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Professional Development of English Teachers regarding Online Resources: An SR Approach

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Abstract

The objective of this study was to analyze the needs of school personnel in terms of their professional development related with online resources in the province of Punjab at secondary level. An SR approach (Systematic Review) had been done rigorously. A pool of 300 research articles were selected purposively. Further selection had been done on the basis of criterion that the already available researches should be in English as there were some relevant papers which were in languages other than English which were not understandable to the researchers. A systematic criterion was set on the basis of which the research papers had been using keywords like Smart Classroom Online Resources which includes multimedia, videos in English and Urdu Languages, Resource, and games in visual style of learning. Instrument used for collection of data was an online resource itself. The results of SR showed that there is a dire need to develop the school personnel in terms their professional development related with online resources which are going to be used in Pandemic situation throughout the province of Punjab. Some recommendations were made for teachers and school administrators as well as managers for better teaching learning process via digital mode as well.

Key words: Professional Development, School Personnel, Online Resources, Pandemic Situation, Need Analysis, SR (Systematic Review) Approach

Introduction

World has become a global village. To make progress in this world the quality of education must be raised. E-learning is an emerging concept in education. Education has shifted from board to multimedia system. Textbooks are now being digitalized by making the knowledge assessable, searchable, and reachable only through a few computer commands. Student's evaluation process has undergone significant changes which not only reduce the teacher's effort but also analyze the student's progress statistically and then adopt the teaching strategy according to the student's response and performance. In this rapid growth of computer age, the interest of students cannot be captured only by using traditional lecture method of education. Students learn more in less time by using online resources.

The COVID-19 pandemic has affected all aspects of life, especially education. Closing of school and stay at home has affected the learning process of students. Online resource is the only tool which can replace the school. In this tough time digital

resources are good supplement for our students to continue their educational process in a smooth way. Different countries have adopted various technologies in education sector according to their requirements, culture, and level of teaching and student's expertise. In Pakistan, many schools are finding it difficult to adopt the policy of Online Resource due to various reasons which include lack of teachers training and motivation. Economic and technical constraints add to icing on the cake to adopt. The integration of Online Resource can make traditional methods much more effective as well as interesting. But more inculcation of information in Online Resource in traditional method does not eliminate the significance and the need of teachers. It just changes the role of teacher as facilitator from instructor. Students still need to be guided but the source of knowledge does not remain the teacher and the outdated curriculum. This technique not only creates interest of students in a topic but also save students time in getting right and up to date knowledge on the topic.

Statement of Research Problem

The commonly used method for teaching in Pakistan is lecture method. It is found that students are passive in this learning style. Now-a-days Online Resource is used for many educational purposes because it makes the work of students and teachers easier and is less time consuming. The teachers in Pakistan avoid using Online Resource due to lack of training. Teachers mostly focus on rote memorization of students for good results in exams. Students cram the topics to get good marks or to pass the exams without having understanding about topic. There had been dire need to replace Online Resource with traditional method of teaching. Conceptual learning of students might be improved by using digital Online Resource. This research was conducted to analyze the needs of teaching learning style of school personnel in the province of Punjab Pakistan.

Objectives of the Research

This research was conducted to achieve following objectives:
  i.   To analyze the needs of school personnel in terms of their professional development related with online resources.
  ii. To identify the benefits for school personnel in terms of their professional development related with online resources.

Significance of the Study

Teachers can also get benefit from it. They can easily check the performance of their students by taking online assessments. Assessments are necessary to give information about the performance of students. Through assessments the level of achievement and difficulties of students can be judged. They can find it easily that which areas of students are weak and require more assistance by getting the information of Resource available. It will be helpful for teachers to take the test of many students at a time. Due to heavy workload teachers cannot properly check the tests of their students. Sometimes they spend a lot of time in checking the test that students are no more interested in these test results. Online Resource help the teachers to check the result of many students within few seconds. The results compiled by computers are more accurate and reliable. Online Resource makes this difficult task easy. With the help of videos teachers can easily play and pause the videos according to the need of their students. They can provide additional information along with videos by pausing it. Teachers can keep the record of many tests at the same place easily. Teachers can do other tasks of school by engaging their students in these helpful activities. Teachers can preview the answers and solution of Resource.

This program is also helpful for parents they can get the performance of their children at home whenever they need. They can also compare the performance of their children with other students.

It is also very helpful for the management of schools. Those schools where teaching staff is not available according to the need of students will get help from this program. Large number of students can be managed easily at a time. Students can easily understand the difficult topics by using videos. Workload of management and teachers can be reduced.

