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Synthesizing Human Resource Skills Development for Higher Education Students

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Abstract

With the progress witnessed in the current era in all fields, the need of learners, especially in higher education institutions, is increasing to provide a supportive teaching and learning environment that provides them with the necessary knowledge and skills to participate in serving their communities, and thus human resources are invested effectively to improve the lives of individuals and communities. Therefore, this study dealt with human resources efficiency research in higher education, because indexing and classifying studies, determining their results and proposals, and presenting recommendations would provide researchers and institutions with a comprehensive and integrated view of what has been accomplished in previous research, in addition to accurately identifying the aspects that need further research. To achieve this, this study uses systematic reviews and meta-analysis (PRISMA) to shed light on HR skills in higher education students using 35 research articles. The study tracks many important aspects such as the skills, theories and models that were addressed. The results confirm the necessity of conducting future research to shed light on aspects that have not been adequately studied due to the importance of this in developing students' personality, academic performance, and future skills. The results recommend conducting more research in unexplored disciplines and elsewhere and with a larger number of samples, and focusing future research on the subject on technology and artificial intelligence and addressing the controls, rules and ethics that govern their use, especially in this era characterized by rapid technological and informational progress.

Keywords: Human Resource, Human Resource Skills, Human Resource Development, Higher Education Students, Systematic Literature Review.

Introduction

Human resource development, which emphasises the human person as a basic and active component in development across all sectors, is a subject that is profoundly rooted and essential in all spheres and domains of existence. The foundation of human resource development is the notion that organisations are created by humans and, in order to define and accomplish their objectives, need human competence. Employee development is a methodical sequence of activities designed to enhance the abilities, knowledge, and experiences of personnel in order to fulfil present and future requirements in the pursuit of objectives (Alhalboosi, 2018). Development is an all-encompassing and ongoing procedure that aims to improve conditions by investing in human capacities, energies, refining experiences, and augmenting potential. It recognises the human element as foundational to development and strives to facilitate progress and evolution across all domains and spheres of life for communities and individuals.

To accomplish its objectives, development places emphasis on the enhancement and cultivation of knowledge and skills, given that skills are fundamental to the process of development. The fundamental purpose of development is to transform people' skill sets via the transmission and mastery of those talents. According to industry partners and students, personal skills are a critical component for achieving success in the professional environment, according to the findings of a research (Patacsil & Tablatin, 2017). Therefore, academic establishments, particularly universities, must prioritise the development of students' individual competencies. This may be accomplished via the development of training methods tailored to these talents, and by encouraging industry partners to contribute to the creation of curriculum and courses that foster better collaboration across institutions and sectors. This may assist in narrowing the gap between the skills that are being created and taught in institutions and the future skills that are required by industry.

When approached methodologically effectively, the acquisition of essential skills by human resources personnel or individuals in their respective sectors and fields of expertise, particularly in higher education institutions that are the focus of this study, inexorably contributes to the attainment of the utmost levels of advancement and progress at both the individual and societal levels. Based on our investigation, consultation, and review of existing studies and research pertaining to this subject, we have been unable to identify any work that has systematically compiled and categorised the studies and research on the subject in the manner that we intend to present in our systematic literature review. Hence, the principal objective of this literature review is to furnish research data pertaining to the subject matter through the identification of research gaps that warrant future investigation and to assist scholars in comprehending the present state of research concerning the development of human resource skills in higher education establishments. Furthermore, by monitoring the historical progression of scientific inquiry in this domain, one may rectify the trajectory of research in order to guarantee the resurgence, variety, and expansion of forthcoming investigations and studies. It is critical that individuals and organisations responsible for establishing policies for growth and improvement commit time, resources, and human talents in a methodical manner that is grounded on empirical evidence. This research sought to do this by answering the next main question: What is the status of human resource skills of higher education students in previous research and where should future research go? This research sought to do this by responding to the below sequence of questions:

- What theories have previous studies employed?
- What type of sample was used in previous studies? And through that, what are the specializations that these studies focused on?
- What are the human resource skills in higher education institutions that previous studies focused on?
- What are the geographical locations in the world where previous studies were conducted?
- What research methods and what type of statistical processing were used in previous studies?
- What future agenda did previous studies recommend?"

This study provides a systematic review and integrated vision on the topic "Human Resource Skills for Higher Education Students." The importance of the study is evident through the time and effort it will save researchers, and also through directing research paths on this topic by identifying what has been accomplished in previous research and identifying the basic paths and axes that need further research in the future. As we mentioned previously, through our review of previous research on the topic, we did not find any research that dealt with the topic in the way we did in this research. This research also sheds light on important, new or previously unaddressed axes, which will constitute, from our point of view, a real difference and a qualitative shift in future research and in directing its paths, especially since the approach we followed helped in achieving this through systematic reviews and meta-analysis (PRISMA).

Methodology

Research Design

The present study employs a systematic literature review (SLR) methodology that is both rigorous and organized to thoroughly synthesize and analyze pre-existing academic material. The study procedure conforms to accepted protocols for carrying out SLRs (Kitchenham et al., 2009). This study followed other research (Alshabibi et al., 2024; Qi et al., 2024; Alsaadi et al., 2024; Mousa et al., 2024; Al-Lamki et al., 2024; Alhayan & Abuhassna, 2024; Awae et al., 2023; Yaarubi et al., 2023; Din et al., 2023; Alsubhi et al., 2023; AlShehhi et al., 2022; Yaarubi et al., 2022; Alshabibi et al., 2022; Kiyomi et al., 2022; Yusof et al., 2022; AlShehhi et al., 2022; Alsheeb et al., 2022; Mamman et al., 2022a; Mamman et al., 2022b; Abuhassna et al., 2022a; Abuhassna et al., 2022b; Alsharif et al., 2021).

Identification

Database Selection: Preeminent academic databases, including Scopus, will be searched methodically for pertinent material. Regarding human development abilities, this resource offers higher education students an exhaustive compilation of peer-reviewed literature.

Search Strings: To guarantee the retrieval of relevant research, a mix of keywords and phrases will be used, such as "students in higher education," "human development abilities," and other important terms. By using Boolean operators (AND, OR), search queries will be refined. Additionally, additional keywords were included to reduce the number of results. As an example, the TITLE-ABS-KEY (human and development and skills and higher education and students) AND PUBYEAR > 2011 AND 2023 AND (LIMIT-TO (SUBJAREA, "SOCI" OR LIMIT-TO ("ARTS"))).

Inclusion and Exclusion Criteria: Articles that centre on the incorporation of technology into instructional design in accordance with the ADDIE Model will be considered for inclusion. Non-English publications, sources without peer review, and research published before 2010 will be excluded from the analysis, since current advancements in technology integration will be given precedence. Moreover, only articles will be considered; for example, AND (LIMIT-TO (DOCTYPE, "ar")) will be excluded. Thus, only articles published in the English language were considered; for example, "AND (LIMIT-TO (LANGUAGE, "English"))" was used to achieve this.

Search Period: The scope of the search will include works published between 2010 and 2022, in accordance with the fast development and emergence of educational technology.

Screening and Selection

Initial Screening

The preliminary evaluation will include a review of the titles and abstracts of the papers that have been obtained, in order to determine their pertinence to the research inquiries. At this step, irrelevant articles will be eliminated. The preliminary screening identified a total of 2040 documents. By using a set of inclusion and exclusion criteria, the number of papers included in the article was reduced from 2040 to 376. Furthermore, after commencing the download process, 249 documents could not be recovered for various reasons. A limited number of items were not accessible online without cost. Very few papers lack a DOI connection. In all, 127 papers were downloaded in total. The materials were further evaluated for quality and suitability, resulting in the inclusion of just 35 items in this evaluation.

Full-Text Review: Articles that successfully navigate the preliminary screening process will be subjected to an exhaustive full-text examination. In this stage, an evaluation will be conducted on every article to determine whether or not it satisfies the inclusion/exclusion criteria and the research questions.

Data Extraction: Information pertinent to the research inquiries, such as publication particulars (e.g., author, year), research methodologies, significant discoveries, and contributions, must be methodically retrieved from the chosen papers.

