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Research Paper Title: Educational Research Methodologies in Online and Distance Learning

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DECLARATION

I, the undersigned, hereby would like to explicitly state that the write-up titled, "EDUCATIONAL RESEARCH METHODOLOGIES IN ONLINE AND DISTANCE LEARNING" is original and has not been published earlier, or that it is not under consideration for possible publication elsewhere.

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Educational Research Methodologies
in Online and Distance Learning

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Abstract

Educational research involves a systematic attempt to gain a better understanding of the educational process, for improving its efficiency. It is resolution with scientific method to analyze the educational issues. The major objective of educational research is basically to discover the existing body of knowledge with providing solutions to different gaps in pedagogy though enhancing teaching and learning practices. Educational researchers also pursue solutions to issues creating hindrances on learner-motivation, development, and (virtual) classroom management. The twenty-first century has seen the level of education rising up through educational research, along with the technology advancement.

Other names of Online Distance Learning (ODL) are e-learning, distance-education / online learning, which provides a methodology of education activity in which both teachers and students are located at different places during the teaching-learning process. The computer-based learning is known as e-learning whereas internet-based e-learning can be treated as on-line learning. Implementation of emerging technologies enables to integrate and assist the seamless

communication between the both teacher-student as well as student-student that opens new avenues for educational research.

The educational research methodologies are involved to resolve the teaching-learning issues. The nature of method and involvement of technology makes the teaching-learning issues related to ODL different and more challenging than conventional learning. In this paper, the evolving educational research methodologies over conventional educational research methodologies and enabler technologies were reviewed with its applicability specific to ODL.

Keywords: Online Distance Learning (ODL), Educational Research Methodologies, Technology, Pedagogy, Ubiquitous Learning.

INTRODUCTION

Generally any research involves collecting new data from primary or first-hand sources or using existing data for a new innovative purpose. Research is based upon either observable experience or empirical evidence. Research demands accuracy in observation and description which is applicable to educational research also.

Each student has a his own learning curve, which differs from student to student in terms of time taken to learn and the methodology adopted (Dyer, Thomas; Larson, Elizabeth; Steele, John; Holbeck, 2015) this facts must be considered while elaborating the concepts of lesson in an meaningful manner that motivate and appeal the students is not easy task. The educational research is performed with the aim to develop new body of knowledge about the

teaching-learning situations to enhance educational practices accordingly. In general, to improve the educational methodology means to constantly encourage, sustain and increase individual and joint knowledge and understanding of specific areas of study, skills as well as expertise.

There is a sudden upsurge in on-line courses with exponential growth rate in it due to COVID circumstances, having restrictions on conventional classes and face-to-face learning. However, this situation has elevated the expectations and demands from on-line classes that include visual, kinesthetic, textual and auditory delivery in ODL; accordingly the selection and implementation of applicable integrated technologies enabling to meet these increasing demands.

Hence educational research methodologies specifically in ODL differ from conventional educational research methodologies.

LITERATURE REVIEW

Guidance document for Good Academic Research Practices (GARP)-September 2020 provides the research life cycle as a framework for quality, impactful and ethical research (Patwardhan et al., 2020). According to this document the research needed to avoid the malpractices in terms of fabrication, falsification and plagiarism to increase the public trust, specifically for research institute, funders, producers, publishers and products in research. The values underlying the Research Integrity such as ethics (with dignity and safety), rigor (by adopting methods), relevance, transparency, respect, impartiality, independence and accountability plays vital role in GARP. The three stages of research

life cycle are suggested to focus for good research as follows

1. Research Design: which includes all planning related activities

2. Conduct of Research: includes execution, documentation and storage related activities

3. Research Dissemination: consist of selection of appropriate medium for publication

Subsequently the good research should always have following objectives

1. Contribute new knowledge

2. Solve the challenges

3. Correct errors / gaps in the existing literature

4. Develop new methods for conducting research

They suggested the following two applications / systems accordingly

1. Clarivate ᵀᴹ: This platform (https://clarivate.com/industries/academi

a/) provides the Master Journal List for the researchers to find the appropriate journal for the needs across multiple indices hosted on the Web of Science platform which will have following benefits:

- Optimize your existing resources in the institution, infrastructure and future investments to explore the new opportunities

- Ensure effective benchmarking to get the betterment in the institutional performance, positions, research environment and total transformation in quality of education

- Enhance the institutional efficiency and productivity with better collaboration, higher profitability with the skilled and talent resources

- Comprehend the consolidated value of research with business benefits, and building the organization's

knowledge and intellectual property with its safety

2. Web of Science ™: An application on website that provides subscription-based access to multiple databases that provide comprehensive citation data for several academic disciplines. It was originally created by the Institute for Scientific Information and is presently maintained by Clarivate Analytics.

