PalArch's Journal of Archaeology of Egypt / Egyptology

INTEGRATING NEW LITERACY INSTRUCTION TO SUPPORT THE ONLINE READING COMPREHENSION PERFORMANCE OF UNDERGRADUATE STUDENTS

Nazia Kalsoom[1], Prof. Dr. Naveed Ahmad[2]

[1]Assistant Professor Department of English, Government Graduate College Civil Lines

Multan, Pakistan

[2]Chairman Department of English, Bahauddin Zakariya University, Multan, Pakistan

Email: [1]nazia.farasat@gmail.com, [2]naveed_76a@hotmail.com

ABSTRACT

In a world that is increasingly mediated by Information Communication Technologies (ICTs), the skills, competencies, and knowledge underpinning new literacies have become ever more important for our young generation. To be regarded as 'fully literate' in today's world, readers must be digitally literate. Drawing upon the theoretical framework of the New Literacies, the present study aims to examine the impact of new literacies instruction on the online reading comprehension performance of Pakistani undergraduate university students. A pre-test posttest control group quasi-experimental design was used to investigate how far an online reading comprehension instructional programme improves the online reading comprehension levels of students. The study was conducted at three public sector universities in Multan, Pakistan. One hundred and fifty undergraduate university students (n=150) participated in the quasi-field experiment. The participants were assigned to both the control and experimental groups using a stratified random sampling technique, with 75 participants (n=75) in each condition. The participants of the experimental group participated in eight weekly sessions integrating new literacies of online reading comprehension. The data was collected through an Online Reading Comprehension Assessment (ORCA-I). The data were analyzed descriptively using the software package SPSS. The findings of this study indicate that a statistically significant increase (p =.000) in posttest ORCA-I scores in the experimental group was likely to be produced by the online reading comprehension instructional programme. It is hoped that the

findings of this study, along with future replications, will have implications for pedagogical practice by encouraging Pakistani teachers to integrate the new literacies of online reading comprehension into their regular language teaching. It is also hoped that the results will prompt national curricular development bodies to recognize the potential of online comprehension instructional programmes.

INTRODUCTION

New technologies and growths in media have revolutionized the way people communicate, learn, work and govern in the 21st century (Hague & Payton, 2011). In a world that is progressively mediated by Information Communication Technologies (ICTs), the skills, competencies, and knowledge underpinning new literacies have become ever more important for our young generation. Efficient Internet users can ensure a more enriching life by getting at the online resources and prospects. Internet-based competence is a gateway to new social opportunities and employability (Hague & Williamson, 2009; Schmar-Dobler 2003; UNESCO IITE, 2011). The European Parliament and the Council (2006), therefore, recognize digital competence as one of the eight core competencies for lifelong learning. Considering the ubiquitous control of ICTs in today's society, educators, governments, foundations, and researchers call for the acquisition of "twenty-first century skills" and competencies in preparing students, employees, and citizens (Partnership for 21st Century Skills, 2011; Luna Scott, 2015; Leu et al., 2009; UNESCO IITE, 2011).

The ICTs have featured in education, all over the history, ultimately reshaping "its very nature" (Ryder & Wilson, 1996, p. 643). While the ICTs have influenced many aspects of education, perhaps the greatest effect has been observed in the domain of literacy. The rise of ICTs has "acutely altered the nature of literacy" (Coiro et al., 2008, p. 325). The International Reading Association (2009) maintains that literacy "instruction, assessment, and research" is imbued with new technologies (p.3). Thus, to be regarded as "fully literate" in the 21st century, readers must be digitally literate (International Reading Association, 2009, p. 3). This digital age has led to a re-envision of "literacy" where the Internet becomes a context for reading, writing, and communicating.

The exponential rise of ICTs continues to shape contemporary teaching-learning practices. It is significant to note that, while ICTs have the potential to revolutionize teaching-learning practices, this potential will not be materialized until factors like access, maintenance, and adequate pedagogical and technical support are addressed (Carvin, 2000; Hargittai, 2002; Warschauer, 2004; Pedró, 2009; Peña-López, 2010; Devey, 2016; Van Dijk, 2020). New technologies constantly remodel former literacies; redefining regularly what it entails to become 'fully literate' in the 21st century. The Internet and related digital technologies require a new set of skills, competencies, and strategies for their effective use (Hartman et al., 2010; Leu et al., 2017). Traditional approaches to literacy learning are inadequate for 21st century learners (Eagleton & Dobler, 2015; Leu et al., 2017; Coiro, 2003). Digital natives or "native speakers" of 21st century technologies, stand in need of teaching-learning contexts that uphold their demand to learn and think in technological language (Prensky, 2001).

The New Literacies Theory

The present study draws upon the New Literacies theory (Leu et al., 2017). Broadly speaking, the New Literacies theory is premised on the proposition that the nature of literacy is increasingly changing as a result of updated technologies. The major common assumptions of an array of new literacies perspectives established by Coiro et al. (2008) are discussed below to bring a deeper insight into new literacies skills.

The Internet and associated digital technologies entail a new set of skills, competencies, and strategies for their effectual use. Typically, new literacies bank on foundational literacies rather than swap them fully. However, foundational literacies will be insufficient to fully exploit the potential of the Internet and related ICTs (Hartman et al., 2010; Leu et al., 2017).

New literacies are cardinal to full civic, social, and economic participation in contemporary global society. From a sociocultural perspective, literacy is immersed in and evolves out of the social practices of a society. (Gee & Hayes, 2012; Lankshear & Knobel, 2011; Cope & Kalantzis, 2000). Truly, the Internet has turned out to be the "defining technology for literacy" in the 21st century (Leu et al., 2017, p.5). The adoption of new technology by a multitude of people in so short a period, with strong effects on both literacy and life, has no parallel in the history of civilizations (Leu et al., 2017).