Quality Assessment

In order to ascertain the dependability and accuracy of the chosen studies, a quality evaluation will be conducted using predefined criteria to evaluate the source's methodological rigour. Aspects like sample sizes, study designs, and data collecting techniques will be considered throughout the evaluation. The materials were further evaluated for quality and suitability, resulting in the inclusion of just 35 items in this evaluation.

Data Synthesis and Analysis

Thematic Analysis: In order to discover reoccurring themes pertaining to the human development skills of higher education students, the extracted data will be thematically grouped. Themes must be extracted from the research inquiries, and discernible patterns, parallels, and distinctions among the investigations shall be discovered.

Reporting

The results of this systematic literature review will be disseminated in accordance with standard SLR reporting criteria (Kitchenham., Brereton., et al, 2019). A narrative synthesis of significant themes and results, as well as implications for instructional design practise and suggestions for future study, will comprise a thorough report. Styling of Manuscripts.

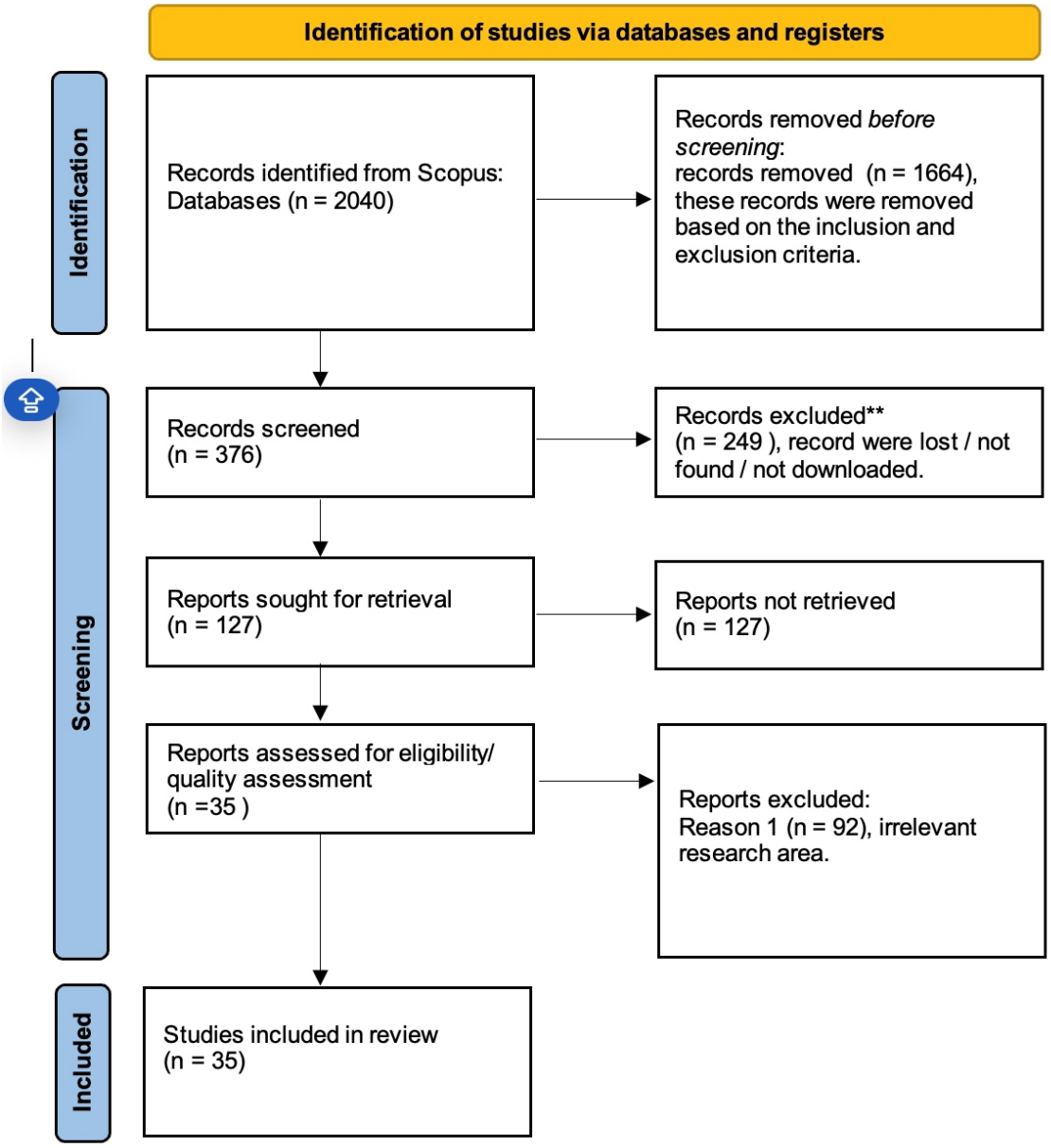

Figure 1: Prisma framework

Results

PRISMA was used to assess, procure, scrutinise, and include 35 research in order to accomplish the study's predetermined goals. The studies in the domain of human resource skill development for students in higher education institutions were subjected to critical evaluation and analysis in order to uncover commonalities.

Theoretical Integration

It is apparent from the examination of 35 studies that their principal objective is to promote the growth and improvement of human resource competencies inside higher education establishments, with a particular focus on the student body. Most of these studies and research endeavours were centred on the preparation and qualification of university students with the necessary capabilities and skills to enter the labour market upon completion of their academic careers. A closer examination, however, indicates that secondary aims arose from this basic purpose, with some research having distinct objectives while others had similar ones. The use of theories and models in these investigations provides clear evidence of this. Ten of the thirty-five studies implemented the Professional Identity Formation (PIF) theory or model. Subsequently, specific techniques and learning models were utilised in five studies, and problem-based learning (PBL) and project-based learning (PBL) approaches were adopted in another five studies. Following this, four research included Personal and Professional Development (PPD), three studies used Emotional Intelligence (EI), and three more studies implemented patient-centric approaches within the medical and health fields. Then, two studies used Evidence-Based Practice (EBP) or Evidence-Based Medicine (EBP), two studies utilised Education for Sustainable Development (ESD), two studies implemented Sustainable Development, and two studies utilised competence models (SD). Subsequently, the Interactive, Constructive, Active, and Passive (ICAP) learning activities model or theory, Critical Thinking (CT), employment models, the Cultural Awareness Scale (CAS), Lifelong Learning (LLL), and the Global Talent Competitiveness Index (GTCI) were all implemented in one study each.

Sample Types

Medical students comprised a substantial proportion of the sample in the aforementioned research, according to this systematic review of the medical and health sciences. Participation of medical students was seen in 15 out of 35 investigations, either alone or in conjunction with other groups. Furthermore, other studies examined samples from various disciplines within the medical and health sciences. For instance, students pursuing midwifery, physical therapy, occupational therapy, speech therapy, pharmacy (two studies), nursing, and sociology (one study each), and students enrolled in health sciences programmes were examined in one study each. There was also one study devoted to students of the MEL occupational therapy programme. At addition, the research included academic members, lecturers, and staff in medical schools, who were represented in five of the studies, extending the reach beyond student populations in the medical and health sciences. University and higher education institutions were included in three research including an additional sample type. Subsequently, in three further investigations, sample types included categories of lecturers and students with backgrounds in different academic disciplines. Further, without identifying a specific expertise, five research used samples of students from diverse academic fields attending institutions of higher education. Moreover, three research investigations directed their attention towards an alternative sample composition, including school educators, staff, and pupils.

Human Resource Development Skills

The present systematic review has identified and categorised human resource development abilities into nine distinct categories. Notably, the number of research that concentrate on a specific type of these talents differs considerably from the others. A total of

15 research (or 43 percent of the total) examined thinking abilities, while 13 studies (or 13 percent of the total) concentrated on personal qualities and professional growth skills. Subsequently, five research examined problem-solving abilities and their incorporation into curriculum, while seven studies examined communication skills, six studies examined leadership and management skills, and five studies examined lifelong learning and sustainable development skills. Following this, four research examined the relationship between emotional intelligence and emotion management in the workplace, two studies investigated digital skills, and one study examined stress management abilities explicitly. Figure 2 presents an additional mind map that represents this data in percentage form.

