15,21], there are also critical expectation gaps in the skills required by employers [5,13,22,23]. According to Boyd [22], the changing demands of stakeholders in the property industry have contributed to a significant gap that education providers need to address. Warren and Heng [13] questioned how well higher education providers prepare graduates in facilities management (FM) courses across the UK, the USA, and Australia. Baxter [23] called for greater attention to detail in property education to ensure graduates' preparedness for the industry's dynamic demands. A recent study by Abidoye et al. [5] affirms that these expectation gaps are still relevant in the Australian property industry, further indicating that more deliberate actions are required to better equip property graduates for the dynamic demands of the modern client.

As the property industry struggles to address these generic expectation gaps, an even wider disparity has become apparent in recent years due to technological advancements in the digital age [5,24]. Baum [10] referred to the use of digital technologies in the property industry as *PropTech*, a term that has become increasingly relevant due to recent technological developments and a general shift towards data-oriented decision making and automation [25,26]. In one of the earliest papers on the growing divide between academia and practice, Boyd [22] reported changes to client preferences and further cautioned against the potential for property graduates to become redundant should education providers fail to adapt to these new demands. These gaps are a result of decades of change, culminating in a more sophisticated property market linked to the finance sector and involving more stakeholders [27].

These shortcomings call for all stakeholders to take proactive measures to better prepare property graduates for the digital age [6,9,24,26]. Notably, most previous studies have focused on the perspectives of property graduates [5,19], current students [28,29], or employers [7,30]. Despite being primarily responsible for designing a curriculum and delivering lessons to students, property academics have been the subject of very little research interest in equipping property graduates for the digital age. Callanan and McCarthy [9] posited that many graduate programs are designed based on faculty availability. To that end, the competency levels of property academics may be the most relevant driver of change to prepare property graduates for the digital age. Some extreme projections suggest that traditional roles in valuation and construction could be phased out within decades due to more efficient digital tools [31]. Consequently, there is a genuine risk that property graduates with limited exposure to digital tools may struggle to secure jobs in a market that no longer values their skills [5]. This sentiment is a common theme in the extant literature; future property professionals must understand the technological advancements

transforming the industry and be able to apply these technologies to enhance efficiency and value to meet dynamic client needs [26].

The aim of this research was to address the significant gaps between the training offered by education providers and the skills demanded by the property industry, with a specific focus on preparing property graduates for the digital age in Australia. Recognising the pivotal role of property academics in curriculum design and delivery, this study explored their perspectives on the challenges they face and the efficacy of proposed strategies to bridge the divide between property education and industry expectations. Unlike previous studies that were mainly conducted from the viewpoint of property graduates and employers, this study explored the opinions of property academics. Moreover, this study considered the views of academics in all recognised subsectors of the property industry and was not limited to just one discipline like the bulk of previous studies. As such, the findings of this study highlight critical perspectives on the shortcomings of current approaches and frameworks, as well as potential dimensions of focus for various stakeholders and decision makers to improve property graduates' preparedness for the future of the property profession. Additionally, the underlying themes and interrelationships underscore the need for a holistic approach that incorporates the perspectives of academics, graduates, and employers to design and deliver property education.

The rest of the paper is structured as follows: The next section presents a review of relevant studies covering key themes related to the preparedness of the property industry for the digital age, the necessity for technological training, and the role of property educators in equipping property graduates. This is followed by the methodology in Section 3, where we explain the research process and methods. Section 4 presents the results and discussion, with conclusions being detailed in Section 5.

2. Literature Review

The property industry is a complex and intricate system of subjects and disciplines without a clearly defined body of knowledge [9,32]. The success of the property industry is dependent on the ongoing relationship between several stakeholders: education providers to equip students with the relevant skills, graduates to apply the requisite skills to meet client demands, employers to provide jobs and further training for graduates, and policymakers to provide a framework within which the needs of all stakeholders are represented [6,33,34]. Aliu and Aigbavboa [11] reported that the dynamism of present-day clients' needs requires education providers to constantly upgrade the curricula and teaching methods to keep up with trends and continuously produce graduates who can seamlessly transition as technology evolves. The skillset required of a property professional has transformed over recent decades due to digitisation, internationalisation, and the shift from traditional property services to quasi-financial services [35].

2.1. How Prepared Is the Property Industry for the Digital Age?

Technology has transformed decision making, value assessment, client preferences, construction, management, and every other facet of the property market [10,26]. According to Starr et al. [26], the digital transformation of the built environment is driven by the need for industry standards to be more efficient, adaptable, and flexible. Further, the emergence and proliferation of digital tools have resulted in irreversible changes to traditional practices and increased the competition for property professionals [25]. Baum [10] espoused the disruptive potential of PropTech. Similarly, Cornish et al. [36] emphasised the benefits of embracing technology in service delivery and client interaction to boost efficiency. Although the ongoing digital transformation represents an opportunity to streamline services and productivity, the property sector has generally been slow to adopt these innovations [24].

These technological advances have implications for all subsectors of the property industry. The process of property valuation has progressively shifted from manual to automated approaches [25,27,37]. In particular, automated valuation models (AVMs) are

increasingly limiting the need for trained professionals to determine the value of properties for mortgage and sale purposes, a dynamic that is slowly transforming the practice into more of a science than an art [34,37]. In Australia, industry leaders such as CoreLogic, APM Price Finder, and Monitor now adopt AVMs as standard practice [17]. Similarly, blockchain technology has facilitated the creation of decentralised networks of banks and valuers to facilitate the speedy listing, verification, and sharing of valuations [26]. In the construction subsector, technology has revolutionised building information modelling (BIM), alternative delivery systems, and collaborative partnerships [8]. There are also significant gaps in the training of quantity surveying graduates due to rapidly changing trends and client demands [38,39]. The real estate agency has evolved to incorporate online listing platforms such as *Domain* and *Flatmates* and virtual reality (VR) technologies for remote property inspections.

The work readiness of graduates conceptualises their proficiency in the skills required by employers to fulfil roles towards client needs [40]. In the digital age, a graduate without adequate competence in the digital tools adopted in the industry cannot be deemed work-ready [40,41]. With the property industry being generally regarded as a slow-moving asset class with conservative stakeholders, the rate of adopting technological tools has lagged compared with the rest of the market [24,42]. As economies become more digitised and data become more readily available, there are calls for all property market stakeholders to evolve their practices and competencies [24,34,36]. However, Parker [15] highlighted a worrying trend of higher education institutions in Australia employing the cheapest available resources to deliver their property courses as more experienced academics retire, citing the casualisation of teaching as a particular issue of note.

2.2. The Need for Technological Training

Property education is complex due to the nature of the asset class, the number of stakeholders involved, and the difficulty in clearly defining a body of knowledge [9]. Recent improvements in data processing and the ongoing integration of PropTech in the property industry have also contributed to a paradigm shift that is increasingly making traditional skills redundant [10,24,26]. To address the challenges of the digital age, modern property professionals must understand the intricacies of the property market and possess an appreciable competence in technological tools and skills [33]. Not only will this digital skillset maintain their professional relevance, but a lack of it will inevitably force them out of a market that places a premium on the speed and efficiency of newer methods over the laborious processes of yesteryear [10,25,33]. Future property professionals must evolve with industry demands to retain a role as critical stakeholders providing valuable services in this age of automation [17].

Even before the uptick in adopting technological tools in the property industry, the existing literature reported gaps between the expectations of employers and the training provided for graduates by higher education institutions [4,9,13,43]. Moreover, graduate employers consistently comment on the extended periods of integration they have to offer to new graduates due to the lack of practical knowledge [44]. These gaps largely remain unaddressed [5,7]. In addition to these generic challenges, the digital age and increased technological needs have exacerbated the gaps between academic training and industry readiness [24,26,36]. According to Hefferan and Ross [27], the sophistication of the property market, technological advancements, and specialised client needs have increased the demand for property professionals in Australia. Decades of change driven by technological advances have also shifted the skillset required to service property clients [35].

