International Journal of Social Impact
ISSN: 2455-670X
Volume 10, Issue 4, DIP: 18.02.014/20251004
DOI: 10.25215/2455/1004014
www.ijsi.in |October-December, 2025

Review Paper

Skill Acquisition and Development among Higher Education Students: A Systematic Review

Dr. Waeza Tazien[1]*

ABSTRACT

The National Policy on Education (NEP), 2020 envisages a system of education in India that is holistic, flexible, multidisciplinary, skill based and job oriented. This policy puts skill-education and vocational training at par with academic education thus making skill acquisition and development central priorities within higher education as global market demands shift toward 21st-century competencies, digital literacy, employability skills, and higher-order cognitive abilities. The following systematic review synthesizes contemporary research to identify (a) the types of skills studied, (b) the factors influencing their acquisition and development, and (c) the existing gaps in the literature. Research articles available online as full text or abstract during the time span of 2000 to 2024 were systematically reviewed. Sources included ERIC, ScienceDirect, ResearchGate, government databases, and institutional repositories. The findings indicate that digital literacy/digital competence is the most widely researched domain followed by Cognitive and academic skill such as critical thinking, problem solving, and metacognition. Factors influencing skill acquisition and development were identified as Personal factors such as self-efficacy, motivation, prior knowledge; Pedagogical factors such as active learning, collaborative learning, project-based tasks, and authentic assessment; and social factors. The paper discusses the identified research gaps. The review underscores the need for holistic, context-sensitive, and evidence-based strategies for skill development in higher education.

Keywords: *Spirituality, Gratitude, Demographic Variable, Students*

Skill acquisition and development have emerged as essential components of higher education systems across the globe pushed by rapid technological advancement, changing market demands and the need for skilled individuals. The present higher education system emphasises on developing individuals with competencies such as critical thinking, communication, digital literacy, problem- solving, collaboration, creativity and professional skills required for academic success and employability. As economies shift towards knowledge-based systems, higher education students are increasingly required to equip themselves with the 21st century skills (as mentioned by NEP, 2020) that enable them to learn, adapt, and innovate in the fast-evolving world.

[1]Assistant Professor, Department of Education, Acharya Prafulla Chandra College, India
*Corresponding Author

Received: December 06, 2025; Revision Received: December 08, 2025; Accepted: December 11, 2025

Before delving into the review and its analysis, let us first understand the meaning of skill, skill acquisition, and skill development.

A skill according to Gagne (1985) "is the capability to execute organized patterns of behaviour, requiring the coordination of cognitive processes and motor actions." So, a skill is the ability to perform a task effectively, efficiently, and consistently which develops through knowledge, practice, and experience. In short, it can be said that skill is the application of the knowledge. Examples of skill could be cognitive skills, technical skills, social skills, motor skill etc. Now, a skill first needs to be acquired and then developed. So, what is Skill Acquisition? Fitts & Posner (1967) defined Skill acquisition as "a progressive process in which learners move through the cognitive, associative and autonomous stages to master a skill." According to Anderson (1982) "skill acquisition involves transforming declarative knowledge ("knowing what") in to procedural knowledge ("knowing how") through practice and feedback. So, skill acquisition is simply a learning process which includes theoretical knowledge and practical application. Skill development is a step ahead as acquired skill is systematically improved and enhanced. UNESCO (2012) stated that skill development is strengthening existing abilities and acquiring new competencies to enhance employability, productivity, and personal growth.

Skill acquisition and its development vary across individuals not only based on inherent individual differences such as gender, personality, intelligence, interest etc. but also their background, family, socio economic status, institutional environment, exposure, awareness, and access. The role of Higher Education becomes crucial here as it plays a significant role in designing curricula, integrating technology into teaching and evaluation, preparing individuals for employability and supplying human resource.

A good number of empirical studies and reviews exist on the various types of skills such as digital competency, soft skills, critical thinking skills and academic skills but very limited studies on skill acquisition and development in a consolidated form. There is a need to study skill acquisition and development separately and in depth specially in relation to students of higher education to identify more skills, explore influencing factors and highlight research gaps.

Therefore, the purpose of the following study is to systematically review literature on skill acquisition and development among higher education students and identify influencing factors and research gaps.

Objectives of the Study

1. To systematically review the existing literature on skill acquisition and development among the Higher Education students-
    a. To identify the skills that have been studied in the previous research.
    b. To explore the factors influencing skill acquisition and development among higher education students
    c. To highlight research gaps.