New literacies are deictic—they change rapidly along with the advent of new technologies. With the emergence of each technological innovation, a new literacy arises, demanding novel skills and competencies for their efficient use (Leu et al., 2008). New technological launchings consistently and continually remodel former literacies; redefining regularly what it entails to become fully literate.

New literacies are "multiple, multimodal, and multifaceted" and so they benefit from diversified viewpoints (Leu et al., 2017, p. 6). The New London Group (1996) coined the term "multiliteracies" and captured a broader standpoint of literacy from a sociocultural perspective. A multiliteracies pedagogical approach views a linear "text" embedded in a multimodal "text" combining sound, visuals, illustrations, and videos via high-tech features (Cope & Kalantzis, 2000; Walsh, 2010).

Critical literacies hold the topmost priority in the New Literacies. Critical skills are more important than ever in a context where anybody may publish anything of his free will (Bråten et al., 2011). Information from people having a strong political, religious, or ideological background is liable to affect the authenticity and reliability of the information presented. Therefore, we must help learners to become more informed and critical users of the online content they come across (Flanagin & Metzger, 2010; Leu et al., 2017).

The Internet and ICTs have changed the teaching-learning landscape and triggered "a different kind of relationship between the teachers, the learners, and what is being learned" (Laurillard, 2013, p. xvi). In the rapidly changing digital

environment, with the latest and updated technologies coming out all the time, everyone is a learner. In this scenario, the role of the teacher shifts from a dispenser of skills to an orchestrator of learning who, while facilitating learning, often learns alongside his students (Leu et al., 2017; Vanek, 2014).

New Literacies is a dual-level theory involving uppercase and lowercase theories. Uppercase theories depict the broader concepts underlying New Literacies theory, whereas lowercase theories delineate the skills and competencies required for specific technological innovation (Leu et al., 2017). Within this wider perspective of New Literacies' uppercase theory, the present study centers particularly on the new literacies' lowercase theory of online reading comprehension (Leu et al., 2008).

Online Reading Comprehension

Online reading comprehension (ORC) is a complicated process. The multifarious nature of ORC places huge demands on students' literacy skills (RAND Reading Study Group [RRSG], 2002). Several studies in the field of ORC challenged the initial assumption of isomorphism between online and offline reading comprehension (Leu et al., 2017). These studies maintain that although online reading comprehension shares a good deal of similitudes with offline reading comprehension, new skills and strategies are called for during ORC (Coiro & Dobler, 2007; Coiro, 2011; Leu et al., 2007; Devey, 2016). The theory of New Literacies conceives ORC as "a process of problem-based inquiry" that calls for additional new skills, competencies, inclinations, and social practices as we more and more depend on the Internet to carry on research, resolve problems, and respond to queries (Leu et al., 2017, p. 7). Five additional new skills transpire during ORC: "(1) reading to identify important questions, (2) reading to locate information, (3) reading to evaluate information critically, (4) reading to synthesize information, and (5) reading to communicate information" (Leu et al., 2017, p. 8).

Several empirical studies have been conducted to investigate the impact of instruction on ORC performance (Kuiper, 2007; Castek, 2008; Coiro, 2007; Kingsley, 2011; Kingsley & Tancock, 2014; Dwyer, 2010; Leu & Reinking, 2005; Kingsley et al., 2015; Yamaç & Öztürk, 2019). Two important postulates drawn from these studies are: first, comprehension strategy instruction enhances the ORC levels of students; and second, explicit teacher modelling during instruction fosters collaborative learning and Internet inquiry tasks.

STATEMENT OF THE PROBLEM

Today's young people, grown up in the media-saturated world, are referred to as "digital natives," "cyberkids," "the net generation," "goggle generation," etc. (Prensky, 2001; Gibbons, 2007; Tapscott, 1998; Oblinger & Oblinger, 2005). However, the question arises whether this tech-savvy generation has as much knowledge about technology as is inferred by the term "digital natives." This interface with digital tools does not necessarily mean that "digital natives" are the informed users of technology or that they have an in-depth knowledge of how to use ICTs meaningfully for literacy purposes (Hague & Williamson, 2009; Hague & Payton, 2011). Although "digital natives" may be skilled with

social networking, text messaging, video and MP3 downloads, or mash-ups, they are not always as skilled with online research and reading comprehension, involving locating (Kuiper & Volman, 2008; Bilal, 2000; Eagleton et al., 2003), and evaluating online content (Forzani, 2018; Kiili et al., 2018; Hämäläinen et al., 2020; Castek, 2008; Bennett et al., 2008). This digital generation tends to extrapolate their skill to read online information efficiently, informed by their skill to involve successfully in social networking, text messaging, downloading, and gaming (Kuiper & Volman, 2008; Kuiper, 2007). Thus, this recreational and uninformed use of ICTs by the "digital natives" shouldn't drive us to whimsical expectations about their actual digital competence (Hague & Payton, 2011; Hague & Williamson, 2009).

Having been cognizant of the poor digital literacy skills of Pakistani undergraduate university students initially experienced as an English language teacher for 13 years at The Women University, Multan, and later confirmed by a modest pilot study examining the online reading comprehension skills among undergraduate students, the researcher became fairly convinced that undergraduate students require explicit instruction in new literacies. Prompted by the situation as such the researcher led to hypothesize that a New Literacies online reading comprehension instructional programme improves online reading comprehension performance.

The aim of this study was to examine the impact of instruction on the online reading comprehension of undergraduate university students using a measure of online reading comprehension. The current study is of remarkable importance in the Pakistani context since no empirical study has been undertaken to date in the field of online reading comprehension instruction. It is, therefore, going to be a groundbreaking study in this area of the world.