With more firms and industry providers adopting technological tools to automate core tasks and keep up in the digital age, education providers must redesign curricula to reflect dynamic client needs [5,19,34]. Additionally, these advancements highlight the potential risk of redundancy to future property professionals. Without the needed competence in technological tools, property graduates could become relics in an increasingly digital

market that no longer requires traditional skills better handled by these digital tools [31,45]. These changing dynamics require all stakeholders to adapt, especially education providers, who must take a more proactive role in shaping programmes to better prepare graduates for an evolving industry [35]. According to Starr et al. [26], significant upgrades to the current knowledge base must be made to keep up with the rapidly changing digital age. The role of education providers and academics as stakeholders in bridging these gaps cannot be overstated. Academics are equally responsible for equipping graduates with the skills to make them work-ready and delivering an adequately competent workforce to prospective employers.

2.3. Equipping Property Graduates: The Role of Property Academics

All stakeholders have a role to play in securing the future of property education in Australia: the government to make resources available, policymakers to provide a framework within which the transition can occur, the industry to further the training of the graduates, and the students to upskill and ensure their job readiness [34,40,46]. However, much of the success will rely on property academics, given their intermediary role of equipping graduates with in-demand skills for industry roles. According to Borg and Scott-Young [47], the educator's role includes the delivery of literacy skills embedded with practical industry knowledge, career coaching, and industry engagement. Beyond the acceptance that universities have a crucial role in ensuring the successful transition of property graduates into the industry, very little has been reported on the exact role of academics in driving this change [46,48].

The issue of expectation gaps in Australian property education has been explored from the perspective of different stakeholders, including policymakers [46], graduates [16,17], and employers [5,47]. Despite being responsible for delivering these skills to future property professionals, property academics have been the subject of limited research interest.

Several strategies have been proposed to foster stronger ties between academia and practice. Guest speakers familiar with industry practices could help facilitate graduates' exposure to essential technological skills before joining the industry [49]. Weinstein and Worzala [6] suggested mentorship programs as an avenue to facilitate practical training for property graduates during and beyond their time as students. Similarly, active learning focuses on transmitting knowledge to students through project-based activities, a strategy that improves the cognitive capacities of graduates by simulating the conditions under which most will ultimately work [50]. Borg and Scott-Young [47] reported the following themes as the main strategies proposed by employers to better prepare property graduates for the industry: industry engagement, embedded practice, literacy lessons, and career coaching.

Mainly, other stakeholders, such as graduates and employers, have proposed these strategies. No previous study in the existing literature has investigated the pressing need to equip property graduates for the digital age from the perspective of academics and the challenges they face as they strive to close these expectation gaps. Thus, this study assessed the challenges property academics face in Australia as they try to equip property graduates with the necessary skills to succeed in the digital age as well as strategies to aid these proactive attempts.

3. Materials and Methods

This study adopted a quantitative exploratory research design to assess the perspectives of Australian property academics on the challenges they face in equipping property graduates for the digital age, and the study has proposed strategies to improve these attempts. Figure 1 summarises the research process implemented to explore these concepts.

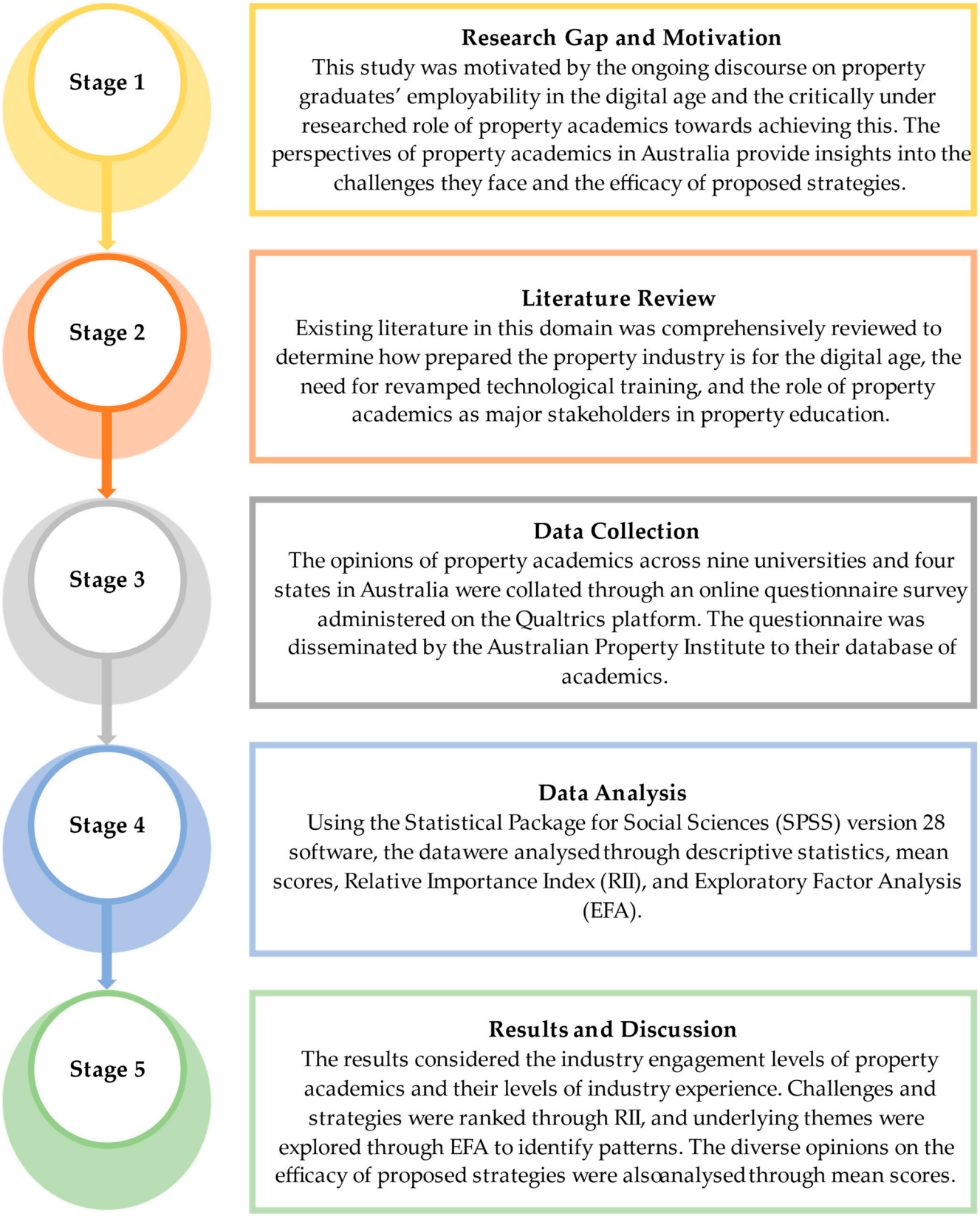

Figure 1. Research process on property academics' challenges and strategies.

3.1. Data Description

These opinions were gathered through an online questionnaire survey designed and administered on the Qualtrics platform. The online survey approach allowed for data collection across geographical borders in addition to ensuring the anonymity and confidentiality of responses [51]. The eligibility criteria for respondents were limited to active property academics currently teaching property-related courses at Australian universities accredited by the Australian Property Institute (API).

