LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374E-ISSN:1855-363X
VOL.22,NO.S1(2024)

ENABLING STRATEGIES FOR SLOW LEARNERS IN BUILDING INDUSTRY 4.0 SKILLS AND ASSESS THE PREPAREDNESS FOR EMPLOYABILITY

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ABSTRACT

The Industry 4.0 refers to the fourth industrial revolution. It calls for a dynamic transformation of how all aspects of business and production are done. A new wave of global technology will change global production. Internationalization, in all aspects of business and industry, will be the norm. The research study onenabling strategies for slow learners in building industry required skills and assess the preparedness for employability is a quantitative as well as qualitative aspects of research on both primary and secondary data collection. A probability sampling method is adopted because the data is collected and analyzed in a statistically valid way, the results of quantitative analysis can be easily standardized and shared among researchers. A sample size of 120 slow learners from various industries to analysis and evaluate through experimental. The research has achieved its research objective to develop a proposed framework from an extensive literature review and in-depth analysis of the findings obtained from slow learners in building industry skill and assesses the preparedness for employability. Institutions also plays a vital role in student's future career, it should focus on enabling new strategies and provide practical hands on training, Career counseling, Industry specific teaching and learning experience and real-time technological exposure for students to fulfill corporate expectations and Industry requirements through which the institution can bridge the demand supply of corporate and industries.The male respondents are 67% at the age group of 20-30 years age with a educational level on 58% are studied in public university. Both the business and technical skills are not having a relationship between enabling strategies for slow learners in building industry and assess the preparedness for employability.

Keywords: Industry 4.0, slow learners, business skill, technical skill, employability

Introduction

Industry 4.0 refers to the fourth industrial revolution. It calls for a dynamic transformation of how all aspects of business and production are done. A new wave of global technology will change global production. Internationalization, in all aspects of business and industry, will be the norm. Countries can no longer remain confined within their borders but must become citizens of the world. Leaders in this new era will need to be critical thinkers, problem solvers, and be able to interact across the globe. In short, they need to be liberally educated, but how should this impact on education. In the future workers will need to be highly trained in the emerging technologies but also, as importantly, in the values associated with using those technologies. In the future, it must not only possess the ability to develop the technology but also to know whether, when, and where to use that technology. This kind of thinking is both reflective and interdisciplinary. Schools must reinvent themselves quickly. They need to adapt to the demands of the RI4 and have the obligation to come out of its shell, its hermetic spaces and try to give as many opportunities as possible by creating the adequate contexts for students to be prepared for the future jobs. The problem in the future could not

be the lack of employment, but the shortage of skills that the new jobs will demand. The students need to understand how they can correlate and use and apply different knowledge in diversified contexts, what they really mean and how they can create synergies among different subjects to develop/create "something" that connects to the real world. This takes us to another very important point: students need to work in a framework of projects and from there they need to collaborate with their colleagues, with their teachers and with the outside world. They need to develop new ways of communicating; they need to be put in front of complex situations to develop critical thinking and complex problem solving and to learn how to be imaginative, creative, adaptable, and flexible and to develop brain plasticity.In other words, Industry 4.0 will require the world to produce a new kind of workera knowledge worker! Tomorrow's industry leaders and managers must possess new skill sets to adapt, to manage, and to take advantage of Industry 4.0. They must be critical thinkers, problem solvers, innovators, communicators, and provide value driven leadership. They must be able to see beyond the technology at play to the implications for society for the use of that technology. These traits define the knowledge worker. They must know the technology but be able to meet and solve all aspects of the challenges engendered by this technology. This kind of leader requires a new approach to education. As Alex Gray (2016) states "Change won't wait for us: business leaders, educators and governments all need to be proactive in up-skilling and retraining people so everyone can benefit from the Fourth Industrial Revolution". So, we have the obligation to create the models and contexts to allow it to happen, otherwise we will have a generation with no skills shortage for the new demands of the labor market and that will become a big problem to society.

