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**EFFECTIVENESS OF COMPUTER-ASSISTED LEARNING MATERIAL IN
ENHANCING STUDENT ACHIEVEMENT IN RELATION TO SELECTED
INSTRUCTIONAL VARIABLES AND CONTIGUITY**

DR. HIRALKUMAR M. BAROT

Assistant Professor,
Sheth MNC College of Education,
Dabhoi, Dist. Vadodara.

INTRODUCTION

The modern educational software carries inbuilt interaction of different modalities-instructional, functional and real face to face human interaction. Text-video and computers achieve teacher-taught interaction, feedback and control through mediated instruction. Packages developed on educational content helps to reduce the teacher-taught ratio and cater the needs of individual. In multi varied setting of classroom it is difficult for teachers to take care of all students equally according to their individual needs. Teacher cannot justify to all the students while instructing in the classroom. Learning can be enhanced and teaching learning process can be facilitated by the use of computers in the classroom. Branching style of programming helps an individual student to learn topics of their own interest as well as with their own pace and time. Slow learners, gifted as well as average students can learn according to their own pace.

We are living in the 21st century, an age of computers. Computers / Internet has affected all sub systems of society including education. Last century itself is witnessing of computer revolution, in which information processing and retrieval are being reliably done at incredible speed. Present is an age of ace-media in which media merge with the academic. In recent years computers have become an important tool for instruction. Good teachers all over the world are always been looking for more effective teaching aids.

Computer is an impersonal machine system that can help to store and retrieval information at incredible speed. Internet helps to seek information from all over the world. Exchange of information, ideas and knowledge is facilitated very fast irrespective of geographical restriction.

According to National Policy on Education (1986) emphasis should be given to computer literacy and computer literacy and computer education should be integrated in classroom. It states that –“as computers have become an important tool of imparting instruction and exchanging information, a minimal exposure to computers and training in their use should be form a part of professional education. Program of computer education will be recognized on a wider scale from the stage.”

After reviewing the status of schools and society, Rammurti Committee reported in (1990): Computer education is important because computerization has become an integral part of technology contributing to development in all spheres.

Computer education should be made an integral part of curricula.

According to one of the strategy suggested by Programme of Action (1992), “Computer application with adequate facilities of computer in schools would be encouraged on operational basis at secondary and higher secondary level.”

The world of technology is growing at a very rapid rate. It is impossible to measure its impact of the educational sphere due to continuous and growing interaction between the learning process and application of technology. It will be unwise on our part if we fail to adopt a suitable mix of modern and conventional technique of learning. As in all things computers have influenced our way of living and even our way of thinking.

Various curricular subjects like Science, Mathematics and English can be taught very effectively using computers as a tool of instruction. Computer assisted learning helps to see the unseen, to test theoretical concepts, to comprehend abstract idea, to communicate more effectively, reducing teacher student ratio and so to grasp the concepts. Interacting nature of instruction sustain the interest of learner.

INTRODUCTION OF CALM CLASSROOM

In 40s and 50s words like ‘teaching aid’ or ‘audio-video aid’ has a definite meaning in India. In 50s, with B. F. Skinner’s efforts in USA the concept of ‘programmed instruction’ travels across seven seas and touched our nation. In Indian context ‘education technology’ is used as a synonym of ‘technology of instruction’, which deals with the process and software production aspects. The software will both text as well as visuals. Individualization of instruction is possible only through computers. In context of developing software for providing instruction terms like CAI, CBI, CPI terms are used alternatively. These terms are

integrated and can be termed as Computer Assisted Learning Material (CALM). Thus CALM refers to learning materials, which provides online direct interactive instruction. CAI becomes the buzzword of the 1970. CALM of the 1970-1980 period are text based and follow a behavioural model. Drill and practice is always the key strategy. The computer based technology (CBTs) of the 1980 to 1990 period used graphics based system, to provide the first of the naturalist model software. Since the advent of multimedia in the early 1990s hyper linked material allows controlled inter veining of pictures, sounds, video and animation, simulations the enhance learning.

