

Integrating Industry-Relevant Skills in Home Science Curriculum through Hybrid Learning: A Study on Indian Higher Education

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Abstract

The increasing emphasis on employability and competency-based education necessitates the systematic integration of industry-relevant skills within higher education curricula. Despite its applied and interdisciplinary nature, Home Science education in India continues to exhibit a predominant reliance on theoretical instruction, resulting in a mismatch between academic outcomes and industry expectations. Hybrid learning, combining face-to-face and digital instructional modalities, presents a viable framework for addressing this gap.

This study investigates the extent and effectiveness of integrating industry-relevant skills into the Home Science curriculum through hybrid learning in Indian higher education institutions. A descriptive and analytical research design was employed, utilizing both quantitative and qualitative approaches. Data were collected from undergraduate and postgraduate Home Science students and faculty members using structured questionnaires and semi-structured interviews. Respondents were selected through purposive sampling to ensure exposure to hybrid learning environments. Data analysis involved descriptive statistical techniques and thematic analysis to interpret patterns and perceptions related to skill acquisition and pedagogical effectiveness.

The findings reveal that hybrid learning significantly enhances students' practical competencies, digital literacy, and industry readiness by facilitating experiential learning, virtual industry engagement, and flexible curriculum delivery. Faculty responses indicate that hybrid pedagogies support curriculum innovation and industry alignment; however, constraints related to technological infrastructure, faculty training, and institutional readiness persist.

The study concludes that the strategic adoption of hybrid learning models can effectively strengthen the integration of industry-relevant skills within Home Science education, thereby improving graduate employability. The findings offer empirical insights for curriculum developers, academic administrators, and policymakers seeking to advance skill-oriented reforms in Indian higher education.

Keywords: Home Science Education; Industry-Relevant Skills; Hybrid Learning; Skill-Based Curriculum; Indian Higher Education; Employability; Industry–Academia Integration

Introduction

In the contemporary global educational landscape, the primary objective of higher education has shifted beyond the mere dissemination of theoretical knowledge toward the development of industry-relevant

skills among learners. In a developing country like India, with a large youth population, higher education institutions bear a critical responsibility to design curricula that are skill-oriented, practice-based, and aligned with employment opportunities. In this context, **Home Science**, as an interdisciplinary field, holds significant potential to bridge the gap between academic learning and industry requirements.

Home Science encompasses diverse and applied domains such as Nutrition and Dietetics, Textile and Apparel Designing, Human Development, Family Resource Management, and Community Development. Despite its practical orientation, Home Science curricula in Indian higher education institutions often remain predominantly theoretical, with limited integration of contemporary industry-specific competencies. As a result, graduates frequently face challenges in meeting the evolving expectations of the job market, highlighting the need for curriculum innovation and pedagogical reform.

The emergence of **Hybrid Learning**, particularly in the post-COVID-19 era, has transformed teaching–learning processes by combining face-to-face instruction with digital and online learning modes. Hybrid learning offers flexibility, accessibility, and opportunities for incorporating virtual laboratories, online skill modules, industry-led workshops, internships, and project-based learning within academic programs. This blended approach is especially relevant for skill-oriented disciplines such as Home Science, where experiential learning is essential.

The present study examines the **integration of industry-relevant skills into the Home Science curriculum through hybrid learning in Indian higher education**. It seeks to explore the effectiveness of hybrid learning models in enhancing students' practical competencies, employability, and readiness for industry engagement. Additionally, the study analyses the challenges and prospects associated with implementing hybrid learning frameworks in Home Science education.

This research aims to contribute to curriculum development, pedagogical strategies, and policy formulation by providing insights for educators, academic planners, and policymakers. By aligning Home Science education with industry needs through hybrid learning, higher education institutions can foster skill development, entrepreneurship, and sustainable career pathways for students.