In the paper which elaborate the research areas identification and further research design approaches specifically in distance education in India (Passi & Mishra, 2004) explained. The numerical data was collected on processes for identifying the areas for research, accordingly research design, and appropriate methodologies specifically in distance education. The process-oriented research approach which involved observing media and technology, learners and related learning methods, and unique distance

learning assessment is included with the conclusion that a mixed approach which consists of both quantitative as well as qualitative methods are proven appropriate for research in distance education in India.

Dyer et al (2015) elaborated the integration of technology with collaborative approach with adopting major features which includes objectives sharing, forming the inquiry cycle which will be rigorous, constant communication, effective decision making, productive activities and value assessment. He further stated that the technology determines the type, location and method of information to be communicated to students to obtain more learning approaches, high level of students involvement and high students result.

The three essential elements explained in the teaching-learning generic model (Wang, 2008) as 1. Pedagogy: Instructions 2. Social interaction: Public Communication and 3.

Emerging Technology required for interacting with defined interfaces. It was specified that the effectiveness of technology is depends upon its value and its usability.

On-line learning is made possible using Internet connectivity, however doing the courses which needs laboratory is still remains challenge (Ndahi, 2006), the approach suggests innovative methodology for the laboratory courses that can be planned, scheduled and delivered in the Distance Education environment. As stated in the article distributing the learning-kits the support service and demonstration labs can be able to conduct even laboratory courses remotely. This is unique approach applicable for all professional courses.

The significance and real use of Information and Communication Technology (ICT) in understanding the learning and application of unique assessment applicable to ODL is

described in the article (Chinchorkar, 2010) which elaborate the role of Technical and Vocational Education and Training (TVET). In the paper 'Introduction to Online Teaching and Learning' major types of distance learning were identified (Stern, 2018) as follows

- Correspondence course: conducted through mails

- Tele-courses: application of broadcasting using radio and TV

- CD ROM base courses: applications using static computer

- Actual Online Learning: Connecting the computers to Internet Network

- Mobile learning: using cellular phone and devices like PDA

The educational research methodologies are revolved around these types of distance learning.

Across following five key levels of education the Technology can be applied:

1. Presentation level: Basically involved navigation and look and feel

2. Demonstration level: Includes the actual contents

3. Drill and practice level: Consist of collapsible information arrangement

4. Interaction level: For effective communication

5. Collaboration level: Formation of framework for teamwork

Various types of research methodologies are being adopted to achieve the advantages of technology application in those specific levels.

The development in distance learning application (Marsap & Narin, 2009) explained which was initiated in year 1840. Isaac Pitman tried to teach remotely his staff-steno located far away using the letters.

He stated that the distance learning visual approach with the letterings is needed for managing, participation and creativity enabled by applying the relevant Technology.

The constraints such as time and place (Beldarrain, 2006) association is being achieved by adopting social media application like blogs, wikis, podcasts in addition to technologies such as chat-room, discussion boards, podcasts including vblogs and audioblogs, An RSS (Really Simple Syndication) feed which is an online file that contains details about every piece of content a site has published. The strong association between interactions and technology was established. The paper further explained how various technologies maintains the records of an individual like performance, accomplishments and related information. The perception of belonging provides the feeling of security to faculty and students

while communication with each other. According to them, the technology should be adopted with the seven principles as:

1. Motivate the students and faculty relations.

2. Create mutual cooperation within students.

3. Adoption of techniques like active learning.

4. Provide quick response.

5. Give importance to time on task.

6. Share the expectations.

7. Admire assorted abilities and methods of learning.

He stated that learning outcome is basis of the instructional theory, whereas the theory about learning is all about the learning process and technology impact social dealings and its impact on learning process. The system that focuses on learner is emphasis on content on demand rather than

the standardization of content. The cultural diversity, learning priorities/preferences and individual aptitude level is basis for further improvement.

The reviews and annotated bibliography collection on e-learning specifically in Africa (Lodhia, 2006) is explained with the higher education environment and related challenges.

