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Preparedness of Nepalese Academia for Society 5.0: A Study on Human Resources and Technology Transformation

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Abstract

The present study applied a positivist-deductive approach with a causal-comparative research design, using purposive convenient sampling to select four hundred and thirty three participants from different Nepalese academic institutions. An online platform facilitated the administration of a meticulously structured data collection instrument, i.e., structured questionnaire. Descriptive and inferential statistical analysis using SPSS software 24 was conducted. Validity and reliability tests were performed with Amos 22, offering empirical insights into the preparedness of Nepalese academia for the Society 5.0 paradigm shift, which allowed for an in-depth examination of the preparedness of Nepalese educational institutions, contributing to theoretical insights and practical understanding of the interplay between human resources and technology integration. Findings revealed a low level of preparedness among Nepalese academia for transitioning to Society 5.0, particularly in human resources and technology integration. Application of technology in recruitment processes enhanced efficiency and reduced time-to-hire, aligning with Society 5.0 goals.

However, a significant gap in digital literacy among faculty members was identified, highlighting the need for resources and training programs to facilitate technology integration into teaching methodologies. Nevertheless, institution advocates for its faculty to adopt innovative teaching methods such as blended learning and flipped classrooms, which are crucial for providing experiential learning opportunities in alignment with Society 5.0 principles. The study provides valuable insights for educational leaders, universities, and policymakers aiming to enhance institutional preparedness for Society 5.0, enriching an understanding of factors influencing preparedness and laying a foundation for impending research in the context of technological and educational advancements in Nepalese Academia.

Keywords: *academia, digital, HR, society 5.0, technology*

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Introduction

The rapid advancement of technology and its integration into different aspects of society have given rise to the concept of "Society 5.0," characterised by the seamless fusion of the physical, digital, and biological realms (Kagermann, Wahlster & Helbig, 2013). This transformative paradigm envisions a future where cutting-edge technologies such as artificial intelligence, the Internet of things, robotics, and biotechnology converge to address complex societal challenges and enhance human well-being (Schwab, 2016). As nations worldwide strive to embrace this new era, assessing the preparedness of different sectors, including academia, is imperative to effectively navigate the challenges and opportunities presented by Society 5.0 (UNESCO, 2020).

Nepal, a nation rich in cultural heritage and natural resources, has progressively embraced technological advancements (World Bank, 2021). However, the transition to Society 5.0 requires technological innovations, a comprehensive understanding of its socio-economic implications and the cultivation of a workforce capable of harnessing these technologies (Sugiyama & Kudo, 2019). This research seeks to explore the state of preparedness of the Nepalese academia in the context of Society 5.0, focusing on the transformation of human resources and technology adoption.

While a growing body of literature has addressed the challenges and opportunities of technological transformation in different contexts, there remains a dearth of research specifically examining the preparedness of Nepalese academia for the transition to Society 5.0. Several notable research gaps can be identified, such as limited empirical research that provides a comprehensive overview of the current state of Nepalese academia concerning its understanding of engagement with, and contributions to the principles and technologies of Society 5.0.

The evolving landscape of technology and its imminent convergence with different aspects of society in the context of Society 5.0 presents a significant knowledge gap concerning the comprehensive preparedness of Nepalese academia. While existing studies have touched upon elements such as technology adoption, digital skills development, and innovative teaching methods, a substantial research gap exists in the broader assessment of how well Nepalese academic institutions are positioned to embrace the challenges and opportunities of Society 5.0 holistically. This research gap pertains to the intricate interplay between institutional policies, the preparedness of faculty members, collaborative endeavours with industries, perceptions and preparedness of students, and the sustainability of initiatives aimed at enhancing preparedness. The absence of a comprehensive exploration in these areas leaves an incomplete understanding of the academic ecosystem's true preparedness for the impending changes. To bridge this gap, a thorough investigation is required to ascertain institutional strategies' alignment and effectiveness, faculty capabilities' adequacy, the depth of industry partnerships, the perspectives and adaptability of students, and the long-term viability of initiatives. Addressing this research gap will offer nuanced insights into the holistic preparedness of Nepalese academia for the societal shifts brought about by Society 5.0, thus enabling the formulation of targeted interventions that can ensure a seamless transition and effective participation in this new era.

Literature Review

Review of Theoretical Perspective

The theoretical framework for studying the preparedness of Nepalese academia for Society 5.0, focusing on human resources and technology transformation, could draw from different disciplines such as sociology, education, technology studies, and organisational theory. Here is a suggested theoretical framework:

Society 5.0 Concepts: Begin by defining the key concepts of Society 5.0. Society 5.0 represents a future society where technology, particularly artificial intelligence, the Internet of Things (IoT), robotics, and big data, are seamlessly integrated into every aspect of human life to enhance societal well-being (Carayannis & Morawska,

2023), Narvaez Rojas et al., 2021, Deguchi et al., 2020). It emphasises the harmonious integration of technological advancements with human values (Alimohammadlou & Khoshsepehr, 2023; Deguchi et al., 2020).

Human Resource Development (HRD) Theory: HRD theory provides a lens through which to understand human capital development within organisations and societies (Alhalboosi, 2018). In the context of Nepalese academia, HRD theory can be applied to assess the current skill sets, competencies, and learning needs of educators, researchers, and administrators.

Technology Acceptance and Adoption Models: Utilise models such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT) to understand how individuals perceive and adopt new technologies (Lee & Coughlin, 2015; Lee et al. 2018). This may help analyse the willingness of Nepalese academia to embrace technological transformations and integrate them into teaching, research, and administrative practices.