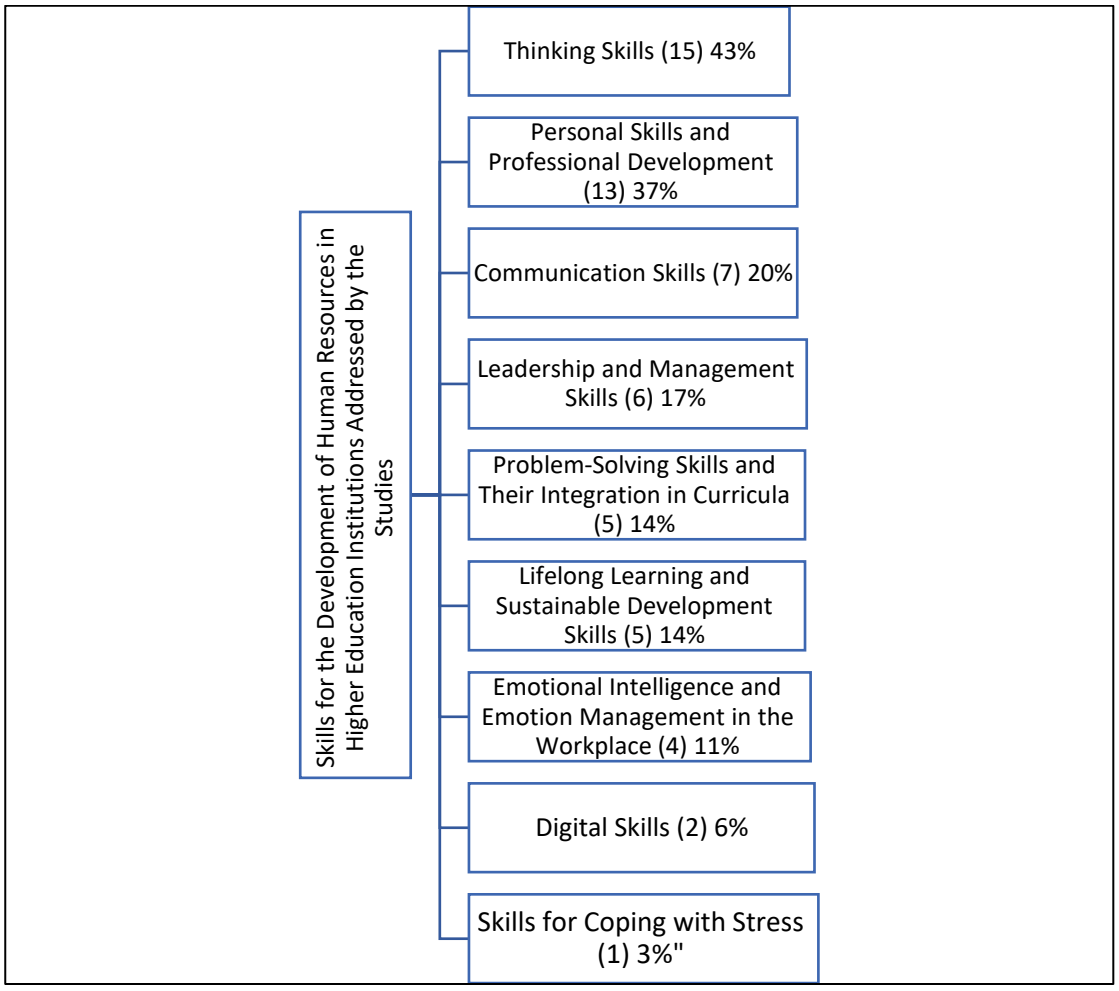

Figure 2: Human resources competencies that have been the subject of inquiry and study at institutions of higher education

Geographical Locations

Through the monitoring of study and research sites pertaining to the enhancement of human resource abilities inside institutions of higher education worldwide, thirty (30 out of thirty-five) nations could be identified from a total of thirty-four studies. The research was dispersed across the aforementioned nations, with the exception of one study, which failed to provide its specific site of execution study by (Leikuma-Rimicane., Baloran., et al, 2022). The only mention of the location in this research was that it included several higher education institutions across multiple nations. Some studies examined two or more countries, including the following: the research conducted by (Caldeiro-Pedreira., Renés-Arellano., et al, 2021),

which examined Spain and Chile; the study conducted by (Garanina., Al Said., et al, 2021), which examined Kazakhstan, Russia, and the United Arab Emirates; and the study conducted by (Klarare., Rydeman., et al, 2022), which examined eleven countries represented by Australia, Bahrain, Thailand, and China.

Research Methods and Statistical Processing

Undoubtedly, in order to conduct exact scientific research, a scientist must ascertain the scientific methodology that will serve as the foundation for their investigation, together with the suitable research instruments and statistics processing techniques. Commencing with the first phases of data and information collection, hypothesis formulation, and validity verification, this progresses through the subsequent stages until culminating in findings acquisition, discussion, and the formulation of suggestions and recommendations. The level of trust and credibility that the study will acquire is contingent upon this procedure.

By means of this systematic review's analysis, categorization, comparisons, and examination of similarities and differences, we were able to classify nine research in accordance with their respective methodologies. A considerable proportion of the studies, comprising 16 out of 35, employed a mixed methods approach. For instance, the following studies utilised this methodology (Doherty., P.A & Offiah, 2013; Singh., Pai., et al, 2013; Chew., Zain & Hassan, 2013; Laven., Keefe., et al, 2014); (Scicluna., O'Sullivan., et al, 2015); (Yoon., Choi, I., et al, 2016; Wei Wei., Alkureishi., Maria., et al, 2017; Thomas., Han., et al, 2017; Reefman., Daelmans., et al, 2017; Golos & Tekuzener, 2019; Chung, 2019; Rodríguez., Pérez., et al, 2019; Leikuma-Rimicane., Baloran., et al, 2022). In contrast, the following nine investigations used a quantitative methodology (Ospina., Brand & Aristizabal, 2017; Roslan., Siew., et al, 2020; HakemZadeh., Neiterman., et al, 2020; Garanina., Al Said., et al, 2021; Yurong., Takeda., et al, 2022; Aslam., Parveen., et al, 2022; Al-Nuaimi & Al-Ghamdi, 2022; Bußenius., Harendza, 2022; Zhang., Hu., et al, 2022).

Three investigations subsequently used the qualitative approach: (Knoll., 2014), Tagawa (Tagawa., 2020; Sánchez., Lesmes., et al, 2022). The case study technique was used in two investigations (Ross., Dlungwane & Van, 2019); (Hache., Honoré & Hache, 2022). One research used each of the following approaches: a questionnaire-based cross-sectional study (Möller & Shoshan, 2019); an inductive investigation (Posenau & Handgraaf, 2021); a non-experimental study using a correlational design (Caldeiro-Pedreira., Renés-Arellano., et al, 2021); and an analytical study (Klarare., Rydeman., et al, 2022). One research, used a procedure that was not described clearly and remained elusive to clarify, even after using inference and analysis (Viviani, 2022). It can only be described as analytical follow-up research that employs conjectural deduction to trace the phases of the university's contributions in the sphere of human resource development using the historical method.