Literature Review

AyuHartini 2017, they stated that Children with slow learning problem or a slow learner are those who have low learning achievement or slightly below average of children in general. Today, the children slowly learn many encountered not only in school inclusion, but in regular schools too. Teachers who do not have adequate experience will find it difficult to deal with in the classroom. So the goal of this research is to find appropriate learning strategies for slow learners in elementary school.**DanayTinawin, Robina, 2022**, The employability of ICT graduates is a critical issue that needs to be addressed by Higher Education Institutions (HEIs). It can be argued that there are different challenges for higher education institutions, employers, and regulatory bodies around graduates' readiness to join the modern workplace. This study seeks to investigate the challenges Higher Education Institutions face in designing and delivering an industry-driven curriculum that would satisfy the expectations and requirements of students, academics, regulatory bodies, and employers. It aims to address the gaps and identify the mismatches in the expectations of these stakeholders. The goal is to develop a sustainable framework for curriculum design that contains strategic and measurable provisions in curriculum delivery, ensuring that experiential learning is genuinely embedded in the ICT curriculum. The research has achieved its research goal to develop a proposed framework from an extensive literature review and in-depth analysis of the findings obtained from online surveys and focus groups involving the different stakeholders – students, alumni, academia, and employers. This study contributes to the literature where minimal research is available on collaborative design and delivery of an ICT curriculum involving the different relevant stakeholders.**Vijaya Sunder M, 2024**, the study on the role of organizational learning on Industry 4.0 (I4.0) deployments for enhancing business performance within the manufacturing industries of developing

countries. Based on a survey of 246 manufacturers from 12 developing countries recognized by Deloitte's global manufacturing competitiveness index report, a theoretically derived model was verified using structural equation modeling. This study's results show that I4.0 adoption mediates the impact of I4.0 awareness on organizational learning, and I4.0 adoption and organizational learning serially mediate I4.0 awareness and business performance toward creating smart factories. This study contributes: first, by conceptualization and operationalization of the constructs to clarify the role of organizational learning in I4.0 deployments; second, through an organizational learning hierarchy, it presents I4.0 awareness or familiarity as first-order learning, the experience of adopting I4.0 as the second-order learning, and learning that emerges from cycles of awareness and adoption together (cumulatively) as third-order or meta-learning. This study extends the microfoundations of learning capability in the I4.0 context and opens new agendas for future research and practice. It guides managers to consciously develop higher order learning in I4.0 deployments to safeguard I4.0 investments and enable competitive advantage in digitization.**Azmi, A, 2018**, Industry 4.0 is the recent topic of interest among the academicians and the society at large since it is considered as the latest era of digitalization. This era demands changes in the contents of education in general. Across disciplines, new emphasis is required on certain skills and new contents have to be added to meet changing demands. However, research on the alignment of pedagogy institutions, Industrial Revolution 4.0 is still scarce. Therefore, to fulfil this gap, this study was conducted specifically to explore teaching preferences and perceptions, as well as perceived challenges among academicians in a specific discipline, which is Tourism and Hospitality in the face of Industry 4.0. Twelve respondents were interviewed and guided by in-depth semi-structured interview questions. The transcription of the interview was analysed using a thematic analysis. Six themes surfaced through the analysis. The findings disclose that the academicians prefer conventional and hands-on methods of teaching. Apart from that, the challenges faced by the academicians in teaching the Tourism and Hospitality students towards Industry 4.0 include the lack of facilities and limited Internet accessibility. In addition, the study found that those teaching the Tourism and Hospitality courses perceive that in implementing Higher Education 4.0 in the era of Industrial Revolution 4.0, the use of e-Learning and Immersive Learning is crucial. Findings from this study are beneficial for the policy-makers in the higher institutions since the teaching preferences are highlighted by the Tourism and Hospitality academicians, as well as issues related to the challenges towards Industry 4.0 that they are facing.