Innovation Diffusion Theory

Explore how innovations, including technological advancements, spread, and are adopted within organisations and societies (Dearing & Cox, 2018). This theory may shed light on the factors influencing technology diffusion within Nepalese academic institutions, including institutional structures, leadership support, and resource availability.

Organisational Learning and Change Theory

Investigate how organisations, including academic institutions, learn and adapt to technological changes (Basten & Haamann, 2018). This theory can help assess the capacity of Nepalese academia to foster a culture of continuous learning, innovation, and adaptability in response to evolving technological landscapes.

Cultural Determinism

This theory posits that cultural values, beliefs, and practices shape technological development and adoption. In the context of Society 5.0, cultural determinism suggests that cultural attitudes towards technology influence how societies embrace and integrate advanced technologies into different aspects of life, including academia (Rabie, 2013).

Social Construction of Technology (SCOT)

SCOT emphasises that technology is socially constructed through interactions between different social groups, institutions, and cultural contexts. It highlights how cultural norms, power dynamics, and societal expectations influence technology's design, use, and impact (Li & Lin, 2021). In Nepalese academia and Society 5.0, SCOT may help understand how social actors negotiate and shape the adoption and adaptation of technological innovations within academic settings.

Cultural Ecology

Cultural ecology examines the relationship between culture and the environment, emphasising how environmental conditions and technological innovations influence cultural practices and adaptations (Lapka, Vávra & Sokolickova, 2012). In the context of Society 5.0, cultural ecology may elucidate how Nepalese academia navigates environmental and socio-economic challenges while embracing technological advancements to address societal needs and aspirations.

By integrating the above mentioned theoretical perspectives, researchers have developed a comprehensive framework for assessing the preparedness of Nepalese academia for Society 5.0, with a specific focus on human resources and technology transformation. This framework can inform policy decisions, institutional strategies, and professional development initiatives aimed at fostering innovation and sustainability within Nepalese academic institutions.

Empirical Review

Technology Integration in HR Practices

Sehrawat and Brahma (2018) emphasise that technological advancements in recruitment contribute to increased efficiency, enabling institutions to expedite the hiring process and minimise the time required to fill vacant positions. Chapman et al. (2003) findings highlight that e-recruitment enhances efficiency, reduces

administrative burdens, and shortens the time-to-hire, contributing to improved organisational performance. Kluemper et al. (2016) research delves into the role of social media in HRM practices. The study underscores how technology, particularly social media platforms, facilitates efficient candidate sourcing, communication, and engagement, thereby reducing the time taken to identify suitable candidates. The study by Alabi et al. (2015) investigated the influence of e-recruitment on organisational performance in Nigeria. The findings suggest that adopting e-recruitment practices leads to improved efficiency in the recruitment process and reduces the time-to-hire, ultimately contributing to enhanced organisational performance.

Similarly, Adhikari (2023) explores the role of information technology in HRM practices within Nepalese higher education institutions. The study highlights how integrating technology, particularly in recruitment processes, results in quicker candidate evaluation and selection, thus reducing the time-to-hire. This alignment is achieved through leveraging technological innovations to create more responsive and adaptive recruitment systems, which are key objectives of Society 5.0 in fostering a highly efficient and human-centred society (Saxena et al., 2023). Based on the above mentioned findings, the present scribe hypothesised the following statement:

H_1: Using technology in recruitment processes enhances efficiency and reduces time-to-hire in Nepalese academic institutions, thereby advancing toward the goals of Society 5.0.

Digital Skills Development

Kibuku et al. (2020) examined the digital literacy levels in academic institutions. The research highlights the importance of adequate resources and training in enhancing digital literacy, which, in turn, positively impacts their ability to integrate technology into teaching methods effectively. Omboto, Kanga, and Njageh (2022) highlight the role of proper resources and training programs in enhancing digital literacy, which subsequently empowers faculty to incorporate technology into their teaching methodologies effectively. Al-Azawei, Parslow and Lundqvist (2017) investigated the relationship between faculty members' digital literacy levels and their integration of technology in higher education. The study found that faculty members with higher digital literacy skills are more likely to incorporate technology into their teaching practices.

Margaryan, Littlejohn and Vojt (2011) examined faculty members' perceptions and practices related to technology integration in higher education. The research highlighted the importance of providing adequate resources, training, and support to enhance faculty members' digital literacy, positively impacting their willingness to integrate technology into teaching methods. Yan, Yu, and Liang (2020) examined the relationship between digital literacy and faculty members' utilisation of online learning resources. The findings suggested that faculty members with higher digital literacy are more likely to utilise online resources to support their teaching methods effectively. Adopting innovative teaching methods that leverage technology is a core aspect of Society 5.0, which seeks to integrate advanced technologies to create a human-centred and sustainable future (Carayannis & Morawska, 2023). Based on these findings, the present scribe hypothesised the following statement:

H_2: Adequate resources and training to enhance digital literacy among faculty positively influence their ability to integrate technology into teaching methods that align with society's 5.0 principles within Nepalese academic institutions.

Innovative Teaching and Learning Methods

In the study of Bizami, Tasir and Kew (2023), they found that using creative teaching methods like blended learning in schools helps students learn through experiences with technology. This gives them valuable online learning moments that go well with regular teaching methods. Utilising blended learning tools holds the potential for radical improvements in educational quality, cost-effectiveness, and accessibility within HEIs in Bangladesh (Chowdhury, 2019). Notably, the success of innovative educational reforms hinges on the enthusiastic endorsement and

adoption of the above mentioned measures by key stakeholders, including students, educators, administrators, researchers, and policymakers (Chowdhury, 2019). The study's findings propose a three-stage model for enhancing student-teacher interaction, including integrating online peer-group comments in face-to-face classes, employing off-campus synchronous interactions for personal study hours, and utilising off-campus asynchronous interactions to foster collaborative learning flexibility (IIslam, Sarker & Islam, 2018).