METHODOLOGY

Research Design

The present study is quantitative in nature. The researcher used a pre-test posttest control group quasi-experimental design to test the hypothesis that a New Literacies online reading comprehension instructional programme influences students' online reading comprehension levels in a positive way. The pretest-posttest control group design is one of the most extensively employed quasi-experimental designs in education research (Rogers, & Révész, 2020; Ary et al., 2018). In this quasi-field experimental design, the experimental group participates in some type of intervention. The design includes a pretest and a posttest, in which both the experimental and control groups take part. The aim of the pretest is to assure that the two groups are comparable prior to the intervention, whereas the posttest permits the researcher to ascertain the immediate impact of the intervention on the dependent variable (Rogers, & Révész, 2020). The pretest-posttest control group quasi- field experimental design used in the study is outlined in Table 1.

Table 1 Quasi-field Experiment Design

Conditions	Treatment level
Experimental group	ROXO
Control group	ROO

In the present study, the independent variable was online reading comprehension instructional programme that continued over an eight-week period in the experimental condition. The dependent variable was ORC levels which were assessed pre-intervention and post-intervention for both the experimental and control groups.

Setting and Sampling

The study was conducted in the region of Southern Punjab, which is a relatively disadvantaged area of Punjab, Pakistan. Three public sector universities of Multan city were selected: The Women University Multan (WUM), Bahauddin Zakariya University Multan (BZU), and the National University of Modern Languages Multan Campus (NUML). Students from almost all the cities of Southern Punjab (e.g., Multan, Rajunpur, Dera Ghazi Khan, Bhakkar, Layyah, Lodhran, Muzaffar Garh, Khanewal, Vehari, etc.) join these universities. The selected universities are, therefore, expected to be representative of the whole region of Southern Punjab. One hundred and fifty (n=150) BS English undergraduate students from the selected universities participated in the quasi-field experiment. One hundred and two female participants (n=102) and 48 male participants (n=48) took part in the study. The undergraduate participants recruited for the study were in their first or second semesters of BS English in the year 2021. The researcher employed a stratified random sampling method to allocate participants to the control and experimental conditions. The stratified random sampling technique was selected as the researcher wanted to divide the target sample into homogenous groups Kumar (2018) claims stratified random sampling is applied when adequate representation from a sub-group is required to achieve greater accuracy in your estimate. For the purposes of this study, the sub-groups or strata were gender and university type.

The Research Instrument

Data was collected using the Online Reading Comprehension Assessment (ORCA-I). An adapted version of the "Online Research and Comprehension Assessment (ORCA) Elementary" (Castek, 2008), the "ORCA Elementary-Revised" (Kingsley, 2011) is used as pretest and posttest to assess the undergraduate students' levels of ORC. The researcher slightly modified the wording of Kingsley's (2011) scale to suit the context of this study. In addition, the researcher also tailored the issue of a few discontinued sites in Kingsley's (2011) scale by replacing them with similar sites without making any changes to the topics of the tasks. The ORCA-I is a performance-based measure fashioned to evaluate online reading comprehension by asking participants to carry out authentic research in an online context. The ORCA-I involves four

information tasks that assess the basic skills of the new literacies of online reading comprehension. Each student was provided up to fifteen minutes to accomplish each of the four information tasks.

The ORCA-I was adapted from other measures designed to assess the online comprehension of primary-level students; therefore, the researcher put some provisions into effect to determine the reliability of this measure for the targeted population of undergraduate students in this study. Leveraging insights from detailed discussions with the supervisor and university teachers, as well as 13 years of teaching undergraduate university students in the same underprivileged area of the country, the researcher was reasonably assured that the ORCA-I was appropriate for this population. Additionally, the researcher conducted a pilot test with 10 students. Through pilot testing, the ORCA-I was shown to be both a reliable and valid scale for undergraduate students who were from an underprivileged area (Southern Punjab) of a technologically backward country, Pakistan. The tasks and scoring rubrics for the ORCA-1 can be seen in Appendix *A*.

THE INSTRUCTIONAL PROGRAMME
The researcher designed and assembled an online reading comprehension instructional programme that was taught in the experimental condition for eight weeks. The instructional programme was designed after a comprehensive review of the literature and, in particular, the premise underlying the New Literacies Theory (Leu et al., 2017). The instructional programme comprised eight sessions on the new literacies of ORC strategies: questioning, locating, evaluating, synthesizing, and communicating information. These sessions were conducted using the learning management systems (LMS) of the universities, Zoom meetings, and Google Classroom. The lessons, handouts, and activities incorporated within these eight online reading sessions were taken from different sources. The researcher sought permission from the authors of the websites (where applicable) to use them for research purposes. The researcher acknowledged all these sources properly in this study. A suggested timeline for the sessions of the instructional programme can be found in Table 2

Table 2

Session	Skill	Lesson	Source	Estimated Time
1	Identifying Questions/Searching for Information	1.Picking the right search terms 2.Understanding search results 3.Narrowing a search to get the best results	Google Search Literacy Lesson Plans	60-90 min
2	Searching for Information	1.Find Command 2.Search Box Strategy	Information Fluency	60 min

3	Critical Evaluation	Is This a Hoax?'	Read Write Think.	60-90min
4	Critical Evaluation	1.Ten Points to Detect Disinformation 2.Don't Fall for Fake: Spotting disinformation online	MILCLICKS & Be Internet Awesome by Google	60 -90 min
5	Critical Evaluation	Recognizing Bias Evaluation Wizard	Ohio State University Libraries Information Fluency	90 min
6	Synthesis	Synthesizing	RIMT University & Guided Reading and Reading Workshop	90 min
7	Communication	Email Writing	British Council	90 min
8	Communication	Blogging in the Primary Grades? Yes, Indeed!	ReadWriteThink	90 min

Suggested Timeline for Online Reading Comprehension Instructional Sessions
The instructional programme was built on the Internet Reciprocal Teaching Model (IRT) (Leu et al., 2008). The IRT model has gained the recognition of being an appropriate instructional framework for teaching ORC skills to students (see Leu et al., 2008; Leu & Reinking, 2010; Castek, 2008; Kingsley, 2011; Kingsley, & Tancock, 2014; Kingsley et al., 2015; Castek et al., 2011). The ORC skills of questioning, locating, evaluating, synthesizing, and communicating were integrated into a three-phase teaching model. In Phase 1, explicit teacher modelling and think-alouds were used to model the application of the correct strategy in an online context. Phase 2 involved students' collaboration to practise and exchange online strategies with peers. At this stage, tasks were designed to increase students' involvement by gradually releasing the responsibility to them. Phase 3 involved students in independent online inquiry tasks to apply online reading comprehension strategies in authentic practice situations. Within the IRT model, the online reading tasks followed a progression from simpler to more complex. The skills and strategies became gradually more difficult as students proceeded through the three phases.