The boundaries differentiating between online, e-learning and virtual learning is going to be blur is explained (Traxler, 2018) with the dissimilarity between campus and distance education. In which he narrated the difference between formal and informal learning with reference to the factors such as pedagogies, delivery modalities, epistemologies and cultures. He further mentioned that in the formal learning major activities involved are accreditation, qualification, assessment and ranking and

claimed that there is lot of scope for research in this area.

The three-part taxonomy of technical framework originally recommended by Gibbons and Bunderson was explored further (Picciano, 2017) as an integrated model on the basis of explore, explain and design. The methodology got enhanced further with name as Bloom's taxonomy. The approach is developed around six key elements which are creating, evaluating, analyzing, applying, understanding and remembering. The three innovative models further suggested by him are as follows:

- Community of inquiry model: Consist of three elements as cognitive, social and teaching
- Connectivism model: Includes the application of techniques like MOOCS
- Online Collaborative Learning Model: Idea generation, idea

organizing and intellectual convergence are the building blocks of this model

Unique research methodologies are applicable to each of this model.

OBJECTIVE

The objective of this paper is to explore the existing body of knowledge in educational research methodologies specifically in ODL by analyzing the various solutions provided for various problems identified in pedagogy with intention to improving the teaching and learning practices and filling the gaps in knowledge due to technology evolution.

Because reliable researches are important to make use of them and the relevant methodologies as a result help to make it valid and useful to the topic and in a generalized manner. Several methods help researchers formulate the research area and

to improve their knowledge in the sector of education.

METHODOLOGY

The conventional types of research method are social surveys, experiments, interviews, participant observation, ethnography and longitudinal studies which are applicable for educational sector also.

The approach adopted to critically evaluate a study's overall validity and reliability includes identification, selection, processing, and analyzing the information about a topic for which the base is taken as secondary data from Internet. This approach includes literature review of existing literature on internet relevant to the topic. Specific search conducted for latest developments in the teaching-learning process such as 'ubiquitous learning' (learning anywhere and anytime). New technological

development in the sector and its applications are recognized.

DISCUSSION

The educational research methodologies are categorized based on seven elements of philosophy of education as Essentialism, Perennialism, Progressivism, Social Reconstructionism, Existentialism, Behaviorism, Constructivism, Conservatism, and Humanism.

The data collected during the surveys in the conventional educational and existing study papers are collected with the help of various tools of investigation. The tools and techniques of investigation generally involves questionnaires, optionnaires, attitude scales, schedules, conducting interviews, collecting data and case-studies, applying the rating scales, and expert's observations.

Educational research refers to a systematic endeavor to obtain a better realization of the educational process, generally with a view in improving its efficiency and quality. It is an application of scientific methodology to analyze the problems in educational sector. Conventional Educational Research can be classified into Five Types as follows

1. **Correlational Research**

   A correlational study is a research method that includes a two or more quantitative variables from similar groups of subjects while attempting to establish an association between the two variables. Theoretically, correlation of the two quantitative variables is possible as long as the scores from similar participants are there.

   However, it may prove of no use to collect and analyze the data when there is insufficient cause to propose

the two variables are related. The data can be gathered using actual testing activity, i.e., a collection of marks in a knowledge test, e.g., math exam or test.

Additionally, you can also carry out a psychological test or a survey and questionnaire among other data gathering methodologies where you'll get quantitative responses. The collected data can be used if is in numerical type.

2. **Experimental Educational Research**

   The key feature that segregates this Experimental Educational research from other types of research is that the researcher would be able to control the independent variables. In this research, there are numerous design groups for experiments out of which some of them succeed as

research analysis.

In actual experimental research, the researcher would not only control the independent variables but would also assigned individuals randomly to diverse treatment categories. In quasi-experimental research the subjects would not be randomly allocate to control groups and treatments, i.e., the treatment would not be disseminated among the participants randomly.

In certain situations, the researcher will assign an entire group randomly to treatment path and another group to control path. Thus this experimental research would consist of the use of treatment groups in the experiment instead of random assigning of individuals to investigate state of affairs.

The causal-comparative study research consists of the research involving the groups which have already been formed. This research does not fulfill the initial norms because there is no control of independent variable therein.

3. **Quantitative Research**

Quantitative educational research is a research method that focuses on statistical, measurement, and numerical analysis by collecting the data through surveys, polls, and questionnaires by controlling pre-existing statistical information based on computational techniques.

The primary objective of conducting this research is to establish the relationship between one thing and another within a population. The study research design is in only two forms narrative or experimental.