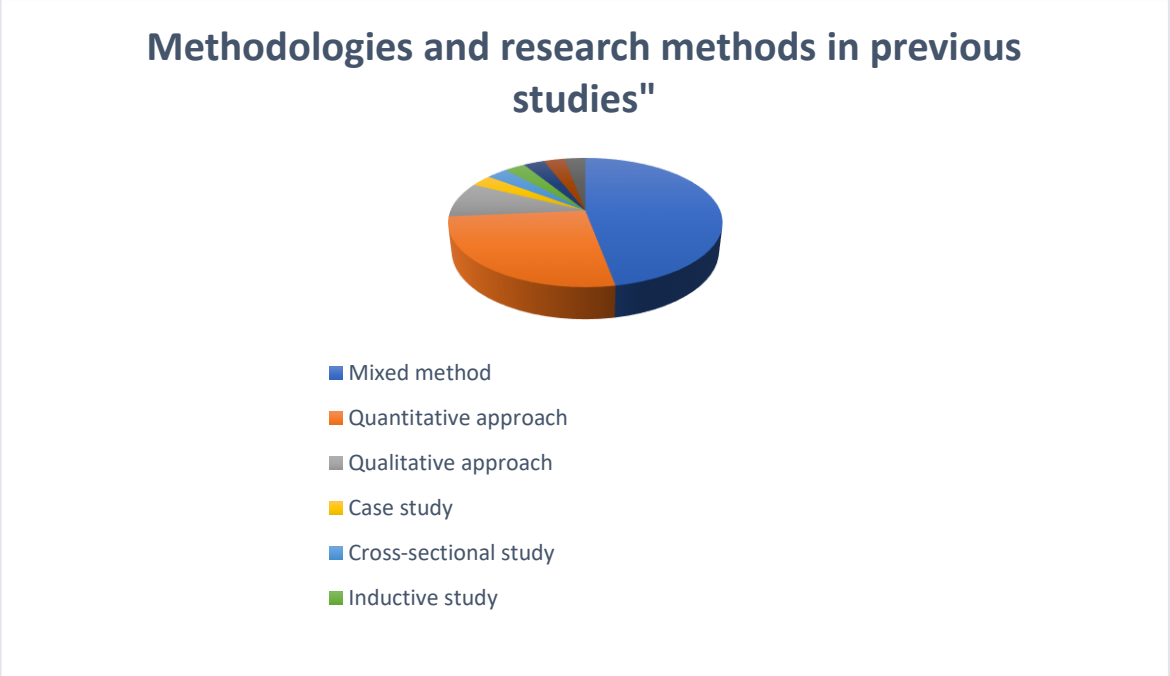

Figure 3: Research approaches and methods in previous studies

About the statistical software used in the statistical analysis, a total of nine such programmes were recognised as having been utilised in the investigations. The findings of this review indicated that SPSS was utilised by a significant proportion of the studies, comprising 17 out of 35, as evidenced by the following studies: (Doherty., P.A & Offiah, 2013; Singh., Pai., et al, 2013; Chew., Zain & Hassan, 2013; Scicluna., O'Sullivan., et al, 2015; Thomas., Han., et al, 2017; Rodríguez., Pérez., et al, 2019; Tagawa., 2020; **Roslan., Siew**., et al, 2020; Szabó., Davis & Antal; Kumlien., Bish., et al, 2020; Khamis., Abdi & Basgut, 2022; Zhang., Hu., et al, 2022).

Following this, four of the thirty-five research used the EXCEL statistical analysis tool, including (Ross., Dlungwane & Van, 2019; Caldeiro-Pedreira., Renés-Arellano., et al, 2021; Garanina., Al Said., et al, 2021; Al-Nuaimi & Al-Ghamdi, 2022). Two of the remaining investigations were allocated to each of the subsequent statistical programmes (Leikuma-Rimicane., Baloran., et al, 2022; HakemZadeh, Neiterman (HakemZadeh., Neiterman., et al, 2020; Wei Wei., Alkureishi., Maria., et al, 2017). Nvivo, utilised in the studies by (Scicluna., O'Sullivan., et al, 2015; Khamis., Abdi & Basgut, 2022) SPSS Statistics, (Yoon., Choi, I., et al, 2016; Bußenius., Harendza, 2022), and AMOS, (**Roslan., Siew**., et al, 2020; Zhang., Hu., et al, 2022).

One research (Rodríguez., Pérez., et al, 2019) used Atlas.ti, which was positioned toward the end of the list. Additionally, it is worth noting that several investigations included statistical evaluations, tests, correlation coefficients, and other methodologies; nevertheless, the specific statistical software utilised was not specified. The aforementioned studies consist of the following: (Knoll., 2014), which examined induction and analysis; (Laven., Keefe., et al, 2014), which employed chi-square tests; (Ospina., Brand & Aristizabal, 2017), which utilised Cronbach's alpha and Likert scales; (Reefman., Daelmans., et al, 2017), which gathered data for all seminars conducted in 2016; (Posenau & Handgraaf, 2021), which focused on literature

analysis and insights derived from experimental conversation research; (Viviani, 2022), which monitored and analysed activities within the realm of education at the University of Siena.

Furthermore, it is beneficial to specify the research instruments used in these investigations. In 15 investigations, certain instruments such as questionnaires were used often, while questionnaires were combined with other instruments in 8 studies. Five studies employed scales and other instruments, three studies conducted interviews, two studies utilised observation, and one study combined testing and self-reporting. In tracking and analysing university activities in the field of Education for Sustainable Development, one study (Viviani, 2022) appeared to have utilised observation-like methods.

Future Agenda

Following an analysis of the assessed publications, a series of suggestions were discerned and are categorised herein according with the subject matter investigated in the investigations. In relation to pedagogical approaches, methods, and instructional strategies for fostering specific human development competencies in pupils, further investigation is warranted into the influence of career specialisation decisions on graduates' evaluations of the calibre of preparation provided by medical programmes (Laven., Keefe., et al, 2014). The high demand for human resources is one disadvantage of employing SPs in Problem-Based Learning (PBL), according to (Yoon., Choi, I., et al, 2016); hence, further study is required to determine the ideal time periods for incorporating SPs into PBL in medical curricula. Further study and local comparisons, according to (Ross., Dlungwane & Van, 2019), will aid in the identification of practical and successful teaching, evaluation, and feedback strategies that promote student engagement and profound learning in South African higher education institutions. Future research should include qualitative data and investigate new psychometric factors, according to (Golos & Tekuzener, 2019). In addition to the cost-effectiveness of implementing new programmes, future study should investigate the views and levels of contentment of community partnerships and supervisors about the community service performed by occupational therapy students. Further investigation is necessary to determine the most effective strategies for fostering in students the growth of critical and creative thinking, problem-solving, and interdisciplinary cooperation skills (Rodríguez., Pérez., et al, 2019). It is suggested that students be actively engaged in ethical discussions to develop an understanding of the significance of ethics in modern research. Additionally, regular training in oral communication is necessary for physicians to effectively communicate scientific information to patients and non-specialists (Möller & Shoshan, 2019). As an alternative to induction, integration of empirically valid ideas is recommended for health profession courses (Posenau & Handgraaf, 2021). Further evidence on the educational usefulness of integrating WSLA into the ICAP framework should be gathered by organised observations in classrooms during activities planned to use the WSLA technique, according to (Sánchez., Lesmes., et al, 2022).

In relation to emotional intelligence, it is recommended that medical educators modify the professional development (PDD) programme, which incorporates an evaluation of EI, to align with their requirements and include it into their medical curriculum (Doherty., P.A & Offiah, 2013). According to (Chew., Zain & Hassan, 2013), more research might investigate the correlation between emotional intelligence and general intelligence, as well as the impact of these two factors together on academic achievement in medical school. Further study might investigate the effects of fieldwork assignments on the development of evidence-based

practise (EBP) competences, as suggested by studies on teaching features and characteristics of instructors of students in higher education institutions (Thomas., Han., et al, 2017).

Concerning the subject of professional competences, long-term future studies and research in various regions are required to validate the scale's sensitivity and enhance its applicability (Tagawa., 2020). In their work, (**Roslan., Siew**., et al, 2020) suggest that future research should replicate the GEI indicator using a more extensive sample size and diverse demographic cohorts. Further research is required to evaluate the efficacy and consequences of comparable initiatives by employing a more extensive student sample, particularly when introducing the programme in the second and third years of Master of Pharmacy programmes in conjunction with introductory pharmacy practise experiences (Khamis., Abdi & Basgut, 2022).

Concerning the suggestions put forth by the research regarding the correlation between internet usage by higher education students and the development of personal skills and social values, it is pertinent to emphasise the necessity of augmenting the sample size to encompass proportions of students hailing from a greater number of universities. Additionally, there is a need for a more in-depth examination of young people's views of online hazards, including an analysis of the components and measurement of any such beliefs (Caldeiro-Pedreira., Renés-Arellano., et al, 2021). In relation to the subject of fostering a culture of sustainable development among students in higher education institutions, (Aslam., Parveen., et al, 2022) advocate for the necessity of augmenting the participant sample size in replicated investigations conducted in Pakistan or analogous settings to ascertain the generalizability of the findings. Furthermore, further exploration is warranted of certain matters, including students' scientific perceptions of SD and the effects of sustainability-focused courses. Regarding the function of higher education establishments in talent cultivation, attraction, and advancement, it is recommended that forthcoming scholars examine the condition of talent competition and expansion during the last two years (Leikuma-Rimicane., Baloran., et al, 2022). (2020-2021). Engaging in qualitative research about the influence of higher education institutions on talent development and competitiveness will provide scholars with comprehensive insights from the various settings of higher education institutions worldwide.