RESULTS

In order to determine the impact of the online reading comprehension instruction, the researcher examined the pre and posttest ORCA-I scores for both the control and experimental groups. An Independent Samples T-Test was performed to examine the impact of online reading comprehension instructional programme on the ORC levels of students.

First, a comparison between the experimental and control groups was made by conducting an Independent Samples T-Test to ascertain the difference between the overall ORCA-I pretest and posttest scores.

Table 3: Independent Samples T-Test for Overall ORCA-I Pre-test scores

Group	N	M	SD	t	df	p	95% CI of Mean Difference
Control	75	14.320	4.192	0.155	148	0.438	[-1.255, 1.469]
Experimental	75	14.213	4.253				

P=N.S

Table 3 shows the results of the Independent Samples T-Test for the Overall ORCA-I Pre-test scores of both groups. The results indicated no statistically significant difference between the pretest scores of the control and experimental groups. However, the control group achieved greater mean scores (M=14.320) than the experimental group (M=14.213) in the pretest.

Table 4; Independent Samples T-Test for Overall ORCA-I Post-test scores

Group	N	M	SD	t	df	p	95% CI of Mean Difference
Control	75	15.053	3.428	6.371	148	0.000*	[-4.419, -2.326]
Experimental	75	18.426	3.045				

*P<0.05

Table 4 records the results of the Independent Samples T-Test for the Overall ORCA-I posttest scores of both groups. The Independent Samples T-Test for ORCA-I posttest scores indicated a statistically significant difference between the posttest scores of both groups.The experimental group displayed significantly greater progress from pretest to posttest than the control group on the ORCA-I. The significant increase occurred in the experimental group's ORCA-I scores from pretest to posttest, suggesting that the online reading comprehension instructional programme improves students' performance on the ORCA-I. The performance trends of the two groups can be seen in Figure 1.

Figure 1: *Experimental and Control group Pre and Post ORCA-I Mean Scores*
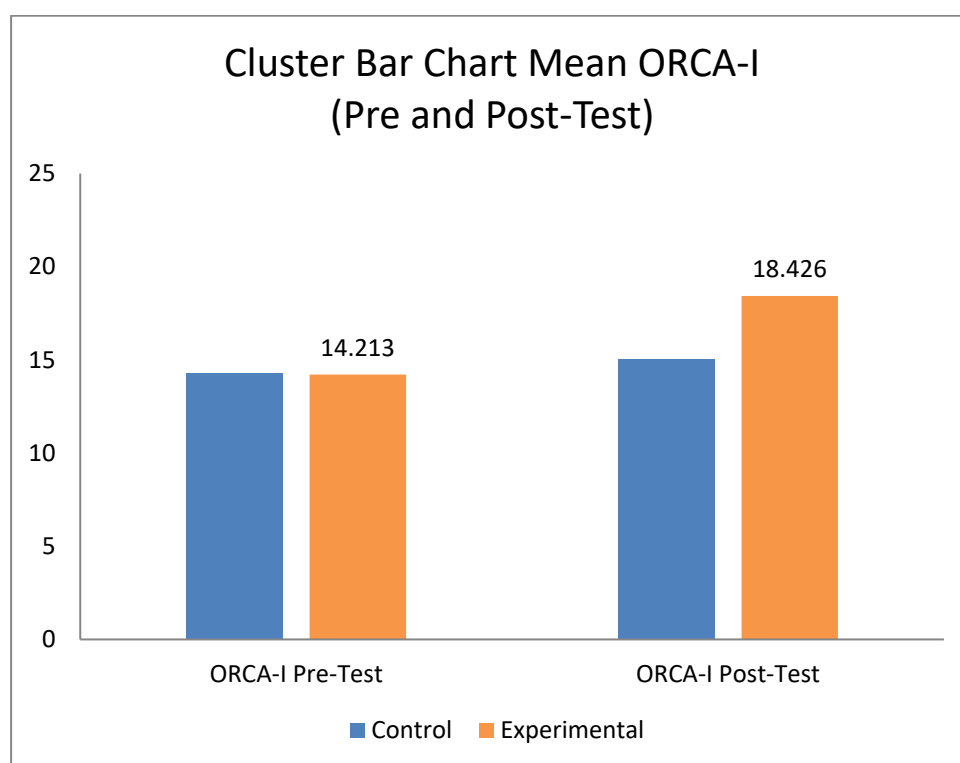
The researcher also explored participants' performance of individual skills incorporated into the ORCA-I. An Independent Samples T-Test was run to examine if there was a significant difference in the three subscales of ORCA-I from pretest to posttest. Questions involved in the four subtasks of ORCA-I were categorized under the online reading skills of locating, critically evaluating, and synthesizing.