Literature Review

Barbara Stern (2016) compare the similarities and differences of course offered by Foundations of American Education in online and traditional face-to-face format. She concluded that to make online course effective allocation of time for teaching will remain an issue for instructor. Instructor should design and monitor his course to keep students to participate and manage time their time. Students proficient in reading and writing perform better in online classes. She reported that students whose age is between 18 to 24 likes to learn in face-to-face courses but they prefer online courses due to their personal reasons (Stern, 2016). Meta-analysis of 24 articles showed significant impact of Online Resource on the outcome of students, to motivate them and to change their attitude towards learning. Effective use of Online Resource enhances mathematics achievement (Kristina Higgins, 2017). To maximize the learning of students a curriculum plan was implemented by teachers which includes methods and strategies to implement Online Resource. Online Resource was applied to facilitate the evaluation and assessment strategies, to enhance the productivity professional training of teachers. Teachers should understand and know how to apply the ethical, legal, and social issues regarding to the use of Online Resource. By using digital media students can communicate and collaborate with students at distance to support their individual and help other students in learning. They can gather, uses, and evaluate information. By using critical thinking skills students can plan their work to conduct research, to manage different projects, solve different kind of problems and make fruitful decisions by using appropriate tools and Online Resource. It was expected that preservice teachers use many kinds of technologies in their research at elementary and secondary level. Depending on the grade level of student instructional applications of these technologies is different. At elementary level teachers use digital cameras for the documentation of their student's projects while at secondary level teachers ask their students to document their findings. Due to lack of Online Resource at school and at home teachers do not assign Online Resource related projects to students at home. Prerequisite skills are very important for students and teachers to use Online Resource. Preservice teachers do not have adequate time to teach both Online Resource related skills and to complete their academic content at same time. Teachers face consistent challenges in the use of Online Resource as tool for learning. Many schools lack access to the use of Online Resource. Students and teachers have lack of access to Online Resource computer labs and computers were rare, to meet the need of students (Thieman, 2016). Appropriate software was also insufficient to meet the demand of students. Internet connectivity, availability of recording devices, and printers is also a big problem. Lack of staff for technical support, allocate time to figure out the use of equipment, set up of Online Resource and its testing are the hurdles faced by many teachers. Students most frequently use internet as a search tool for research purposes. Several digital tools are in use by students for gathering and evaluation of information. Research can be easily conducted with internet browser or by using web quest. Students have better chance of understanding the historical events,

their impact on the life of people by comparing the sources available on internet and current information. Students can participate in virtual field trips online or they can use simulation. Text version of plays and novels can be compared and analyzed with video version. Spreadsheets and graphs can be created to analyze the mathematical data of lab work. Proper instructions about safe Online Resource usage and its ethics were not given to teachers. To research a topic effectively is a big challenge for teachers. Students mostly do not know how to appropriately access the internet source, about authentication of source. Interpretation of any online source is also a big problem for students. In this research 73 % of preservice teachers uses variety of technologies for instruction purpose with their students (Thieman, 2016).

Teachers and students should have regular access to those technologies that supports and advances sense making skills, problem solving skills, communicative skills, and communication skills of students. By capturing the interest of students using Online Resource teachers can increase their proficiency in mathematics. Strategical use of Online Resource can provide access for students of math. Use of technological tools maximizes the possibilities to increase the knowledge of students (2015). Online Resource influences students by motivating them to learn and change their attitude towards learning. Type of content used, learning environment and duration for which Online Resource is being used are important factors in the achievement of educational goals (Higgins, 2019). The use of instructional Online Resource in schools enhances the learning of students. Students learn more effectively using Online Resource. In most of the schools of developed countries Online Resource is extensively used. In Online Resource implemented classes learning become more interactive and fun for students. It was observed that student and teachers both get benefit from Online Resource integrated learning environment. Use of Online Resource for instruction purpose enhances the learning capacity of students, increase motivation level, and engage students in learning process in an effective way. Online Resource helps teachers to create learning context that was not possible to create with traditional teaching method. Online Resource provides excellent avenue for imaginative and creative teaching. Appropriate use of Online Resource has positive impact on the achievement and success of students. It helps teachers to provide instant feedback to students, promote collaborative, cooperative and active learning. It provides flexibility of learning to students. Using Online Resource in classrooms enhance teaching and provide better learning opportunity. For effective learning educators believe that using different and appropriate form of Online Resource is necessary (Eyyam & Yaratan, 2014).

Arithmetic questions and logical reasoning are considered as the foundation of science and Online Resource. For this reason, mathematics has been regarded as the fundamental subject in all fields. Educational authorities focus on the computation and problem-solving skills of students at all levels. More learning opportunities can be provided to students if every student is equipped with a separate device to learn in school and at home. Immediate feedback motivates students to actively participate in mathematics learning and improves their productivity. As compare to other countries students of Taiwan have low interest in learning math. In most elementary math classes in Taiwan instructions of conventional teacher remains dominant. Students may fall behind in mathematics achievement and loses their interest because teachers rarely care about all students in such conditions. To enhance the interest and achievement of low achievement students in mathematics is a major problem. Interest level, calculations and word problems of students can be improved by using game-based learning environment. Learning based on games enhance and sustain the interest of students in

learning math, facilitates students in learning, increase their motivation level, improves their situation learning and problem-solving skills. It also facilitates math performance, self-efficiency, enjoyment level, improves their mental calculation ability and their confidence in math. Teachers and students follow the predefined sequence as given in textbooks and classrooms. The structure of knowledge given is not linear but is in the form of network. Students explore knowledge and while learning they find the relationship among these pieces of knowledge. In the opinion of teacher game-based learning environment do not disturb their instruction process. Interesting games, appealing and joyful learning tasks helps to attract the attention and motivate students to learn mathematics. Digital technologies help teachers to manage portfolio of students. System can keep the record of all learning activities of students. Teachers can monitor the functioning of students. They have the progress of individual student and average status of whole class. It is difficult for the teachers to deal with the progress of low and high achieving students to take care of all the student's abilities at same time. In such self-directed learning environment future teacher should be versatile to use different teaching strategies at same time. Some students are interested in geometry and some are interested in algebra. Games available provide different routes to clear the concepts of students. Low achieving students require more time to complete their tasks while high achieving students easily clear their tasks and move to next one. High achieving students should be provided more difficult tasks. Students learn well in self-directed learning environment by using Online Resource (Charles Y. C. Yeh, 2019).