Literature Review

Recent studies emphasize that the alignment of higher education curricula with industry requirements is essential for enhancing graduates' employability and practical competence. **According to World Economic Forum (2020)**, skill gaps remain a major challenge in higher education, particularly in applied and interdisciplinary disciplines. Researchers have highlighted that traditional content-heavy curricula often fail to equip students with job-ready skills, thereby necessitating pedagogical innovations focused on experiential and competency-based learning.

Kumar and Gupta (2019) found that curriculum designs incorporating industry exposure, practical training, and project-based learning significantly improve students' workplace readiness. In the context of Home Science education.

Sharma (2021) observed that despite the subject's applied nature, inadequate industry linkage and limited hands-on training restrict students' professional growth. The role of hybrid learning in skill development has gained prominence in recent years.

Garrison and Vaughan (2018) described hybrid learning as an effective instructional approach that combines the strengths of face-to-face and online learning environments.

Singh and Mishra (2020) revealed that hybrid learning enhances learner engagement, flexibility, and access to industry-oriented digital resources, making it particularly suitable for skill-based disciplines.

In the Indian higher education context, research indicates that hybrid learning has positively influenced teaching–learning processes post-pandemic.

Patil et al. (2022) reported that blended and hybrid learning models enable institutions to integrate virtual labs, online certification courses, and industry expert interactions into regular curricula. These approaches have been found to improve students' technical skills, digital literacy, and self-directed learning abilities. Specific to Home Science, limited but emerging literature supports the use of innovative pedagogies.

Verma and Kaur (2021) emphasized the need to modernize Home Science curricula by incorporating digital tools, entrepreneurial skills, and industry-relevant training. Their study suggested that hybrid learning can effectively support skill acquisition in areas such as nutrition counselling, apparel designing, early childhood care, and community-based services.

Overall, the reviewed literature highlights a growing consensus on the importance of integrating industry-relevant skills through hybrid learning models in higher education. However, there is a noticeable research gap concerning systematic studies focused on Home Science education in the Indian context. The present study seeks to address this gap by examining the effectiveness and challenges of integrating industry-oriented skills into the Home Science curriculum through hybrid learning.

Objectives

1. To examine the need for integrating industry-relevant skills into the Home Science curriculum in Indian higher education.
2. To explore the role of hybrid learning in facilitating the integration of industry-oriented skills in Home Science education.
3. To analyse the effectiveness of hybrid learning models in enhancing practical competencies and employability of Home Science students.
4. To identify the opportunities and challenges associated with implementing hybrid learning for skill development in Home Science programmes.
5. To suggest strategies for strengthening industry–academia collaboration through hybrid learning in Home Science curricula.

Methodology

Research Design

The study adopted a descriptive and analytical research design to examine the integration of industry-relevant skills in the Home Science curriculum through hybrid learning in Indian higher education institutions. A mixed-methods approach was employed to obtain both quantitative and qualitative insights regarding the effectiveness, implementation, and challenges of hybrid learning practices.

Population of the Study

The population consisted of undergraduate and postgraduate Home Science students and faculty members from Indian higher education institutions offering recognized Home Science programs and implementing hybrid or blended learning models.

Sample and Sampling Technique

A total sample of **100 respondents** was selected using a **purposive sampling technique**, ensuring the inclusion of participants with direct exposure to hybrid learning environments. The sample comprised:

- Home Science students (UG and PG)
- Home Science faculty members

The respondents represented major specializations within Home Science, including **Nutrition and Dietetics, Textile and Apparel Designing, Human Development, Family Resource Management, and Community Extension.**

Sampling Frame

The sampling frame included selected higher education institutions offering Home Science programs where hybrid learning practices were operational. Within these institutions, the sampling frame consisted of enrolled students and teaching faculty actively engaged in hybrid instructional practices.

Tools for Data Collection

Data were collected using the following tools:

1. **Structured Questionnaire** developed by the researcher to assess perceptions of industry-relevant skills, hybrid learning effectiveness, and employability outcomes.
2. **Semi-Structured Interviews** with selected faculty members to obtain qualitative insights into curriculum design, industry linkage, and pedagogical challenges.