Discussion

Theoretical Integration

Through the implementation of this systematic study, an estimated seventeen theories and models have been categorised and quantified. Table 1 detailing the many views and theoretical models is provided below (Alhalboosi, 2018). In the ever-evolving landscape of higher education, institutions are increasingly focusing on the development of human resource capabilities to equip their students with the necessary skills for a dynamic global workforce. This entails a deep understanding and implementation of various pedagogical theories and frameworks that are tailored to nurture different aspects of student development. The table below represents a consolidation of seventeen distinct theories and models that have been identified through a rigorous systematic study. These frameworks range from fostering emotional intelligence and personal growth to promoting advanced competencies in problem-solving and critical thinking. Each model or theory has been quantitatively analyzed across multiple studies to determine its impact and effectiveness in the context of higher education. The listed perspectives and theoretical frameworks provide

a comprehensive overview of the multifaceted approach that institutions can adopt to enhance their human resource capabilities, thereby preparing students to meet the challenges of their professional and personal lives.

Table 1
Perspectives and theoretical frameworks for the development of human resource capabilities in institutions of higher education

Theory	**Studies**
Emotional intelligence (EI)	(Doherty., P.A & Offiah, 2013); (Chew., Zain & Hassan, 2013); (Zhang., Hu., et al, 2022)
Personal and Professional Development (PPD)	(Doherty., P.A & Offiah, 2013); (Szabó., Davis & Antal); (HakemZadeh., Neiterman., et al, 2020); (Khamis., Abdi & Basgut, 2022)
Some techniques and learning models	(Knoll., 2014), (Garanina., Al Said., et al, 2021); (Ross., Dlungwane & Van, 2019); (Scicluna., O'Sullivan., et al, 2015); (Rodríguez., Pérez., et al, 2019)
Problem-based learning (PBL).) and the project-based learning (PBL) approach	(Laven., Keefe., et al, 2014); (Yoon., Choi, I., et al, 2016); (Chung, 2019); (Reefman., Daelmans., et al, 2017); (Möller & Shoshan, 2019)
Patient-centered models, specifically in the field of medical and health specialties	(Wei Wei., Alkureishi., Maria., et al, 2017); (Yurong., Takeda., et al, 2022); (Hache., Honoré & Hache, 2022).
Evidence-based practice (EBP) or evidence-based medicine (EBP)	(Thomas., Han., et al, 2017); (Möller & Shoshan, 2019).
Some models in efficiency	(Möller & Shoshan, 2019); (Bußenius., Harendza, 2022)
Placement models or clinical placement models	(Golos & Tekuzener, 2019)
Critical Thinking (CT)	(Ospina., Brand & Aristizabal, 2017).
Professional Identity Formation (PIF) Assessment	(Tagawa., 2020).
Recruitment forms	(**Roslan., Siew**., et al, 2020).
Cultural Awareness Scale (CAS)	(Kumlien., Bish., et al, 2020).
Lifelong Learning (LLL)	(Khamis., Abdi & Basgut, 2022).
Education for Sustainable Development (ESD)	(Viviani, 2022); (Al-Nuaimi & Al-Ghamdi, 2022).
Sustainable development (SD)	(Viviani, 2022); (Aslam., Parveen., et al, 2022).
Global Talent Competitiveness Index (GTCI)	(Leikuma-Rimicane., Baloran., et al, 2022).
Interactive, constructive, active, and passive (ICAP) learning activities model or theory	(Sánchez., Lesmes., et al, 2022).

Ultimately, although their distinct aims, methodology, and theoretical stances, each of the research underscores the criticality of cultivating human resource competencies inside institutions of higher education. The area of human resource skill development in higher education institutions exhibits a conspicuous integration of many theoretical models and points of view. This integration serves to enhance the discourse and proffers a multidisciplinary perspective on the subject matter. It was observed that most of the research used several frameworks, theories, models, strategies, or methodologies, as shown in Table 1. Some studies included more than one theory or model, while others employed theories and models that were not utilised in other investigations.

Type of Samples

Medical students, who were mostly employed in the health sciences and medical professions, comprised a significant share of the research samples. Fifteen out of thirty-five research were exclusively or collaboratively concerned with medical students. To illustrate, the research conducted by Doherty and Offiah (Doherty., P.A & Offiah, 2013) included a sample of 51 medical graduates. Also, the study conducted by Szabó and Davis (Szabó., Davis & Antal) included 39 dental students in their final year. These are smaller samples compared to another research. Where Scicluna and O'Sullivan (Scicluna., O'Sullivan., et al, 2015) used samples of and 99 pre-clinical medical students, respectively. While chew and Zain (Chew., Zain & Hassan, 2013) analysed data from alrger sample of 163 first and final year medical students. On a sample like sample (Chew., Zain & Hassan, 2013) Laven and Keefe (Laven., Keefe., et al, 2014) examined 124 medical school grads. While Yoon & Choi (Yoon., Choi, I., et al, 2016) used a very large sample consisting of 328 medical students. In Wei Wei and Maria's research (Wei Wei., Alkureishi., Maria., et al, 2017) also, the sample size was large, as it included 96 third-year medical students and 89 second year (MS2) medical students (MS3s). Also, on large samples (Reefman., Daelmans., et al, 2017) examined medical master's students using seminar-stage-dependent sample sizes (108, 135 students). In other research, the samples were much larger than the the samples in previous research. Medical students and first-year staff at Nelson Mandela Medical School were featured in (Ross., Dlungwane & Van, 2019), which included 250 first-year medical students enrolled in the BAP programme and 12 faculty members. Human biology and medical students were examined in (Rodríguez., Pérez., et al, 2019), with 529 students participating in an IBL course, 198 in a creative workshop, and 331 not enrolled in the course. The sample size for (Möller & Shoshan, 2019) was 652 medical students, while (Tagawa., 2020) had 322 participants, which comprised sixth-year medical students, second-year residents, and experienced physicians (teachers). While HakemZadeh and Neiterman (HakemZadeh., Neiterman., et al, 2020) incorporated 456 students enrolled in pre-clinical and clinical placement programmes. Within the framework of large samples, a sample of 1083 final-year medical students from 35 medical schools were used in (Bußenius., Harendza, 2022), whereas (Zhang., Hu., et al, 2022) included 523 medical professors and 3268 medical students.

The sample of some research included other medical specialties and non-medical specialties as a study (Khamis., Abdi & Basgut, 2022); (Hache., Honoré & Hache, 2022), which specifically examined pharmacy students, included samples from several medical and health sciences disciplines. Thirty-five nursing and eighteen sociology students participated in (Ospina., Brand & Aristizabal, 2017), while two hundred students from midwifery, nursing, physiotherapy, occupational therapy, and speech therapy were participating in (Posenau & Handgraaf, 2021).

Caldeiro and Mari (Caldeiro-Pedreira., Renés-Arellano., et al, 2021) also included 305 college students majoring in the social sciences and humanities. Thomas and Han (Thomas., Han., et al, 2017) examined students enrolled in the MEL occupational therapy programme, while Posenau and Handgraaf (Wei Wei., Alkureishi., Maria., et al, 2017) also surveyed an additional 200 students from a range of health professions. Also, the sample size for Golos and Tekuzener (Golos & Tekuzener, 2019) was 155 students pursuing occupational therapy, whereas for (12 students enrolled in health science degrees) Sánchez and Lesmes, (Sánchez., Lesmes., et al, 2022).