Teachers always figure out what students will get from the content, what from activities, what from fellows and what from school and teachers. While designing the plan of study teachers should kept in mind that all the activities should bound to home only. Benefit of using Online Resource in online teaching is that teachers effectively learn the use of Online Resource in an authentic way through experimentation. Teachers should learn the techniques to manage learners in live session remotely while using Learning Management System or web conferencing. Most important thing for teachers to do while moving to digital system of instruction is to make their students successful online learners. Teacher should teach them the basic skills like use of keyboard, send an email, manage file, save data, log in while using web conferencing. Personal skills can also be developed in students related to online learning through motivation, teaching them to manage their time in useful way, and to remain persistent in their learning process. Students should learn different strategies of reading and writing through online sources effectively, make and follow the schedule and learn the skill of managing information from online sources. Productive online skills of students can be improved through these strategies. It is the responsibility of district to provide online education to all students in this situation. This can be done by providing Online Resource to all students. Establish new policies for attendance and participation of attendance in online classes. Students whose houses are not conductive for online learning should be provided additional assistance (Burns, 2020). Systematic review of 60 papers was done on the use of mobile Online Resource. Effect of mobile Online Resource on student's achievement, engagement, attitude, and perception was investigated. Attitude of students on the use of mobile Online Resource for learning mathematics was positive but its effect on attitude shows mixed results. Engagements of students with their fellows has increased this also increases their engagement in learning (Fabian, Topping, & Barron, 2016). The use of digital Online Resource in classroom is continuously increasing day by day. Students using iPads for geometry course experience low level of proficiency scores but self-efficiency of both group of students remain same (Perry & Steck, 2015).

Transference in learning situations which includes home and outdoor provide more flexible way for students to work collaboratively (Calder, 2016). Mathematics can be made more meaningful, engaging, and practical by using technologies with appropriate pedagogies. Online Resource facilitates students for practical application of mathematics. Activities using mobile devices and videos are used to create mathematical modelling activities. Realistic Mathematics Approach involves students in developing understanding by engaging problems of their interest from relevant and meaningful context with the assistance of their teacher (Bray & Tangney, 2016). Appropriate pedagogical framework can make math more meaningful and engaging. Curriculum reforms in recent years emphasis on higher order thinking and collaborative skills of students. In twenty first century such learning facilities will be developed for mathematics learning to increase the engagement of students in learning and to improve their confidence level in solving mathematics problems (Bray & Tangney, 2016). Educational games of mathematics provide better learning opportunities by engaging students. Game industry related to computer is growing much faster. Ninety seven percent of students whose age is between 12 to 17 play video games regularly (Bruce M. McLaren, 2017).

Use of digital and physical tools in teaching and learning of math by students and teachers in a thoughtfully designed way at pre-defined time is the strategic use of Online Resource. Strategic way enhances the interaction of students with other students and teachers. It supports effective teaching way of learning and doing math. It also enhances the access of students to information and ideas and clear mathematical concepts. It is not a continuous way of using Online Resource teachers and students use it through their decisions. Teachers and curriculum developers should be well informed and skilled in determining how and when Online Resource should be used to enhance learning (2015). Corona virus could last for weeks or longer. Teachers all over the world are trying to stay connected with their students and are trying to keep their instructional process going with this pandemic corona virus. Researcher (Burney, 2020) in her research article reported that a schoolteacher named Hammel reported that during corona days she send her teaching material to students through photographs and videos. She also started Google classroom and posted her daily assignments on it. She already uses online learning in her class. This transition is smooth with few technical glitches. Some teachers adopted unique techniques of distance learning. In Philadelphia, many students do not have access to laptop or devices many learning guides were created by district in various subjects. Some teachers uploaded their lessons on you tube or on school website. Through Online Resource students also discuss with teachers what is happening in their lives as they do in their classes. They missed their school and want to meet their school friends in corona days.

During COVID-19 situation all school, colleges and universities are temporarily cancelled their face-to-face classes all over the world. It is the need of time teachers and institutions have connection with students. Sometimes students forgot the problems which they face at home when they are with other fellows and sometimes, they do not have safe learning environment at home. Beyond electronic connection teachers also have emotional connection with their students in this time on anxiety. Emotions are considered as key to learning. Teachers must balance the mental and emotional loads of students during these days. Teachers should communicate to their students through email and remind them they are always available to their students. Lectures should be repeated for those students who missed their classes (Imid, 2020). Use of Online Resource has rapidly spread in schools, but people have little knowledge how it

moderates the performance of students and their interest and engagement in mathematics. The study examines that there is no significant difference between pre and post engagement survey of students using iPads as Online Resource. This study shows that there is strong relation between engagement and achievement. Students using Online Resource give corrective feedback because they can independently use Online Resource while other students build fluency (Schuetz, Biancarosa, & Goode, 2018).