Dziuban et al. (2018) explore the outcomes and implications of blended learning (BL) effectiveness in higher education, highlighting its focus on access, success, students' perception of learning environments, and the role of contemporary information communication technologies in shaping BL's evolution. Chaudhry's (2016) research explored using Web 2.0 technologies in classroom settings. The study emphasises that institutions that encourage faculty to adopt innovative teaching methods utilising technology (such as Web 2.0 tools) have the potential to create experiential learning opportunities that foster collaboration, engagement, and higher-order thinking. NCAT has conducted different studies exploring the effectiveness of blended learning models in improving student outcomes and reducing costs. Their research highlights how institutions integrating technology into traditional classroom settings can enhance the learning experience by providing interactive content and personalised instruction.

Tucker's (2012) study conducted by Jonathan Bergmann and Aaron Sams pioneered the flipped classroom model and examined flipped classroom outcomes across different educational levels. The research demonstrates that flipped classrooms can improve student engagement, learning outcomes, and critical thinking skills. The study of Freeman et al. (2014) evaluated the impact of blended learning in a science, technology, engineering, and mathematics (STEM) course. The research indicates that blended learning approaches can improve student performance and engagement by combining face-to-face instruction with online components. Hew and Cheung's (2013) study proposes a conceptual framework for blended learning as an effective pedagogical approach. The research emphasises the potential of blended learning to create engaging and student-centred learning environments. Adopting innovative teaching methods, such as blended learning and flipped classrooms, reflects the principles of Society 5.0, which aims to integrate advanced technologies into all aspects of society to create a human-centred and sustainable future. Based on the above mentioned findings, the present scribe hypothesised the following statement:

H_3: Institutions that encourage faculty to adopt innovative teaching methods, such as blended learning and flipped classrooms, are more likely to expose students to experiential learning opportunities leveraging technology, aligning with the principle of Society 5.0.

Academic Institution's Preparedness for Society 5.0

Sugiyama and Kudo (2019) delved into the implications of Society 5.0. The study examined how integrating technology solutions in line with Society 5.0 principles can enhance the quality of life and support the needs of aging populations by providing new opportunities for engagement, healthcare, and social inclusion. Kushwaha and Kusakabe (2020) and Saxena et al. (2023) focused on Society 5.0 as a human-centred society driven by technological advancements. The study highlights how institutions adopting technology solutions aligned with Society 5.0 principles are better equipped to address complex societal challenges through innovative approaches prioritising human well-being and technological integration. Serpa and Ferreira (2019) study's findings emphasise the intersection of Digital Social Innovation with innovation processes, the social realm, and the digital ecosystem, highlighting technology's role in addressing important social challenges while also stressing the necessity for technological solutions to positively impact humans and the environment, all in alignment with the principles of Society 5.0 (Gaggioli, 2017). Based on the

above mentioned findings of previous studies, the hypotheses set is :

H_4: Institutions that actively adopt technology solutions aligned with Society 5.0 principles demonstrate a higher level of preparedness for the technological transformations of Society 5.0.

Based on the literature reviews, this study aims to assess the preparedness and factors determining the preparedness of academia in Nepal for Society 5.0. The focus is specifically on human resources and technological transformation. The research explores the overall level of preparedness within academia in Nepal for Society 5.0 in terms of human resources and technological advancements. It evaluates how the use of technology in recruitment processes can enhance efficiency and reduce the time it takes to hire, thereby contributing to the goals of Society 5.0. Additionally, it investigates the digital literacy levels among faculty members by examining the impact of adequate resources and training programs on their ability to integrate technology into their teaching methods, which aligns with the principles of Society 5.0. The study also examines how academic institutions in Nepal encourage faculty to adopt innovative teaching methods, such as blended learning and flipped classrooms, and assesses how the above mentioned methods contribute to experiential learning opportunities and align with the principles of Society 5.0. Furthermore, it explores the overall impact of different factors on the readiness of academic institutions to embrace Society 5.0, which prioritizes human well-being and technological integration.

Conceptual Framework of the Study

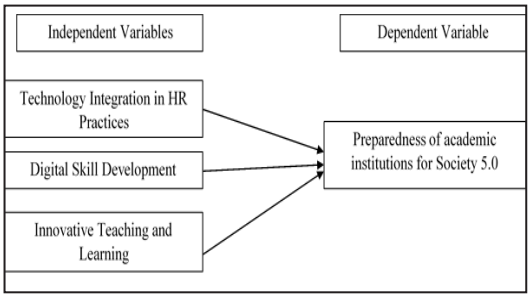

Figure 1: *Conceptual Framework Aopted from Carayannis and Morawska (2023), Narvaez Rojas et al. (2021), and Saxena et al. (2023)*

The conceptual framework for understanding the factors determining the preparedness of academic institutions for Society 5.0 is built upon key variables and their interrelationships derived from a multivariate analysis. The framework encompasses different factors that influence the preparedness of academic institutions to embrace the principles and technological transformations of Society 5.0, a paradigm emphasising the integration of digital technologies for societal advancement. At the framework's core lies academic institutions' preparedness level, denoted by a baseline value represented by the intercept term. This baseline preparedness signifies the foundational state of academic institutions regarding their alignment with Society 5.0 principles, acknowledging the presence of influential factors beyond those directly considered in the model. The conceptual framework highlights several critical variables:

Technology Integration in HR Practices: This variable underscores the importance of integrating technology into human resources practices (Bhatt et al., 2023) within IT institutions. Academic institutions may be adept at leveraging technology in recruitment processes and exhibit enhanced efficiency and reduced time-to-hire, indicating a proactive stance toward technological integration.