As the principal organisational body for Australia's property industry, API represents academics and industry practitioners across the entire sector and retains a database of 110 active property academics who meet the eligibility criteria. Thus, prospective respondents were contacted through the API by sending an initial recruitment email and a follow-up reminder email after a month to boost participation in the study [52]. The online questionnaire survey was open for two months, after which 22 complete responses were received, representing a response rate of 20%.

According to Akintoye and Fitzgerald [53], the established level of response rates in similar survey-based studies ranges from 20% to 30%. Further, previous studies in the property sector conducted through professional bodies reported comparatively lower response rates, notably 2.9% in Poon and Brownlow [7] and 3% in Warren-Myers and Cradduck [54]. The sample size in this study also compares favourably with previous studies assessing technological competencies, education, and practice among property professionals and stakeholders—21 [54] and 18 [55]. Although the small sample size limits the generalisability of these findings, this study provides indications of the wider perceptions of property academics towards the challenges of and strategies for preparing graduates for the digital age. Additionally, the spread of respondents across states and institutions in Australia strengthens the diverse perspectives discussed in this paper.

The first section of the questionnaire queried background information on the respondents' age, gender, educational qualification, academic and industry experience, as well as academic designation and industry certification, if any. Details on their affiliate institutions were also gathered, including locations, programs offered, courses, accreditation, and yearly enrolment estimates. Next, respondents were presented with a list of challenges and strategies developed based on the current literature and asked to rate these measurement items on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). Table 1 presents a profile of the respondents in this study.

Table 1. Profile of respondents (property academics).

Variables		Frequency (n = 22)	Percentage (%)
Age	25–34 years	2	9.1
	35–44 years	6	27.3
	45–54 years	7	31.8
	55–64 years	6	27.3
	Above 65 years	1	4.5
Gender	Male	15	68.2
	Female	6	27.3
	Prefer not to answer	1	4.5
Education	Bachelor's	1	4.5
	Master's	1	4.5
	PhD	20	90.9
Academic experience	0–5 years	2	9.1
	6–10 years	5	22.7
	11–15 years	6	27.3
	16–20 years	5	22.7
	Above 20 years	4	18.2

Table 1. *Cont.*

Variables		Frequency (n = 22)	Percentage (%)
Academic Designation	Professor	2	9.1
	Associate Professor	3	13.6
	Senior Lecturer	13	59.1
	Lecturer	4	18.2
Industry Certification	Certified Fund Manager	1	4.5
	Development Practitioner	1	4.5
	Practising Valuer (CPV)	6	27.3
	Practising Valuer (plant and machinery)	1	4.5
	None	13	59.1
Location (State)	New South Wales (NSW)	6	27.3
	Queensland (QLD)	4	18.2
	South Australia (SA)	1	4.5
	Victoria (VIC)	9	36.4
	Western Australia (WA)	2	9.1

3.2. Analysis Techniques

Data analyses were undertaken using the Statistical Package for Social Sciences (SPSS) software version 28, mainly through the following statistical techniques: descriptive statistics, mean scores, relative importance index (RII), and exploratory factor analysis (EFA). Following preliminary screening and data cleaning, Cronbach's alpha was computed to measure the internal consistency of the 5-point Likert scales used in the questionnaire. This test returned a reliable alpha of 0.802, well above the recommended 0.7 threshold [56,57].

3.2.1. Relative Importance Index (RII)

Given the limited literature comprehensively assessing the challenges and strategies of property academics in equipping property graduates for the evolving technological industry, these perceptions were ranked through RII. These opinions were collated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to ascertain how critical and promising the challenges and strategies were, respectively. Through the established RII method developed by Kometa et al. [58], the frequencies of these responses were aggregated and transformed to facilitate a more robust ranking. The index was computed using Equation (1).

$$Relative\ Importance\ Index = \frac{\sum w}{A * N} \quad (1)$$

where

w = the weighting of each factor, ranging from 1 (strongly disagree) to 5 (strongly agree);
A = the highest weight (5);
N = the sample size (22).

To interpret the computed indices, the values range from 0 to 1 in ascending order of perceived importance by the respondents [58,59]. Adapted from Akadiri [60], these index scores were categorised into five distinct categories for easy interpretation: $0 \leq RI < 0.2$ = "Unimportant"; $0.2 \leq RI < 0.4$ = "Low"; $0.4 \leq RI < 0.6$ = "Medium"; $0.6 \leq RI < 0.8$ = "High"; and $0.8 \leq RI \leq 1$ = "Critical".

3.2.2. Exploratory Factor Analysis (EFA)

Distinct themes in the challenges and proposed strategies were drawn out through an EFA, which is ideal in the absence of an established theory of behaviour [61,62]. Following the recommendations of Fabrigar and Wegener [62], the following checklist was followed to generate the themes and patterns: data suitability, rotational method, factor extraction, factor retention, and labelling. To ensure the data's suitability for an EFA, correlation

matrices were generated. These values fell within the acceptable range of 0.40 to 0.70, indicating strong relationships between the construct and their suitability for EFA [62,63]. Factor extraction was specified using the direct oblimin rotation method, which is ideal because of the correlation between measurement items [63].

Kaiser's criteria, the scree plot, and the pattern matrix were subsequently adopted for factor extraction and retention [64]. Based on Kaiser's criteria, which specify the retention of factor clusters with an eigenvalue greater than 1, four clusters were retained from the challenges and three were retained from the strategies. Considering that the proposed strategies must directly address existing challenges, further examination of the relationship between these clusters also provides useful insights into the overarching need to reduce expectation gaps between academia and the industry. Tables 2 and 3 detail the initial eigenvalues, total variance explained, and rotation sums of squared loadings. In the EFA, high total variance explained values indicate more comprehensive insights into the relationships and patterns [56]. The merged scree plots are also presented in Figure 2, showing factor clusters with an eigenvalue higher than 1 before the breakpoint. Thus, clusters that tailed off after the breakpoint were rejected based on Kaiser's criteria [56].

Table 2. EFA of challenges (eigenvalues and total variance explained).

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings
	Total	*% of Variance*	*Cumulative %*	*Total*
1	3.048	30.479	30.479	2.419
2	1.943	19.431	49.910	1.696
3	1.326	13.265	63.175	2.017
4	1.256	12.560	75.735	2.116
5	0.884	8.836	84.571	
6	0.540	5.397	89.968	
7	0.420	4.205	94.173	
8	0.333	3.329	97.502	
9	0.178	1.784	99.286	
10	0.071	0.714	100	

Table 3. EFA of strategies (eigenvalues and total variance explained).

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings
	Total	*% of Variance*	*Cumulative %*	*Total*
1	2.136	30.513	30.513	2.136
2	1.423	20.334	50.847	1.423
3	1.234	17.636	68.482	1.234
4	0.913	13.047	81.529	
5	0.630	8.996	90.525	
6	0.379	5.413	95.938	
7	0.284	4.062	100	

Finally, the factor loadings of the various clusters were observed and analysed to define the themes and underlying relationships in the challenges and strategies related to equipping property graduates for the digital age from the perspective of property academics in Australia. The pattern matrices were preferred for this stage of factor retention and labelling as it aligns with the initial choice of the direct oblimin rotation method [63]. By suppressing coefficients less than 0.30, higher factor loadings were prioritised to better reflect the underlying themes [62]. Further, this prevented cross-loading to limit ambiguity in the results and capture the essence of the coefficients [62,63].

