

## **TEACHERS' PERCEPTION TOWARDS ICT INTEGRATION: PROFESSIONAL DEVELOPMENT THROUGH BLENDED LEARNING**

Integrating Information and Communication Technology (ICT) into teaching and learning is a growing area that has attracted many educators' efforts in recent years. The teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. Teachers' perception is major predictor of the use of new technologies in instructional settings. The early studies indicated that blended learning can be as successful as either online or face-to-face instruction particular in prepared teacher field. Blended learning can lead to improved training, increased access and flexibility, and better cost-effectiveness. The objective of this paper is to analyze the science teachers' perception towards the usage ICT on e-course design through training them by Blended learning approach. The study was conducted on a sample of 60 science teachers of secondary school in Yemen. Questionnaire was used to know the teachers' perception toward integrating ICT in instructional design, which included 25 items. To analyse and interpret the data, t-test and ANCOVA statistical techniques were used. The finding showed that there was significant difference between the teachers' perception towards integrating ICT in favour of experimental group who used blended learning approach. Recommendations were although there was the teachers' readiness to use ICT, but the concerned parties should determine the training needs for proper ICT integration in the classrooms, and improve their

programmes for preparing teachers to use ICT according to their needs.

**Keywords:** Blended learning, e-course design, ICT integration in teaching, in-service teachers, teachers' perception

### **Introduction**

The rapid growth in Information Communication and Technologies (ICT) has brought remarkable changes in the recent years. ICT is becoming increasingly important in daily lives and in educational system. As the teacher plays a very essential role in the management of learning, they should possess training in using the most modern technologies in the field of education. So the teachers' perception is important as it forms a tendency which helps them to be favourable or unfavourable towards the usage of the most modern technology in the field of education in future when they go out for teaching. Previous Researches focused on explaining technology adoption and acceptance, how a technology's attributes affect an individual's perception of a technology. This in turn affects the usage of the specific technology and Technology readiness [1], to embrace and use new technologies to accomplish goals in home life and at work [2]. It is a combination of positive and negative technology-related beliefs.

Teachers must develop not only essential computer skills but also proficiency in using a variety of technology tools to solve problems, make informed decisions, and generate new knowledge related to their professional performance [3]. Establishing quality in E-learning is a very important issue for any academic program or course of study [4]. So there is the need to encourage

e-course production at various levels of education [5]. [6] stated that e-course is digital information delivered over network-based electronic devices which allows them to share visions and influence each other's knowledge, attitudes or behaviour. The content experts agree that the online course followed the general design principles for web-based course instruction criteria on completeness. Constructivism supports several approaches to explain the design and development processes of content development [7]. The ADDIE model is a basic model for designing and developing of educational content, it includes Analysis, Design, Development, Implementation, and Evaluation [8].

Consequently, developing technology offers many methods and tools, facilitating the flexibility now needed in the learning environment which can help reshape teacher preparation programs to better assist teachers to be more effective in the classroom. Yet developers of online professional learning communities face significant challenges in organizing and maintaining a virtual community in which participants develop a sense of belonging, trust, and support which are prerequisites to learning in a community [9]. One strategy to address the challenge of community building in online environments is to utilize a blended approach to professional development. Moreover the interest in research on blended learning in the context of teacher education has increased and developed greatly [10], as evidenced by the growing literature on blended learning and its value being identified and recognized. While there are a wide variety of definitions of blended learning, the most common is that which recognizes some combination of virtual and physical environments [11]. There are three categories of blended learning systems based on the primary objective of the blend [12]:

Enabling blends by providing the same

learning experience but through a different mode where learners choose the option that meets their cost and time constraints.

Enhancing the blend by adopting learning management systems to provide supplementary resources for courses that are mainly conducted face-to-face.

Transforming blends by utilising technology-mediated approaches in teaching as a main instruction method combined with traditional learning [13]

The study of [14] has shown that such workshops for preparation of teachers may offer impact on changing teachers' practice on their student's achievement. In the context of the above explanations that the use of blended learning approach to improve teachers' performance in ICT integration and to develop positive perception towards e-course using ICT, the present study attempted to determine how blended learning approach affects on teacher perception towards ICT use in e-course design.

## **Methodology**

### **Research design**

The present study is quasi-experimental in nature wherein a pre-test and post-test design was employed with experimental group and control group. The experimental group used blended learning approach whereas the control group used traditional method.

### **Participants**

The sample consisted of 60 science teachers distributed into two groups: one experimental group consisting of 30 teachers and the other control group consisting of 30 teachers. The sample of the study was chosen according to teacher's level as indicated in their in-service training profile to use computer and internet. Subjects were arranged randomly after matching in experimental as well as control group.