Digital Skills Development: This variable underscores the importance of digital skills development among faculty members in human resources practices. A robust technological infrastructure and well-defined institutional policies catalyse the effective application of enhanced digital literacy skills among faculty members. The above mentioned elements create an enabling environment where faculty members can readily leverage their digital skills to enrich teaching, research, and administrative activities within academic settings. This highlights the empowering dynamics of digital skill enhancement, demonstrating how supportive technological resources and clear institutional guidelines facilitate the seamless integration of digital literacy into different facets of academic life (Kibuku et al., 2020).

Innovative Teaching and Learning Methods: Academic institutions embracing innovative teaching and learning methods demonstrate a heightened preparedness for Society 5.0. Adopting innovative pedagogical approaches, such as blended learning and flipped classrooms, fosters experiential learning opportunities leveraging technology (Freeman et al., 2017).

The conceptual framework elucidates the complex interplay of factors shaping the preparedness of academic institutions for Society 5.0. By delineating key variables and their relationships, the framework provides a structured lens to analyse and enhance institutional preparedness for the technological advancements inherent in Society 5.0.

Methodology

Research Methods

The study applied a positivist deductive approach (Bagozzi, 1988) with a causal-comparative research design, using purposive convenient sampling (Chaudhry, 2016) to select 433 participants from different academic sectors in Nepal. Data collection was facilitated through an online platform, utilising a carefully structured questionnaire aligned with the theoretical framework of Society 5.0. Descriptive analysis, including frequency, percentage, mean, and standard deviation alongside inferential statistical analysis, including multiple regression, were conducted using SPSS software twenty-four, with validity and reliability tests performed using Amos 22 (Bagozzi, 1988). The structured questionnaires had aimed to measure the preparedness of academic institutions by assessing factors such as technology integration in HR practices, digital skills development, and innovative teaching methods. By systematically exploring hypothesised relationships, the present study contributed to both theoretical understanding and practical knowledge regarding the evolving socio-technological landscape within Nepalese academia

The data analysis involved the utilization of a Likert scale to assign a score to each survey response, ranging from 1 to 5. Subsequently, the total preparedness score for each respondent was computed by summing their individual responses. Aasa (2016) delineated that the maximum attainable score could be obtained by multiplying the number of questions by 5, yielding a top score of 80. To determine the preparedness percentage Total Score is divided by Maximum Possible Score and multiplied by 100. Based on the above mentioned percentages, the levels of preparedness were categorized into three groups: Low Preparedness (below 50%), Moderate Preparedness (ranging from 50% to 74.99%), and High Preparedness (75% and above).

The normality of the data was assessed using established guidelines. For small sample sizes ($n < 50$), a z-value of ± 1.96 is considered indicative of normality, while for medium-sized samples ($50 \leq n < 300$), a z-value of ± 3.29 is used. In the present case where the sample size exceeds 300, i.e., 433, the determination of normality relies on the absolute values of skewness and kurtosis. Specifically, an absolute skewness value ≤ 2 or an absolute kurtosis (excess) ≤ 4 is considered indicative of considerable normality (Hair et al., 2010; in Noordin et al., 2021). Upon analysing the data presented in Table 2, it is evident that the skewness and kurtosis values for the variables fall below the specified thresholds. Therefore, according to these criteria, the data collected for this study can be considered normally distributed. Since each construct's Variance Inflation Factor (VIF) is below 10, there is no indication of multicollinearity (Shrestha, 2020). Additionally, the Durbin-Watson value 2.289 suggests the absence of autocorrelation in the regression models (Uyanto, 2020).

Based on the information provided in the table, ANOVA (Analysis of Variance) was conducted to examine the relationship between the type of academic institution and the level of preparedness for Society 5.0. ANOVA is used to determine if there are statistically significant differences among the means of two or more groups (Sawyer, 2009).

In this section, the researcher applied both descriptive and inferential statistical methods to analyse the study's variables and the participants' responses. It is divided into three

main parts: principal component analysis (PCA), the application of confirmatory factor analysis (CFA), and the execution of multivariate regression analysis. These analytical techniques were employed to extract meaningful insights and evaluate the relationships between the dependent and independent variables.

Principal Component Analysis (PCA) with Varimax rotation was utilised to identify and extract the items with the highest performance for the constructs. Additionally, a fixed number of four variables and a threshold with an absolute value below 0.50 were used to simplify the identification of items associated with the study variables.

The Kaiser-Meyer-Olkin (KMO) value being above 0.50 indicates that our sample size is sufficient for the exploratory factor analysis. Additionally, the Bartlett test of sphericity being statistically significant ($P < .05$) shows that the correlation matrix differs significantly from an identity matrix, which is desirable for factor analysis. The results of the exploratory factor analysis confirm that our initial assumption of having 4 factors is valid, and all the items align well with their respective factors. These four factors collectively account for around 72 percent of the total variance, indicating that these factors explain a substantial proportion of the data's variability. This outcome demonstrates that the factors derived from the analysis possess good validity. Considering these findings, the dataset is deemed appropriate and can be confidently used for further analyses, such as confirmatory factor analysis.

