ICT and Experiential Learning Implementation (Openness to Challenges and Experiences) for Better Learning Outcomes

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Purpose :*The main aim of this research study is to understand the importance of AI(ICT) and Experiential learning for creating future ready professionals with future ready competencies to take on the world tomorrow. The purpose of this study is also to inform others the importance of this AI Enabled learning for enriched learning by work experience.*
Methodology: *The researcher analyses critically and concisely earlier research and literature related to a particular research topic or problem to properly understand the importance of the problem and earnestly try to solve it. Data is taken from primary source like interviewing the respondents basically University Educators and also from secondary method from the sources available in the google scholar like journal papers, books from good authors, conference proceedings, websites, reports from well-known sources, doctoral theses.*
Findings :*It shows experiential learning is more beneficial in modern times than other ordinary methods like face-to-face methods and online methods since most often in classroom learning knowledge is rarely created. Experiential learning allows face-to-face interaction with the boss (Guru) and peers(co-learners) in this case. They work on real-world problems and hence develop problem-solving skills which are very much in demand nowadays. They also develop interpersonal skills, lifelong learning skills by looking at peers or from the boss, leadership through risk-taking ability by accepting new challenges, learning to be stable economically, sentimentally, physically (health), and emotionally which is required to do work for long duration in life.*
Research limitations/implications*: Lack of proper understanding about AI and ICT terminology among respondents could lead to biased responses. The participants might overstate or understate their ICT skills. ICT tools and digital practices evolve rapidly, which may render some findings less relevant over a period of time. Access to detailed institutional data on educators' digital practices may be restricted due to institutional privacy policy.*
Originality/value : *Experiential learning method is talk of the town as traditional methods like lecturing, contextual learning by bringing problems to class environment has not been satisfactory. This experiential learning will get traction over next decade as world needs better or new breed of problem solver for problems that are unsolved in the last century and the problems that are created by other problem solvers.*
Paper type : *Conceptual and Analysis paper*
Keywords: Experiential learning, Internship, Mentorship, Job shadowing, service learning, Cooperative Education, curriculum based on entrepreneurship

1.INTRODUCTION :

(Cronin, C., 2017). and (Hug, T., 2017). explains that Education's foundation rests on the principle of openness, facilitated by knowledge sharing and collaborative creation. Open education builds upon this by employing accessible resources and practices to drive global educational improvement. This includes: removing entry barriers through open admissions, providing free access to information, utilizing adaptable open educational resources (OER),

and promoting collaborative learning through open educational practices (OEP). The concept of "open" in this field is multifaceted, encompassing free access, critical thinking, flexible regulations, community building, and open licensing models[1][2]. (Hunt, E. B., 2014)., (Warwick, K., 2012)., (Berente, N. et al., 2021)., (Brynjolfsson, E. et al., 2017)., (Amisha, Malik et al., 2019). Stresses how Educators are exploring the integration of advanced technologies, beyond Web 2.0, into university teaching. Specifically, Artificial Intelligence (AI), encompassing machine learning, IoT, Web 3.0, and robotics, is being considered to enhance teaching competence. AI, defined as the ability of machines to mimic human intelligence, is rapidly evolving. Notable advancements include improved perception through voice recognition technologies and enhanced cognition and problem-solving through machine learning, demonstrated by applications in data centre optimization, fraud prevention, and cybersecurity. The concept of distributed intelligence, viewing networked computers as a collective brain, further underscores AI's potential. AI is also making significant strides in medicine, with applications ranging from virtual health data management to robotic surgery and prosthetics. The ongoing development of AI, particularly in areas like the Turing Test, reflects a drive towards achieving human-level cognitive performance in machines[3][4][5][6][7].

2. LITERATURE REVIEW :

(Johnson, Kawana W., 2018). Illustrious Work-based learning integrates practical experience into education by addressing workplace challenges through collaborations between institutions and employers. These programs, characterized by partnerships, employee-learners, curriculum-aligned tasks, competency assessments, on-site projects, and a shared evaluation framework, provide structured learning within a professional setting [8].