A descriptive research study defines

an association between variables while the experimental one would define the causality. A qualitative research is related to actual stance numbers and logic to differentiate and classify.

The research focuses on the numeric detailed fixed data and convergent rational. Its key characteristic consists of the gathering of data by help of structured research instrument.

4. **Qualitative Research**

   A qualitative educational research is an exploratory research study that is applied for obtaining knowledge of underlying reasons, motivations, and opinions. The study research proposes insights into the problem or assists in further developing ideas or hypothesis for future quantitative research.

This research study can also be used in discovery of trends in opinions polls and thoughts and micro level into the problem. Additionally, the research method differs by use of unstructured and semi-structured techniques. Also, it is used in numbering the issue by creating data which can be converted into real statics.

The research consumes quantifiable data in framing facts and discovery of patterns in research. The data collection methodology adopted in the quantitative research is more structured and systematic than qualitative ones.

This research method includes various forms of conducting the surveys, e.g., questionnaire based, online, mobile, paper and kiosk surveys. Other methodologies

involve face to face, telephone interviews, online polls, website interceptors, and longitudinal studies.

5. **Mixed Educational Research**

The mixed research method consists of the collaborating the qualitative and quantitative data, paradigms, process, and various methodology in study analysis or set of studies related.

This research is a particular case of multi-method study. The research can be further enhanced through the use of several methodologies, standpoints methods, facts, and perspectives.

The learning approaches adopted in future (Georgiadou & Siakas, 2006) were explained in which the research focus and methodologies applicable can be as follows:

1. Funding factor: These are based on the funds availability and institution policies

2. Learner's requirements: Every student have unique learning needs, to be prioritize

3. Stakeholder's expectations: The needs of the parties involved should be considered

4. Career prospects: The gap between career and corporate need to be minimized

5. Norms defined by Quality Standards: The specifications of frameworks need to be adopted

6. The learner's needs and stakeholder's demands should be select first, over the career opportunities and policies. Quality standards should be configured to suite these approaches.

CHALLENGES IN ODL RESEARCH

The Online Education got developed by resolving several challenges faced in every generation of development. The relevant research methodologies with technology for these challenges were got developed accordingly for every stages like data generation, collection, analysis and conclusion.

The First Generation (1850-1960) of Online Education consist of simple print, radio and TV as media (Sadeghi, 2019). The print media got the issues such as delayed response, and the media like radio and TV were live but restricted to unilateral direction.

The Second Generation (1960-1985) involves many technologies except computers; examples are audio cassettes, fax and mix-media. Scalability and maintaining the status updated were major challenges for these set of technologies.

The Third Generation (1985 onwards) is build on the Internet technology. Integration of devices brings many more advantages than earlier generations achieved; examples are Ubiquitous Learning; it saves large amount of time and money required for traveling, gives lot of flexibility for time and location.

The limitations of Third Generation of Online Learning are realizes as

- High chances of distraction: Disturbance due to issues like poor connectivity due to over dependence on Internet.
- Complex technology: An online platform becomes intricate due to availability of various features and functions of different.

- Lack of social interactions: The restrictions on social interactions cause hindrances because social interactions are vital in learning. In online education there are.

- The unusual interactions with instructors: There are serious limitations on natural contact which is essential.

- Online education treated as inferior qualification by the job market: Hand-on skills which are difficult through online education are preferred by industries.

To overcome these challenges and respond the specific requirements, several solutions and research methodologies got developed as follows

- Identify the requirement with scope of training to teachers and students on the technology

- Application of virtual class-rooms and transform the internet technology to 5G

- Use of frameworks like Moodle for distribution of the learning material

- Inclusion of simulations techniques, virtual reality, game-based learning etc.

- Implement adoptive learning with personalization and data-driven methodologies

- Creation of asynchronous audio-videos and make it available to students

- Application of proctored tests for advanced assessment and evaluation

- Comprehension of COVID-19 situation, research and justify the online education

The emerging technologies like Ubiquitous Learning (UL) can be considered as new invention of Information and

Communication Technology (ICT) that allows students to be in suitable environment useful for learning. The main purpose of UL is to provide the flexibility to teachers and students where to study and when to study, which is essential in the current situation.

Therefore the objectives of educational research methodologies in ODL should align with such emerging concept like UL also known as 'anywhere and anytime learning'.

