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Impact of ICT Integration on Higher Education Teaching Strategies

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Abstract: *ICT has revolutionized teacher professional development. Computers, smart phones, laptops, tablets, LCD, multimedia, and projectors are utilized in classrooms to make learning more engaging and effective. The research examined instructors' views on ICT and its influence on university teachers' professional growth. A descriptive survey was conducted. Sample selection was done using simple random sampling. Study participants included all central Punjab public and private higher education institutions. The survey sampled 90 teachers, 120 students, and 12 department heads at random. Information was collected using a self-developed questionnaire for teachers and students and a structured interview schedule for department leaders. Data was analyzed using percentage, mean, and standard deviation. The research found that ICT improves teacher professional development. University lecturers struggled to prepare lectures using technological advancements and ICT in classrooms. The research suggested ICT refresher courses for academics' professional growth.*

Keywords: ICT, Professional Development, Effects, Higher Education

I. INTRODUCTION

ICT plays a major role in teaching instructors to improve their pedagogical skills and topic understanding. Teachers can create excellent lesson plans using current ICT expertise. Cetin (2016) believed that instructors using ICT educational gadgets in classrooms assist pupils learn. The regular use of helps instructors improve their subject matter understanding and teaching. Chai & Linkoh argued that ICT instructional resources had changed teaching and learning. OECD found that proper use of advanced ICT devices like internet services (internet telephony, e-mail, instant messaging, chat), web-based services and cloud computing services in classrooms, workplaces, and homes can improve teacher and student learning.

In this age of science and technology, education and teacher preparation are evolving. Teachers require ICT training to keep up with worldwide changes. Professional development helps instructors stay current and enhance their pedagogical abilities to manage classrooms. Omar also believed that better teachers could better educate future generations because they now have key responsibilities in educational institutions and must be equipped with modern technology to meet globalization's demands.

Modern computer software is utilized in education and training to improve instructors' and students' skills. It retrieves, processes, creates, and transfers instructional technical information. All teaching, administrative, and supporting personnel, including students, use ICT to achieve instructional goals and improve regular tasks. Computers, LCD, projectors, laptops, multimedia, smart phones, and more are used by instructors to improve student learning.

Teachers are national builders who must prepare future generations to meet modern difficulties, but they must be proficient in ICT instructional equipment. ICT expertise helps instructors stay current with latest instructional technologies. ICT has become a global need, and no sector can function without it. It improves teaching and learning in education and training. ICT facilities in teacher training programs are essential in classrooms and considered the most crucial foundation for student learning. Meta-analysis of several research studies found that teacher ICT training is the most important factor in improving subject matter knowledge professional competency.

Uslu & Bumen stated that using technology in education and teacher training has become a global trend since it improves teaching and learning settings. Teachers need updated technologically integrated knowledge and abilities to use these teaching devices in classrooms. Technology integration in education and training takes time. Professional development helps instructors utilize ICT to improve teaching and help students learn. Training using ICT improves lesson planning and classroom delivery.

Gebremeskel et al. believed that ICT helps create, acquire, share, disseminate, change, support, and recognize knowledge, skills, and access to improve student learning and teacher competence. It is also useful for professional trainings of instructors in ICT usage, making it simpler for them to adopt new ways for engaging and effective teaching and student results. Teachers must be taught ICT fundamentals to incorporate new technologies and pedagogical abilities to enhance instruction. It helps identify students' learning goals, capacities, results and methods. This learning paradigm technology changes education.

Teachers gain information and improve their pedagogical abilities via professional development. One of the biggest issues impacting teachers' ICT integration in the classroom. Teachers need professional development to increase their subject matter knowledge, abilities, and attitudes to better teach. However, owing to short teacher training programs and other issues, trainees could not even comprehend ICT-related fundamental instructional terminology.

Tertiary instructors need training to use ICT educational facilities correctly in classrooms to satisfy student needs. Oyaid and Sipila agreed that teachers' use of computer technology in the classroom is still low and needs further training to overcome classroom challenges. Stephanie et al. believed that instructors must be taught in ICT instructional aids usage to meet educational goals.

Numerous studies have identified the primary elements affecting ICT integration in education and training. In schools, ICT infrastructure, access, time, and curricular flexibility are most crucial. Bristi found that instructors knew ICT might help them improve professionally. They learn more about teaching and learning technology. They read and write papers, journals, and websites online, which improves teacher professional development. Poor internet speed, excessive cost, lack of institutional support, workload, lack of technology abilities, and lack of sufficient training were their issues. Reading and creating articles, journals, and websites online helps teachers improve professionally.