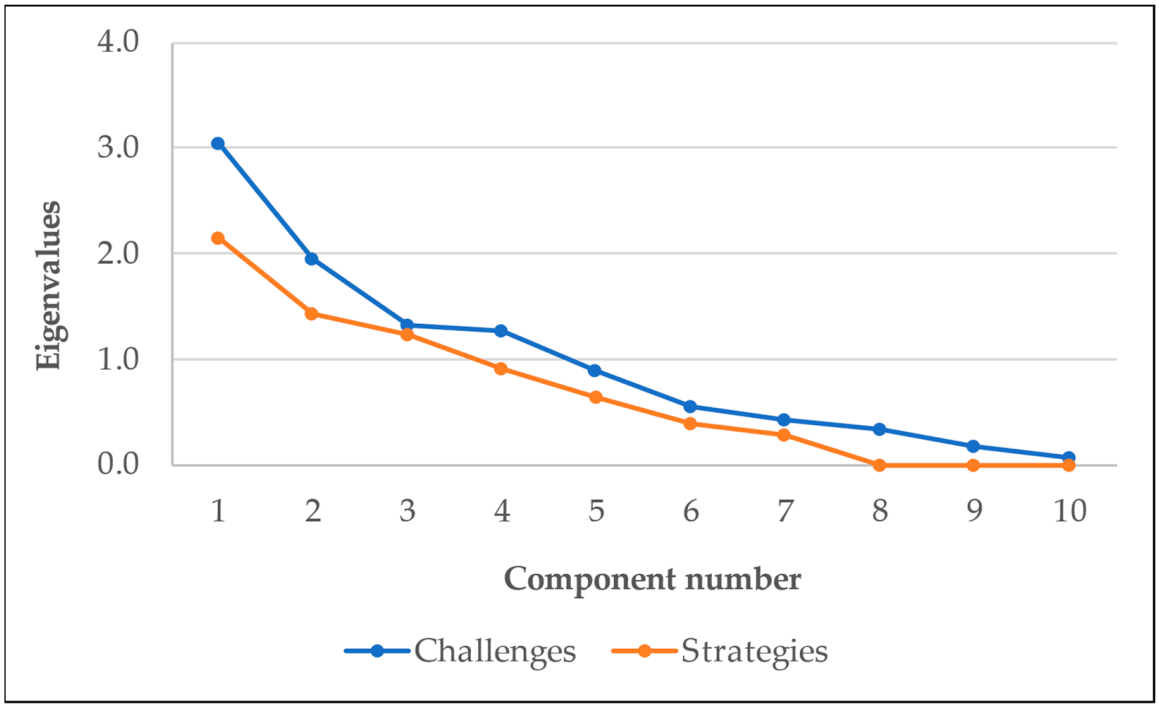

Figure 2. Scree plot (challenges and strategies).

4. Results and Discussion

4.1. Industry Engagement among Property Academics

The starting point of these discussions considered the level of industry engagement among property academics in Australia given the well-documented instances of a disconnect [25,26]. Industry engagement among academics reflects not only a current understanding of what the industry requires but also the basis for proactive changes to keep graduates up to date [26,65]. Critically, industry engagement among academics is a fundamental strategy for bridging the expectation gaps, especially as they become more glaring in the digital age [26,47].

As reported in Table 4, approximately half of the surveyed respondents in this study have five years or less of industry experience, and 54.5% currently have some form of ongoing industry engagement. The existing literature reports no definitive ideal level of industry experience, but there are several indications that higher and more active engagement with the industry correlates with more proactive training of graduates [66]. As recommended by Van De Ven and Johnson [67], open lines of communication and engagement among the key stakeholders of the property sector are critical for a smoother transition into the technological age, particularly as graduates come under increasing pressure to acquire new skills and hit the ground running in their industry roles [5,9,39].

Table 4. Industry engagement among property academics in Australia.

Variables		Frequency (n = 22)	Percentage (%)
Industry experience	No industry experience	2	9.1
	1–5 years	9	40.9
	6–10 years	1	4.5
	11–15 years	5	22.7
	16–20 years	3	13.6
	Above 20 years	2	9.1
Current industry engagement	Yes	12	54.5
	No	10	45.5

4.2. Challenges in Equipping Property Graduates for the Digital Age

4.2.1. Challenges Property Academics Encounter in Equipping Property Graduates

Despite the ongoing calls for industry engagement and the widening expectation gap, little work has been performed on the unique challenges faced by property academics in their efforts to better equip graduates for the digital age. In the age of PropTech, there are several operational, regulatory, and social barriers inhibiting the rapid adoption of digital technologies in the property industry [10]. The existing literature has highlighted a few notable challenges impeding the process of incorporating digital technologies in course delivery [5,68].

Much has been reported on the expectation gaps between the industry and academia, but it has mostly been through the perspective of other stakeholders such as students, graduates, and employers [5,40,50]. Although academics play a critical role in designing curricula and equipping graduates with the required skills, there is no definitive framework to assess the obstacles faced by academics. In this study, the following challenges were considered in the context of their significance towards property academics in the digital age: limited funding to procure software; insufficient time to upskill; limited technical support from the universities; insufficient knowledge of new tools; no access to the required tools; insufficient time to incorporate technological tools in the curricula; difficulty in modifying the curricula; no industry demand for technological skills; and rigid structure of property programs. Thus, these challenges were ranked through an RII to establish how significant each of them is from the perspective of property academics in Australia. As shown in Figure 3, the 10 challenges considered the range from "Medium" ($0.4 \leq RI < 0.6$) to "High" ($0.6 \leq RI < 0.8$) in terms of importance.

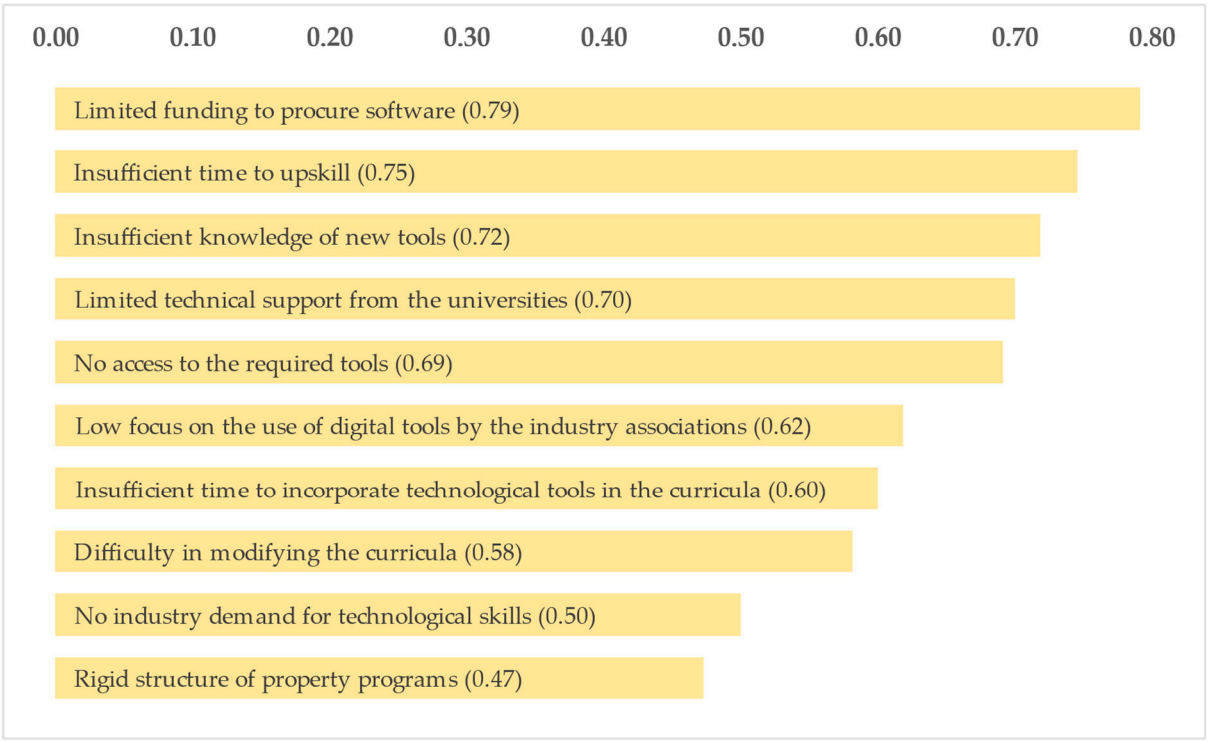

Figure 3. Relative importance index ranking of challenges.