In this study, the researcher conducted different analyses to verify the suitability of the data for structural equation modelling. Confirmatory factor analysis (CFA) was performed to evaluate the factor loading of each of the 18 items extracted through PCA, confirming their appropriateness for further analysis. The overall model fit was also assessed using several fit indices, including P-value, CMIN/DF, SRMR, TLI, CFI, and RMSEA. The values (Bagozzi & Yi, 1988) of these fit indices (Hu & Bentler, 1998) were compared against established acceptable thresholds (Hair et al., 2010; Bentler, 1990), and all were found to be within these acceptable ranges. This indicates that the model accurately represents the relationships among the variables and fits the data well.

Multiple regression analysis is a statistical technique utilised to explore the relationship between a single dependent variable (also known as the criterion) and multiple independent variables (often referred to as predictors or explanatory variables) simultaneously (Hair et al., 1998). This method allows researchers to examine how a set of independent variables collectively influences or predicts the behaviour of the dependent variable. The multivariate analyses have been used to test the impacts among independent variables, i.e., Technology Integration in HR Practices, Digital Skills Development, and Innovative Teaching and Learning Methods, on dependent variables, i.e., Academic Institution's Preparedness for Society 5.0. In multivariate analyses, adjustedR^2, F test as the overall test, and the regression coefficient test was calculated. We applied the Fornell and Larcker (1981) criteria to establish discriminant validity.

Results and Discussion

Analysis of Demographic Responses

In this part of the study, the researcher applied descriptive statistics to examine the participants' demographic information. The demographics considered included age, gender, education level, length of service, type of academic institution, and current position. The demographic details were summarised and analysed (see Table 1).

Table 1: *Demographics of Respondents [N=433]*

Demographics		Frequency (Percentage)
Gender	Female	132(30.5%)
	Male	301(69.5%)
	Total	433(100%)

Age-Group	18-30 Years	50(11.5%)
	31-40 Years	95(21.9%)
	41-50 Years	163(37.6%)
	Above 51 Years	125(28.9%)
	Total	433(100%)
Service Tenure	Less than 2 Years	52(12%)
	3 to 5 Years	28(6.5%)
	6 to 10 Years	208(48%)
	More than 10 Years	145(33.5%)
	Total	433(100%)
Academic institution type	University	243(56.1%)
	College	97(22.4%)
	School	59(13.6%)
	Research Institute	34(7.9%)
	Total	433(100%)
Present Role	Faculty	177(40.9%)
	Administrator	164(37.9%)
	Non-Faculty	92(21.2%)
	Total	433(100%)

The above mentioned statistics provide insights into the demographics of the surveyed population in terms of gender, age groups, service tenure, academic institution types, and present roles. In this study, we examined the demographics of a sample group consisting of 433 individuals within an academic context. The gender distribution revealed 30.5 percent females and 69.5 percent males. Age-wise, participants were categorised into groups: 11.5 percent were aged 18-30, 21.9 percent were 31-40, 37.6 percent were 41-50, and 28.9 percent were above 51 years old. Regarding service tenure, 12.0 percent had less than 2 years, 6.5 percent had 3 to 5 years, 48.0 percent had 6 to 10 years, and 33.5 percent had over 10 years. The academic institution type showed 56.1 percent from universities, 22.4 percent from colleges, 13.6 percent from schools, and 7.9 percent from research institutes. In terms of roles, 40.9 percent were faculty, 37.9 percent were Administrators, and 21.2 percent were non-faculty. This comprehensive overview of demographics offers valuable insights for understanding the composition of the surveyed academic community.

Table 2: *Normality, Multicollinearity Test and Autocorrelation*

Values	TI	DS	ITL	AIRS
Mean	2.903	3.296	4.042	3.838
SD	0.750	0.580	0.601	0.593
Skewness	-0.090	-0.098	-0.531	-0.626
SE (Skewness)	0.117	0.117	0.117	0.117
Kurtosis	-0.155	-0.216	0.875	1.076
SE (Kurtosis)	0.234	0.234	0.234	0.234
VIF	1.185	1.558	1.471	
Durbin-Watson	2.289			

***Note**: TI: Technology Integration in HR Practices, DS: Digital Skills Development, ITL: Innovative Teaching and Learning Methods, AIRS: Academic Institution's Preparedness for Society*

The normality of the data was assessed using established guidelines. For small sample sizes ($n < 50$), a z-value of ± 1.96 is considered indicative of normality, while for medium-sized samples ($50 \leq n < 300$), a z-value of ± 3.29 is used. In the present case where the sample size exceeds 300, i.e., 433, the determination of normality relies on the absolute values of skewness and kurtosis. Specifically, an absolute skewness value ≤ 2 or an absolute kurtosis (excess) ≤ 4 is considered indicative of considerable normality (Hair et al., 2010; in Noordin et al., 2021). Upon analysing the data presented in Table 2, it is evident that the skewness and kurtosis values for the variables fall below the specified thresholds. Therefore, according to the above mentioned criteria, the data collected for this study can be considered normally distributed. Since each construct's Variance Inflation Factor (VIF) is below 10, there is no indication of multicollinearity (Shrestha, 2020). Additionally, the Durbin-Watson value 2.289 suggests the absence of autocorrelation in the regression models (Uyanto, 2020).