**Table 4:** Comparison of Individual Skills Difference between Pre and Posttest ORCA-I scores

Study Variables	Group	Mean	SD	df	t	CI
Pre-test ORCA-I Locating	Control	6.96	2.165	148	0.038	[0.675,0.701]
	Experimental	6.95	2.098			
Pre-test ORCA-I Critically Evaluating	Control	4.07	2.002	148	0.000	[-0.69,0.69]
	Experimental	4.07	2.268			
Pre-test ORCA-I Synthesizing	Control	3.29	0.882	148	0.580	[-0.224,0.411]
	Experimental	3.20	1.078			
Post-test ORCA-I Locating	Control	7.52	1.863	148	-6.855*	[-2.267,-1.253]
	Experimental	9.28	1.214			
	Control	4.09	1.645	148		[-1.051,0.144]

Post-test ORCA-I Critically Evaluating	Experimental	4.55	2.035		-1.500	
Post-test ORCA-I Synthesizing	Control	3.47	0.859	148	-7.817 *	[-1.420,-0.847]
	Experimental	4.60	0.915			

*P<0.05

Table 4 shows a comparison of individual skills differences from pre to posttest ORCA-I scores for both the control and experimental groups. The results revealed that participants in the experimental group displayed significantly greater scores than their control group counterparts from pretest to posttest on two out of the three online reading skills. These skills involve locating and synthesizing information. The subskill of critically evaluating information did not display a statistically significant increase in performance, notwithstanding the experimental group had greater mean scores (M=4.55) than the control group (M=4.09).

Figure 2: Experimental and Control group Individual Skills Difference between Pre and Post ORCA-I Mean Scores
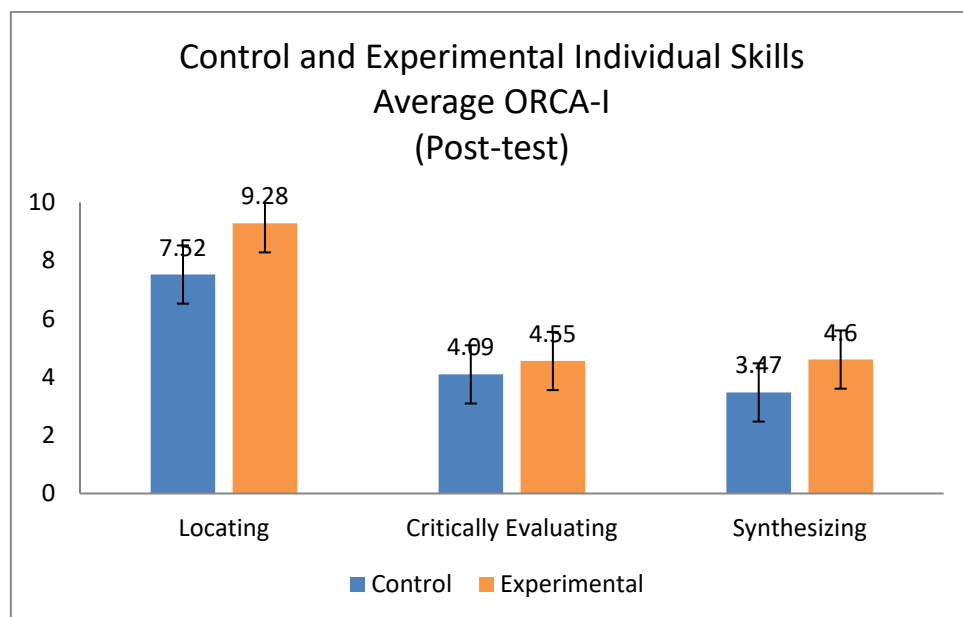
DISCUSSION

This study hypothesized that New Literacies online reading comprehension instructional programme would improve the online reading comprehension performance of a sample of Pakistani undergraduate university students. The null hypothesis was rejected as the results of the Independent Samples T-Test displayed a statistically significant growth (p.000) in online reading comprehension scores from pretest to posttest in the experimental condition. The hypothesis was additionally reinforced by the results of the Independent Samples T-Test, which exhibited no statistically significant difference in ORC scores from pretest to posttest in the control condition. Results indicate that

participants who received online reading comprehension instruction demonstrated greater proficiency in the application of online reading comprehension skills than participants who did not.

These findings are consistent with past studies that indicate the crucial role of instruction in the development of online reading comprehension performance levels. Several empirical studies with primary-level students revealed that explicit strategy instruction enhanced the online reading comprehension levels of students (Castek, 2008; Dwyer, 2010; Kingsley, 2011; Kingsley & Tancock, 2014; Kingsley et al., 2015; Devey, 2016).

The instructional programme, which was built on the IRT Model (Leu et al., 2008), was displayed as an efficient model to enhance online reading comprehension levels for undergraduate university students. The IRT model, with its three phases including initial teacher modelling, collaborative practice, and independent Internet inquiry, has been acknowledged as an appropriate instructional framework for teaching ORC skills to students (Leu et al., 2008; Leu & Reinking, 2010; Castek, 2008; Kingsley, 2011; Kingsley & Tancock, 2014; Kingsley et al., 2015; Castek et al., 2011). The findings of this study support previous findings in this area. The integration of ORC skills of questioning, locating, evaluating, synthesizing, and communicating into a three-phase teaching model may have supported students in the acquisition of these new literacies.

Results from the individual skill analysis displayed a significant increase for locating and synthesizing in the experimental condition. The skill of locating relevant information out of the vast array of online information is an essential element of successful ORC (Leu et al., 2017). The skill of reading to locate online information serves as a vital "gatekeeper" skill that governs the efficacy of online reading comprehension (Henry, 2006). Past studies have revealed students, while reading online, often face a new set of problems such as "information overload" and "information anxiety" (Bawden & Robinson, 2009; Schmar-Dobler, 2003). It is, therefore, crucial that online readers gain the ability to use ORC skills to locate information relevant to their purposes (Leu et al., 2017). The instructional programme incorporated into the present study involved two sessions on the "Reading to Locate Online Information" skill to facilitate students in online inquiry tasks. The significant increase in the posttest scores of the experimental group on the skill of locating online information may suggest how teaching the fundamental competencies of ORC can considerably affect performance. The skill of synthesizing online brings additional challenges as the readers need to construct text while navigating through multiple sources and summarize side by side (Kiili & Leu, 2019; Coiro & Dobler, 2007; Kuiper & Volman, 2008). Theorists of New Literacies argue that the skill of synthesizing is difficult to measure as the whole process occurs internally (Leu et al., 2007). Results acquired from this study indicate that participants who received explicit instruction on synthesis obtained higher scores on this skill in the posttest ORCA-I than participants who did not. Session six of the instructional programme focused on the "Reading to Synthesize Online Information" skill. This significant growth for the experimental group in the

skill of synthesizing could be ascribed to the instructional sessions intended to teach the skill of synthesizing.