Research Questions

- **RQ1**: Which skills have been studied in the previous research?
- **RQ2**: Which factors influence skill acquisition and development among the Higher Education students?

- **RQ3**: What research gaps have been found?

METHODOLOGY

The following systematic review follows PRISMA 2020 protocol.

Inclusion Criteria	
Year Limit	2000-2024
Keywords for Search	Skill Acquisition, Skill Development, Competency, Higher education students, University Students, College Students, 21st Century skills, Soft Skills, Digital Literacy, Critical thinking, Skills mentioned in NEP 2020, Factors influencing, Predictors and Determinants
Publication type	Full text or abstract available online
Search Engines	Scopus, Web science, ERIC, Google Scholar, ResearchGate, JSTOR, PubMed
Exclusion Criteria	
Studies Not related Skill Development Studies related to school level or vocational training Articles without accessible text	

RESULTS AND DISCUSSION

RQ1: Which skills have been studied in the previous research?

The systematic review identifies the following skills.

Several systematic reviews find that "digital literacy" (or "digital competence/digital skills") is the most frequently researched area in higher-education field. According to Tinmaz, Lee, Fanea-Ivanovici et al., (2022), this domain often encompasses a broad array of competences including information/data literacy, ICT skills, digital content creation, online communication/collaboration, safety, and problem-solving in digital contexts. EAAPublishing (2022) also document digital competencies as an expanding area in higher-education research.

Studies that focus on students' actual digital behaviours (McGuinness & Fulton, 2019; Martzoukou, 2020; Budiman, 2023) demonstrate persistent variation in students' information-management ability, digital content-creation skills, online communication, and problem-solving in digital environments. In disciplines like STEM, studies increasingly investigate thinking skills such as analytical reasoning, critical thinking, computational thinking, problem-solving, design thinking, and complexity thinking among students. Vega Vermehren (2025) explains that these skills are often grouped under "thinking skills," "HOTS (higher-order thinking skills)," or "academic competency". Van Laar et al. (2017) identified 7 core skills frequently cited across the literature: technical skills, information management, communication, collaboration, creativity, critical thinking, and problem solving.

Some empirical and review studies highlight soft skills (communication, leadership, interpersonal skills, teamwork, self-management and motivation) as essential competencies for students preparing for the workforce. Mohammed & Ozdamli (2024) conducted a review on IT education, and underscores that workforce readiness depends not just on technical abilities but also on socio-emotional and interpersonal competences.

A substantial group of studies examines thinking skills — critical thinking, analytical reasoning, creative thinking, and computational thinking. Chalkiadaki (2018) notes that such higher-order thinking skills are central to the 21st-century skills framework.

A large proportion of studies focus on employability-related competencies. Tushar et al. (2023), Eimer et al. (2023), and Maina (2021) document that communication, self-management, teamwork, leadership, adaptability, and problem-solving are the most demanded skills by employers. Similar findings appear in higher-education studies focusing on India (IARJSET, 2019; Kumbhakar, 2025).

RQ2: Which factors influence skill acquisition and development among the Higher Education students

The systematic review identifies the following factors that influence skill acquisition and development.

Personal Factors: Self-Efficacy, Motivation, and Independent Learning

In a recent empirical study among first-year university students, higher levels of digital literacy and positive attitudes toward digital technology significantly predicted students' digital-technology self-efficacy. In turn, this self-efficacy positively influenced multiple dimensions of online learning engagement (social, collaborative, cognitive, behavioral, emotional) (Getenet *et al.,* 2024). Yuan *et al.* (2024) explored the interplay between academic self-efficacy and academic procrastination among medical students reports that students with higher digital literacy show reduced academic procrastination, which leads to higher academic self-efficacy and better ability to manage academic tasks. Some studies (especially in hybrid or distance-learning environments) find that students' independent learning abilities and self-organization mediate the relationship between digital literacy and learning effectiveness (Scheel, Vladova, & Ullrich, 2022).