Research in the medical and health sciences has included not only students, but also medical college instructors, lecturers, and staff. To illustrate, the study conducted by Singh and Sinha (Singh., Pai., et al, 2013) included 57 faculty members specialising in undergraduate medicine (MBBS) and dentistry (BDS). Similarly, Ross and Van (Ross., Dlungwane & Van, 2019) examined the BAP programme, which enrolled 250 first-year medical students and 12 faculty members. 523 medical instructors and 3268 medical students participated in (Zhang., Hu., et al, 2022), whereas (Tagawa., 2020) analysed a sample of 322 medical students and experienced physicians (teachers). In a similar approach, the study conducted by Hache and Honoré (Hache., Honoré & Hache, 2022) included patients, a senior clinical pharmacist, and a lecturer in educational sciences. The course was attended by 47 pharmacists, of whom 19 patients served as patient instructors, in addition to four patients.

An additional category of samples included colleges and institutions of higher education, such as the one described in (Garanina., Al Said., et al, 2021), which comprised 400 students from two universities in Russia as well as institutions in the United Arab Emirates and Kazakhstan. Higher education institutions in 88 nations were also the focus of (Leikuma-Rimicane., Baloran., et al, 2022), while 79 medical schools in mainland China were the subject of (Yurong., Takeda., et al, 2022). Although samples from instructors and students specialising in other fields within higher education institutions were included, their scope was rather restricted in contrast to the emphasis on medical and health sciences. For example, 305 university students from the faculties of humanities and social sciences participated in (Caldeiro-Pedreira., Renés-Arellano., et al, 2021), and students from the faculties of human biology and medicine comprised (Rodríguez., Pérez., et al, 2019), with 529 students attending an IBL course, 198 in a creativity workshop, and 331 without the course. Furthermore, there were investigations utilising samples from a wide range of general disciplines in higher education institutions. For instance, Al-Nuaimi and Al-Ghamdi (Al-Nuaimi & Al-Ghamdi, 2022) conducted a study involving 212 higher education students in Qatar and Aslam and Parveen (Aslam., Parveen., et al, 2022), which examined 1109 students from ten higher education institutions in Pakistan, comprised studies of this nature. In their study, Roslan and Ping (**Roslan., Siew**., et al, 2020) surveyed 425 undergraduates from a wide range of academic fields. Similarly, Kumlien and Bish (Kumlien., Bish., et al, 2020) examined 191 students enrolled in healthcare and social care university programmes. Once again, also 305 university students from the arts and social sciences participated (Caldeiro-Pedreira., Renés-Arellano., et al, 2021).

Additionally, there were samples comprising school employees, employees, and students; for instance, (Knoll., 2014) and (Viviani, 2022), which included students, employees, citizens, and high school teachers; the former included an unspecified number of teachers

pursuing certification for school buildings and district leaders; and the latter, although the sample size was not specified. Included were 31 studies on students, instructors, and librarians (Klarare., Rydeman., et al, 2022). As indicated earlier, this systematic review concentrated on medical and health science domains, with a particular emphasis on medical students. This highlights the need for further research to include understudied or neglected domains, therefore affirming the applicability of human resource skill development in many industries and professions of life.

Human Resource Development Skills

The emphasis of the research on human resource competencies in higher education establishments differed considerably. The bulk of the research examined cognitive abilities, as shown by (Ross., Dlungwane & Van, 2019), which combined critical thinking with deep learning to represent higher levels of thought, and (Ospina., Brand & Aristizabal, 2017), which examined critical thinking. Additionally, the course emphasised assessment, which encompasses both peer and self-evaluation while maintaining a critical thinking and constructive criticism framework. Additionally, (Klarare., Rydeman., et al, 2022) emphasised critical thinking abilities via the development and mastery of many forms of academic writing. In the same way, (Chung, 2019) and (Möller & Shoshan, 2019) emphasised critical thinking and a variety of abilities, respectively, including the capacity to track the progression of information and integrate it critically. (Tagawa., 2020) examined assessment skills that incorporate critical thinking to provide constructive criticism; similarly, (Szabó., Davis & Antal) examined a range of skills, including constructive critical assessment through the evaluation of whether a prospective workplace aligns with the personalities, aspirations, and expectations of students. Like how (Khamis., Abdi & Basgut, 2022) emphasised self-assessment awareness and abilities, they also emphasised the need of organising, monitoring intelligently, and recording individualised learning plans and activities. Certain research investigations, such as the one conducted by (Kumlien., Bish., et al, 2020), examined the relationship between cultural competency and awareness, which serves as an indication of developed thought processes. It reflected constructive and conscientious thought that (Aslam., Parveen., et al, 2022) aimed to raise knowledge about human rights, environmental concerns, post-graduation goals, and job hunting. Concerning value-conscious thought, (Möller & Shoshan, 2019) discussed the ethics and competencies of scientific inquiry, while (Caldeiro-Pedreira., Renés-Arellano., et al, 2021) examined societal values. Preparing students for worldwide collaborative innovation, scientific publication, talent development, and critical thinking, hence stimulating and using higher levels of thought, was the aim of (Leikuma-Rimicane., Baloran., et al, 2022). Rodrguez and Pérez (Rodríguez., Pérez., et al, 2019) addressed a variety of cognitive abilities, such as higher-order, research, and creative thinking. Roslan and Ping (**Roslan., Siew**., et al, 2020) emphasised, among other things, exploring abilities.

Then, research shifted its attention to professional growth and personal abilities; for instance, Singh and Sinha (Singh., Pai., et al, 2013) examined student interaction, personal characteristics, and professional development skills. The emphasis of Scicluna & O'Sullivan (Scicluna., O'Sullivan., et al, 2015) was on collaboration and peer learning. Both Golos & Tekuzener (Golos & Tekuzener, 2019) and Reefman and Daelmans (Reefman., Daelmans., et al, 2017), which also included personal development skills, focused on personal and professional competencies. In their 2017 article, Thomas and Han discussed professional

accountability and self-efficacy abilities. Professional identity development was the emphasis of Tagawa (Rodríguez., Pérez., et al, 2019); professional management qualities and talents were the subject of Roslan, Ping (**Roslan., Siew**., et al, 2020); and career growth, resume writing, and professional portfolio preparation were the topics covered in (Szabó., Davis & Antal). Garanina and Al Said (Garanina., Al Said., et al, 2021) and Caldeiro and Mari (Caldeiro-Pedreira., Renés-Arellano., et al, 2021) both directed their attention on personal growth abilities. Incorporated were professional development skills (Leikuma-Rimicane., Baloran., et al, 2022). Then, research shifted its attention to professional growth and personal abilities; for instance, Singh and Sinha (Singh., Pai., et al, 2013) examined student interaction, personal characteristics, and professional development skills. The emphasis of Scicluna and O'Sullivan (Scicluna., O'Sullivan., et al, 2015) was on collaboration and peer learning. Both (Golos & Tekuzener, 2019) and (Reefman., Daelmans., et al, 2017), which also included personal development skills, focused on personal and professional competencies. In their 2017 article, Thomas and Han discussed professional accountability and self-efficacy abilities. Professional identity development was the emphasis of Tagawa (Rodríguez., Pérez., et al, 2019); professional management qualities and talents were the subject of (**Roslan., Siew**., et al, 2020); and career growth, resume writing, and professional portfolio preparation were the topics covered in (Szabó., Davis & Antal). Garanina and Al Said (Garanina., Al Said., et al, 2021) and Caldeiro and Mari (Caldeiro-Pedreira., Renés-Arellano., et al, 2021) both directed their attention on personal growth abilities. Incorporated were professional development skills (Leikuma-Rimicane., Baloran., et al, 2022).

Thereafter, more research was conducted with an emphasis on management and leadership abilities, as shown by (Knoll., 2014), (Scicluna., O'Sullivan., et al, 2015), and (Reefman., Daelmans., et al, 2017), which examined several talents including leadership. The subject matter of (Posenau & Handgraaf, 2021) was negotiation skills pertaining to objectives, goals, and choices. Additional research has also examined managing talents, like that of Buchsenius and Harendza (Bußenius., Harendza, 2022) and Roslan and Ping (**Roslan., Siew**., et al, 2020), which examined personal and professional management qualities, and professionalism and managerial skills, respectively. Subsequently, research emerged that examined the integration of problem-solving abilities into academic curricula. For instance, (Laven., Keefe., et al, 2014) and (Yoon., Choi, I., et al, 2016) focused on Problem-Based Learning (PBL), whereas [Chung, 2019] included many skills, including PBL and problem-solving. In addition, (Möller & Shoshan, 2019) addressed several talents, problem-solving being among them, while (Szabó & Davis, 2020) emphasised abilities such as PBL.