### **The tool used**

A perception scale was used to measure the teachers' perception of ICT integration

on e-course design. The perception scale consisted of 25 items, and the response for each item was assessed using Likert Scale with 5-point scale ranging from 1=strongly disagreed to 5=strongly agreed. The content validity was established by the questionnaire which contained contained questions concerning the teachers' perception on motivation, facilities and current skill of ICT in terms of e-course design. The content validity was established by experts in this field. And it had a reliability coefficient (Cronbach Alpha value) of 0.89.

### Experimental Intervention

This study adopted a Model of Blended Learning which is flex; this model features an online platform that delivers most of the curricula.

Face to face instruction includes 12 sessions in computer lab and online learning includes 20 sessions (asynchronous and synchronous).The training Program extended over 8 weeks approximately, selecting 4 days per week for 32 periods of two hour session each.

Table (1) Blended Instruction Model

Time allocation for training program processes	
Process	session
<b>Face to face</b> Project(discussion, feedback, workshop) Computer assisted instruction	12
<b>Online learning</b> Asynchronous (e-mail, discussion, forum, blog in web website) Synchronous(chat ,video ,audio conference live in website)	20
Total	32

Experimentation along with the computer assisted instruction was by using CD-ROM, and presentation PowerPoint. Online learning was facilitated via website online learning platform (<https://sites.google.com/site/alearning/>). Before intervention the participants were informed about objectives of the program and session processes and they were extended invitation to join in website through their emails.

Control group had a total of 32 sessions in class room and also in computer laboratory, they had assignments which were delivered and discussed with the trainer.

### Data analysis

The data collected using the scale is sub-

jected to the percentage, arithmetic mean, t-test, ANCOVA, and the findings were interpreted. For the differences and relationships, a significance level of  $p < 0.05$  was deemed as sufficient.

### Results

#### Equivalence and According

Table 2 summarizes the findings on the equivalence between the experiment and control groups in perception scores before intervention.

**Table (2):** Mean scores between experimental and control group in pre-test before intervention on perception scale toward using ICT in e-course design

Group	N	Mean	Std. Deviation	t	df	Sig (P-value)
experimental	30	59.3000	4.57994	1.630	58	.108
Control	30	57.3667	4.60497			

An examination of t-test results in Table 2 reveals that there is not any significant difference between the two groups in their perception scores ( $t_{(2,58)} = 1.630$ ,  $p > 0.05$ ). It is indicated that the groups were equivalent in their perception, to put it differently, that the experiment and control groups were similar in their perception. It has been observed that the teacher perception scores of the two groups are close to each other when the scores of their perception scale are taken.

### Effectiveness of Blended learning on perception scale

ANCOVA was performed there was significant difference between experimental group and control group in the post test scores of perception on ICT use when their pre test scores of perception on ICT use is taken as covariate for which the results are given in table(3,4,5):

**Table (3):** The adjusted mean post test perception scores of experimental group and control group

Group	N	Adjusted Mean Scores of perception scale	
		Mean	Adjusted Mean
Experimental	30	86.27	85.983 <sup>a</sup>
Control	30	73.60	73.884 <sup>a</sup>
a. Covariates appearing in the model are evaluated at the following values: pre perception = 58.33.			

It is found from the table (3) that the adjusted mean scores on perception of experimental group (mean=85.983) was found to be greater than that of the control group (mean = 73.884). Through analysis of covariance the results were tabulated in the

table 4

**Table (4):** analysis of covariance associated with perception scale on ICT use after intervention of groups with knowledge perception on ICT use before intervention as covariate

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
perception scale on ICT use before intervention	105.358	1	105.358	5.117	.028	.082
group	2099.654	1	2099.654	101.968	.000	.641
Error	1173.709	57	20.591			
Total	387046.000	60				
a. R Squared = .682 (Adjusted R Squared = .670)						

From the ANCOVA table, it is evident that the obtained  $F_{(1, 57)} = 5.117$  on the adjusted means of perception scale on ICT use before intervention of the treatment groups is significant at 0.05 level. This signifies that the covariate perception before intervention predicts the dependent variable perception” after intervention. And obtained  $F_{(1, 57)} = 101.968$  on the adjusted

means of perception after intervention of the treatment groups is significant at 0.05 level. Hence there is significant difference between experimental group and control group in the adjusted mean in posttest perception scores when their pretest score of perception is taken as covariate. From the main effect of treatment it is concluded that there is a significant effect of treatment

on perception after intervention after controlling the effect of perception before intervention. From the table (5) it is noticed that there is a difference among the groups

in perception by taking the adjusted mean.

**Table (5):** Post Hoc tests (DLS) for the effect of treatment on perception scale of experimental group and control group

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>
Experimental	Control	12.099*	1.198	.000
Control	Experimental	-12.099*	1.198	.000
Based on estimated marginal means				
*. The mean difference is significant at the .05 level.				
a. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).				

The table (5) shows that the mean differences in post test of groups with teachers' perception on ICT integration before intervention as covariate were positive signifying better effect on experimental group than traditional group, and p value < .05 is statistically significant. The result found that there is significant difference in the effect of blended learning on teachers' perception than traditional method. This indicates that the blended learning strategy is more effective compared to traditional method on development of teacher's perception toward ICT use in e-course design.