Sample Training

Prior to data collection, **orientation and sample training** were conducted for the 100 respondents. The training was delivered through a **hybrid mode** and focused on familiarizing participants with the objectives of the study, hybrid learning platforms, industry-oriented skill modules, and questionnaire response procedures. This step enhanced response accuracy and reliability.

Validity and Reliability

Content validity of the research instruments was ensured through expert review by specialists in **Home Science education and educational technology**. A pilot study was conducted, and reliability was established using appropriate statistical measures to ensure internal consistency.

Procedure of Data Collection

Necessary permissions were obtained from the concerned institutions. Data were collected through **online and offline modes**. Participation was voluntary, and informed consent was obtained from all respondents.

Methods of Data Analysis

Quantitative data were analysed using **descriptive statistical techniques** such as frequency, percentage, mean, and standard deviation. Qualitative data obtained from interviews were analysed using **thematic analysis** to supplement quantitative findings.

Ethical Considerations

Ethical standards were strictly followed. Confidentiality and anonymity of respondents were maintained, and data were used solely for academic research purposes.

Results and Discussion

Demographic Profile of Respondents

Out of the total **100 respondents**, the majority were **undergraduate and postgraduate Home Science students**, while the remaining participants were faculty members teaching Home Science subjects using hybrid learning approaches. Respondents represented major specializations such as Nutrition and Dietetics, Textile and Apparel Designing, Human Development, Family Resource Management, and Community Extension. This diversity ensured a comprehensive assessment of hybrid learning practices across Home Science domains.

Awareness of Industry-Relevant Skills

The findings revealed that a substantial proportion of respondents demonstrated **moderate to high awareness of industry-relevant skills** required in the Home Science sector. Students associated industry relevance primarily with practical competencies, digital skills, entrepreneurship, and professional certification. Faculty members emphasized the importance of aligning curriculum outcomes with industry standards and emerging occupational roles. These findings support earlier studies highlighting the need for industry–academia alignment in applied disciplines.

Effectiveness of Hybrid Learning in Skill Development

A significant majority of respondents reported that **hybrid learning enhanced practical skill acquisition** compared to traditional classroom instruction. The integration of online modules, virtual demonstrations, industry-oriented assignments, and experiential learning activities was perceived as effective in improving technical proficiency and conceptual clarity. Students indicated that hybrid learning facilitated self-paced learning and greater exposure to industry practices, while faculty acknowledged improved instructional flexibility and engagement.

Impact on Employability and Industry Readiness

Results indicated a positive relationship between hybrid learning and **students' perceived employability and industry readiness**. Respondents reported improved confidence in applying theoretical knowledge to real-world contexts, particularly in areas such as nutrition counselling, apparel designing, early childhood care, and community-based services. Faculty members noted that hybrid learning enabled the inclusion of industry experts, virtual internships, and project-based learning, thereby strengthening career-oriented outcomes.

Challenges in Implementing Hybrid Learning

Despite its advantages, respondents identified several challenges in implementing hybrid learning effectively. Key issues included **inadequate technological infrastructure**, limited access to digital resources, lack of formal industry partnerships, and the need for continuous faculty training. Students from resource-constrained backgrounds reported difficulties in accessing stable internet connectivity. These findings highlight the need for institutional support and policy-level interventions to ensure equitable and sustainable implementation.

Faculty Perspectives on Curriculum Integration

Faculty responses underscored the potential of hybrid learning to support **curriculum innovation and**

skill-based education. However, they emphasized the need for structured curriculum frameworks, institutional incentives, and collaboration with industry stakeholders. The findings align with national education reforms advocating outcome-based and skill-oriented curricula.

Discussion

The results of the study indicate that hybrid learning serves as an effective pedagogical approach for integrating industry-relevant skills into the Home Science curriculum in Indian higher education. The positive perceptions of students and faculty corroborate existing literature on blended and hybrid learning models in skill-based education. However, the identified challenges suggest that successful implementation requires systematic planning, infrastructure development, and faculty capacity building. The findings also support national policy directions emphasizing employability, digital learning, and industry engagement in higher education.

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