Business Skills

- Complex problem solving (CPS)
- Critical thinking (CT)
- Creativity (C)
- People management (PM)
- Coordinating with others (CWO)
- Emotional Intelligence (EI)
- Judgment and decision making (JDM)
- Service Orientation (SO)
- Negotiation (N)
- Cognitive Flexibility (CF)

Technical skills

- Quantitative skill (QS)
- Programming Skill (PS)
- Data Interpretation skill(DIS)
- Data visualization skill (DVS)
- Virtual collaboration skill (VCS)

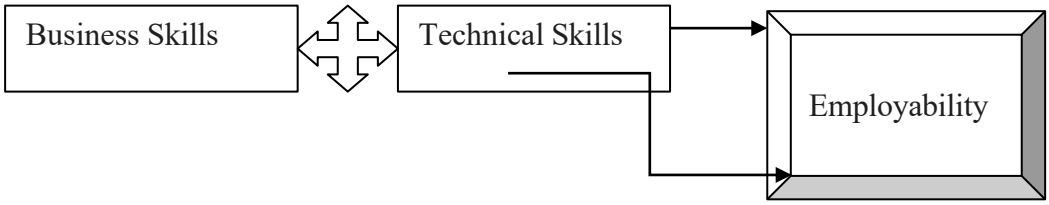
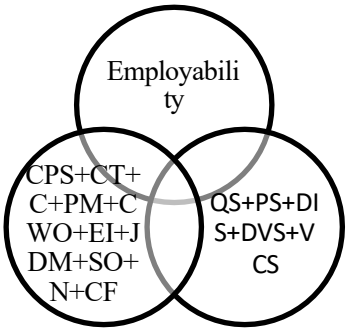


Figure:1Conceptual framework

Employability =(CPS+CT+C+PM+CWO+EI+JDM+SO+N+CF)+ (QS+PS+DIS+DVS+VCS)



Research Objectives

1. To study the business skills enabling strategies for slow learners in building industry skill and assess the preparedness for employability.
2. To Study the technical skills enabling strategies for slow learners in building industryskills and assess the preparedness for employability.

Hypothesis Testing

- **H01:**Business Skills are not important and have noenabling strategies for slow learners in building industry required skill and assess the preparedness for employability
- **H02:** Technical Skills are not important and have no enabling strategies for slow learners in building industry needed skill and assess the preparedness for employability

Research Methodology

The research study onenabling strategies for slow learners in building industry required skills and assess the preparedness for employability is a quantitative as well as qualitative aspects of research on both primary and secondary data collection. A probability sampling method is adopted because the data is collected and analyzed in a statistically valid way, the results of quantitative analysis can be easily standardized and shared among researchers. A sample size of 120 slow learners from various industries to analysis and evaluate through experimental.

Data Analysis

Table No: 1 Demographic variables

Particulars	**Factor**	**Frequency**	**Percentage**
Gender	Male	80	67
	Female	40	33
Total		**120**	**100**
Age	Below 20	30	25
	20-30	50	42
	30-40	20	17
	40-50	10	8
	Above 50	10	8
Total		**120**	**100**
Educational type	Public University	70	58
	Private University	50	42
Total		**120**	**100**

Source: Primary data

The study reveals a gender imbalance in the demographic profile of slow learners, with 67% of participants being male and 33% female. The majority of participants are 20-30 years old, with 42% being students or early career entrants exposed to Industry 4.0 skill requirements. A smaller representation is found in the 30-40 years and 40-50 years and above 50 years categories. The majority of respondents are enrolled in public universities, with 58% enrolled in public universities and 42% from private universities. This indicates that learners from both institutions are engaged in developing employability skills aligned with Industry 4.0. The demographic data emphasizes the need for inclusive strategies to bridge skill gaps across gender lines and address generational differences in preparedness. The findings emphasize the importance of tailoring enabling strategies that align with diverse learner needs and institutional contexts. These demographic insights are crucial in contextualizing the analysis of slow learners' challenges and opportunities, as preparedness for employability is influenced by cognitive and skill-building interventions and the educational and social ecosystem within which these learners are situated.