The skill of critical evaluation is challenging for students because the Internet has become a context where anybody may publish anything (Leu et al., 2008). Research confirms students lack the skills required to critically evaluate online information (Hämäläinen et al., 2020; Forzani, 2018; Castek, 2008; Kuiper et al,, 2009; Kiili et al., 2018; Kingsley, 2011). It is because students temperamentally believe that all information published online must be regarded as authentic and trustworthy (Large & Beheshti, 2000; Leu et al., 2007; Kingsley & Tancock, 2014), and hardly ever question the credentials of websites (Fabos, 2008; McCrory Wallace et al., 2000). As could be expected in light of past research, the skill of critical evaluation turned out to be challenging for undergraduate students in this study. Participants' answers in response to the question regarding the reliability of websites on the pretest ORCA-I, such as, "I think these sites are reliable because Internet and Google are credible sources of information," bespeak participants' naivety with regard to online content. Considering students' struggle with critically evaluating online information, three of the eight instructional sessions were aimed at teaching evaluation skills. Regardless of this intensive focus on critical evaluation, participants continued to struggle with this skill as the experimental group showed no significant increase in the posttest ORCA-I on critical evaluation. Results acquired from this individual skill analysis (critical evaluation) implies that this population of undergraduate university students needs more intensive instruction on critically evaluating online information.

CONCLUSION
The present study, informed by the theory of New Literacy, has focused exclusively on the new literacy needs of today's learners in this digital age as well as the role of instruction in the development of online reading comprehension skills. The main aim of the study was to examine the impact of new literacies instruction on the online reading comprehension performance of Pakistani undergraduate university students.

The findings of this study indicate that New Literacies online reading comprehension instructional programme improves online reading comprehension performance. The experimental group demonstrated significantly greater growth from pretest to posttest than the control group on the ORCA-I. These findings imply that an online reading comprehension instructional programme can raise students' ORC levels. Findings based on the individual skills analysis directed the researcher to conclude that the skill of critical evaluation is problematic to acquire. An examination of the overall increase in the posttest ORCA-I scores in the experimental condition suggests that the instructional framework (IRT) employed in this study to deliver the eight sessions of the online reading comprehension programme was effective for teaching online reading comprehension skills.

RECOMMENDATIONS
Drawing on the findings of this study, following recommendations have been made for pedagogical practice and educational policy:

- Teachers should integrate online reading comprehension instruction into their regular language teaching. As the Internet is redefining literacy, the issue of teaching the new literacies of online reading has become of far greater significance in this digital age than ever before. Overall, students' knowledge of the new literacies of online reading comprehension and their performance in the pretest ORCA-I indicated a dearth of online comprehension skills among them, but they appeared keen to learn about these skills throughout the instructional sessions. Informed by these findings, it is recommended that this keenness should be exploited wisely by integrating online comprehension skills into language teaching.

- Students require targeted instruction in the application of higher-order online comprehension skills such as Reading to Critically Evaluate Online Information. The findings of this study indicate that despite the intensive focus on critical evaluation participants in the experimental group continued to struggle with this skill. In light of these findings, it is recommended that undergraduate university students should receive extended support for the development of critical evaluation skills.

- Online reading comprehension instruction should be integrated within the Internet Reciprocal Teaching Model. The IRT model was shown as an appropriate instructional framework for teaching online reading comprehension skills to students in this study. Based on these findings, the researcher recommends the use of the IRT model for online reading comprehension instruction.

- The professional growth of teachers must be ensured to keep them cognizant of the new literacies arising from the advent of ICTs. In this regard, Pakistani policymakers and education departments should devise a Continuing Professional Development (CPD) framework including training workshops, conferences, and events in the respective institutions of the teachers providing training on how to implement an online reading comprehension instructional programme.

- The Curriculum Division of HEC should revisit the language curriculum of the BS programme and ensure that online reading comprehension is included and assessed in the Scheme of Studies devised for undergraduate university students. The instructional programme designed in this study opens up new potentials for online literacy curriculum development within the Pakistani educational context. Drawing on these findings, the researcher recommends that online reading comprehension must be included as part of the BS programme course titled "English I: Reading and Writing Skills," featuring the following contents:

1. Introduction to New Literacies
2. Significance of New Literacies for 21ST Century Students
3. A Comprehensive Definition of Online Reading Comprehension
4. The Difference between Online Reading Comprehension and Print-based Comprehension

5.   A List of ORC Skills including: Reading to Identify Important Questions, Reading to Locate Information, Reading to Evaluate Information Critically, Reading to Synthesize Information, and Reading to Communicate Information.

AREAS FOR FUTURE RESEARCH
The present study investigated the impact of instruction on the online reading comprehension performance of Pakistani undergraduate university students. This study is limited in scope, so it's hard to claim the generalizability of the study. The results, however, are insightful, provoking further inquiry either replicating the same design or extending it to suit the purpose.

REFERENCES

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). Introduction to research in education (10th ed.). USA: Cengage Learning.

Bawden, D., & Robinson, L. (2009). The dark side of information: overload, anxiety and other paradoxes and pathologies. Journal of information science, 35(2), 180-191.

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. British journal of educational technology, 39(5), 775-786.

Bilal, D. (2000). Children's use of the Yahooligans! Web search engine: I. Cognitive, physical, and affective behaviors on fact-based search tasks. Journal of the American Society for information Science, 51(7), 646-665.