Furthermore, there were five additional studies that examined the relationship between sustainable development skills and lifelong learning. Two of these studies, namely (Reefman., Daelmans., et al, 2017) and (Möller & Shoshan, 2019), incorporated future practical life skills into the concept of lifelong learning. Viviaani (Viviani, 2022) directed their attention towards education for sustainable development and the promotion of sustainable lifestyles. Aslam and Parveen (Aslam., Parveen., et al, 2022) explored the integration of sustainable development principles into training curricula at the tertiary level. Al-Nuaimi and Al-Ghamdi (Al-Nuaimi & Al-Ghamdi, 2022) similarly centred their attention on sustainable development. Emotional intelligence and the management of emotions in the workplace were the subject of subsequent research, including (Doherty., P.A & Offiah, 2013), (Chew., Zain & Hassan, 2013), (Viviani, 2022), and (Zhang., Hu., et al, 2022), which examined the impact of emotional

education on the holistic and sustainable development of medical education. Finally, the topic of digital skills was examined in a mere two studies: the first (Leikuma-Rimicane., Baloran., et al, 2022), which examined the relationship between digital skills, internet usage, and professional development; and the second (Caldeiro-Pedreira., Renés-Arellano., et al, 2021), which investigated the correlation between internet usage and perceived social values. This emphasises the need for more research in this field, particularly considering the present technological revolution and the magnitude and nature of technical advancements that are transforming the globe.

In conclusion, only two research examined the correlation between internet use and perceived social values (Caldeiro-Pedreira., Renés-Arellano., et al, 2021) and professional growth, information technology, and digital abilities (Leikuma-Rimicane., Baloran., et al, 2022). The present state of technical advancements and the information revolution underscore the criticality for further research in this field, particularly considering its magnitude and nature.

Geographical Locations

The present condition of prior research in the domain of human resource skill development in higher education establishments, as identified by this systematic review, suggests that more investigations are required in this specific topic, spanning diverse global geographical regions. China is the nation that has conducted the most research in this field, with five studies, followed by Malaysia with four studies, and the United States, Australia, and Spain, each with just three studies. Additionally, cooperative research was conducted in some nations or regions. Since human resource development is a critical issue that encompasses all aspects of life and sectors, the number of studies that have been undertaken to date should have been greater, given that the nations in question are developed. This underscores the need for more research, particularly considering the broad scope and pervasive influence of human resources across all industries and domains of life. Following that, the nations are listed according to the number of studies conducted: Canada, South Africa, Sweden, Pakistan, and Germany, each contributing two studies. Ireland, Korea, Colombia, the Netherlands, Israel, Turkey, Chile, Russia, the United Arab Emirates, Kazakhstan, Egypt, Qatar, France, Bahrain, Iran, New Zealand, Taiwan, and the United Kingdom are all represented with single research. This suggests the need for more research in the future. Furthermore, it is apparent that some industrialised nations possess an equivalent number of studies as less developed nations, when one takes into account the progress made in tangible aspects such as education, economics, and health. Hence, it is not possible to assert that the concentration of studies in this field is limited to developed nations exclusively, particularly considering that not all developed countries possess the most extensive body of research. The geographical regions and the corresponding number of studies done in each are shown in Table 2.

Table 2
Geographical locations, studies conducted there and their number

Number of studies	Place/country	Studies
1	Ireland	(Doherty., P.A & Offiah, 2013)
4	Malaysia	(Singh., Pai., et al, 2013); (Chew., Zain & Hassan, 2013); (Roslan., Siew., et al, 2020); (Klarare., Rydeman., et al, 2022)
3	United State	(Knoll., 2014); (Wei Wei., Alkureishi., Maria., et al, 2017); (Klarare., Rydeman., et al, 2022)
3	Australia	(Laven., Keefe., et al, 2014); (Scicluna., O'Sullivan., et al, 2015); (Klarare., Rydeman., et al, 2022)
1	Korea	(Yoon., Choi, I., et al, 2016)
1	Colombia	(Ospina., Brand & Aristizabal, 2017)
2	Canada	(Thomas., Han., et al, 2017); (HakemZadeh., Neiterman., et al, 2020)
1	Holland	(Reefman., Daelmans., et al, 2017)
2	South Africa	(Ross., Dlungwane & Van, 2019); (Klarare., Rydeman., et al, 2022)
1	Israel	(Golos & Tekuzener, 2019)
5	China	(Chung, 2019); (Kumlien., Bish., et al, 2020); (Yurong., Takeda., et al, 2022); (Klarare., Rydeman., et al, 2022); (Zhang., Hu., et al, 2022)
3	Spain	(Rodríguez., Pérez., et al, 2019); (Caldeiro-Pedreira., Renés-Arellano., et al, 2021); (Sánchez., Lesmes., et al, 2022)
2	Sweden	(Möller & Shoshan, 2019)
1	Japan	(Tagawa., 2020)
1	Hungary	(Szabó., Davis & Antal)
1	Türkiye	(Khamis., Abdi & Basgut, 2022)
2	Germany	(Posenau & Handgraaf, 2021); (Bußenius., Harendza, 2022)
1	Chile	(Caldeiro-Pedreira., Renés-Arellano., et al, 2021)
1	Russia	(Garanina., Al Said., et al, 2021)
1	Egypt	(Viviani, 2022)
2	Pakistan	(Aslam., Parveen., et al, 2022); (Klarare., Rydeman., et al, 2022)
1	Qatar	(Al-Nuaimi & Al-Ghamdi, 2022)
1	France	(Hache., Honoré & Hache, 2022)
1	the two seas	(Klarare., Rydeman., et al, 2022)

Research Methods and Statistical Analysis

The systematic review highlighted temporal variations in the use of research approaches and techniques. Research articles were published annually over the period from 2013 to 2022, using mixed approaches. Since 2017, quantitative approaches have been used, although qualitative methods first emerged in one research in 2014 and then resurfaced in two studies

in 2020. One research conducted in 2019 and another in 2022 using case study methodologies. Additional distinct study approaches, some of which were used just once in 2021 and some in 2022, including cross-sectional studies using correlational designs, inductive investigations, analytical studies, and non-experimental studies based on surveys. In the realm of statistical programmes, a considerable proportion of research were dependent on certain programme types, but a lesser percentage shared specific programme type. Certain research used certain programme types in a distinctive fashion, but others did not define the statistical programmes utilised and instead relied on tests, assessments, or techniques of statistical analysis. Thirteen investigations were conducted with the SPSS software between 2013 and 2022. The EXCEL initiative was implemented in four studies spanning the years 2019 to 2022. The R statistical software, which was deemed difficult to use and required instructions for data processing, was utilised exclusively in two investigations in 2019 and 2022. One research (2017) and one study (2022) used STATA, which encountered some constraints when applied to more complex statistical analysis equations. In two separate studies, SPSS Statistics was implemented in 2016 and 2022. Following its first use in 2015, Nvivo was reintroduced in one research in 2022. Recent programmes include AMOS, which was used in one research in 2022 and one in 2020, and Atlastic, which was utilised in one study in 2019. The time frame for studies using statistical techniques, tests, correlation coefficients, and other evaluations without disclosing the statistical software used was from 2014 to 2022. In terms of the research instruments employed in the studies, it is important to highlight that the majority relied solely on surveys, with 15 out of 35 studies employing surveys. For instance, several studies (Chew., Zain & Hassan, 2013), Scicluna & O'Sullivan (Scicluna., O'Sullivan., et al, 2015), Yoon & Choi (Yoon., Choi, I., et al, 2016), Reefman & Daelmans (Reefman., Daelmans., et al, 2017), Ross & Van (Ross., Dlungwane & Van, 2019), Golos & Tekuzener (Golos & Tekuzener, 2019), and others utilised demographic paper surveys. In eight research, surveys were used in conjunction with other methodologies, including Singh and Sinha (Singh., Pai., et al, 2013), which utilised a cross-sectional study design and a 24-statement survey, among others.