Starting with the least pertinent, academics rated the rigid structure of university curriculums (RII = 0.47) and difficulties in modifying the curricula (RII = 0.58) as quite low, with it being a "Medium". The curricula for training property graduates need to be diverse and up to date with the skill requirements of the industry and employers [6,49,69]. Warren and Heng [13] concur that existing curricula should be a point of focus in bridging

the expectation gaps. Notably, insufficient time to incorporate technological tools in the curriculum had a "High" level of importance (RII = 0.60). These differing perspectives suggest that although the curricula may not be rigid enough to impede training for the digital age, academics have little time to incorporate them. The rapid evolution of standard practice in the property industry to keep up with technology in the digital age may mean that standard education approaches cannot keep up with the ever-changing industry [68]. This finding is consistent with the prevailing notion that PropTech is transforming all aspects of the property industry [5,24] but challenges suggestions that the fundamental issue is the rigid structure of property programs [4,39].

Given that the challenge "no industry demand for technological skills" was only "Medium" (RII = 0.50), this evinces that property academics recognise a growing demand for these skills [5,36]. This aligns with Baum's [10] assertion on the growth of PropTech in the property industry and the global shift towards digital technologies. However, the most prominent challenges stem from limited funding to secure bespoke software (RII = 0.79), insufficient time to upskill (RII = 0.75), insufficient knowledge of the new tools (RII = 0.72), and limited technological support from the universities (RII = 0.70). Low access to the required tools (RII = 0.69) confirms limited funding to secure these software and digital tools, which inhibits the efforts of academic departments to offer advanced training opportunities [70].

Limited funding to secure and incorporate these tools in education attempts essentially shifts the burden of training to employers, further reducing the appeal of employing fresh graduates [5,9,13,69]. Although unexpected, the limited technical support from the universities requires renewed efforts from all stakeholders to put property academics in a better position to train property graduates for the digital age. Similarly, a low focus on the use of digital tools by industry and regulatory associations (RII = 0.62) suggests that a shift in focus is required to provide the required training to future property graduates.

4.2.2. Underlying Themes in the Challenges Property Academics Encounter (EFA)

Based on the initial challenges surmised based on the extant literature and previous studies from the perspectives of other stakeholders, four underlying themes were generated through an EFA to explain the relevance of these challenges from the unique standpoint of property academics. Collectively, these four-factor clusters explain 75.735% of the total variance. Table 5 summarises the results of the EFA conducted, the labelled factor clusters, and the associated factor loadings.

Table 5. Themes in the challenges academics encounter.

Factor Cluster	Challenges	Factor Loading
Resource Constraints	Insufficient time to incorporate technological tools in the curriculum	0.876
	Insufficient knowledge of new tools	0.794
	Limited funding to procure software	0.644
External Industry and Regulatory Framework	Low focus on digital tools by industry associations	0.833
	No industry demand for technological skills	0.779
	No access to the required tools	0.504
Curricula rigidity	Rigid structure of property programs	−0.946
	Difficulty in modifying the curricula	−0.903
Technical support and upskilling limitations	Limited technical support from the universities	−0.916
	Insufficient time to upskill	−0.584

Labelled "resource constraints", three challenges loaded onto the first cluster, which also accounted for 30.479% of the total variance explained. Insufficient time to incorporate technological skills into the curricula, insufficient knowledge of these tools, and limited funding to procure bespoke software are all linked to this initial cluster, representing some of the most prominent challenges [9,69,70]. This factor suggests that limited access to the resources required to integrate technology is a critical and ongoing challenge. Overall, the results indicate that property academics may not have enough time to incorporate new technological tools, lack the requisite level of proficiency in these tools, and face budgetary constraints when trying to procure bespoke software and technological tools [68,70].

The second cluster (external industry and regulatory framework) explained 19.431% of the total variance and comprised the following three challenges: low focus on digital tools by industry associations, no industry demand for technological skills, and no access to the required tools. Primarily, these challenges relate to wider factors beyond the control of property academics, mainly the industry and regulatory landscapes. According to Wilkinson et al. [25], industry and regulatory associations need to proactively drive changes in focus and training to keep property professionals relevant in the digital age. The emergence and integration of PropTech are integral external drivers that further enforce the need for university training to adapt to changing industry demand [24,71]. These challenges underscore the importance of industry associations and regulatory bodies driving changes to incorporate technological skills into property education. Additionally, professional institutes play a critical role to graduates and early career practitioners through career advancement opportunities [72], which must reflect the digital skills currently in demand.

The third-factor cluster (curricula rigidity) explained 13.265% of the total variance and comprised the following challenges: the rigid structure of property programs and difficulty in modifying the curricula. As previously established in the ranking of challenges, property academics do not view curricula rigidity as a paramount challenge. Instead, time to incorporate the changes and new tools represents the more pressing need [5,40,69].

Lastly, the "technical support and upskilling limitations" cluster reflects difficulties related to the support and training opportunities property academics receive from their institutions. This factor cluster accounted for 12.56% of the total variance. This variable suggests that universities may not provide adequate technical support to faculty members, including assistance with technology integration, troubleshooting, and access to resources [68]. Insufficient time to upskill further suggests strong links to a lack of technical support. In the absence of sufficient technical support, academics may be less willing to take on the extra burden of technological training and upskilling in digital competencies.

4.3. Strategies to Equip Property Graduates for the Digital Age

4.3.1. Ranking of Proposed Strategies

In recognition of the widening expectation gaps created by the adoption of digital tools in practice, several initiatives have been explored to equip future property graduates with these skills and competencies. With employers emphasising these novel skill sets, property graduates must necessarily have an appreciable understanding of the fundamental property skills and digital advancements currently used to facilitate tasks in the industry [40,41]. This study explored seven proposed strategies: retraining of property academics to gain digital proficiency; increased technical support from the universities; active learning (project-based course delivery); revision of the property curriculum to incorporate digital technology; increased support from industry partners; increased demand for technology by the industry/regulatory bodies; and uncreased funding from universities to procure software. Analysed through an RII, these strategies are presented in Figure 4.