Table (4) shows that the effect size  $\eta^2 = 0.641$  is large on teachers' perception toward ICT integration in teaching which means that the effect is significant. This large effect may be due to the activities and techniques which are used in blended learning program to develop teachers' perception. On the other hand, the results found that effect of Blended learning environment on the teachers' perception was more than the effect of traditional learning environment on the teachers' perception.

#### Conclusion

At the end of this study, it has been observed that the teachers who were trained in blended learning environment

are academically more successful than the teachers who have trained in traditional learning environment. Based on the findings the following conclusions were reached:

Blended learning provided teachers with a better learning environment through variety of multi-media resources which enhanced self-learning strategies and reflected on their perception toward ICT use [15].

Blended learning stimulated teachers towards independent practice e-course design instead of direct instruction. According to [16] some of the main motivators for learners' participation are the ability to learn from others by gaining opinions, advice or responses from others and giving or receiving help from moderators.

Blended learning provided teachers with enjoyment, pleasure, and variation which were significant enough to affect the teachers' perception positively on the usage of ICT in teaching. The findings of [17] on learner perceptions of participation opportunities in online synchronous, they revealed common factors that motivated the teachers. These factors are presenter role, the facilitation style, the assessment of participation, which encouraged more activity which indicated greater tendencies

towards making early and additional contributions to discussions.

Therefore this paper is an attempt to present the important issues that must be addressed by in-service teacher professional development programs if schools and other educational institutions are to fully exploit the potential of computers and the Internet as educational tools, in terms of using ICT as a resource for e-course design. Further, the teachers must be prepared and always accept any changes in technology. This

study may help to determine teachers' professional development needs for proper ICT integration in the classrooms. It is from such contextual uses of ICT, that the concerned parties can improve their programmes, and predict that e-course production enriches the e-learning in a dynamic way. It is said that people are visual minded. They retain 20% of what they hear. 50% of what they hear and see. And probably, 100% of what they hear and see and do.

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ՈՒՍՈՒՑԻՉՆԵՐԻ ԸՆԿԱԼՈՒՄԸ ՏՀՏ-ՆԵՐԻ ԻՆՏԵԳՐԱՆ ՄԱՍԻՆ/ ՄԱՍՆԱԳԻՏԱ-  
ԿԱՆ ԶԱՐԳԱՅՈՒՄ ԽԱՌԸ ՈՒՍՈՒՑՄԱՆ ՄԻՋՈՑՈՎ

## **ԱՐՎԱ ԱՀՄԵԴ ԱՐԴՈՒ ՔԱՍԵՄ**

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Վերջին տարիներին տեղեկատվական և հաղորդակցական տեխնոլոգիաների ինտեգրումը ուսուցման/ուսումնառության գործընթացում անհամեմատ աճել է: Ուսուցիչները պետք է ներգրավված լինեն համագործակցային ծրագրերի ստեղծման և դրանց զարգացման գործընթացներում, աջակցեն բարեփոխումների ռազմավարություններին և կիրառեն ՏՀՏ-ները որպես դասավանդման անփոխարինելի գործիք: Նախնական ուսումնասիրությունները ցույց են տալիս, որ խառը ուսուցումը, որը ներառում է և՛ առցանց, և՛ դեմ առ դեմ ուսուցում, կարող է ավելի արդյունավետ լինել, եթե ունենանք ՏՀՏ-ների մասին խորը գիտելիքներով զինված և պատրաստված ուսուցիչներ: Խառը ուսուցումը ապահովում է հասանելիություն, ճկունություն և առկա ներուժի արդյունավետ ծախսում: Սույն հոդվածի նպատակն է վերլուծել ուսուցիչների ընկալումը ՏՀՏ-ների մասին և դրանց հնարավորինս լայն կիրառումը դասավանդման գործընթացում:

## **О ВОСПРИЯТИИ УЧИТЕЛЯМИ ИНТЕГРАЦИИ ИКТ /ПРОФЕССИОНАЛЬНОЕ РАЗВИТИЕ ЧЕРЕЗ СМЕШАННОЕ ОБУЧЕНИЕ**

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В последние годы в процессе преподавания значительно возросла интеграция информационно-коммуникационных технологий обучения. Учителя должны быть вовлечены в процессы создания и развития совместных программ по поддержке стратегии реформирования и применения средств массовой информации в области ИКТ в качестве необходимого инструмента обучения. Предварительные исследования показывают, что смешанное обучение, включающее в себя как обучение онлайн, так и обучение «лицом к лицу», может быть более эффективным, если преподаватели обладают глубокими знаниями в области ИКТ. Смешанное обучение предоставляет доступ к гибкому экономически эффективному потенциалу. Целью данной статьи является анализ восприятия учителями ИКТ и возможно широкое их (ИКТ) использование в учебном процессе.