As shown in (Ospina., Brand & Aristizabal, 2017), five research used scales and other instruments, including the California Critical Thinking Disposition Inventory (CCTDI), Likert scale, and computed tomography measuring scale. Interviews were used in three research, with some using structured interviews (Hache., Honoré & Hache, 2022) and others semi-structured interviews. Two research used observational methods, such as environment monitoring and task duration assessment in (Knoll., 2014), whereas one study (Wei Wei., Alkureishi., Maria., et al, 2017) utilised human-level SP evaluation and Likert-style questions. A solitary investigation (Doherty., P.A & Offiah, 2013) combined self-reporting with exams by using the EQ-i and Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT V2.0).

Future Agenda

This systematic review provides a comprehensive overview of previous research on the development of human resource skills in higher education institutions, also highlights several recommendations, including emphasizing the need for future investigations to prioritise qualitative approaches and case studies. Especially since this systematic review showed the paucity of research using these methodologies compared to studies using mixed and quantitative approaches. So, further investigations in this regard are needed to use the quantitative technique, specifically, ss several studies have suggested that future study should

include bigger samples that are more geographically and culturally varied. This review also showed that there is an urgent need to conduct research based on employing modern technology such as artificial intelligence and nanotechnology in developing human resources skills in higher education institutions, as research has not addressed this, and it is indeed an urgent need, especially in future studies.

Future Directions, Research Gaps, and Recommendations

Following an exhaustive and meticulous examination of 35 research studies utilising the PRISMA framework, we have discerned the subsequent research requirements and stages pertaining to theoretical integration, sample selection, human resource competencies, geographic locations, methodology, data analysis, and further investigation. The future research gaps and planned tasks are delineated in Table 3. The pursuit of excellence in higher education is a continuous process that necessitates ongoing research and development. Table 3 presented herewith serves as a guide for future academic inquiries, highlighting key areas where further investigation is paramount. It delineates the current gaps in research, particularly concerning the understanding of sustainable development, digital literacy, and the theoretical underpinnings of educational practices. This document underscores the need for a diversified approach in studying various disciplines and the impact of higher education on talent growth and competitiveness. It also stresses the importance of expanding the geographical scope of research and employing robust qualitative methodologies to capture the nuanced impact of education on human resource skills. The table further recommends a focus on under-researched skills such as stress management and ethical decision-making in the digital era. The synthesis of these elements is critical for shaping a future workforce that is adaptable, ethical, and equipped to harness the potential of emerging technologies and paradigms.

Table 3
Future work and research gaps highlighted

Theory	Research gap	Future agenda
Theoretical integration	Limited research has been conducted on the talents and facets that are now and, in the future, regarded as crucial to ascertain. In addition to talent development and digital competencies, they include Education for Sustainable Development (ESD), Sustainable Development (SD), Critical Thinking (CT), Employability Models, and Lifelong Learning (LLL).	Certain significant matters need more investigation, including the scientific perspective of students toward SD and the extent to which sustainable development courses influence students' perceptions as opposed to their beliefs. Further research is required to examine the elements that comprise young people's views of Internet hazards and to quantify these beliefs more precisely. It is advisable that forthcoming investigations scrutinise the state of talent growth and competitiveness and do qualitative inquiries into the influence of higher education establishments on talent development and growth.
Sample type	Limited research has been undertaken on other academic disciplines; the majority of studies have been on samples of	Further research should be undertaken using samples from various university majors, regardless of whether these samples include university staff, professors, or students enrolled in those majors.

	medical and health sciences majors.	Further examining the correlation between students' Internet usage and the development of personal skills and social values would necessitate augmenting the sample size in replicate studies conducted in Pakistan or analogous settings. This would enable a more comprehensive assessment of the results' applicability to the culture of sustainable development.
Human resources skills	In addition to the existence of other unprocessed skills, digital skills and stress coping abilities have been the subject of a limited number of studies.	Future research should prioritise digital skills and associated dimensions, with a particular emphasis on the ethical implications of this domain, alongside stress management abilities. This is due to the psychological aspect's significance and its influence on an individual's productivity. Additional untapped talents that are critical for students in higher education institutions need to be the subject of future study.
Geographic locations	Certain geographic areas have been the subject of a limited number of research, with an average of one study per site. Furthermore, there are several unexplored geographical areas.	More study must be conducted in contexts that have been less explored and have been understudied so far.
methodology	A dearth of research exists about the use of qualitative and case study methodologies.	Further investigation is warranted to include a greater number of case study and qualitative approaches, with a particular emphasis on the qualitative method when examining the influence of higher education institutions on the development and competitiveness of its faculty and staff.
Recommendation and future work	Prior study has shown a significant disparity in the number of studies that used the mixed strategy, quantitative approach, and qualitative approach, in addition to concentrating on a particular domain of human resources abilities while neglecting others.	Further qualitative research is warranted in the domain of human resources skills owing to the significance of this methodology in furnishing researchers with comprehensive qualitative data. Concentrating efforts on undiscovered or underappreciated personal abilities, as well as on specialties or other forms of samples that have not been the subject of investigation. Attaining expertise in technology and artificial intelligence while considering the regulations, rules, and moral considerations that oversee its implementation.

Conclusion

Drawing on the thorough analysis of research, the following conclusions may be formulated with respect to the development of human resource skills inside institutions of

higher education. Diversity in Research Methods: Over time, there has been a discernible evolution in the use of research methodologies. Although mixed approaches were continuously used from 2013 to 2022, there was a noticeable surge in the utilisation of quantitative methods beginning in 2017. The infrequency with which qualitative methodologies and case studies were used indicates a possible avenue for future research to delve further into. Statistical Programs Utilization: The preponderance of examined papers that used the SPSS software indicates its extensive acceptability and utilisation in the field of research. The limited prevalence of other statistical software like as Nvivo, Atlastic, EXCEL, R, STATA, AMOS, and Notwithstanding, indicates a possible avenue for future study to broaden the range of statistical analysis tools used. Research Tools Predominance: Surveys have been identified as the prevailing research instrument, with a considerable proportion of investigations only using them. This phenomenon highlights the need of integrating a wider array of research instruments and techniques in order to get a more comprehensive selection of data and insights. Geographical Distribution of Studies: The examination revealed a considerable concentration of research in certain nations, including Malaysia, China, the United States, Australia, and Spain, whereas studies from other regions were conspicuously underrepresented. This observation suggests that more research is required to investigate human resource development across a more diverse array of cultural and geographical settings. Future Research Directions: The results emphasise the need of using a wider range of research techniques, with a specific focus on qualitative approaches and case studies. Further investigation is required to include a broader spectrum of geographic regions, with an equal emphasis on established and emerging nations, to get a more holistic understanding of human resource development within distinct socioeconomic and cultural milieus. Addressing Research Gaps: Significant gaps were detected in the existing corpus of data, namely with the use of diverse research methodologies, the geographic distribution of studies, and the extent of statistical analysis. Further research should be conducted to fill up these knowledge gaps, so enhancing the breadth and depth of knowledge on human resource development at institutions of higher education.

In conclusion, although the current body of research offers valuable insights into the development of human resources in higher education. But there are some aspects that still need further research, as they can be considered at the same time as practical applications awaiting research, study and exploration, including:

1) Further investigation is unequivocally required to incorporate a wider range of research methodologies, a more extensive geographical scope, and more comprehensive statistical analysis. Implementing this methodology would not only contribute to the current corpus of knowledge but also guarantee a more comprehensive comprehension of the discipline in various international settings.
2) There is a new research need to study the use of technology in developing human resources skills in higher education institutions and measuring their effectiveness. Such as artificial intelligence, whose applications include almost all disciplines, and nanotechnology related to related fields such as physics, mechanical, biological, and chemical engineering., and other technology. As this matter has not been researched, and it is indeed important in light of the rapid cognitive and technological progress.
3) Of course, when applications of modern technology, such as artificial intelligence, nanotechnology, etc., are employed in the field of human resources, future research will require attention to studying the human and ethical controls that regulate the use of

technology in order to protect humanity and avoid unethical uses. Future research will also require focusing on studying how to employ this technology, such as artificial intelligence, to develop human resources, not to reduce or replace them, this topic is considered one of the most prominent current caveats surrounding the use of artificial intelligence.

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