Numerous technologies help human in many ways during COVID-19. This disease has affected the life of large number of people. Tools like software applications, smart phone, and friendly simulations help in many ways (Polakovic, 2020). Due to COVID-19 schools and universities are taking precautionary measures and are finding the ways for students to learn from home. Teachers and students should maintain their routine by using Online Resource. Learning process should continue as was in normal school days. Classes will start at normal school time. Teachers and students both should have required educational material before the closure of school and markets. They should behave like responsible person and complete the decided tasks otherwise they will be left behind when the schools will reopen again. Students should maintain good communication with their teachers it will be very helpful. Classes will continue with small pauses or breaks between them (Airth, 2020). Madeline in her research article reported that a survey was conducted between 20 to 28 May to get the views of teachers, principals, and district leaders about the opening of schools and continuation of their teaching activities. Three quarter of the teachers said that their moral level had become low, and they do not want to continue their teaching activities. Social distancing and safety measures will disturb their typical teaching style. Many teachers are really concerned about health risks while returning to school (Will, 2020). Exploration of new methodologies is very necessary for education. Many websites like and platforms like study.com were developed with thousands of short time informative videos were designed. Short Resource having five questions each were developed. Teachers should clearly need to specify their weekly goals and communicate to their students through any platform in the beginning of every week. In this way students have freedom of choice in learning process. Motivate students by involving them in weekly goals by giving them weekly tasks in the form of different tools like videos, online games, articles, interactive websites and by involving them in interactive science experiments by using common household items. Develop rubrics and provide them with every assignment so students have clear idea what is exactly expected from them. Establish a support program to help students other than office online hours through an email. Encourage students, parents, teaching staff who were making effort to handle the situation. Some students do not have in-home support and availability of internet to participate in online activities (Calderwood, 2020). Bethany in her article suggested the ways of learning for students during COVID-19 situation. She suggested that students should select a suitable area of their home away from TV room or play area with available basic facilities like table and good lighting. Students should select suitable time for studying and give regular breaks between them. Formulate a daily plan of action to complete their tasks. Underline the important definitions, record key words, and make notes. While watching videos focus on videos and left other work aside. Keep paper and pen to note down important information and pause video if you need time to complete writing. If they have any problem while answering question review the relevant part of video. Gather important information at appropriate place (Calderwood, 2020). In article Hamilton (2020) suggested the ways to set up remote classrooms.

According to Hamilton the transition of class to online learning is a difficult task but with little creative effort it can become easy. To setup remote classroom is very easy, first select suitable online learning management system and compile a list of learning material. Select suitable app for communication to students and parents like skype or zoom to speak to students as teachers speak to them while standing face to face. They can use live streaming app for the purpose of teaching. Select calendar app to plan the activities of the day. Following these steps can help teachers to setup their class (Hamilton, 2020).

Use of internet as supplement tool in teaching has become popular. The impact of online education on student learning was investigated by researchers Akhtar & Mahmood (2018) at higher level in Islamabad and Rawalpindi, so quality of teachers need to be improved by equipping teachers with the use of Online Resource (Zahra-Malik, 2020). Literature shows that digital learning is an innovative method of teaching. It reduces the cost of learning and is convenient for learner because it has removed the barrier of location. It motivates the learner and saves their time. Skills like ICTs, information processing skills and critical thinking are necessary for the students of present century. These skills and competencies should be added in students through integrating Online Resource in the learning of students. Academic performance of student refers to enhancement in the present state of knowledge of students and their skills reflected in the improvement of GPA, their academic growth from lower to higher level of study. To bring a change in the methodology of teaching at secondary level, a paradigm shift is required, and it would recommend the adoption of approaches that are student cantered. For successful improvement in the quality of education, government of Pakistan needs to implement the effective policies. Mixed results of previous studies confirm that there is inadequate evidence of the impact of Online Resource on the academic achievement. There is also an absence of well-developed and reliable study material to support the benefits resulting from Online Resource implementation. Therefore, this study had been conducted.

Method and Procedure
The method and procedure adopted in this study is mentioned here in below:
Design
This experimental study adopted "Descriptive Research" design.
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Instrument
The data of this study was collected with the help of online resources available to the researchers, workplaces.
Procedure
The technique used for data collection had been Document Analysis. The data were obtained in research findings, conclusions, recommendations and results as depicted in the literature review section.

Data Analysis
The data were analyzed with a focus on research findings, conclusions, recommendations and results as depicted in the literature review section and already mentioned. Meta-analyses had been done of the already existing latest researches.

Findings

These findings were observed from the meta-analysis of the data:
  i.   There is a dire need for school personnel in terms of their professional development related with online resources in the province of Punjab.
  ii. Many benefits for school personnel in terms of their professional development related with online resources in the province of Punjab might be obtained through proper training.

Conclusion

The results of SR showed that there is a dire need to develop the school personnel in terms their professional development related with online resources which are going to be used in Pandemic situation throughout the province of Punjab.

Recommendation

Schools in Pakistan remain closed during coronavirus crisis and students remain home for extended period. Government should take measures to build simple   Online Resource which students from low-income household and low-resourced schools can easily use to continue learning during this period and to take action to provide availably of data for educational purpose. Current online educational system is not enough to improve academic achievement of students. It is recommended that online   Online Resource should be improved, It is advised that online education support students by providing additional opportunities of learning. Online learning increase enhance motivation level of students, flourish students thinking abilities, support student's problem-solving skills, and enhance student's creativity. Such constructs/sub-constructs may be investigated by the researchers in upcoming days and in near future.

