CHAPTER - I

INTRODUCTION

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1.0.0 BACKGROUND OF THE STUDY

Science education is the teaching and learning of science and delivery of scientific information, the field of which includes work in science content, science process and teaching pedagogy. Good science is strengthened by vigorous debate, but public understanding of some research topics can be distorted by external influences, making it even harder to muster support for research, perception and investment. As individuals learn through their interaction with others, learning occurs in a broad landscape that is influenced by culture, practice, and history. Learning attends to prior experiences and provides learning opportunities that welcome the individual, social, and sociocultural aspects, further addressing inequities and providing enriched opportunities for all learners (Servilio, 2009). As each generation has been steeped in the tradition of scientific inquiry and advanced our understanding of biological science, the engaged citizenry has unraveled the complexities of human function. Despite this long legacy of progress, I propose that the skill sets and tool kits of our generation will be insufficient to create the next generation of biological scientists. Targeted availability and delivery of reliable, resourceful and educational modules in a defined scientific discipline without dimensions of time, place, quantity, space and access would be considered as a commencement towards tomorrow. Biology can no longer be viewed as the science that drives our understanding, but rather, an elegant expression of chemistry, physics,

mathematics, social science and all sciences which collectively are needed to provide new insights. We have entered an era where new biological knowledge of human function and its pathology are informed by nontraditional disciplines (Muppudathi, 2012). Covid19 has been seen to have side effects in all areas during lockdowns because of our systemic insufficiencies. Countries, their economies and the global order are affected, thus affecting the education sector, a reality check of feasibility can be seen to everyone for analysis, mitigation and adaptation. Although many universities and educational institutes had already implemented online education in their places, making the whole system online for everyone was not an easy task but there is a saying that necessity is the mother of invention proved right here. Most educational institutes successfully implemented the online education system and reduced the impact of COVID-19 on education (Sharma, 2021). The shutdown accelerated the adoption of emerging technologies. The unexpected lockdown during the Covid-19 pandemic forced schools and teachers in both public and private institutions into a crisis mode in remote and blended teaching-learning paradigms. The current technological advancements have allowed us to employ several ways to design the online content and demand more educational engagement. It has motivated both teachers and students to become more tech savvy. New ways of implementing and measuring learning have opened up tremendous opportunities for significant improvement in the field of curriculum development and pedagogy (Sharma, 2021). E-contents are studied in this experimental research because of their flexibility in terms of time, place and pace of learning (Norzaimi, 2021), providing supplementary learning resources after school (or before school) to transact information in classroom teaching learning situations. It is very important to consider the preferences and perception of learners while designing e-contents, as it enhances effective and productive learning. Studies have documented both favorable and unfavorable perceptions by students on online learning interfaces. Several studies

indicate that the instructor's interaction with students has considerable impact on the student's perceptions of E-content mediated learning (Prabakaran, 2021). Consistency in course design, the capability of the interaction with course instructors to promote critical thinking ability and information processing rate of interactivity in the online setting; the extent of instructional emphasis on learning through interaction, the flexibility of online learning, chances of engaging with teachers and peers in online learning settings, social presence, academic self-concept and competencies required to use the technology were identified as the perceived strengths of online learning. Hence an effective delivery of E-contents in an online, offline, blended or remote class depends upon well-structured course content, well-prepared instructors, advanced technologies, feedback and clear instructions (Gilbert, 2015). However, several weaknesses related to E-content mediated learning were also described in the literature; namely delay in responses, skepticism of their peers, supposed expertise, lack of a sense of community and/or feelings of isolation, problems in collaborating with the co-learners, technical problems, issues related to instructor, the need for greater discipline, writing skills, and self-motivation; and the need for online users to make a time commitment to learning are considered to be barriers. Several researchers compared the efficacy of online, blended, self paced learning programs with conventional teaching in classrooms, these studies supported the fact that online, blended or self paced classes will be as effective (or more) as traditional classes if designed appropriately (Noesgaard, 2015; Allen, 2011).