The Experiential Learning Model as discussed in (Shaketange, L.,Kanyimba, A. T., & Brown, E., 2017). posits that knowledge is developed through the transformation of experience. Its rising popularity in university education is attributed to:

* Advances in training and learning technologies.

* The preference of young learners for experiential approaches.

* The value of innovative ideas generated through practical experience [9].

AI-aided education includes prediction, intelligent education, data analysis and innovative virtual learning. Emerging technologies like Embedded computers and sensors have facilitated the transfer of artificial intelligence to machines, buildings and robots (Chen, L. et al., 2020). [10]. AI can match 53% of adult competence level and are closing in on another 36% competence level as in the OECD survey.

First implementing AI-based tools to aid learning and the second employing AI tools to help in learning are the two complementary strands in AI in Education(AIEd) (Holmes, W. et al., 2020). [11]. Learning issues are solved using AI techniques in three different paradigms. In Paradigm One, to describe knowledge models and direct cognitive learning AI is employed where the beneficiaries of AI service are learners. In Paradigm Two, learners act as co-workers with AI to support learning. AI allows learners take the help of agency to learn in Paradigm Three (Ouyang, F. et al., 2021). [12]. Both AIEd and educational technology are computer applications, that challenge the teacher’s role, change the idea of class strength, and pedagogy (Schiff, D., 2021). [13]. There are 3 viewpoints on the growth of AI. The first viewpoint is “education for understanding AI”, the second viewpoint is “education using AI”, and the third viewpoint is “AI expert training” (Paek S, & Kim N., 2021). [14].

3. RESEARCH GAPS IDENTIFIED :

The research gap identified is that how different AI technologies like Web 3.0,IoT and Robotics would transform the education scenario in the classroom and in the campuses of Education institutions. And see how this AI technologies help to build a smarter world or smarter Society for good governance in the institutions and in the states.

There is a research gap for determining the skillset learned during the practical or work-based learning especially in the case of industrial internship learning.

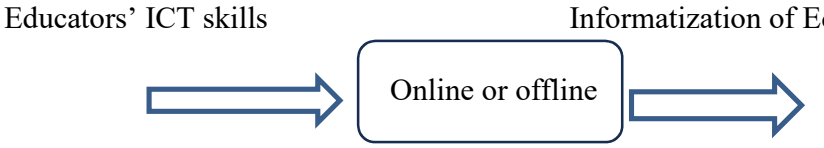
4. OBJECTIVES OF THE STUDY :

For the research study researcher has put forward the below-mentioned objectives that are to be fulfilled for:

1. To Investigate how Web 3.0, IoT and Robotics can help in higher education scenarios through ICT mechanisms for digital delivery of information [for primary data findings].
2. To prove that informatization of Education is it because of gender, work experience or social support [for primary data findings].

5. METHODOLOGY :

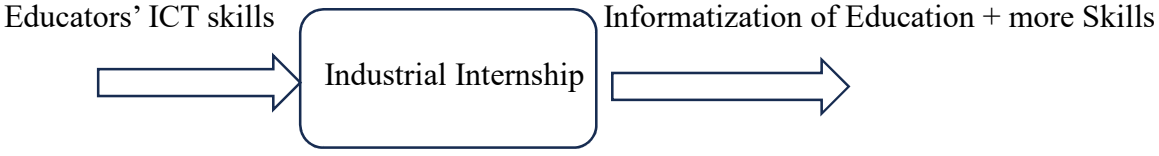
Traditional classroom (online or offline) model of learning with Educators' ICT skills as Input and Informatization of Education and less skills as outcomes is represented in Figure 1 as shown below



The research paper Bing Liu(2020) explained that Only about 10% is learned through formal training and about 70% of human knowledge is learned while working on a task or on the job. The remaining 20% knowledge or skill is learned through imitation [15].

The main advantage of workplace learning is that learners through experience can make a productive contribution to the company (Batalla-Busquets, J.-M. et al., 2013). [16]. Below is a work-based learning model with Educators' ICT skills as input and Informatization of Students according to (Ahmed M. I. Alnajjar, 2020) skills like practical and social skills like teamwork, Interpersonal skills, Communication skills and problem-solving skills, critical decision-making skills are learned easily through work-based learning than traditional class-based learning (Alnajjar, A. M., 2020). [17].