Bråten, I., Strømsø, H. I., & Salmerón, L. (2011). Trust and mistrust when students read multiple information sources about climate change. Learning and Instruction, 21(2), 180-192.

Carvin, A. (2000). More than just access: Fitting literacy and content into the digital divide equation. Educause review, 35(6), 38-47.

Castek, J. M. (2008). How do 4 th and 5 th grade students acquire the new literacies of online reading comprehension? Exploring the contexts that facilitate learning (pp. 1-288). University of Connecticut.

Castek, J., Zawilinski, L., McVerry, J. G., O'Byrne, W. I., & Leu, D. J. (2011). The new literacies of online reading comprehension: New opportunities and challenges for students with learning difficulties. In Multiple perspectives on difficulties in learning literacy and numeracy (pp. 91-110). Springer, Dordrecht.

Coiro, J. (2003). Exploring literacy on the internet: Reading comprehension on the internet: Expanding our understanding of reading comprehension to encompass new literacies. The reading teacher, 56(5), 458-464.

Coiro, J. (2007). Exploring changes to reading comprehension on the Internet. Paradoxes and possibilities for diverse adolescent readers (Thesis doctoral). University of Connecticut, Rhode Island, US.

Coiro, J. (2011). Predicting reading comprehension on the Internet: Contributions of offline reading skills, online reading skills, and prior knowledge. Journal of literacy research, 43(4), 352-392.

Coiro, J. & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth grade skilled readers to search for and locate information on the Internet. Reading Research Quarterly, 42, 214–257.

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (2008). Central issues in new literacies and new literacies research. In J. Coiro, M. Knobel, C. Lankshear, & D. J. Leu (Eds.), Handbook of research on new literacies (pp. 1–22). Mahwah, NJ: Erlbaum.

Cope, B., & Kalantzis, M. (Eds.). (2000). Multiliteracies: Literacy learning and the design of social futures. London and New York: Routledge.

Devey, C. (2016). A mixed methods investigation of effective online comprehension strategy instruction within the Irish Primary School context (Master's thesis, Mary Immaculate College, University of Limerick).

Dwyer, B. (2010). Scaffolding Internet reading: A study of a disadvantaged school community in Ireland (Doctoral dissertation, University of Nottingham).

Eagleton, M., Guinee, K., & Langlais, K. (2003). Teaching Internet literacy strategies: The hero inquiry project. Voices From the Middle, 10, 28 – 35

Eagleton, M. B., & Dobler, E. (2015). Reading the Web. Strategies for internet inquiry (2nd ed.). New York: Guilford.

Fabos, B. (2008). The price of information: Critical literacy, education, and today's Internet. In J. Coiro, M. Knobel, C. Lankshear, & D.J. Leu (Eds.), Handbook of research on new literacies (pp. 839 – 870). New York, NY: Erlbaum.

Flanagin, A. J., & Metzger, M. J. (2010). Kids and credibility: An empirical examination of youth, digital media use, and information credibility (p. 154). Cambridge, MA: The MIT Press.

Forzani, E. (2018). How well can students evaluate online science information? Contributions of prior knowledge, gender, socioeconomic status, and offline reading ability. Reading Research Quarterly, 53(4), 385-390.

Gee, J. P., & Hayes, E. (2012). Nurturing affinity spaces and game-based learning. Games, learning, and society: Learning and meaning in the digital age, 123, 1-40.

Gibbons, S. L. (2007). The academic library and the net gen student: Making the connections. Chicago: American Library Association.

Google. (2021). Be Internet Awesome Curriculum. Retrieved February 12, 2021, from https://storage.googleapis.com/gweb-interland.appspot.com/en-us/hub/pdfs/2021/BIA_Curriculum_June-2021_EN_PDF-Version.pdf

Hague, C., & Payton, S. (2011). Digital literacy across the curriculum. Curriculum Leadership, 9(10).

Hague, C., & Williamson, B. (2009). Digital participation, digital literacy, and school subjects. A review of the policies, literature and evidence. A report for Futurelab.

Hämäläinen, E. K., Kiili, C., Marttunen, M., Räikkönen, E., González-Ibáñez, R., & Leppänen, P. H. (2020). Promoting sixth graders' credibility Evaluation of Web pages: An intervention study. Computers in Human Behavior, 106372.

Hargittai, E. (2002). Second-Level Digital Divide: Differences in People's Online Skills. First Monday, 7(4).

Hartman, D. K., Morsink, P. M., & Zheng, J. (2010). From print to pixels: The evolution of cognitive conceptions of reading comprehension. In E.A.

Baker (Ed.), The new literacies: Multiple perspectives on research and practice (pp. 131 – 164). New York, NY: Guilford.

Henry, L. A. (2006). SEARCHing for an answer: The critical role of new literacies while reading on the Internet. The reading teacher, 59(7), 614-627.

Information Fluency. (2002b). Search Box Strategy. Retrieved March 12, 2021, from https://21cif.com/tutorials/micro/mm/searchbox/

International Reading Association. (2009). New literacies and 21st-century technologies: A position statement of the International Reading Association. Newark, DE: Author.

Kiili, C., & Leu, D. J. (2019). Exploring the collaborative synthesis of information during online reading. Computers in Human Behavior, 95, 146-157.

Kiili, C., Leu, D. J., Marttunen, M., Hautala, J., & Leppänen, P. H. (2018). Exploring early adolescents' evaluation of academic and commercial online resources related to health. Reading and writing, 31(3), 533-557.

Kingsley, T. L. (2011). Integrating new literacy instruction to support online reading comprehension: An examination of online literacy performance in 5th grade classrooms. Ball State University.

Kingsley, T. L., Cassady, J. C., & Tancock, S. M. (2015). Successfully promoting 21st century online research skills: interventions in 5th-grade classrooms. Reading Horizons: A Journal of Literacy and Language Arts, 54(2), 5.

Kingsley, T., & Tancock, S. (2014). Internet inquiry: Fundamental competencies for online comprehension. The Reading Teacher, 67(5), 389-399.