LIMITATIONS OF EDUCATIONAL RESEARCH METHODOLOGY IN ODL

An educational research methodology specifically in ODL is subset of educational research methodologies as a whole.

Additionally research methodologies in ODL need to take care of issues related to ODL such as misuse of technology, a lack of student support services, alienation or isolation, cost effectiveness, quality of instruction, and problems with equipment.

The major limitations of educational research methodology specifically in ODL can be as follows:

- **Difficulties in observation**: Observation of human behavior is more subjective than the observation of physical or biological phenomena. The subjectivity on the part of the observer has a direct impact on the interpretation and findings on which he bases his conclusions. In ODL situation it becomes difficult to get the feedback received through body-language (which communicate more than 80% message). Hence the methodology is depends upon the data received through formal communication only.

- **Misuse of Technology**: The misuse of application such as bots created can mislead the faculty. Proctored

examinations also have its limitations.

- **Dependency on Internet Network**: It becomes difficult to conduct the research work remotely where the network coverage is poor.

These are few representative limitations that give opportunities to explore the educational research methodologies in ODL environment.

FINDINGS AND CONCLUSION

Education is treated as engine of growth. The capability of applying the knowledge and creating the value during teaching-learning is magnified by adopting the ODL approach.

The perpetual inventions in technologies make it essential to recognize the changes regularly and improve the educational research methodologies accordingly. Online Distance Learning is specific class of academics where high degree of application

of technology is involved hence the need of education research is significant. Because of the unique teaching-learning approach in ODL, the same traditional research methodologies may not be applicable to ODL environment as it is. Development of "Ubiquitous Learning" is typical example of such changes, where impact of technology and accordingly methodology need to consider for educational research.

REFERENCES

1. Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education, 27*(2), 139–153. https://doi.org/10.1080/01587910600789498

2. Chinchorkar, S. (2010). Role of technical and vocational education and training (TVET) in sustaining

and enhancing the quality of education. *Symbiosis International Research Journal on Open & Distance Learning, 2*(2).

3. Dyer, T., Larson, E., Steele, J., & Holbeck, R. (2015). Integrating technology into the online classroom through collaboration to increase student motivation. *Journal of Instructional Research*, *4*(2015), 126–133. https://eric.ed.gov/?id=EJ1127739. https://doi.org/10.9743/JIR.2015.16

4. Lodhia, R. (2006). Annotated bibliography on e-learning and Application of Educational Technology in African Countries, or in Contexts Relevant to Africa. Carnegie Corporation of New York Table of contents. *Educational Technology*.

5. Marsap, A., & Narin, M. (2009). The integration of distance learning via internet and face to face learning: Why face to face learning is required in distance learning via internet? *Procedia - Social and Behavioral Sciences, 1*(1), 2871–2878. https://doi.org/10.1016/j.sbspro.2009.01.510

6. Ndahi, H. (2006). The use of innovative methods to deliver technology education laboratory courses via distance learning: A strategy to increase enrollment. *Journal of Technology Education*, *17*(2), 33–42. https://doi.org/10.21061/jte.v17i2.a.3

7. Passi, B. K., & Mishra, S. (2004). Selecting research areas and research design approaches in distance education: Process-issues.

International Review of Research in Open and Distributed Learning, *5*(3). https://doi.org/10.19173/irrodl.v5i3.203

8. Patwardhan, B., Desai, A., Chourasia, A., Nag, S., & Bhatnagar, R. (2020). Good academic research practices, Retrieved *September* 1956. https://www.ugc.ac.in/e-book/UGC_GARP_2020_Good Academic Research Practices.pdf. University Grants Commission.

9. Picciano, A. G. (2017). Theories and frameworks for online education: Seeking an integrated model. *Online Learning*, *21*(3), 166–190. https://doi.org/10.24059/olj.v21i3.1225

10. Sadeghi, M. (2019). Manijeh Sadeghi 1. *International Journal of Research in English (IJREE)*, March, 80–88.

11. Stern, J. (2018). Introduction to online teaching and learning. *International Journal of Science Education*, *3*, 1–10. https://doi.org/10.1002/9781118784235.eeltv06b

12. Traxler, J. (2018). Distance learning—Predictions and possibilities. *Education Sciences*, *8*(1). https://doi.org/10.3390/educsci8010035

13. Wang, Q. (2008). A generic model for guiding the integration of ICT into teaching and learning. *Innovations in Education and Teaching International*, *45*(4), 411–419. https://doi.org/10.1080/14703290802377307