Table No: 2Descriptive statistics on business skill

Business Skill	**Mean**	**SD**	**N**
Complex problem solving (CPS)	1.097	0.5162	120
Critical thinking (CT)	1.256	0.3451	120
Creativity (C)	1.876	0.5422	120
People management (PM)	1.922	0.9451	120
Coordinating with others (CWO)	1.212	0.6564	120
Emotional Intelligence (EI)	1.324	0.6342	120
Judgment and decision making (JDM)	2.312	0.1452	120
Service Orientation (SO)	1.091	0.5243	120
Negotiation (N)	1.767	0.7425	120
Cognitive Flexibility (CF)	1.564	0.6621	120
Complex problem solving (CPS)	1.652	0.8452	120
Employability	1.872	0.3216	

Source: Primary data

The study examines the business skill levels among slow learners and their preparedness for employability in the context of Industry 4.0. The results show that judgment and decision-making are the most prominent skills, suggesting a higher capacity for evaluating alternatives and making informed choices. Service orientation and complex problem-solving score the lowest, reflecting weaker readiness in areas essential for client-centered tasks and adaptive problem-solving in dynamic business contexts. Other critical dimensions such as people management, creativity, and employability demonstrate moderate scores, indicating the latent potential of learners but also signaling the need for structured interventions. Negotiation and cognitive flexibility register intermediate values, suggesting that these learners require additional scaffolding to meet Industry 4.0's demand for versatility and adaptability. The findings suggest that slow learners are not entirely deficient in business-oriented competencies but rather have uneven development across skill domains. Targeted interventions by educational institutions could significantly enhance learners' preparedness for the future workplace, aligning with earlier research emphasizing the integration of higher-order thinking skills and soft skills in curricula.

Table No: 3Descriptive statistics on technical skill

Technical Skill	**Mean**	**Stddev**	**N**
Quantitative skill (QS)	1.331	0.3784	120
Programming Skill (PS)	1.356	0.3328	120
Data Interpretation skill(DIS)	1.467	0.4561	120
Data visualization skill (DVS)	1.423	0.4842	120
Virtual collaboration skill (VCS)	1.398	0.3677	120
Employability	1.256	0.3124	120

Source: Primary data

The study reveals that slow learners have a higher level of technical skills than their peers, which affects their employability preparedness in the context of Industry 4.0. Data interpretation and data visualization skills are the most important, indicating a greater aptitude for data processing and representation. Programming and virtual collaboration skills are moderate, indicating the potential for slow learners to adapt to digital teamwork and computational tasks. However, quantitative skills are the lowest, indicating limited proficiency in numerical reasoning, which is crucial for analytics and decision-making in Industry 4.0 contexts. The employability score derived from technical skills is lower than the means of individual technical skill domains, suggesting limited collective preparedness for employment. This highlights the need for integrated training interventions that build holistic capacity for digital transformation. Technical readiness is a critical determinant of employability in emerging digital economies, and learners with slow adaptability benefit from experiential, technology-supported pedagogy. Strengthening quantitative reasoning and programming competencies, while reinforcing collaborative and visualization skills, is essential for slow learners to thrive in Industry 4.0 workplaces.

Chi-Square analysis

H01: Business Skills are not important and have no enabling strategies for slow learners in building industry and assess the preparedness for employability

Table No: 4Relationship on Business Skills and have enabling strategies for slow learners in building industry and assess the preparedness for employability

Pearson Chi-Square	Calculated Chi-square Value	Df	Table value	S/NS	Remarks
Business Skill	23.688[a]	18	28.87	NS**	Accepted (H0)

Pearson's chi-square value of the above table is 23.688[a] and table value is 28.87 at 5% level of significant. Hence, the null hypothesis (H_0) has been accepted and the alternative hypothesis (H_1) has been rejected. There is not a significant relationship between business skills are not important and have no enabling strategies for slow learners in building industry and assess the preparedness for employability.