Based on the information provided in the table, ANOVA (Analysis of Variance) was conducted to examine the relationship between the type of academic institution and the level of preparedness for Society 5.0. ANOVA is used to determine if there are statistically significant differences among the means of two or more groups (Sawyer, 2009). The p-value for F-test is 0.118 which is greater than the common significance level of 0.05, which suggests that there is not strong evidence to reject the null

Table 3: *Result of ANOVA between Type of Academic Institution and Preparedness for Society 5.0*

Type of institution	Frequency (Percent)	F	P-value
University	243 (56.1%)	1.431	0.118
College	97 (22.4%)		
School	59 (13.6%)		
Research Institute	34 (7.9%)		
Total	433 (100%)		

hypothesis. In other words, there is no statistically significant difference in the preparedness for Society 5.0 among the different types of academic institutions.

Analysis of Variables-Related Responses

In this section, the researcher applied both descriptive and inferential statistical methods to analyse the study's variables and the participants' responses. It is divided into three main parts: principal component analysis (PCA), the application of confirmatory factor analysis (CFA), and the execution of multivariate regression analysis. The above mentioned analytical techniques were employed to extract meaningful insights and evaluate the relationships between the dependent and independent variables.

Principal Component Analysis (PCA)

Principal Component Analysis (PCA) with Varimax rotation was utilised to identify and extract the items with the highest performance for the constructs. Additionally, a fixed number of four variables and a threshold with an absolute value below 0.50 were used to simplify the identification of items associated with the study variables.

Table 4: *Factor Loading Items Related to Study Variables*

Items	Standardised Factor Loadings	Cronbach's Alpha
TI1	0.701	0.913
TI2	0.87	
TI3	0.82	
TI4	0.789	
TI5	0.842	
TI6	0.86	
DS1	0.822	0.777
DS2	0.82	
DS3	0.795	
ITL1	0.85	0.919
ITL2	0.859	
ITL3	0.852	
ITL4	0.81	
ITL5	0.789	
AIRS2	0.739	0.876
AIRS3	0.865	
AIRS4	0.884	
AIRS5	0.774	

***Source**: Survey, 2023*

The results show that the total number of items related to the study's dependent and independent variables used in the factor analysis. Using PCA, 18 items were initially extracted. Due to weak commonality and cross-loading issues, 3 items were removed from the rotated component matrix. Additionally, Cronbach's alpha was calculated to assess the reliability of the data for each construct (see Table 4).

The Kaiser-Meyer-Olkin (KMO) value being above 0.50 indicates that our sample size is sufficient for the exploratory factor analysis (see Table 5, 6 and 7). Additionally, the Bartlett test of sphericity being statistically significant ($P < .05$) shows that the correlation matrix differs significantly from an identity matrix, which is desirable for factor analysis. The results of the exploratory factor analysis confirm that our initial assumption of having 4 factors is valid, and all the items align well with their respective factors. The above mentioned four factors collectively account for around 72 percent of the total variance, indicating that the above mentioned factors explain a substantial proportion of the data's variability. This outcome demonstrates that the factors derived from the analysis possess good validity. Considering the above mentioned findings, the dataset is deemed appropriate and can be confidently used for further analyses,

such as confirmatory factor analysis.

Confirmatory Factor Analysis (CFA)

In this study, the researcher conducted different analyses to verify the suitability of the data for structural equation modelling. Confirmatory factor analysis (CFA) was performed to evaluate the factor loading of each of the 18 items extracted through PCA, confirming their appropriateness for further analysis. The overall model fit was also assessed using several fit indices, including P-value, CMIN/DF, SRMR, TLI, CFI, and RMSEA.

The values (Bagozzi & Yi, 1988) of these fit indices (Hu & Bentler, 1998) were compared against established acceptable thresholds (Hair et al., 2010; Bentler, 1990), and all were found to be within these acceptable ranges. This indicates that the model accurately represents the relationships among the variables and fits the data well. Tables 5, 6, and 7 present the comprehensive model fit indices and the reliability and validity outcomes derived from the CFA.

RMR	*≤ 0.05*	*Diamantopoulos and Siguaw (2000)*	*0.030*
GFI	*>.90*	*Hair et al. (2010)*	*0.892*
CFI	*>.90*	*Bentler (1990)*	*0.938*
RMSEA	*<.08*	*Hu and Bentler (1998)*	*0.075*
TLI	*>.90*	*Hu and Bentler (1998)*	*0.926*
SRMR	*<.08*	*Hu and Bentler (1998)*	*0.0444*

Note: *P-value=Likelihood Ratio, CMIN/DF=Relative X2, CFI= Comparative Fit Index, RMSEA= Root Mean Square Error of Approximation, TLI= Tucker-Lewis's coefficient, RMR=Root Mean Squared Residual, SRMR=Standardized Root Mean Squared Residual, GFI= Goodness Fit Index.*

All items standardised factor loading was above 0.60. AVE is also above 0.50, indicating good convergent validity (Hair et al., 2017).

Table 5: *Variable ways KMO, Eigenvalue, and Percentage of Variance*

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings			KMO and Bartlett Test
	Total	*% of variance*	*Cumulative %*	*Total*	*% of variance*	*Cumulative %*	
1	6.544	36.357	36.357	4.211	23.396	23.396	0.873 (0.000)
2	3.045	16.915	53.271	3.772	20.956	44.352	
3	1.872	10.399	63.67	2.958	16.431	60.782	
4	1.58	8.778	72.448	2.1	11.666	72.448	

The result of CFA shows that the model had good fit statistics. The recommended values are provided in the bracket based on the guidelines of Hu and Bentler (1999) (RMSEA<0.08, RMR<0.05, CFI>0.90).