Updated professional training for teachers is crucial to their excellence. Teacher quality, procedures, education, and training are in dire need of improvement. Hennessy & London believed instructors' lack of ICT professional and instructional abilities was causing classroom issues. Hennessy & London cited time, curriculum flexibility, ICT availability, and staff assistance as issues. Tondeur, Cooper & Newhouse believed ICT coordinators and school leaders may help teachers improve professionally. Sang et al. identified several ICT barriers to improving teachers' professional skills, including a lack of ICT resources and infrastructure, teachers' ICT pedagogical skills and attitudes, finances for technology, ICT teacher training, and motivation. Cetin also said that a lack of training, knowledge, and abilities for using ICT in the classroom was a key obstacle to improving teaching and learning. OECD (2016) found that ICT is not properly incorporated into teaching and learning. Teachers lack the ability to utilize ICT in the classroom.

ICT is a vital technology for instructors and students, making teaching easier and more engaging. It takes several classroom abilities and strategies to provide pupils good outcomes. Teachers must know how to utilize ICT in various subjects to assist students study. Teachers need ICT skills to run classrooms and help pupils with schoolwork. This research highlighted the relevance of ICT for university lecturers and students to improve teaching and learning.

Objective of the Study

The research examined instructors' views on ICT usage and its consequences on university teachers' professional development.

Research Questions

1. Does ICT enhance instructors' professionalism?
2. Does ICT impact instruction delivery?
3. Does ICT impact evaluation and assessment for successful teaching and learning?

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4. What is the connection between ICT and teacher professional development?
5. How does ICT impact teacher professional development?

II. METHODOLOGY

Surveys were employed for descriptive studies. All Punjabi public and private university teachers, department heads, and students were targeted. Punjab has nine divisions, but researchers chose Sahiwal for its simplicity. The Higher Education Commission recognizes six university campuses in Sahiwal division. Twenty students, fifteen teachers, and two department heads from each university campus were sampled. The sample included 90 instructors, 120 students, and 12 department heads. This self-developed questionnaire was given to faculty and students via friends, colleagues, and self-visit. The five-point likert scale questionnaire has 24 statements. The questionnaire was evaluated by educational specialists and has 0.79 reliability before survey. A planned interview schedule for department heads was also created for data collecting.

III. RESULTS

Presentation and Analysis of Data

Research Question No. 1 Is ICT helpful to uplift teachers' professionalism?

Table 1: Analysis of ICT helpful to uplift teachers' professionalism

Statement	N	Respondents	Degree of Response					Mean	Std. Dev.	t value	Sig.
			SA%	A%	U%	DA%	SDA%				
ICT helpful	90	Fa-	32	20	17	13	8	3.622	1.354	4.055	.000
to uplift		culty	35.5	22.2	18.9	14.4	8.9				
teachers' pro-		Mem									
fessionalism		bers									
	120	Stu-	39	30	25	13	11	3.208	1.229		
		dents	32.5	25	20.8	10.8	9.2				

Table 1 shows that 57.7% of faculty felt that ICT boosts teachers' professionalism, 23% disagreed, and 18.9% were indecisive. ICT promotes teacher professionalism, as seen by the mean score 3.622 and standard deviation 1.35. ICT helps teachers' professionalism, according to 57.5% of pupils, 20% disagreed, and 20.8% were uncertain. The mean score and standard deviation demonstrate that ICT boosts teacher professionalism. The t-value showed that ICT boosts teacher professionalism.

Research Question No. 2 Is ICT effects on delivery of instruction?

Table 2: Analysis of effects of ICT on delivery of instruction

Statement	N	Respondents	Degree of Response					Mean	Std. Dev.	t value	Sig.
			SA%	A%	U%	DA%	SDA%				
ICT ef-	90	Fa- culty	27	21	20	17	5	3.533	1.256		
fects on		Mem	30	23.3	22.2	18.9	5.6			3.026	.003
delivery of in-		bers									

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struction	120	Stu- dents	37 30.8	35 29.2	22 18.3	20 16.7	6 5	3.325	1.231		

Table 2 demonstrates that 53.3% of teachers agreed that ICT affects instruction, 24.5% disagreed, and 18.9% were unsure. The mean score 3.533 and standard deviation 1.2560 suggest that ICT affects teaching. 60% of students agreed that ICT affects teaching, 21.7% disagreed, and 18.3% were unsure. The mean score and standard deviation suggest that ICT affects teaching. The t-value 3.026 showed that ICT substantially affects teaching.

Research Question No. 3 Is ICT effects on evaluation & assessment system for the effective teaching learning process?

Table 3: Analysis of effects of ICT effects on evaluation & assessment system for the effective teaching learning process

Statement	N	Respondents	Degree of Response					Mean	Std. Dev.	t value	Sig.
			SA%	A%	U%	DA%	SDA%				
ICT effects on evaluation & assessment system for the effective teaching learning process	90	Faculty Members	29 32.2	26 28.9	22 24.4	9 10	4 4.4	3.744	1.1472	4.447	.000
	120	Stu- dents	32 26.7	29 24.2	25 20.8	25 20.8	9 7.5	3.217	1.1166		

Table 3 demonstrates that 61.1% of faculty agreed that ICT affects evaluation and assessment for successful teaching and learning, 14.4% disagreed, and 24.4% were indifferent. ICT affects evaluation and assessment for successful teaching and learning, as shown by the mean score of 3.744 and standard deviation value. 51% of students agreed that ICT affects evaluation and assessment for effective teaching and learning, 20.8% were unclear, and 28.3% disagreed. Both the mean score and t-value support the idea that ICT greatly impacts evaluation and assessment.