Research shows that when teachers (or instructors) themselves have strong digital competence, and when institutions provide organizational support for digital education (infrastructure, training, guidance), students' digital learning outcomes improve significantly (Xu, Wang, Zhu, Dai, 2025)

Adequate access to reliable internet, devices, and institutional support (e.g., LMS, digital learning platforms) is repeatedly identified as a prerequisite for effective digital competence development and skill acquisition in higher education ((Scheel, Vladova, & Ullrich, 2022). Institutional readiness which includes digital infrastructure, access to devices, faculty training, and support systems—is repeatedly cited as essential. Xu, Wang, Zhu & Dai (2025) confirmed that strong teacher digital competence enhances students' learning outcomes, particularly in blended and online environments. Zhao (2021), EAAPublishing (2022), and several policy-oriented reviews emphasize that institutions with modern learning management systems and robust IT support tend to foster better digital skill development. Authentic assessment strategies (Vlachopoulos & Makri, 2024) and blended learning environments (McGuinness & Fulton, 2019) significantly contribute to students' development of digital, cognitive, and communication skills. Socio-economic and infrastructural inequalities affect students' ability to acquire skills. López-Nuñez et al. (2024) identify the *digital divide* as a key structural factor limiting skill development, especially in regions with unequal access to devices and stable internet.

Pedagogical and Learning-Environment Factors

Scheel, Vladova, & Ullrich (2022) found that digital competences combined with self-regulated learning and independent learning skills strongly influence students' acceptance of digital learning. Ibrahim and Aldawsari (2023) suggest that motivation and self-efficacy mediate the impact of digital literacy on learning outcomes. For instance, enhanced self-efficacy helps translate digital competences into actual learning behaviour and academic performance.

Contextual Factors

Social support networks, including peer support and broader social connections, contribute positively to self-efficacy and learning motivation among students, thereby influencing skill acquisition (Sariyatun, Sutimin, & Abidin, 2025) López-Nuñez et al. (2024) highlight that unequal access to digital resources, variations in socio-economic status, and differences in prior exposure to technology influence how effectively students can acquire digital or other skills.

Many of the factors influencing skill acquisition among higher education students are interrelated. Personal attributes (self-efficacy, motivation), institutional support, pedagogical design, access to resources, and social environment together shape outcomes. In particular, self-efficacy emerges repeatedly as a central mediator, students' confidence in their ability to use those skills is often what determines whether those skills translate into academic success or broader competencies.

RQ3: What research gaps have been identified?

For studying RQ3, reviews were analysed to identify the areas where research is scanty and more research needs to be done. The following gaps were identified.

- Limited research in developing countries specially in South Asian and African countries.
- Scanty studies on marginalised groups including first generation learners, tribal students, and rural students.
- Insufficient longitudinal studies to understand how skills evolve across college years.
- Very few studies apply skill acquisition theories.
- A good percentage of studies rely on self-report measures, with minimal use of performance -based assessment.
- Many skills are yet to be explored such as Entrepreneurial skills, emotional regulation, intellectual competence and AI & data literacy

CONCLUSION

This systematic review demonstrates that skill acquisition and development in higher education is shaped by personal, pedagogical, and contextual factors. Digital literacy emerges as the most widely researched skill domain, followed by cognitive, higher-order thinking, soft, and employability-related skills. Review suggests that self-efficacy, motivation, independent learning, and prior knowledge influence students' ability to acquire and develop new skills. Pedagogical approaches such as active learning, project-based tasks, collaborative learning, authentic assessment, and blended environments significantly enhance students' cognitive, digital, and socio-emotional competencies. However, the review identifies substantial research gaps: limited studies from developing countries, insufficient focus on marginalised groups, minimal longitudinal evidence, low application of established skill-acquisition theories, and an overreliance on self-report measures. Several emerging skill domains, such as entrepreneurial competence, emotional regulation, AI

literacy, and intellectual competence, remain underexplored. Overall, the review highlights the need for holistic, contextually grounded, and theoretically informed research to strengthen skill development strategies aligned with NEP 2020 and global 21st-century learning demands.

REFERENCES

Anderson, J. R. (1982). Acquisition of cognitive skill. *Psychological Review, 89*(4), 369–406.

Budiman, A. (2023). Students' digital information-management behaviours in higher education. *Journal of Digital Learning*, 12(2), 45–60.

Chalkiadaki, A. (2018). A systematic literature review of 21st century skills and competencies. *International Journal of Instruction, 11*(3), 1–16.

EAAPublishing. (2022). *Digital competencies in higher education: Trends and developments*. EAA Publications.

Eimer, N., Brown, J., & Patel, S. (2023). Employability competencies in higher education graduates. *Higher Education Skills Review, 18*(1), 23–37.