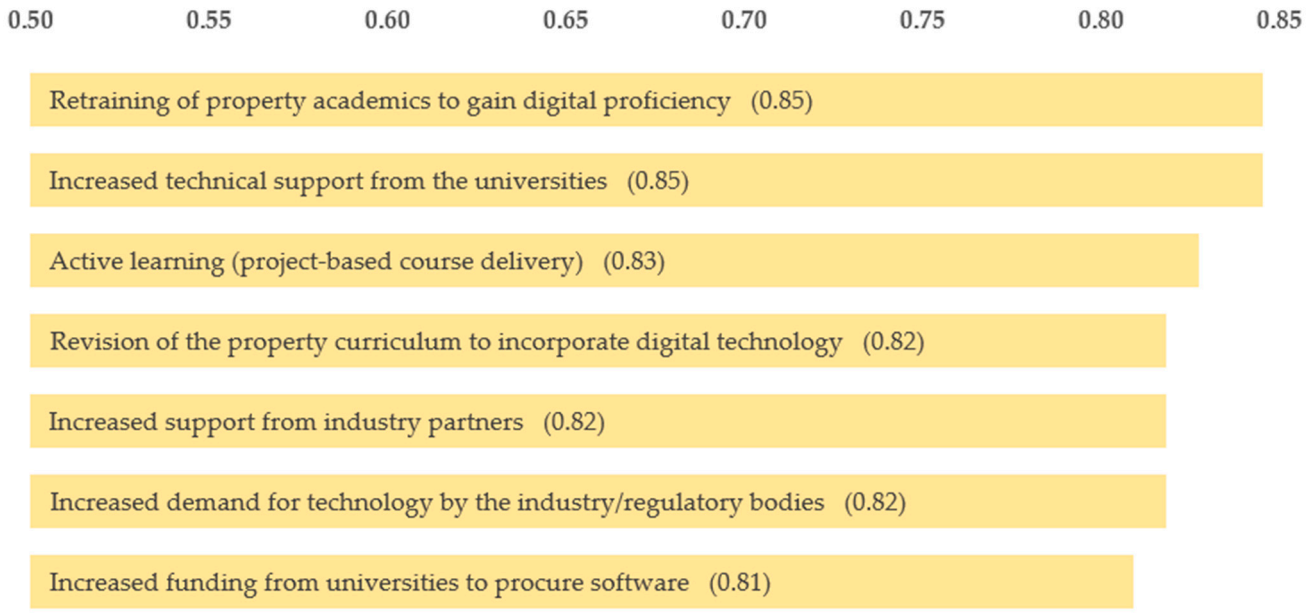

Figure 4. Relative importance index ranking of strategies.

Initial screening of the index ranking suggests that property academics rate the efficacy of these proposed initiatives highly, as all seven were rated "Critical" ($0.8 \leq RI \leq 1$). Retraining of property academics to gain digital proficiency (RII = 0.85) and increased technical support from the universities (RII = 0.85) were rated most highly. This strategy requires the provision of training and professional development opportunities to enhance the digital proficiency of property academics and keep them up to date with industry requirements. This is a commonly suggested initiative to improve the work readiness of graduates [28,73] but has rarely been explored for academics. In the same vein, increased technical support from the universities would facilitate the incorporation and integration of these digital tools, providing a basis for more innovative course delivery [68].

Active learning or project-based course delivery (RII = 0.83) and revision of the property curriculum to incorporate digital technology (RII = 0.82) also rank highly in popular proposed strategies to equip property graduates for the digital age. Active learning is a teaching approach that encourages students to actively engage with digital technologies while working on real-world projects [50,74,75]. Significant strides have already been made in this respect, but further efforts are required to incorporate novel digital technologies while working on real-world projects [36,74,75]. Rather than encouraging academics to make these changes at the classroom level, an overhaul of the academic curricula is required to consistently ensure the delivery of technological competencies to equip future property graduates with the skills required in the digital age [39,74].

The final set of strategies relates largely to external influences by industry and regulatory partners: increased support from industry partners (RII = 0.82), increased demand for technology by the industry/regulatory bodies (RII = 0.82), and increased funding from universities to procure software (RII = 0.81). Ongoing collaboration with industry partners is required not only to provide networking opportunities but also digital competencies for property academics [5,74]. This increased collaboration would also provide access to latest software and would provide proficient professionals that could interact with students in the form of guest lectures and workshops [17,36,74]. Industry and regulatory bodies also have a crucial role to play by encouraging collaboration and providing further opportunities for training as new skills become standard practice [25]. Despite the widely publicised funding constraints of universities [70], strategic allocation of these funds to training programs for academics and access to bespoke software would be an effective route for securing the future of property graduates as work-ready industry practitioners [76,77].

4.3.2. Underlying Themes in the Proposed Strategies (EFA)

Following a ranking of the strategies to identify their perceived efficacy among property academics, three-factor clusters were generated through an EFA to highlight the underlying themes in these strategies. Approximately 68.482% of the total variance was explained by these factor clusters, which are presented and labelled in Table 6.

Table 6. Themes in the proposed strategies to equip property graduates for the digital age.

Factor Cluster	Strategies	Factor Loading
Holistic Curriculum Integration	Active learning (project-based course delivery)	0.811
	Increased support from industry partners	0.791
	Increased demand for technology by the industry/regulatory bodies	0.623
	Revision of the property curriculum to incorporate digital technology	0.466
Capacity Building and Resource Acquisition	Increased funding from universities to procure software	0.867
	Retraining of property academics to gain digital proficiency	0.759
Infrastructure and Technical Support	Increased technical support from the universities	0.918

The first cluster, "Holistic Curriculum Integration", underscores the need for an integrated approach to training graduates and reflects the key roles of several stakeholders such as academics, industry partners, regulatory bodies, and academic institutions, as well as the nature of course design and delivery [7–10]. Four strategies were loaded onto this cluster, representing different phases of property graduates' training. Regarding course design and structure, increased support from industry partners [8,70] and increased demand for technology by these bodies [4,27,45] are crucial in establishing the need for property education to evolve. Given the underlying responsibility of the employer to their clients, this increased demand for digital competency can drive change in other stakeholders, such as property academics [26,45]. Essentially, a shift in priorities by prospective employers in the industry would signal necessary shifts for both graduates and employers.

Active learning, particularly through project-based course delivery, emphasises practical application and hands-on experience [50,74,75]. This approach cultivates critical thinking and problem-solving skills, allowing students to directly engage with digital tools. Collaborating with industry partners establishes a vital link between academia and the practical demands of the property industry [50,74,75]. It ensures that academic content aligns with current industry needs, exposing students to real-world challenges and the latest technologies. Moreover, revising the property curriculum to incorporate digital technology is crucial for a comprehensive update. This strategy involves a systematic overhaul, embedding digital proficiency throughout the curriculum in terms of content, assessments, and teaching methods [5,19,34]. The practical implications of Cluster 1 underscore the importance of a holistic approach to curriculum development that considers industry partnerships, technology demands, and innovative teaching methods. This approach ensures graduates are not only technically proficient but also well prepared to apply their skills effectively in the dynamic digital landscape of the property industry, fostering a smoother transition from academia to the professional world.

Cluster 2, denoted as "Capacity Building and Resource Acquisition", concentrates on the need for increased funding from universities and the retraining of property academics to achieve digital proficiency. The strategy of increased funding addresses the financial dimension of acquiring essential software, acknowledging the pivotal role technology plays in property education [70,78]. Adequate financial support facilitates the procurement of

cutting-edge software, ensuring students have access to the latest tools and fostering a technologically advanced learning environment. Simultaneously, the retraining of property academics recognises the importance of educators possessing the necessary digital skills to effectively teach and mentor students [46,48]. Faculty retraining contributes to the seamless integration of digital technologies into the curriculum, enabling educators to deliver more effective and up-to-date instruction. This, in turn, positively impacts the overall learning experience and serves as a model for students navigating the complexities of the digital age [47,50]. The practical implications of Cluster 2 emphasise the critical need for a balanced approach that addresses both financial resources and human capital to build and sustain the capacity for effective property education in the digital era. It further highlights the importance of continuous investment for ongoing software updates, acquisitions, and faculty development, ensuring a robust and forward-looking educational environment.

Only one strategy was loaded onto the third cluster, underpinning the need for technical support from the universities. Although this is a statistically significant cluster, it offers very little practical thematic relationships. Nonetheless, the strategy to ensure technical support for property academics was discussed in the context of its relative importance to other strategies and academics' diverse opinions on its efficacy.