Table 6: *Computation and Analysis of Model Fit Indices for CFA*

Model Fit Indices	Recommended Value	Sources	Obtained Value
P-value	*≤ 0.05*	*Bagozzi and Yi (1988)*	*0.000*
CMIN/DF	*3-5*	*Hair et al. (2010)*	*3.462*

Another evidence of convergent validity is that the Maximum Shared Variance is less than the respective Average Variance Extracted for all variables (see Table 7).

Table 7: *Test of Reliability and Validity Measures*

Constructs	Cronbach's Alpha	CR	AVE	MSV	MaxR(H)
TI	*0.913*	*0.914*	*0.641*	*0.124*	*0.924*
DS	*0.724*	*0.779*	*0.540*	*0.124*	*0.783*
IT	*0.919*	*0.916*	*0.688*	*0.276*	*0.945*
AIRS	*0.840*	*0.883*	*0.658*	*0.276*	*0.917*

Note: *TI: Technology Integration in HR Practices, DS: Digital Skills Development, ITL: Innovative*

Teaching and Learning Methods, AIRS: Academic Institution's Preparedness for Society

The Cronbach alpha and composite reliability for all variables are above 0.70, which shows that our variables had good reliability.

We applied the Fornell & Larcker (1981) criteria to establish discriminant validity. The bold diagonal values in the table represent the square root of the Average Variance Extracted (AVE), while the other values indicate inter-variable correlations.

Table 8: *Discriminant Validity*

Constructs	TI	IT	AIRS	DS
TI	*0.800*			
IT	*0.325***	*0.829*		
AIRS	*0.277***	*0.525***	*0.811*	
DS	*0.352***	*0.264***	*0.132**	*0.735*

Note: ****, **, * significant at 1%, 5% and 10% respectively*

The requirement is that the bold diagonal values must be higher than the other values in their respective rows and columns, which is satisfied, as shown in the table. Therefore, we can conclude that our variables exhibit good discriminant validity(see Table 8).

Overall Preparedness Level

Table 9: *Overall Preparedness Level of Academia for Society 5.0*

Preparedness Level	Responses (Percent)
Low Level of Preparedness	234 (54.04%)
Moderate Level of Preparedness	199 (45.96%)
High Level of Preparedness	0 (0.00%)
Total	433 (100%)

The results show that "Overall Preparedness Level of Academia for Society 5.0", illustrates Nepalese academic institutions' preparedness level for Society 5.0, focusing on human resources and technological transformation. The data showed that 54.04 percent (234 respondents) reported a low level of preparedness, while 45.96 percent (199 respondents) indicated a moderate level. Notably, none of the respondents feel highly prepared. With a total of 433 respondents, the findings highlighted a significant need for improvement in academia to meet the demands of the Society 5.0 principle (see Table 9).

Multivariate Analysis

Multiple regression analysis is a statistical technique utilised to explore the relationship between a single dependent variable (also known as the criterion) and multiple independent variables (often referred to as predictors or explanatory variables) simultaneously (Hair et al., 1998). This method allows researchers to examine how a set of independent variables collectively influences or predicts the behaviour of the dependent variable. The multivariate analyses have been used to test the impacts among independent variables, i.e., Technology Integration in HR Practices, Digital Skills Development, and Innovative Teaching and Learning Methods, on dependent variables, i.e., Academic Institution's Preparedness for Society 5.0. In multivariate analyses, adjusted, F test as the overall test, and the regression coefficient test was calculated.

Table 10: *Multivariate Analysis*

Variables	B	t	P-value
Intercept	1.537	7.953	0
Technology Integration in HR Practices (TI)	0.14	3.605	0
Digital Skills Development (DS)	-0.006	-0.156	0.876
Innovative Teaching and Learning Methods (ITL)	0.467	9.876	0
Adjusted R-Square	0.253		
F-Test	49.823		
P-value	0.00		

The results of a multivariate analysis that aimed to understand the relationships between different variables. The intercept term indicates a baseline value in the preparedness of academic institutions for Society 5.0. This baseline preparedness is

statistically significant ($p < 0.001$), suggesting that other influential factors beyond those included in the model contribute to the overall preparedness level. Positive and statistically significant ($\beta = 0.140$, $p < 0.001$), implying that academic institutions that effectively integrate technology into their HR practices tend to be more prepared to embrace the principles of Society 5.0. This suggests that organisations embracing technology integration in their HR practices are likelier to exhibit the measured outcome. Therefore, the null hypothesis is rejected. So, we can conclude that using technology in recruitment processes enhances efficiency and reduces time-to-hire in Nepalese academic institutions, thereby advancing toward the goals of Society 5.0 (see Table 10).

The coefficient is negative ($\beta = -0.006$) and does not reach statistical significance ($p = 0.876$), suggesting that enhancing digital skills alone may not directly impact the preparedness for Society 5.0. Therefore, the null hypothesis is accepted. So, we can conclude that adequate resources and training to enhance digital literacy among faculty positively influence their ability to integrate technology into teaching methods that align with society's 5.0 principles within Nepalese academic institutions. This could be because the lack of a supportive technological infrastructure and institutional policies for technology integration might hinder the effective application of enhanced digital literacy skills among faculty in Nepalese academic institutions. This variable, "Innovative Teaching and Learning Methods", has a substantial positive impact ($\beta = 0.467$, $p < 0.001$), indicating that academic institutions that adopt innovative teaching and learning methods are more likely to exhibit higher preparedness for Society 5.0. Therefore, the null hypothesis is rejected. So, we can conclude that institutions that encourage faculty to adopt innovative teaching methods, such as blended learning and flipped classrooms, are more likely to expose students to experiential learning opportunities leveraging technology, aligning with the principle of Society 5.0 (see Table 10).