RATIONALE

Many efforts have been made to prepare computer assisted learning material (CALM) and studies have been conducted to see the effectiveness of CALM for various subjects like science Mathematics and studies English. The studies are at various levels i.e primary, secondary and higher secondary levels only studying the effectiveness by implementing CALM in classrooms is not sufficient, in order to make CALM more effective and systematic there is a need to analyze these materials in terms of their production variables (message type, message form, and message mode). Micro analysis in terms of production variables and contiguity of space and time helps in understanding the following questions.

- How do children learn in relation to production variables and contiguity?
- Does message form –i.e. text-graphic, text-graphic-music affects learning?
- Does spatial contiguity affect the learning of students?
- Does temporal contiguity affect the learning of students?

OPERATIONAL DEFINITION OF TERMS

Production variables: In the present study production variables refers to message-form, message-type and message mode.

Message form

- (1) Explicit means communicated directly
- (2) Implicit means communicated indirectly

Message type

- (1) Naïve means common message
- (2) New and simple
- (3) New and technical

Message mode

- (1) Only text
- (2) Text graphic
- (3) Text graphic-music

Contiguity: In the present study contiguity refers to spatial contiguity that is contiguity of space between text and animation and temporal contiguity that is contiguity of time between animation and narration.

- (1) Space wise (spatial contiguity) I. Text integrated with Animation
II. Text preceding Animation
III. Text following Animation
- (2) Time wise (temporal contiguity)
I. Animation and Narration at same time
II. Narration preceding animation
III. Narration following animation

Effectiveness of CALM:

Achievement test prepared by the investigator keeping in the mind the learning items significance of difference between means of achievement, scores of students belonging to pre-test and post-test group reflects the effectiveness.

STATEMENT OF PROBLEM

Effectiveness of Computer-Assisted Learning Material in Enhancing Student Achievement in Relation to Selected Instructional Variables and Contiguity

OBJECTIVES OF THE STUDY

- To analyze CALM in relation to production variables and contiguity.
- To study the effectiveness of CALM in terms of mean achievement of students.
- To study the learning through various message items in relation to production variables and contiguity

METHODOLOGY POPULATION

All schools having computer facilities for teaching computer as a subject in their curricula constitute population for the present study.

SAMPLE

Thirty students of standard VIII (2000-2001) of Shreyas Vidyalaya, Manjalpur, Baroda were selected purposively for the present study.

DESIGN OF THE STUDY

In order to study the effectiveness of the developed CALM pre-test post-test single group design was used.

NATURE OF THE DATA

The data collected with respect to objective 1 are qualitative in nature, whereas, the data collected against objective 2 are the scores on pre-test and post-test.

TOOLS

Two types of tools were used to collect the data for the study.

1. CALM prepared by students of DAU, Indore was used as a treatment tool.
2. Achievement tests prepared by the investigator were used as testing tools.

FINDINGS OF THE STUDY

1. The correlated 't' values on CALM on solar system and Magnet have been found significant at 0.01 level. So there has been significant gain through interaction with the CALM.
2. Largely the status of CALM has been found significantly higher on production variables and contiguity vis-à-vis achievement.
3. Some of the teaching points on CALM solar system and Magnet have been found wanting in terms of mode of presentation, spatial contiguity and temporal contiguity.
4. Achievement has been found relatively higher when technical message item were supported with animation on the same frame.
5. Text mode was found dominating in both the CALM, which is against the characteristics of computer.

CONCLUSION

There has been found significant gain through interaction with the CALM on solar system and Magnet through the compound correlated 't' values. The status of the CALM in terms of production variables and contiguity vis-à-vis achievement has been found quite

higher, except on a few teaching points where there was need to improve upon graphics, mode of presentation, spatial contiguity of text and animation and narration.

SUGGESTIONS FOR FURTHER RESEARCH

1. There is a need to conduct more similar studies on CALM on different topics.
2. Studies may be conducted on CALM in terms of content competencies, pedagogic competencies and technical competencies.

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THE IMPACT OF DIGITAL MARKETING ON CONSUMER BEHAVIOUR

NISHA P. PATEL

Teacher,
K. M. Panchal High School,
Ghantlodiya, Ahmedabad.