Refrences

Airth, M. (2020, March 31). *Learning at Home During the Coronavirus Pandemic.* Retrieved from study.com: https://study.com/academy/popular/learning-at-home-during-the-coronavirus-pandemic.html

Akhtar, H., & Mahmood, M. (2018). Study of the Impact of Online Education on Students' Learning at University Level in Pakistan. *International Journal of Distance Education and E-Learning (IJDEEL), 3*. Retrieved from https://eric.ed.gov/?id=ED597924

Al-Hariri, M., & Al-Hattami, A. (2017). Impact of students' use of   Online Resource on their learning achievements in physiology courses at the University of Dammam. *Journal of Taibah University Medical Sciences, 12*(1), 82-85. Retrieved Jan 5, 2020, from https://www.sciencedirect.com/science/article/pii/S1658361216300683

Basri, W. S., Alandejani, J. A., & M.Almadani, a. F. (2018). ICT Adoption Impact on Student's Acadamic Performance: Evidence from Saudi University. *Education Research International*, 9. Retrieved October 10, 2019, from https://www.hindawi.com/journals/edri/2018/1240197/

Bhatti, A. M., Parveen, S., & Ali, R. (2017). Integration of speaking and writing skills for better grades: perception of graduate students in Pakistani public sector colleges. *International Journal of Research and Development in Social Science (IJRDS)*, 3(2). 1-14. http://doi.org/10.5281/zenodo.3987812

Blubaugh, R. P. (2016). Online Resource in Mathematics Education: Preparing Teachers for the Future. *CITE Journal*. Retrieved May 6, 2020, from Retrieved from https://citejournal.org/volume-5/issue-3-05/mathematics/ Online Resource-in-mathematics-education-preparing-teachers-for-the-future/.

Boisselle, L. N. (2014). Online-Learning and Its Utility to Higher Education in the Anglophone Caribbean. *SAGE Journals*. Retrieved March 12, 2019, from https://journals.sagepub.com/doi/full/10.1177/2158244014555118

Bolkan, J. (2018). Foundation for Blended and Online Learning Report Examines Tech Solutions to Rural Ed Challenges. *The Journal*. Retrieved September 8, 2019, from https://thejournal.com/articles/2018/03/27/foundation-for-blended-and-online-learning-report-examines-tech-solutions-to-rural-ed-challenges.aspx

Bossi, D. E. (2018). STEM: At the Crossroads of Traditional and Online Learning. *The Journal*. Retrieved Feb 9, 2019, from https://thejournal.com/articles/2018/06/12/stem-at-the-crossroads-of-traditional-and-online-learning.aspx

Bray, A., & Tangney, B. (2016). Enhancing Student Engagement through the Affordances of Mobile Online Resource: A 21st Century Learning Perspective on Realistic Mathematics Education. *Mathematics Education Research Journal, 28*, 173-197. Retrieved May 30, 2020, from https://eric.ed.gov/?id=EJ109205

Bruce M. McLaren, D. M. (2017). A Computer-Based Game that Promotes Mathematics Learning More than a Conventional Approach. *International Journal of Game-Based Learning*. Retrieved May 31, 2020, from https://www.igi-global.com/article/a-computer-based-game-that-promotes-mathematics-learning-more-than-a-conventional-approach/171667

Burney, M. (2020). *How teachers are using Online Resource to keep in touch with students during coronavirus school closures*. Retrieved June 6, 2020, from Phys org: https://phys.org/news/2020-03-teachers- Online Resource-students-coronavirus-school.html

Burns, M. (2020, May 26). *Getting Ready to Teach Next Year*. Retrieved June 24, 2020, from edutopia: https://www.edutopia.org/article/getting-ready-teach-next-year.

Calder, K. L. (2016). Mathematics education and mobile technologies. *Maths Education Research Journal* .Retrieved on 29th may, 2020. Retrieved from http://link.springer.com/content/pdf/10.1007%2Fs13394-015-0167-6.pdf

Calderwood, B. (2020, March 14). *How to Study Remotely When Your School Closes*. Retrieved June 20, 2020, from study.com: https://study.com/academy/popular/how-to-study-remotely-when-your-school-closes.html

Calderwood, B. (2020, March 18). *How Schools Can Cope with COVID-19*. Retrieved from study.com: https://study.com/academy/popular/how-schools-can-cope-with-covid-19.html. Retrieved on 19 Jun. 2020

Ceylan, V. K. (2017). Effect of blended learning to academic achievement. *Journal of human sciences*. Retrieved September 28, 2018, from http://scholar.google.com.pk/scholar_url?url=https://www.j-humansciences.com/ojs/index.php/IJHS/article/download/4141/2107&hl=en&sa=X&scisig=AAGBfm3gp4l2izNpDVRI25d39TdrNH652w&nossl=1&oi=scholarr

Charles Y. C. Yeh, H. N.-H.-W. (2019). Enhancing achievement and interest in mathematics learning through Math-Island. *Research and Practice in Online Resource Enhanced Learning*. Retrieved May 30, 2020, from https://telrp.springeropen.com/articles/10.1186/s41039-019-0100-9

Chen, H.-C. (2017). A Study of the Effects of Digital Learning on Learning Motivation and Learning Outcome. *EURASIA Journal of Mathematics, Science and Online Resource Education*. Retrieved Aug 29, 2018, from ejmste.com/download/a-study-of-the-effects-of-digital-learning-on-learning-motivation-and-learning-outcome-4843.pdf

Davis, M. (2015). Blended Learning Research: The Seven Studies You Need to Know. *Digital Education*. Retrieved Jan 15, 2019, from http://blogs.edweek.org/edweek/DigitalEducation/2015/04/blended_learning_research_the.html