The overall model fit is reasonably good, as denoted by the adjusted R-squared value of 0.253, suggesting that the included independent variables explain approximately 25.3 percent of the variability in the factors determining preparedness for Society 5.0. The F-test statistic of 49.823 with a significance level of 0.000 ($p < 0.001$) indicates that the overall model is highly significant, suggesting that at least one of the predictor variables has a substantial relationship with the preparedness for Society 5.0. Therefore, the null hypothesis is rejected. So, it can be concluded that institutions that actively adopt technology solutions aligned with Society 5.0 principles demonstrate a higher level of preparedness for the technological transformations of Society 5.0 (see Table 10).

In summary, this analysis emphasises the critical role of "Technology Integration in HR Practices" and "Innovative Teaching and Learning Methods" in influencing the outcome variable. While "Digital Skills Development" did not achieve statistical significance individually, it could still contribute to conjunction with other factors not included in this analysis.

The findings from the study mentioned indicate that Nepalese academia is trying to adapt to the transformative era of Society 5.0 but also highlight areas that may need further attention. Here is a breakdown of what the study suggests:

Technological Integration: The study acknowledges the significant impact of technology integration in academic institutions. This suggests that universities in Nepal recognise the importance of digital technologies and are taking steps to incorporate them into their operations and teaching methods.

Innovative Teaching Methods: Adopting innovative teaching methods is another positive sign, indicating that academia is evolving to meet the demands of Society 5.0. This includes embracing new approaches to education that align with the integration of technology and digital skills development.

Digital Skills Development: The study suggests that the role of digital skills development may be nuanced and requires further investigation. This indicates that while efforts are being made to develop digital skills, there may be challenges

or variations in how effectively the above mentioned skills are being cultivated.

Uniform Preparedness: The study concludes that there are no significant differences in the preparedness for Society 5.0 across different types of academic institutions. This suggests that preparedness to adopt the principles of Society 5.0 is not limited to specific types of institutions, which is a positive sign for the overall academic landscape in Nepal. In summary, the study provides valuable insights into the preparedness of Nepalese academia for Society 5.0. While there are positive indicators, such as technological integration and innovative teaching methods, there may still be challenges in developing digital skills uniformly across institutions.

Overall, the study concluded that academia in Nepal is actively working toward adapting to the transformative era of Society 5.0. Still, ongoing efforts and potential improvements are needed to ensure a more comprehensive preparedness for this societal shift.

Discussion

The present findings underscore a crucial gap between the current state of Nepalese academic institutions and the evolving demands of Society 5.0. With over half of the respondents indicating a low level of preparedness and none feeling highly equipped, the data presents a clear imperative for action. This disparity between the perceived preparedness and the expectations of Society 5.0 emphasises the urgent need for strategic academic interventions *(*Carayannis & Morawska, 2023).

The regression analysis findings shed light on the factors influencing the preparedness of academic institutions to embrace the principles of Society 5.0. This section discusses the implications of the results in the context of technology integration, digital skills development, and innovative teaching methods. The positive and significant impact of "Technology Integration in HR Practices" on academic institution preparedness aligns with Sehrawat and Brahma (2018), Kluemper et al. (2016), and Alabi et al. (2015) studies, emphasising the transformative effects of technology integration in organisational contexts. As the above mentioned practices enhance communication, collaboration, and operational efficiency, academic institutions that effectively leverage technology within HR functions exhibit a higher preparedness for the holistic shifts brought about by Society 5.0.

Interestingly, the lack of statistically significant influence of "Digital Skills Development" on preparedness might suggest that merely enhancing digital skills among faculty and students may not directly translate into institutional preparedness for Society 5.0. Conversely, the substantial positive effect of "Innovative Teaching and Learning Methods" on preparedness underscores the role of pedagogical innovation in shaping an academic institution's preparedness for Society 5.0. The results resonate with Bizami et al. (2023), Chowdhury (2019), Islam et al. (2018), Dziuban et al. (2018), Tucker (2012), and Freeman et al. (2017) studies, which highlighted the significance of innovative strategies in engaging modern learners and fostering a technology-savvy environment.

As indicated by the F-test statistic, the model's overall significance reaffirms the importance of the collective influence of technological integration, innovative teaching methods, and potentially other unexplored factors on academic institution preparedness for Society 5.0. This is consistent with Kushwaha and Kusakabe's (2020) findings, emphasising the multifaceted nature of digital literacy perceptions and practices among faculty in higher education institutions.

Conclusion

The present study demonstrated a significant gap between the preparedness of Nepalese academic institutions and the evolving demands of Society 5.0. While factors like technology integration in HR practices positively influence preparedness, the impact of digital skills development appears limited. However, innovative teaching methods are key in shaping institutional readiness. Overall, the collective influence of the above

mentioned factors highlighted the multifaceted nature of preparedness for Society 5.0, necessitating strategic interventions to bridge the gap.

Nepalese academic institutions should prioritise comprehensive reforms to address the significant preparedness gap highlighted by the present study. This entails investing in and prioritising the incorporation of technology into HR practices, fostering the adoption of innovative teaching methods that reflect Society 5.0 principles, and fostering partnerships with industry and government to facilitate the seamless integration of advanced technologies and interdisciplinary knowledge. Further research should delve into potential moderating variables affecting the relationship between digital skills development and the outcome variable, providing a more comprehensive understanding of their interplay. Such research could identify key factors that enhance or hinder the effectiveness of digital skills training, offering valuable insights for policymakers and educators aiming to optimise educational strategies in the context of rapid technological advancement.

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