Figure 2 shows the work-based learning (Industrial Internship) model with Educators' ICT skills as input and Informatization of Education and a greater number of Skills as outcomes.



NULL Hypothesis made while doing data analysis

H_{01}: Informatization of Education has no association with the gender.

H_{02}: Informatization of Education has no association with the social support (social support from family/friends)

H_{03}: Informatization of Education has no association with the work Experience.

To test this hypothesis researcher needs to collect data.

Sample Design :

Sample design involves various elements like study population, study sample, sampling method

Study population :

The study population consists of University Educators working in Higher Education Institutions and guiding students in carrying out Industrial Projects through Internship learning. The researcher does not know the population size or number of University Educators guiding Internship students.

Study sample :

The study sample consists of different aspects like sampling method, sampling size, study instrument and study procedure.

Sampling method :

A Judgemental sampling method will be applied to select eligible respondents from the Universities or Colleges. University or College will be selected after deciding a fixed number of universities/colleges for an appropriate sample size of the study.

Sample size calculated :

When the population size is not known and population proportion is also unknown then the formula

(Cochran's formula) for sample size n is

$n= z^2 pq/ d2$

where z value at reliability level or significance level. P=0.5,q=0.5

- Reliability level 95% and 85% power factor; z = 1.96

d=15% of 0.5

$n = z^2 pq/ d^2$

$n = (1.96)^2$ 0.5X0.5/(0.15X0.5)2 = 170.

Sampling frame :

During the survey method or interview method 204 respondents from university/college institutions were selected, out of which 29 respondents were from online and rest were offline respondents. 13 respondents were from health or medical field from 7 different Educational institutions. 157 from regular MBA or degree programmes from 39 colleges/Universities were selected. 34 are from Engineering background from 9 colleges or University.

Table 1 below gives sampling distribution for data collection.

S.No	District	State	Online	Offline	
1.	Dakshina Kannada	Karnataka		60	
2.	Udupi	Karnataka		30	
3.	Bangaluru (urban)	Karnataka	15	88	
4.	Dharwad	Karnataka	1		
5.	Tumkuru	Karnataka	1		
6.	Mysuru	Karnataka	3		
7.	Davangere	Karnataka	1		
8.	Kasaragod	Kerala		3	
9.	Kannur	Kerala		9	
10.	Ernakulam	Kerala	1		
11.	Solan	H. P.	1		
12.	Chennai	Tamil Nadu	1		
					Grand total
		Total	**24**	**190**	**204**

Study instrument :

The study employed a validated structured survey questionnaire. The questionnaire was designed in a such a way as to collect Educators' (IT/non-IT) ICT tool usage. The survey had questions asking respondents about the extent of the Informatization of Education in both regular class model and Industrial Internship learning. And questions regarding skills transferred during regular classes (offline and online) method learning and Internship method of learning.

Study procedure :

The study is based on both primary data and secondary data. The primary data is collected through the questionnaires which is distributed to University educators working as internship guides or co-ordinators in private and government Universities/Colleges. Before undertaking the survey, a pre-test was conducted in order to finalize and validate the designed questionnaire. The pilot study was helpful to identify the potential practical problem in data collection.

Content Validity :

The questionnaire was constructed based on prior research and its content validity was assessed by subject experts. Input from experts was sought to refine the questionnaire. A pilot study involving 203 respondents from various branches was conducted, and feedback from this study was used to make necessary adjustments. Subsequently, a pretest was carried out to ensure the questionnaire's validity before its official use with respondents**.**

Reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
0.70	27

The Table 2 above displays the reliability scores for the scales in the questionnaire. Cronbach's Alpha yielded a value of 0.70, indicating a acceptable reliability. The final questionnaire was refined with certain options being removed. Those options showing low responses and minimal impact were eliminated to improve the questionnaire's quality.

The responses obtained by the University Educators who are internship co-ordinators or guides have been coded and entered into the spreadsheet software as per the requirements of the objectives. The data is analyzed using MS excel. Descriptive statistics like mean, percentage, standard deviation have been used. Also, inferential statistics like Chi-Square.