4.3.3. Property Academics' Diverse Opinions on the Proposed Strategies

Although all of the proposed strategies were ranked very highly by property academics, more in-depth analyses highlighted varied perspectives for different groups. These viewpoints also show which strategies specific groups of academics deem most prevalent depending on their academic or industry experience and institutional features. Particularly, opinions differed on the potency of the following proposed strategies: increased funding to procure software, revision of property academic curricula, retraining academics, and increased support from industry partners.

Collectively, increased funding to procure bespoke software was rated as critical by property academics. While this finding implies that all institutions require additional funding [70], it overlooks the current state of software availability and access in different institutions. As shown in Figure 5, the size of the respective institutions (based on yearly enrolment) reveals significant disparities in attitudes towards this strategy.

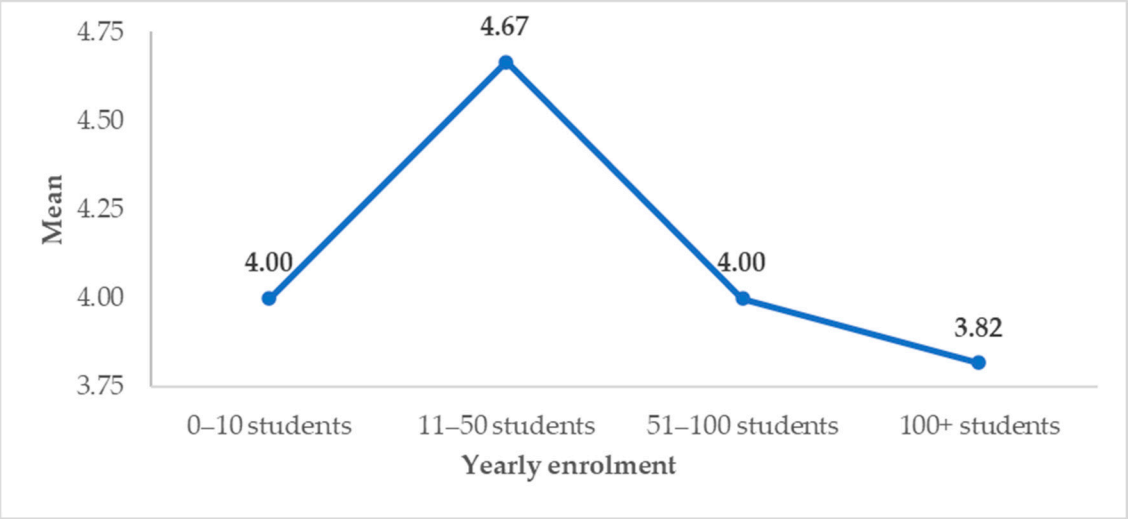

Figure 5. Opinions on increased funding to procure software based on yearly enrolment.

The existing technological resources of bigger universities could inhibit the perceived need for additional funding, a stark contrast to smaller institutions with no current access and limited funding. It is plausible that smaller institutions cannot afford the high cost of bespoke software and tools due to their limited budgets, thus increasing their perceived

need for budgetary support [78]. Because universities' funding and excellence are positively correlated [79], increased efforts and systems are required to improve the accessibility of these smaller institutions to the software and tools required to train property graduates for the digital age [78]. In part, the size of higher education institutes is a relevant factor for continued success due to economies of scale and a wider scope of focus [78]. Even in the absence of public funding, Benito et al. [79] and Rossi [78] showed that alternative networking strategies with industry associations can boost the institution's ability to attract funds towards the research and training of graduates. This is further validated in Figure 6, which indicates that smaller institutions rate higher industry support as a more effective strategy.

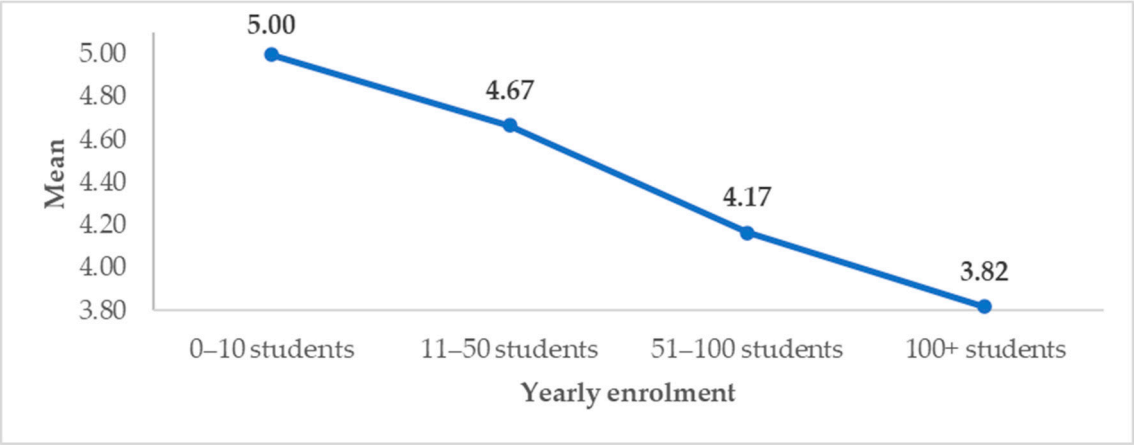

Figure 6. Opinions on increased support from industry partners based on yearly enrolment.

The emergence of PropTech has incentivised the property industry to adapt, prompting continuous dialogue about the necessity of revising academic curricula [5,24,71]. In response to the evolving landscape, there is a growing consensus on the need to modernise curricula by integrating emerging industry practices, harnessing technology, and fostering project-based learning [4,36,40]. Figure 7 depicts a positive relationship between industry experience and the perceived need to restructure academic curricula to better reflect industry requirements.

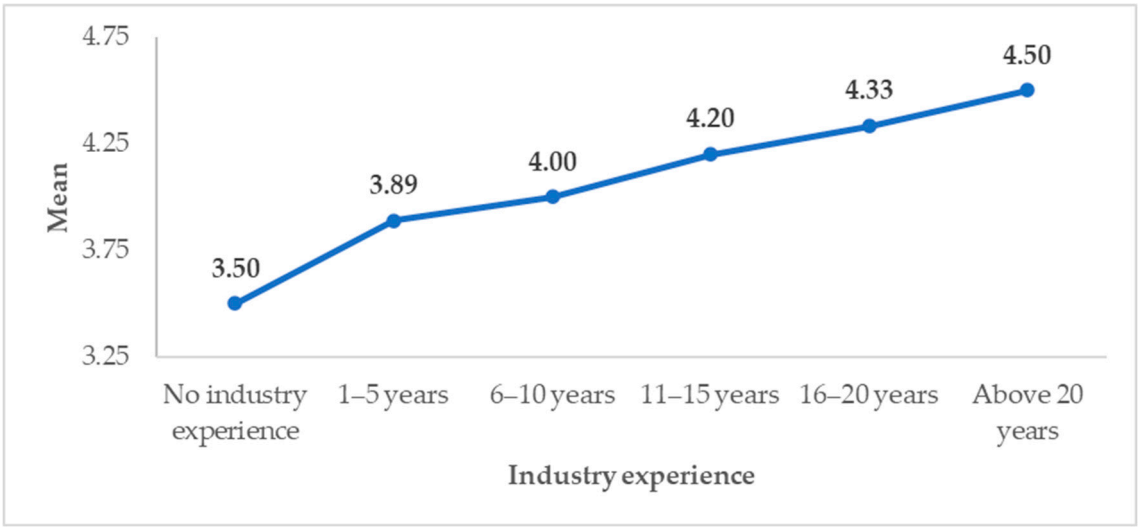

Figure 7. Opinions on revising academic curricula based on industry experience.