1.1.0 SIGNIFICANCE OF THE STUDY

This study intends to collect and analyze pre and post test scores of attitudes and achievements in science from two different groups of respondents from Angul district of Odisha, this would lead to a conclusive idea about the effectiveness of e-contents in aiding academic achievement and nurturing scientific attitudes among learners. Though it would give a south asian

perspective on localized effects on e-content mediated attitudinal or achievement changes in learners, but most importantly it will provide validation of any effect of e-contents on changes in attitudes and achievements during the turmoil of pandemic induced school shutdowns. E-contents are a product of e-learning and it is a modern trend leading towards learning independence of learners, this study will validate students' learning through e-content modules of learning and contribute to blending traditional methods of teaching with e-contents and switching over to modern methods of multisensory and multi-engagement mediated teaching-learning.

1.2.0 STATEMENT OF THE PROBLEM

The movement towards ICT and the interference of behavioral psychology in creating diverse learning environments has influenced the field of teaching and learning. But to believe in the effectiveness of such learning being translated to learners a review is needed. Thus the problem under present investigation is stated as **"Effectiveness of e-content for teaching biology to class IX in terms of achievement in science & attitude towards science"**.

1.3.0 OPERATIONAL DEFINITIONS OF THE KEY TERMS

Att - Attitudes (of respondents studying science in class IX)

Ach - Achievement (of respondents studying science in class IX)

G1S1 - Control Group (G1) Pre Test (S1)

G1S2 - Control Group (G1) Post Test (S2)

G2S1 - Experimental Group (G2) Pre Test (S1)

G2S2 - Experimental Group (G2) Post Test (S2)

1.4.0 OBJECTIVES OF THE STUDY

- To find out whether there is any significant difference between control and experimental group in their pre & post-test scores of attitudes towards science, while lessons are taught to control group through the Existing Practices of classroom transaction and to the experimental group through an E-Content Package as an intervention of teaching biology subject in the school.
- To find out whether there is any significant difference between control and experimental group in their pre & post-test scores of achievements in science, while lessons are taught to control group through the Existing Practices of classroom transaction and to the experimental group through an E-Content Package as an intervention of teaching biology subject in the school.

1.5.0 HYPOTHESIS OF THE STUDY

- There is no significant difference between control group and experimental group students in their pre & post-test scores regarding the intervention of e-content learning material over conventional teaching in terms of attitude towards science.
- There is no significant difference between control group and experimental group students in their pre & post-test scores regarding the intervention of e-content learning material over conventional teaching in terms of achievement in science.

1.6.0 DELIMITATIONS OF THE STUDY

Data is limited to a District of an Indian State and its environment, learners following only the CBSE curriculum and are almost of the same age group at secondary school education, capable & susceptible to infinite variables like discipline, academic skills, and self-motivation, coordination, collaboration, technical problems, issues related to instructor etc. Thus any

conclusive or inconclusive evidence found from this study could conclude a yes-or-no answer to the problem we have posed but the true nature of answer lies in a more elaborate study satisfying needs of every respondent in the experimental group and individualized e-content delivery suiting needs. Structural aspects of our environments can corrupt even our best intentions, COVID induced learning loss being one of them and this has impacted the respondents of the study by being visible in delay in responses, skepticism of peers, supposed expertise, lack of a sense of community and/or feelings of isolation, problems in collaborating with the co-learners, technical problems, issues related to instructor, the need for greater discipline, digital skills, self-motivation, and time commitment to learning.

1.7.0 CHAPTERIZATION OF THE STUDY

Chapter 1 introduces to the area of research, states the background, problem, significance, objectives, hypotheses and delimitations.

Chapter 2 reviews the related literature by analyzing literature according to relevance of the study, provides research gap and the rationale of the study.

Chapter 3 provides information about the design of the study where research methodologies are elaborated.

Chapter 4 analyzes, interprets and discusses the volume of data and presents data as it is showing patterns and deductions pertaining to the experimental event and experimental environment.

Chapter 5 communicates the findings, implicates them for usage and suggests answers.