Diana P. Zwart, J. E. (2017). The effects of digital learning material on students' mathematics learning in vocational education. *Cogent Education*. Retrieved Aug 29 , 2019, from https://research.vu.nl/ws/portalfiles/portal/39279964/Zwart_Van_Luit_Noroozi_Goei_2017_The_effects_of_digital_learning_material_on_students_mathematics_learning_in_vocational_education_Cogent.pdf

Dludla, N. (2016). *Almost half the world will be online by end of 2016; poorer countries will lag, report shows.* Reuters. Retrieved July 20, 2018, from https://www.reuters.com/article/us-internet-itu-idUSKBN13H0XG

Eyyam, R., & Yaratan, H. S. (2014). Impact of use of Online Resource in mathematics lessons on student achievement and attitudes. *Social Behavior and Personality: An international journal, 42*(0), 31-42. Retrieved Sep 3, 2020, from https://www.researchgate.net/publication/273434332_Impact_of_Use_of_Online Resource_in_Mathematics_Lessons_on_Student_Achievement_and_Attitudes

Fabian, K., Topping, K. J., & Barron, I. G. (2016). Mobile Online Resource and mathematics: Effects on students' attitudes, engagement, and achievement. *Journal of Computer in Education*, 77-104. doi:https://doi.org/10.1007/s40692-015-0048-8.F

Fadde, P. (2014). Blended online learning. In *Benefits, challenges and misconception* (pp. 33-47). Nova Science Publisher. Retrieved Jan 25, 2019, from https://www.scopus.com/record/display.uri?eid=2-s2.0-84955389372&origin=inward&txGid=46798dbb7355642d33d0117e1ed114da

Fleming, N. (2020, April 24). *Why Are Some Kids Thriving During Remote Learning?* Retrieved July 5, 2020, from edutopia: https://www.edutopia.org/article/why-are-some-kids-thriving-during-remote-learning

Fleming, N. (2020, May 8). *Curbing Teacher Burnout During the Pandemic*. Retrieved July 04, 2020, from Edutopia: https://www.edutopia.org/article/curbing-teacher-burnout-during-pandemic.

Gemin, B., Smith, B., Vashaw, L., & Watson, J. (2018). *Digital Learning Strategies for Rural America.* Evergreen Education group. Retrieved Dec 23, 2018, from https://static1.squarespace.com/static/59c3f229197aeabbd2a556b2/t/5abaa81b6d2a736740452861/1522182184017/FBOL-Digital-Learning-Strategies-for-Rural-America-March-2018-web.pdf

Grieve, D. (2018). 7 Key Considerations for Online and Blended Learning Programs. *The Journal*. Retrieved Feb 18, 2019, from https://thejournal.com/articles/2018/04/11/7-key-considerations-for-online-blended-learning-programs.aspx

Hamilton, J. (2020, March 22). *Teachers: How to Set Up Remote Classrooms During a School Closure.* Retrieved June 25, 2020, from Study.com: https://study.com/academy/popular/teachers-how-to-set-up-remote-classrooms-during-a-school-closure.html

Hamilton, J. (2020, March 24). *Teaching Online During the Coronavirus Pandemic*. Retrieved from study.com: https://study.com/academy/popular/teaching-online-during-the-coronavirus-pandemic.html

Harris, J. L.-B.-B. (2016). One to One Online Resource and its Effect on Student Academic Achievement and Motivation. *Contemporary Education Online Resource, 7*, 368-381. Retrieved July 5, 2019, from https://eric.ed.gov/?id=EJ1117604

Higgins, K. H.-D. (2019). Effects of Online Resource in Mathematics on Achievement, Motivation, and Attitude: A Meta-Analysis. *Journal of Educational Computing Research, 57*(2), 283-319.

Hofmann, J. (2018). Blended Learning Challenges from Instructional Design. Retrieved September 29, 2018, from https://learningsolutionsmag.com/articles/solutions-to-the-top-blended-learning-challenges

Holland, B., & Kellogg, N. (2020). How Phones Can Facilitate Distance Learning. *Edutopia*. Retrieved September 8, 2020, from https://www.edutopia.org/article/how-phones-can-facilitate-distance-learning

Imid, M. (2020). *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/advice/2020/03/17/10-strategies-support-students-and-help-them-learn-during-coronavirus-crisis

John F. Pane, B. A. (2013). Does an Algebra Course with Tutoring Software Improve Student Learning? *Rand Corporation*. Retrieved December 5, 2018, from https://www.rand.org/pubs/research_briefs/RB9746.html

Kamal, K. (2017). Education in Turkey. *WENR*. Retrieved October 23, 2018, from https://wenr.wes.org/2017/04/education-in-turkey

Kenny Williams, j. (2018). Digital Learning: What exactly do you mean? *Hub For Innovation in Learning and Online Resource*. Retrieved June 15, 2019, from https://hub.msu.edu/digital-learning-what-exactly-do-you-mean/

Kenny, J. N. (2011). Adopting a Blended Learning Approach: Challenges Encountered and Lessons Learned in an Action Research Study. *Journal of Asychronous Learning Networks*, 45-57. Retrieved September 27, 2018, from https://eric.ed.gov/?id=EJ918218

Kristina Higgins, J. H.-D. (2017). Effects of Online Resource in Mathematics on Achievement, Motivation, and Attitude: A Meta-Analysis. *SAGE Journals*, Volume: 57 issue: 2, page(s): 283-319. Retrieved on 17th May 2020 from https://journals.sagepub.com/doi/abs/10.1177/0735633117748416.