Research Question No. 4 What is the effect of ICT on professional development of teach- ers?

Table 4: Analysis of effects of ICT effects on professional development of teachers

Statement	N	Respondents	Degree of Response					Mean	Std. Dev.	t value	Sig.
			SA%	A%	U%	DA%	SDA%				
ICT effects on profes- sional de- velopment of teachers	90	Fa- culty Mem bers	32 35.6	22 24.4	20 22.2	14 15.6	2 2.2	3.756	1.1642	4.180	.000
	120	Stu- dents	43 35.8	35 29.2	19 15.8	12 10	11 9.2	3.358	1.1137		

Table 4 shows that 60% of university faculty agreed that ICT affects teacher professional development, 17.8% disagreed, and 22.2% were indifferent. The 65% of students agreed that ICT helps instructors improve professionally. The mean score and standard deviation support the aforementioned assertion. ICT affected the t-value substantially.

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Research Question No. 5 What is the relationship between ICT and professional develop- ment of teachers?

Table 5: Analysis of the relationship between ICT and professional development of teachers

Statement	N	Respon-dents	Degree of Response					Mean	Std. Dev.	PearsonValue	Sig.
			SA%	A%	U%	DA%	SDA%				
ICT positively relates with professional development of teachers	90	Faculty Mem- bers	39 43.3	27 30	11 12.2	7 7.8	6 6.7	3.956	1.2170	0.741	.00
	120	Stu- dents	40 33.3	32 26.7	25 20.8	13 10.8	10 8.3	3.592	1.2264		

The majority of university instructors agreed that ICT positively affects professional growth, while 14.5% disagreed and 12.2% were unsure. ICT favorably affects teacher professional growth, according to 60% of university students. 19.1% disagree. The mean and standard deviation values of both categories of study participants showed that ICT promotes professional growth. Table 5 demonstrated a substantial Pearson correlation between ICT and teacher professional development.

Analysis of Interview Schedule of Heads of Department

Table 6. Opinions about the effects of ICT on Professional Development of Faculty Members

Sr. No.	Opinions	Frequency	Percentages
1	ICT affects teaching and learningprocess	4	33.33
	ICT affects teaching and learningprocess very much	7	58.33
	ICT does not affect teaching and learn-ing process	1	8.33
2	The performance of the students is easi-ly accessed by using ICT	9	75
	The performance of the students is not easily accessed by using ICT	3	25
3	ICT affects delivery of instruction	5	41.66
	ICT effects on delivery of instructionvery much	6	50
	ICT does not affect the delivery of in-struction	1	8.33
4	ICT helpful in enhancing professionaldevelopment of teachers	10	83.33
	ICT does not helpful in enhancing pro-fessional development of teachers	2	16.66
5	ICT positively relates with professionaldevelopment of teachers	10	83.33
	ICT does not relate with professionaldevelopment of teachers	1	8.33
	No comments about professional devel- opment of teachers and ICT	1	8.33

Most educational administrators believe ICT influences teaching and learning, whereas 8.33% disagree. 75% of responders said they can readily access student performance using ICT, while 25% said they can't. ICT affects teaching, according to 91.66% of participants, while 8.3% disagreed. ICT helps teachers improve professionally, 83.33% say so, while 16.66% say no. The majority 83.33% of educational managers said ICT favorably affects teacher professional development, 8.33% disagreed, and 8.33% did not reply.

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IV. DISCUSSION AND CONCLUSION

Teachers are key to improving student results by using ICT instructional facilities in classrooms, but they need current training and technical skills. Many research produced worrisome outcomes proposing updated ICT professional instructional training for instructors to face modern issues. Sahito & Vaisanen found that 85% of respondents agreed that ICT improves teacher professional development. Updated ICT tools including software and hardware instructional materials are required to improve teacher training programs and support students at all levels of learning. ICT gadgets in professional trainings boost instructors' pedagogical abilities, according to Ahmed. Wajszczyk found that ICT improved student learning.

Information and communication technology has transformed teacher training and student learning. Teachers utilized computers, smart phones, laptops, tablets, LCD, multimedia, and projectors to make teaching and learning more engaging and effective. Today, education is increasingly social, and the competence of teachers is tightly linked to frequent high-level professional training. The global population will demand more from instructors as the globe quickly adopts digital media and information. Teachers need advanced ICT knowledge and professional abilities to satisfy current expectations in the classroom.

This research found that ICT boosts teacher professionalism. ICT impacts education, evaluation, and assessment for successful teaching and learning and teacher professional development. The research found that ICT improves teacher professional development. The current research suggested ICT-based refresher courses for university faculty professional development.

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