6.DATA ANALYSIS AND INTERPRETATIONS :

Below are the descriptive statistics associated with primary data :

- All samples total 204 are aged between 20 and 66 with mean age=37.66 and standard deviation =10.252.
- 189 samples are from Karnataka (92.6%) and 13 are from Kerala(6.3%), 1 from H.P(0.4%) and 1 from Tamil nadu (0.4%).
- 75 samples are from male gender(36.8%) and 129 from female (63.2%).
- 44 samples are from lecturer category(21.6%), 108 assistant professor(52.9%), associate professor 31(15.2%), and professor 21(10.3%).
- Work load in hours per week 1-14 hrs =49(24%), 15-25 = 135(66.2%), 26 -35= 8(3.9%), 36-46 hrs =12(5.9).
- Work experience less than 5yrs =58 (28.4%), 5-10 yrs=52(25.5%), 11-15yrs= 31(15.2%), 16-20 yrs = 20 (9.8%), 21-25 yrs= 19(9.3%), >25yrs=24 (11.8).
- Income level <20,000 INR = 26(12.7), 20001 – 40000 INR= 92 (45.1%), 40001 – 60000 INR = 25(12.3%), 60001 – 80000 INR = 18(8.8%), 80001 - 1,00,000 INR = 16(7.8%), >1 Lakh = 27(13.2%).
- Education qualification: Ph D=51(25.0%), batchelor's degree =8(4%), PG/ Masters degree =145(71%).
- Social support: very good 103(50.5%), Good=73 (35.8%), Average=18(8.8%), Poor=10(4.9%).
- Regularity of ICT usage in classroom: Daily =118(57.8%), Weekly =50(24.5%), Monthly=17(8.3%), Rarely =19(9.3%).
- Programmes/courses taught Batchelor's programme=137(67.1%), Masters programmes= 67(32.8).

Table 3: AI usage minimizing efforts while teaching vs Age groups

		AGE GROUPS							TOTAL
		<25	25 - 30	30 -35	35- 40	40 -45	45- 50	>=50	
To Some extent	Count	11	13	21	18	18	13	16	**110**
	Percentage	50.0 %	31.7 %	60.0 %	56.3 %	66.7 %	65.0 %	59.3 %	**53.9%**
To a great extent	Count	9	24	12	11	8	7	10	**81**
	Percentage	40.9 %	58.5 %	34.3 %	34.4 %	29.6 %	35.0 %	37.0 %	**39.7%**

Not at all	Count	2	4	2	3	1	0	1	**13**
	Percentage	9.1 %	9.8 %	5.7 %	9.4 %	3.7 %	0.0 %	3.7 %	**6.4%**
TOTAL	**Count**	**22**	**41**	**35**	**32**	**27**	**20**	**27**	**204**
	Percentage	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4: Online vs Internship learning skills data

Online/Offline			**Internship**	
Frequency	Percentage	**Generic Skills transferred**	Frequency	Percentage
155	76.0	Oral & written communication skills	138	67.6
114	55.9	Leadership and Decision-making skills	123	60.3
99	48.5	Evaluation skills	116	56.9
139	68.1	Problem Solving skills	164	80.4
80	39.2	Ethical Standards skills	90	44.1
92	45.1	Research and Innovation skills	116	56.9
83	40.7	Commitment to quality skills	110	53.9
75	36.8	Accountability skills	77	37.7
93	45.6	Responsibility skills	61	29.9
98	48.0	Information and Communication Technology (ICT) skills	73	35.8
58	28.4	Comprehension skills	61	29.9

66	32.4	Independent Lifelong Learning skills	64	31.4
56	27.5	Critical Evaluation skills	64	31.4
69	33.8	Memorizing skills	65	31.9
90	44.1	Listening	105	51.5
95	46.6	Team Work skills	116	56.9
78	38.2	Application skills	80	39.2
104	50.9	Confidence skills	96	47.1
62	30.4	Adaptability and Sustainability skills	56	27.4
80	39.2	Analysis skills	93	45.6
95	46.6	Self-motivation skills	103	50.5
204	**100.0**	**Total**	**204**	**100.0**