H02: Technical Skills are not important and have no enabling strategies for slow learners in building industry and assess the preparedness for employability

Table No: 5Relationship on Technical Skills and have enabling strategies for slow learners in building industry and assess the preparedness for employability

PearsonChi-Square	Calculated Chi-square Value	Df	Table value	S/NS	Remarks
Technical Skill	12.347[a]	8	15.51	NS**	Accepted (H0)

Pearson's chi-square value of the above table is 12.347[a] and table value is 15.51 at 5% level of significant. Hence, the null hypothesis (H_0) has been accepted and the alternative hypothesis (H_1) has been rejected. There is not a significant relationship between technical skills are not important and have no enabling strategies for slow learners in building industry and assess the preparedness for employability.

Table No: 6Reliability test on business skills on enabling strategies forslow learners in building industry and assess the preparedness for employability

Business skills on enabling strategies for slow learners	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted	Comment
Business Skill				
Complex problem solving (CPS)	43.0254	68.402	0.785	**Accepted**
Critical thinking (CT)	37.3781	55.591	0.742	**Accepted**
Creativity (C)	46.4317	78.020	0.782	**Accepted**
People management (PM)	48.7490	75.113	0.846	**Good**
Coordinating with others (CWO)	43.4314	68.546	0.873	**Good**
Emotional Intelligence (EI)	43.7321	61.647	0.881	**Good**
Judgment and decision making (JDM)	43.6733	62.093	0.884	**Good**
Service Orientation (SO)				
Negotiation (N)				

Cognitive Flexibility (CF)	41.4463	61.892	0.725	**Accepted**
	47.8872	72.873	0.834	**Good**
	47.1123	71.783	0..856	**Good**

Source: Primary data

In the above table on Reliability analysis's cronbach's Alpha values on business skills on enabling strategies for slow learners in building industry and assess the preparedness for employability the cronbach's alpha if item deleted is Judgment and decision making (JDM) is 0.884 highly internal consistency which is more than 0.8. Hence the reliability of the question is proved i.e., the questionnaire is reliable for the purpose of data analysis.

Table No: 7Reliability test on business skills on enabling strategies for slow learners inbuilding industry and assess the preparedness for employability

Technical skills on enabling strategies for slow learners	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Cronbach's Alpha if Item Deleted**	**Comment**
Technical Skill				
Quantitative skill (QS)	43.027	62.781	0.779	**Accepted**
Programming Skill (PS)	44.673	65.982	0.873	**Good**
Data Interpretation skill(DIS)	45.876	66.787	0.823	**Good**
Data visualization skill (DVS)	47.432	69.562	0.867	**Good**
Virtual collaboration skill (VCS)	44.782	64.876	0.874	**Good**

Source: Primary data

In the above table on Reliability analysis's cronbach's Alpha values on technical skills on enabling strategies for slow learners in building industry and assess the preparedness for employability the cronbach's alpha if item deleted is Virtual collaboration skill (VCS) is 0.874 highly internal consistency which is more than 0.8. Hence the reliability of the question is proved i.e., the questionnaire is reliable for the purpose of data analysis.

Conclusion

The research study onenabling strategies for slow learners in building industry required skill and assess the preparedness for employability is a quantitative as well as qualitative aspects of research. The research has achieved its research objective to develop a proposed framework from an extensive literature review and in-depth analysis of the findings obtained from slow learners in building industry skills and assesses the preparedness for employability. The male respondents are 67% at the age group of 20-30 years agewith a educational level on 58% are studied in public university. Both the business and technical skill not having a relationship between enabling strategies for slow learners in building industry skill and assess the preparedness for employability. Hence the institution should focus on enabling new strategies and provide practical hands on training,Career counseling, Industry specific teaching and learning experience and real-time technological exposure for

students to fulfill corporate expectations and Industry requirements through which the institution can bridge the demand supply of corporate and industries.

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