Kuiper, E. (2007). Teaching web literacy in primary education. Enschede, Netherlands: Imskamp.

Kuiper, E., & Volman, M. (2008). The Web as a source of information for students in K–12 education. In J. Coiro, M. Knobel, C. Lankshear, & D.J. Leu (Eds.), Handbook of research on new literacies (pp. 241 – 246). Mahwah, NJ: Erlbaum.

Kuiper, E., Volman, M., & Terwel, J. (2009). Developing Web literacy in collaborative inquiry activities. Computers & Education, 52(3), 668-680.

Kumar, R. (2018). Research methodology: A step-by-step guide for beginners (5th ed.). London, UK: Sage.

Lankshear, C., & Knobel, M. (2011). New literacies: Everyday practices and classroom learning (3rd ed.). Maidenhead: Open University Press McGraw Hill Education.

Large, A., & Beheshti, J. (2000). The Web as a classroom resource: Reactions from the users. Journal of the American Society for Information Science, 51(12), 1069-1080.

Laurillard, D. (2013) Foreword to the second edition. In Beetham, H. & Sharpe, R. (Eds), Rethinking Pedagogy for a Digital Age (pp. xvi-xviii). London: Routledge.

Leu, D. J., Coiro, J., Castek, J., Hartman, D., Henry, L. A., & Reinking, D. (2008). Research on instruction and assessment in the new literacies of online reading comprehension. In C. C. Block & S. Parris (Eds.),

Comprehension instruction: Research-based best practices (pp. 321–345). New York: Guilford.

Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2017). New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment. Journal of Education, 197(2), 1-18.

Leu, D. J., & Reinking, D. (2005). Developing Internet comprehension strategies among adolescent students at risk to become dropouts. Washington: Institute of Education Sciences.

Leu, D. J., & Reinking, D. (2010). Final report: Developing Internet comprehension strategies among adolescent students at risk to become dropouts. US Department of Education, Institute of Education Sciences Research Grant. Retrieved from www. newliteracies. uconn. edu/iesproject/researchdocuments. html.

Leu, D. J., Reinking, D., Carter, A., Castek, J., Coiro, J., Henry, L. A., ... & Zawilinski, L. (2007). Defining online reading comprehension: Using think aloud verbal protocols to refine a preliminary model of Internet reading comprehension processes. D. Alvermann (Chair) 21st Century Literacy: What is it, How do students get it, and how do we know if they have it.

Luna-Scott, C. (2015). The futures of learning 2: What kind of learning for the 21st Century? UNESCO Education Research and Foresight, Paris. Working Papers, 1(14), 1-7.

Leu, D. J., O'byrne, W. I., Zawilinski, L., McVerry, J. G., & Everett-Cacopardo, H. (2009). Comments on Greenhow, Robelia, and Hughes: Expanding the new literacies conversation. Educational researcher, 38(4), 264-269.

McCrory Wallace, R., Kupperman, J., Krajcik, J., & Soloway, E. (2000). Science on the Web: Students online in a sixth-grade classroom. The journal of the learning sciences, 9(1), 75-104.

Oblinger, D., & Oblinger, J. (2005). Is it age or IT: First steps toward understanding the net generation. Educating the net generation, 2(1-2), 20.

Ohio State University Libraries. (2014, March 13). Recognizing Bias [Video file]. YouTube. Retrieved from https://www.youtube.com/watch?v=YpGVIKjjIOE

P 21. (2011). Framework for 21st Century Learning. Washington DC, Partnership for 21st Century Skills. Retrieved August 20, 2020, from www.p21.org/storage/documents/1.p21_framework_2-pager.pdf

Pedró, F. (2009, September). New millennium learners in higher education: Evidence and policy implications. In International Conference on 21st Century Competencies, Brussels: OECD/CERI.

Peña-López, I. (2010). From laptops to competences: Bridging the digital divide in education. RUSC. Universities and Knowledge Society Journal, 7(1), 21-32.

Prensky, M. (2001). Digital natives, digital immigrants part 1. On the Horizon, 9(5), 1-6.

RAND Reading Study Group. (2002). Reading for understanding: Towards an R&D program in reading comprehension. Santa Monica, CA: RAND.

ReadWriteThink. (2002a). Is This a Hoax? Retrieved March 27, 2021, from https://www.readwritethink.org/sites/default/files/resources/1135_hoax .pdf

Rogers, J., & Révész, A. (2020). Experimental and quasiexperimental designs. In J. McKinley & H. Rose (Eds.), The Routledge handbook of research methods in applied linguistics. New York: Routledge.

Ryder, M., & Wilson, B. (1996). Affordances and Constraints of the Internet for Learning and Instruction. Presented to the Association for Educational Communications Technology. Indianapolis, IN.

Schmar-Dobler, E. (2003). Reading on the Internet: The link between literacy and technology. Journal of adolescent & adult literacy, 47(1), 80-85.

Tapscott, D. (1998). Growing up digital: The rise of the Net Generation. New York: McGraw-Hill.

The European Parliament and the Council. (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. Official Journal of the European Union, L394/310

The New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. Harvard educational review, 66(1), 60-93.

UNESCO IITE Policy Brief. (2011). Digital libraries in education. UNESCO Institute for Information Technologies in Education.

Van Dijk, J. (2020). The digital divide. Cambridge, UK: Polity Press.

Vanek, J. B. (2014). Open educational resources: new technologies and new ways of learning. MinneTESOL Journal 2014 (Fall/Winter 2014).

Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice?. Australian Journal of Language and Literacy, The, 33(3), 211.

Warschauer, M. (2004). Technology and social inclusion: Rethinking the digital divide. Cambridge, MA: MIT Press.

Yamaç, A., & Öztürk, E. (2019). How Digital Reading Differs from Traditional Reading: An Action Research. International Journal of Progressive Education, 15(3), 207-222.