Table 5: AI Tools used in Education

Table 6: AI Tools Used in Education		
AI tools	**Frequency**	**Percentage**
Century Tech (WEB 2.5)	10	4.9
Coursera (WEB 2.5)	49	24.0
Gradescope (WEB 2.5)	1	.5
Tutor Me (WEB 2.5)	9	4.4
Open AI Chat GPT (WEB 2.5)	80	39.2
Duolingo (WEB 2.5)	3	1.5
Edmodo (WEB 2.5)	5	2.5
Pearson AI (WEB 2.5)	13	6.4
Alexa (IoT)	32	15.7
Cortana in windows (Partial Web Component)	2	1.0
Cogni (WEB 2.5)	6	2.9
Turnitin (WEB 2.5)	28	13.7

Nearpod (WEB 2.5)	1	.5
Dream Box (WEB 2.5)	5	2.5
Google bard (WEB 2.5)	21	10.3
Thinkster math (WEB 2.5)	1	.5
Cobots (ROBOTS)	2	1.0
Cisco Webex (WEB 2.5)	46	22.5
Zoom meetings (WEB 2.5)	133	65.2
Teachmint (WEB 2.5)	18	8.9
You tube (WEB 2.5)	104	51.0
Smart boards (IoT)	47	23.0
Lego mindstorm (ROBOTS)	1	.5
Ozobots(ROBOTS)	2	1.0
Scribit (ROBOTS)	10	4.9
NULL	15	7.4
Total	**204**	**100.0**

7. FINDINGS :

OBJECTIVE 1 : To analyse and Investigate how Web 3.0, IoT and Robotics can help in higher education scenarios through ICT mechanisms for digital delivery of information [for primary and secondary findings]

1.1 Web 2.5, IoT & Robotics [primary data findings]

- Zoom meetings 113(65.2%), Youtube 104(51%), Open AI chatGpt 80(39.2%), Coursera 49(24%), Smart Boards 47(23%), Cisco Webex 46(22.5%) are the top 6 AI tools used for teaching learning purposes.
- Respondents for the question does AI usage minimizes efforts ? answered with a pattern: to some extent 110(53.9%), to great extent 81(39.7%), Not at all 13(6.4%).
- Most of the Government owned / Funded Universities lacked proper ICT infrastructure in their classrooms or College premises.

OBJECTIVE 2 : To prove that informatization of Education is not because of gender, work experience or social support [for primary data findings].

2.1 Table 6: **Informatization of Education(class room model) has no significant relationship with gender, work experience and social support. All my hypothesis are accepted.**

	Gender	**Work Experience**	**Social support**
Informatization of Education (class room)	$\chi 2$ =1.616 P=0.446	$\chi 2$=10.826 P=0.371	$\chi 2$=7.177 P=0.305

2.2 **Table 7: Informatization of education(internship) has no significant relationship with gender, work experience and social support. All my hypothesis are accepted.**

	GENDER	**WORK EXPERIENCE**	**SOCIAL SUPPORT**
Informatization of Education in internship model	$\chi 2$=0.943 p=0.624	$\chi 2$=73.483 p=0.679	$\chi 2$=8.939 p=0.177

8. LIMITATION: Following were the limitations of the research study:

1. Lack of proper understanding about AI and ICT terminology among respondents could lead to biased responses. The participants might overstate or understate their ICT skills.
2. ICT tools and digital practices evolve rapidly, which may render some findings less relevant over a period of time.
3. Access to detailed institutional data on educators' digital practices may be restricted due to institutional privacy policy.

9. CONCLUSION AND CONTRIBUTION OF THE STUDY :

Contribution of the study is to very well understand the effect of arrival of AI in education sector and its pros and cons upon usage. To propose alternate way of learning parallel to existing exam/test-based learning so that burden on the college students is reduced and real emphasis is on creating lifelong learning habit. Literatures suggest education for Industry but this research study stresses on Industrial contribution in Education scenario hence we are up

for major shift to Industry for Education. Hence the total effect would be Education with Industry after thorough collaboration for Research and Skill Education.

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