This relationship suggests stronger opinions towards this strategy based on the level of industry exposure. Essentially, the need to restructure current academic curricula is more apparent with industry experience. Lipinski and Kosicek [80] advocated as much by positing that education providers with more industry experience have a better appreciation of industry expectations, which facilitates their preferred training methods. The need for more industry insights calls for higher education providers to incorporate the perspectives of industry veterans and maintain ongoing interactions with industry professionals [36,66,80].

Retraining property academics to gain digital proficiency is another critical initiative towards improving the work readiness of future property graduates. Although the benefits of digitally competent academics are apparent, perceptions towards this strategy differ among younger and older property academics. As illustrated in Figure 8, there is an inverse relationship between age and the perceived effectiveness of this strategy. Speculatively, this reluctance to retrain may point towards intergenerational differences in attitudes towards technology and hesitancy to alter established methods [81,82]. As such, professional development programs for property academics necessarily need to be tailored towards different age groups to address specific concerns and provide flexibility to groups with varying levels of digital proficiency.

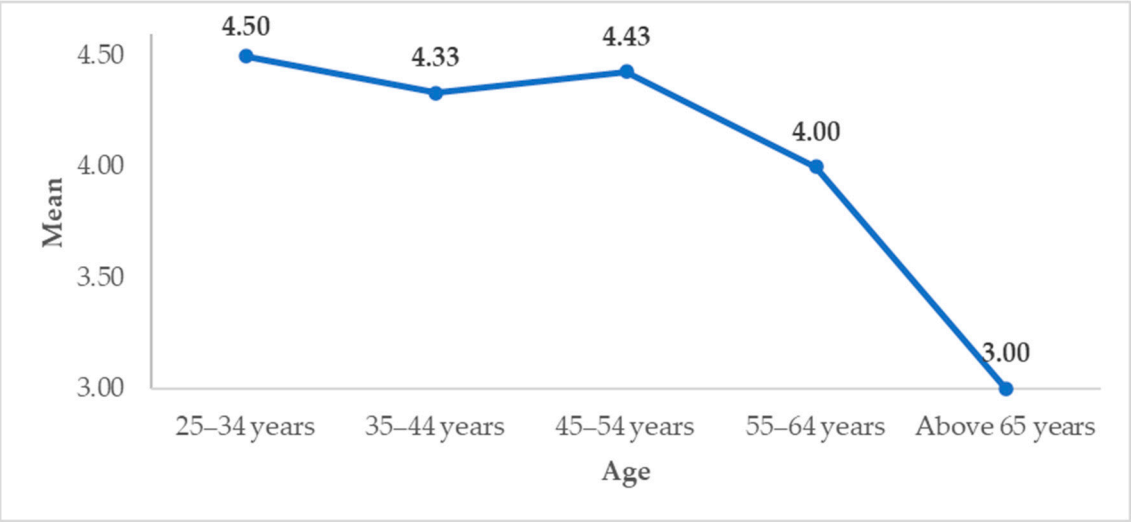

Figure 8. Opinions on retraining academics based on age.

5. Conclusions

This study explored the challenges that property academics face in preparing graduates for the digital age and the efficacy of proposed strategies in addressing the widening gap between the skills taught by property programs and those in demand by employers. The need for graduates to be work-ready is a long-standing issue of contention but has become more apparent over the past few decades with the rise of PropTech and the rapid adoption of digital tools to streamline tasks across various professions. These expectation gaps have been explored from the perspective of a few stakeholders, mainly current students, graduates, and employers. The perspectives of property academics, who play a dual role in training graduates and designing programs to meet industry standards, have been largely overlooked in the extant literature.

These opinions were gathered through an online questionnaire survey designed and administered on the Qualtrics platform to property academics in Australia. Subsequently, a total of 22 valid responses were analysed through RII and EFA using the SPSS software version 28. RII facilitated a ranking of the challenges and strategies, while underlying themes and patterns were identified through EFA.

Approximately half of the surveyed respondents had five years or less of industry experience, with 54.5% currently engaging with the industry. Considering that higher

industry engagement has been proposed as a strategy to improve work readiness, increased engagement levels should be encouraged to enhance the digital proficiency of academics and, consequently, future property graduates.

The most notable challenges faced by property academics when training property graduates for the digital age include limited funding to secure bespoke software, limited technical support from universities, and insufficient knowledge of new tools. To bridge these gaps, academic institutions must allocate resources strategically, invest in technical support infrastructure, and provide ongoing training for faculty. Curriculum revision should prioritise digital skills, and collaboration with industry partners should be leveraged to access resources. Ultimately, addressing these challenges is essential to ensure that property graduates are well equipped to navigate the digital landscape of the property industry, enhancing their employability and readiness for the evolving demands of the field.

Overall, property academics' perspectives suggest that retraining academics to gain digital proficiency, increased technical support from universities, and project-based course delivery could be the most effective strategies. These strategies signal the importance of faculty development and continuous learning, emphasising the need for property academics to remain up to date with digital advancements. Universities should prioritise allocating resources for faculty training and technical support services, recognising that these strategic investments enhance teaching quality and student engagement. Similarly, education providers could leverage the support of industry partners to improve proficiency in and access to digital tools.

Although these strategies all have merit, the findings also highlight distinct preferences and needs within the property academic community. Older property academics tend to be less inclined toward retraining, and property academics with more industry experience have stronger opinions towards curriculum restructuring. Moreover, smaller institutions, often constrained by limited resources, expressed a greater need for increased funding and industry collaboration to effectively implement these strategies. To address the challenges identified in this study, additional solutions could be explored to further enhance the preparedness of property graduates for the digital age. Beyond the strategies already discussed, one potential solution is the establishment of interdisciplinary collaborations among universities. Encouraging collaboration between property programs and departments specialising in technology-related disciplines could facilitate the integration of cutting-edge digital skills into property education. This approach could lead to the development of joint courses or interdisciplinary projects that expose property students to a broader range of digital tools and technologies.

Regarding strategies to bridge these expectation gaps, the need for a holistic approach that incorporates the perspectives of education providers, employers, and students is vital. Collaborating with employers helps align educational objectives with industry needs to incorporate practical and industry-relevant content into coursework. Students, as end-users, offer valuable insights into the relevance of digital tools and the practicality of acquired skills, bridging the gap between theory and application. Establishing a continuous feedback loop involving all stakeholders fosters ongoing improvement, ensuring academics stay abreast of industry trends and evolving student expectations. This collaborative approach facilitates targeted professional development opportunities, such as workshops and industry-academic collaborations, enabling academics to enhance their digital proficiency and stay responsive to the dynamic demands of the property industry in the digital era.

This study provides much-needed insights into the perspectives of one of the main stakeholders with a crucial role in training future property graduates for the digital age: property academics. However, the sample size limitation must be acknowledged. Although this study's sample size is consistent with similar research, it may not fully represent the diverse perspectives of property academics. Future research could benefit from larger sample sizes to provide a more comprehensive overview, which would facilitate more refined analyses to identify the specific needs of academics in different disciplines. Following this study's consideration of property academics' perspectives, future studies could also explore

the diverse perspectives of different stakeholders in a single framework such as a focus group. In particular, the perspectives of stakeholders such as employers and graduates are critical in an attempt to develop a holistic framework to consistently provide the required level of training. While academics play a central role, neglecting the viewpoints of industry professionals and students may result in an incomplete understanding of the challenges and opportunities in preparing property graduates for the digital age. As the digital landscape continues to evolve, ongoing research is also essential to assess the effectiveness of proposed strategies and adapt them to the ever-changing demands of the property industry in the digital age. Notwithstanding these limitations, what these findings make clear is that the transition into the digital age requires proactive and consistent efforts from all stakeholders, including property academics, who are responsible to both the property graduates and the property industry.

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