Literature Review on the Impact of Digital Online Resource on Learning and Teaching. (2015). Retrieved Sep 18, 2018, from https://dera.ioe.ac.uk/24843/1/00489224.pdf

Literature Review on the Impact of Digital Online Resource on Learning and Teaching. (2015). Retrieved May 29, 2019, from https://www.gov.scot/publications/literature-review-impact-digital-Online Resource-learning-teaching/pages/4/#:~:text=The%20effects%20are%20generally%20positive,developing%20speaking%20and%20listening%20skills.

Lynch, M. (2017). Why Digital Learning is Reshaping Education. *The TEC EVOCATE*. Retrieved April 4, 2019, from https://www.theedadvocate.org/why-digital-learning-is-reshaping-education/

Minero, E. (2020). 8 Strategies to Improve Participation in Your Virtual Classroom. *Edutopia*. Retrieved September 5, 2020, from https://www.edutopia.org/article/8-strategies-improve-participation-your-virtual-classroom.

Nagel, D. (2018). Teaching with Online Resource in 2018. *The Journal*. Retrieved June 8, 2019, from https://thejournal.com/articles/2018/07/11/teaching-with-Online Resource-in-2018.aspx

Nazarenkoa, A. L. (2015). Blended Learning vs Traditional Learning: What Works? *Procedia - Social and Behavioral Sciences, 200*, 77 - 82. Retrieved Jan 20, 2019, from https://www.sciencedirect.com/science/article/pii/S1877042815046662

Ozerbas, M. A., & Erdogan, B. H. (2016). The Effect of the Digital Classroom on Academic Success and Online Technologies Self-Efficacy. *Educational Online Resource & Society*. Retrieved April 7, 2020, from https://www.semanticscholar.org/paper/The-Effect-of-the-Digital-Classroom-on-Academic-and-Ozerbas Erdogan/db2d535b2a4e0c57cbbedbe02400439e73294f77

Perry, D. R., & Steck, A. K. (2015, June 10). Increasing Student Engagement, Self-Efficacy, and Meta-Cognitive Self-Regulation in the High School Geometry Classroom: Do iPads Help? *Computers in the Schools*, 122-143. Retrieved June 23, 2020, from https://www.tandfonline.com/doi/abs/10.1080/07380569.2015.1036650

Picha, G. (2018). *Effective Online Resource Use in Math Class*. Retrieved june 1, 2020, from Edutopia: https://www.edutopia.org/article/effective- Online Resource-use-math-class

Pierce, D. (2017). What Effective Blended Learning Looks Like. *THE Journal*. Retrieved Jan 19, 2019, from https://thejournal.com/articles/2017/01/11/what-effective-blended-learning-looks-like.aspx

Plotinsky, M. (2020). Focusing less on the slides and more on student discussion fosters deeper engagement. *Edutopia*. Retrieved June 10, 2020, from https://www.edutopia.org/article/reducing-dependence-slides.

Plotinsky, M. (2020, May 15). *Digital Instruction During the Pandemic*. Retrieved June 26, 2020, from edutopia: https://www.edutopia.org/article/digital-instruction-during-pandemic

Polakovic, G. (2020, March 27). *USC experts explore new technologies to combat COVID-19*. Retrieved June 22, 2020, from USC News: https://news.usc.edu/167401/new- Online Resource-coronavirus-usc-experts-virtual-reality-smartphone-apps/.

Rana, A. M. K., & Bhatti, A. M. (2020). Attitudes of elementary teachers in Lahore towards professional development. *Journal of Elementary Education*, 30(1), 84-106.

Ragad M. Tawafak, A. B. (2018). Assessing the Impact of Online Resource Learning and Assessment Method on Academic Performance: Review Paper. *EURASIA Journal of Mathematics, Science and Online Resource Education*, 2241-2254. Retrieved Aug 29, 2019, from https://www.ejmste.com/article/assessing-the-impact-of- Online Resource-learning-and-assessment-method-on-academic-performance-review-5426

Reiten, L. (2016). Why and How Secondary Mathematics Teachers Implement Virtual Manipulatives.*CITE Journal*. Retrieved from https://citejournal.org/volume-20/issue-1-20/mathematics/why-and-how-secondary-mathematics-teachers-implement-virtual manipulatives/. Retrieved on 16th May, 2020

Retrieved May 30, 2020, from https://nebraska.pure.elsevier.com/en/publications/effects-of-Online Resource-in-mathematics-on-achievement-motivation-an

Roehrig, S. G. (2016). Teaching Science with Online Resource: Case Studies of Science Teacher's Development of Online Resource, Pedagogy, and Content Knowledge. *CITE Journal*. Retrieved from https://citejournal.org/volume-9/issue-1-09/science/teaching-science-with- Online Resource-case-studies-of-

science-teachersdevelopment-of-   Online Resource pedagogy-and-content-knowledge/. Retrieved on 20ᵗʰ April, 2020.