Introduction

Over the past two decades, digital technology has revolutionized marketing practice. Traditional mass-media strategies have been replaced by dynamic, interactive channels that engage consumers instantly. For educators and researchers, understanding this shift is crucial: future professionals must grasp how digital tools influence perception, choice, and loyalty. This paper explores the impact of digital marketing on each stage of consumer behaviour—awareness, information search, evaluation, purchase, and post-purchase—and presents a practical methodological framework for academic inquiry.

Literature Review and Theoretical Background

Classical consumer-behaviour models (Kotler et al., 2021; Solomon, 2020) describe a sequential process from need recognition to post-purchase evaluation. Digital marketing modifies these stages through (a) abundant, real-time information; (b) data-driven personalization; and (c) peer-generated trust.

- (1) **Information Abundance** – Search engines and mobile access have reduced search time and cost, allowing consumers to compare alternatives rapidly.
- (2) **Personalization** – Algorithms recommend products based on browsing history, increasing relevance and convenience (Sundar & Kim, 2019).
- (3) **Social Validation** – Social-media likes, shares, and user reviews act as social proof (Lipsman et al., 2012), shifting credibility from brand to community.

These forces collectively redefine consumer decision-making, creating more informed yet more impulsive buyers.

Proposed Methodology

A cross-sectional descriptive survey can quantify digital marketing's influence on consumer attitudes and purchasing.

Objectives:

- (1) Identify key digital factors affecting awareness and trust;

(2) Assess their effect on purchase intention.

Sample: Approx. 400 respondents aged 18–55, including teacher-education students and faculty, selected purposively.

Instrument: A structured questionnaire with five-point Likert items measuring exposure to online ads, perceived personalization, trust in reviews, influencer credibility, and buying tendency.

Data Analysis: Descriptive statistics to map platform use; factor analysis to confirm constructs; multiple regression to predict purchase intention. Ethical safeguards include informed consent and anonymity.

Synthesized Empirical Findings

Existing literature reveals consistent patterns:

1. **Information Search and Speed** – Digital marketing enables continuous comparison, leading to shorter decision cycles for low-involvement products and longer deliberation for high-value items.
2. **Personalization vs Privacy** – Tailored ads heighten engagement but can provoke discomfort if perceived as intrusive.
3. **User Reviews and Social Proof** – Positive ratings substantially raise purchase intention; mixed or negative reviews prompt further information search (Moe & Schweidel, 2012).
4. **Influencer Endorsements** – Micro-influencers often yield stronger persuasion through authenticity, while celebrity endorsements mainly drive awareness.
5. **Omnichannel Integration** – Campaigns combining search, social, and email deliver higher conversion rates because of repeated, complementary exposure.
6. **Post-Purchase Advocacy** – Accurate digital information fosters satisfaction and online word-of-mouth; unmet expectations quickly lead to negative reviews.

Discussion

Digital marketing alters the cognitive and emotional pathways of consumer choice. Cognitive change arises from data-rich environments enabling rational comparison. Affective change emerges through personalized storytelling and influencer relatability. For educators, these findings suggest the need to teach digital ethics, analytics, and media literacy within marketing and communication courses.

Marketers must balance efficiency with ethics—maintaining transparency in data use, securing consent, and clarifying why consumers see particular ads. Encouraging verified reviews and authentic influencer collaborations can sustain long-term trust.

Conclusion

Digital marketing has become the defining influence on modern consumer behaviour. It accelerates awareness, enables precision targeting, and intensifies social influence. For the teaching community, integrating these insights into curricula ensures that graduates understand both strategic potential and ethical responsibility. Future research should employ longitudinal and mixed-method designs to trace behavioural shifts over time and to evaluate digital literacy's moderating role.

Limitations and Future Scope

This paper synthesizes secondary data without primary empirical validation. Cross-sectional surveys may contain self-report bias; thus, experimental or behavioural-tracking studies are recommended. Comparative analyses across age groups and cultural settings could further clarify variations in digital responsiveness.

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