
2 Chapter 2: Review of related literature

2.1 Introduction-

Reviewing of related literature in the related field of study is an important process of any type of research. Scanning the related literature enables the researcher acquires up to data information in the chosen area of study. Familiarity with the previous research and theory in the area of study can help not only in conceptualizing the problem but also in conducting the study and interpreting the findings. In the words of Merriam (1998),” An investigator who ignores prior research and theory chances pursuing a trivial problem of duplicating a study already done or repeating other’s mistakes. The goal of research contributing to the knowledge base of the field may then, never be realized.”

The review of related literature provides a clear picture of the study to be taken as a pre-requisite to the proper planning of the problem and conducting the research. The review of the past investigations in a particular field serves as a guide to the investigator as it helps him/her to avoid duplication of the work already done in that area. To find the problem to conduct a research study, a researcher does the review of related literature. Here are some details of review of related literature which are done by the researcher-

1. **Akash Ranjan(2017), in his study “Effect of virtual laboratory on development of concepts and skills in physics”** he defined the virtual lab as a computer program that allows student to run simulated experiments via

the web. The researcher tried to find out the effectiveness of virtual lab in understanding the concept of photoelectric effect. The researcher used pre-post-test experimental design to conduct his study and used purposive sampling technique to collect samples.

2. **LoretaJuskaite (2019), In his study “THE IMPACT OF THE VIRTUAL LABORATORY ON THE PHYSICS LEARNING PROCESS”** found the importance of experimental and research skills in the acquisition of subjects. Total 243 students participated in his study. Participants were randomly assigned in control group and experimental group. 3 learning environments were provided to students by the researcher. The researcher concluded in his study that the best results in learning content can be achieved by using a mixed teaching method, i.e. virtual lab physics should only be used together with the traditional method.
3. **Gulsum Asiksoy (2017), In his study “The Impact of the Virtual Laboratory on Students’ Attitudes in a General Physics Laboratory”** investigated the impact of the virtual laboratory experiences on attitudes towards physics laboratories. In his study he also determined the opinions of students in terms of the virtual laboratory. Researcher used mixed-method approach making use of both quantitative and qualitative method. He used the physics laboratory attitude scale to evaluate student views on physics laboratory course. To analyze the data researcher used independent t-test.
4. **Rachel Rose Oser (2013), In her research “Effectiveness of Virtual Laboratories in Terms of Achievement, Attitudes, and Learning**

Environment among High School Science Students” researcher used quasi experimental design to compare students in 11 high school classes who engaged in virtual laboratories with students in 10 high school classes who did not. She focused in two major areas in her research. a. Gender Differences in Science Education and b. Virtual laboratories in science education. She used questionnaires as a tool to collect data.

5. **Manisha Bajpai(2013), In her study “Developing Concepts in Physics Through Virtual Lab Experiment: An Effectiveness Study”** had gone through website PhET and found virtual experiments on photoelectric effect. In this virtual set up simulation allows students to control inputs such as light intensity, wavelength, and voltage, and it allows them to receive immediate feedback on the results of changes to the experimental set-up. The researcher used purposive sampling technique to select the participants. The participants of the study were 50 undergraduate students.

6. **Fortner and Shar (1986) conducted a research on effectiveness of computer simulations to effectiveness of non-simulations with respect to computer awareness and perception of environmental relationships** by college students. Undergraduates (n =110) enrolled in an "Introduction to Conservation of Natural Resources" course participated in this study. The experimental treatment group used workbooks and three simulations that were incorporated into the course as individual learning modules; the control group worked with comparable workbook modules, textbooks, and reference materials that covered the same topics as the computer-simulated modules. "Each simulation module consisted of (a) written background information about the topic, (b) instructions for operating the computer program, and (c) a summary worksheet." Content and presentation techniques were assessed on the basis of knowledge the students gained on

subtest instruments and an environmental relationship perception survey. Simulation programs utilized a method of demonstrating in a simplified version of real-world conditions, providing learning experiences, and allowing students to manipulate variables that offered them feedback.

7. **Barkand, Jonathan; Kush, Joseph (2009)** investigated the Virtual Learning Environments (VLEs) which are becoming increasingly popular in online education environments and have multiple pedagogical advantages over more traditional approaches to education. VLEs include 3D worlds where students can engage in stimulated learning activities such as Second Life. According to Claudia L'Amoreaux at Linden Lab, “at least 300 universities around the world teach courses and conduct research in Second Life.” However, to date, VLEs have been very limited in use for K-12 education. One option for secondary schools was developed by Game Environment Applying Real Skills (GEARS) and can be used in online or traditional schools. This program has been used successfully for over a year as part of the Lincoln Interactive online curriculum.
8. **Wyatt, Erindrankwalter (2010)** examined middle school students engaged in a virtual learning environment used in concern with face-to-face instruction in order to complete a collaborative research project. Experimental cum survey method was used by researcher to conduct the study. Thirty-eight students from three eighth grade classes were taken as sample. Data were collected through observation of student work within the virtual learning environment, an online survey, and focus group sessions with students involved in the project. Results indicated that students found the virtual learning environment to be valuable as a platform to complete a collaborative research assignment because of portability, ease of use, and organization. Embedded resources within the environment were helpful.

2.2 Conclusion-

Above all the related studies analysed the different experimental studies on virtual learning and virtual labs in international level and also national level. The above studies pave way to identify the proper research design, sampling techniques, selection of tools, indicating the research gape, procedure of the study, Statistical technique and data collection.