Ross, N. (2018, September 3). Retrieved October 2018, from https://www.edapp.com/blog/what-is-digital-learning/

Schaffhauser, D. (2018). Flipped Learning Global Launches Lesson Planning Credential. *The Journaal*. Retrieved June 16, 2019, from https://thejournal.com/articles/2018/08/02/flipped-learning-global-launches-lesson-planning-credential.aspx

Schaffhauser, D. (2018). Grant Spotlight: $10,000 Teacher Grants for Blended Learning. *The Journal*. Retrieved Feb 7, 2019, from https://thejournal.com/articles/2018/05/14/grant-spotlight-10000-teacher-grants-for-blended-learning.aspx

Schaffhauser, D. (2018). *The Real Role of Blended Learning in Instruction.* The Journal. Retrieved April 29, 2019, from https://thejournal.com/articles/2018/03/28/report-the-real-role-of-blended-learning-in-instruction.aspx

Schaffhauser, D. (2018). Why Game-Based Learning Works for This Math Teacher. *The Journal*. Retrieved Feb 18, 2019, from https://thejournal.com/articles/2018/03/19/calculus-game-born-out-of-texas-a-m-lab-boosts-student-outcomes.aspx?s=the_bc_280318

Schuetz, R. L., Biancarosa, G., & Goode, J. (2018). Is Online Resource the Answer? Investigating Students' Engagement in Math. *Journal of Research on Online Resource in Education, 50*, 318-332. Retrieved June 22, 2020, from https://www.tandfonline.com/doi/full/10.1080/15391523.2018.1490937?src=recsys

Stakkestad, S. V., & Størdal, G. F. (2017). The Effects of Online Resource on Students' Academic Performance. Retrieved Dec 19, 2018, from https://openaccess.nhh.no/nhh-xmlui/bitstream/handle/11250/2487301/master2017.PDF?sequence=1

Stern, B. S. (2016). A Comparison of Online and Face-To-Face Instruction in an Undergraduate Foundations of American Education Course. *CITE Journal*.Retrieved from https://citejournal.org/volume-4/issue-2-04/general/a-comparison-of-online-and-face-to-face-instruction-in-an-undergraduate-foundations-of-american-education-course/. Retrieved on 24ᵗʰ April, 2020.

Strategic Use of Online Resource in Teaching and Learning Mathematics. (2015). *National Council of Teachers of Mathematics*. retieved from . Retieved from https://www.nctm.org/Standards-and-Positions/Position-Statements/Strategic-Use-of- Online Resource-in-Teaching-and-Learning-Mathematics/. Retrieved on 16ᵗʰ April,2020.

Strategic Use of Online Resource in Teaching and Learning Mathematics. (2015). *National Council of Teachers of Mathematics*. Retrieved June 2, 2020, from https://www.nctm.org/uploadedFiles/Standards_and_Positions/Position_Statements/Strategic%20Use%20of%20 Online Resource%20July%202015.pdf

Sutton, S. (2020, June 25). *Adapting Science Lessons for Distance Learning.* Retrieved June 29, 2020, from edutopia: https://www.edutopia.org/article/adapting-science-lessons-distance-learning

Terada, Y. (2018, March 9). *Edutopia.* Retrieved July 9, 2020, from Research-Tested Benefits of Breaks: https://www.edutopia.org/article/research-tested-benefits-breaks

Terada, Y. (2020). A Powerful Model for Understanding Good Tech Integration. *Edutopia.* Retrieved June 9, 2020, from https://www.edutopia.org/article/powerful-model-understanding-good-tech-integration

Thieman, G. Y. (2016). Using Online Resource as a Tool for Learning and Developing 21st Century Citizenship Skills: An Examination of the NETS and Online Resource Use by Preservice Teachers with Their K-12 Students. *CITE Journal.* Retrieved from https://citejournal.org/volume-8/issue-4-08/social-studies/using- Online Resource-as-a-tool-for-learning-and-developing-21st-century-citizenship-skills-an-examination-of-the-nets-and- Online Resource-use-by-preservice-teachers-with-their-k-12-students/. Retrieved on 25th may, 2020.

Tso, A. W. (2015). Reflection of Blended Learning: A Case Study at the Open University of Hong Kong. *Asian Association of Open Universities Journal.* Retrieved July 20, 2018, from https://www.emeraldinsight.com/doi/pdfplus/10.1108/AAOUJ-10-01-2015-B008

Wael Sh. Basri, J. A. (2018). ICT Adoption Impact on Student's Acadamic Performance: Evidence from Saudi University. *Education Research International*, 9. Retrieved Oct 25, 2019, from https://scholar.google.com.pk/scholar?q=ICT+Adoption+Impact+on+Students+Academic+Performance:+Evidence+from+Saudi+University&hl=en&as_sdt=0&as_vis=1&oi=scholart

Wei, R. M. (2014). *Blended Learning Report.* Michael & Susan Dell Foundation. Retrieved September 15, 2018, from https://5a03f68e230384a218e0-938ec019df699e606c950a5614b999bd.ssl.cf2.rackcdn.com/MSDF-Blended-Learning-Report-May-2014.pdf

Will, M. (2020, June 3). *Teachers Say They're More Likely to Leave the Classroom Because of Coronavirus.* Retrieved June 21, 2020, from Study.com: http://blogs.edweek.org/teachers/teaching_now/2020/06/teachers_say_theyre_more_likely_leave_classroom_because_coronavirus.html

Yusoff, S., Yusoff, R., & Hidayah, N. (2017). Blended Learning Approach for Less Proficient Students. *SAGE.* Retrieved March 13, 2019, from https://www.researchgate.net/publication/318923820_Blended_Learning_Approach_for_Less_Proficient_Students

Zahra-Malik, M. (2020). *The coronavirus effect on Pakistan's digital divide.* 2020. Retrieved April 2, 2021, from https://www.bbc.com/worklife/article/20200713-the-coronavirus-effect-on-pakistans-digital-divide