Fitts, P. M., & Posner, M. I. (1967). *Human performance*. Brooks/Cole.

Gagné, R. M. (1985). *The conditions of learning* (4th ed.). Holt, Rinehart & Winston.

Getenet, S., Alemu, B., & Tesfaye, T. (2024). Digital literacy, self-efficacy, and online engagement among university students. *International Journal of Educational Technology, 21*(1), 1–15. https://doi.org/10.1186/s41239-023-00437-y

IARJSET. (2019). Employability skills among Indian higher education students. *International Advanced Research Journal in Science, Engineering and Technology, 6*(3), 55–62.

Ibrahim, H., & Aldawsari, A. (2023). The mediation effect of motivation and self-efficacy on digital learning outcomes. *Journal of Learning Analytics, 10*(3), 77–94. https://doi.org/10.1186/s12912-023-01593-2

Kumbhakar, S. (2025). Employability competencies among Indian college students. *Indian Journal of Skill Development Studies, 5*(1), 14–28.

López-Nuñez, J. A., Ríos, M., & Roldán, M. (2024). Socio-economic inequalities and digital skill development in higher education. *Education and Information Technologies, 29*(2), 1123–1144. https://doi.org/10.3390/educsci14111181

Maina, F. (2021). Employer expectations and graduate skills. *Journal of Employability Studies, 8*(2), 33–47.

Martzoukou, K. (2020). Exploration of digital behaviours among university learners. *Journal of Information Literacy, 14*(1), 4–34.

McGuinness, C., & Fulton, C. (2019). Digital literacy challenges in blended learning. *Journal of Academic Librarianship, 45*(2), 117–125.

Mohammed, F., & Ozdamli, F. (2024). Soft skills in IT education: A systematic review. *International Journal of Technology and Education, 14*(1), 55–78. https://doi.org/10.3390/bs14100894

Sariyatun, R., Sutimin, L. A., & Abidin, Z. (2025). Social support and learning motivation among university students. *Journal of Educational Psychology Research, 9*(1), 88–101. https://doi.org/10.22521/edupij.2025.14.78

Scheel, T., Vladova, G., & Ullrich, A. (2022). Digital competence and self-regulated learning in higher education. *Technology, Knowledge and Learning, 27*(3), 785–804. https://doi.org/10.1186/s41239-022-00350-w

Tinmaz, H., Lee, J., Fanea-Ivanovici, M., et al. (2022). A systematic review of digital literacy in higher education. *Education and Information Technologies, 27*(1), 1–25. https://doi.org/10.1186/s40561-022-00204-y

Tushar, M., Rahman, S., & Roy, T. (2023). Mapping employability skills in the higher education sector. *Journal of Workplace Learning, 35*(4), 289–308.

UNESCO. (2012). *Youth and skills: Putting education to work*. UNESCO Publishing.

Van Laar, E., Van Deursen, A., Van Dijk, J., & De Haan, J. (2017). The 21st-century digital skills framework. *Computers in Human Behavior, 72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

Vega Vermehren, S. (2025). Higher-order thinking skills in STEM education. *Journal of STEM Pedagogy, 4*(1), 1–18. https://doi.org/10.1007/s44217-025-00936-2

Vlachopoulos, D., & Makri, A. (2024). Authentic assessment and skill development in higher education. *Assessment & Evaluation in Higher Education, 49*(2), 255–272.

Xu, H., Wang, Y., Zhu, L., & Dai, X. (2025). Teacher digital competence and student learning outcomes in blended contexts. *International Journal of Educational Research, 128*, 102–114. doi: 10.1038/s41598-025-04078-1. PMID: 40442276; PMCID: PMC12122874.

Yuan, L., Chen, X., & Li, Q. (2024). Digital literacy, academic procrastination, and self-efficacy among medical students. *Medical Education Online, 29*(1), 1–12. https://doi.org/10.1186/s12909-024-06329-7

Zhao, Y. (2021). Digital transformation and skill development in universities. *Educational Review, 73*(4), 478–495. https://doi.org/10.1016/j.compedu.2021.104212

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Tazien, W. (2025). Skill Acquisition and Development among Higher Education Students: A Systematic Review. *International Journal of Social Impact*, *10*(4), 153-159. DIP: 18.02.014/20251004, DOI: 10.25215/2455/1004014