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Development of Computer-Aided Research Guidance for P.G. Course in Social Science

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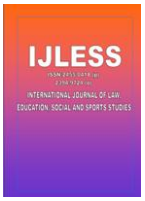

ABSTRACT
This paper explores the integration of computer-aided tools and systems in guiding postgraduate students in Social Science research. It examines the current challenges in traditional research supervision, discusses the potential of technological interventions, and outlines a framework for developing an effective computer-aided research guidance.
Key Words: Computer-aided research, postgraduate guidance, Social Science, technology in education, research tools.

Introduction

Computer aided instruction is new or revolutionary. It represents the effective innovations in teaching learning process as highly as individualized and systematic instructional strategy it has been found quite useful for classroom instruction as well as self learning or auto instruction. In our Country there have been attempts for the use of computer aided instruction especially in providing material to the students of Correspondence course. Suitable self instructional programmed materials for different subject and grades have been prepared and it is being used for instructional or self instructional purposes.

Historical Development of CAI

Computer-assisted Instruction (CAI) refers to the use of computer systems and software to deliver educational content and facilitate learning. Since its inception,CAI has undergone significant evolution, shaped by advancements in technology and changing educational needs. This section traces the historical development of CAI, highlighting its transformation from basic instructional systems to intelligent, adaptive learning tools. In the past forty years, CAI has experienced five Stages.

(1) 1950s-1960s

The concept of CAI emerged during the 1950s and 1960s, coinciding with the development of early computing technologies. This era was marked by experimental efforts to integrate computers into education. The PLATO System (Programmed Logic for automatic Teaching Operation) developed at the University of Illinois in 1960,

PLATO was one of the earliest CAI systems.

It featured interactive lessons, graphical displays, and user feedback mechanisms, making it a pioneering project in computer-based education

(2) 1970s -1980s

The introduction of microcomputers in the 1970s and 1980s expanded the accessibility of VAI.This period saw a shift from mainframe-dependent systems to personal computers, allowing more institutions to adopt CAI

(3) 1990s

This period brought advancements in multimedia capabilities, allowing CAI to incorporate rich, interactive content. This period also saw the rise of internet-based learning.

(4) 2000s-present

With advancements in artificial intelligence (AI) and data analysis, CAI has evolved into intelligent, adaptive learning systems. These modern systems offer personalized learning experiences tailored to individual needs.

Significance of CAI

The significance of Computer-Assisted Instruction lies in its ability to revolutionize the teaching and learning process through the integration of technology.CAI provides personalized, interactive, and self-paced learning experiences, accommodating diverse learner needs and improving engagement. By utilizing multimedia tools such as animations, simulations, and videos, CAI enhances the understanding of complex concepts and supports retention. It also facilitates immediate feedback and performance tracking, enabling learners to identify and address gaps in their understanding. For educators,CAI serves as a valuable tool to streamline lesson delivery, diversify teaching methods, and manage classroom activities more efficiently. In essence,CAI not only promotes effective learning but also fosters innovation and adaptability in Education.

Need and Significance of the Study:

The development of computer-aided research guidance for postgraduate (PG) courses in Social Science is essential to address the growing complexity and demands of modern academic research. Social Science research often involves diverse methodologies, interdisciplinary approaches, and extensive data collection and analysis. Traditional research supervision models are often challenged by high student-to-supervisor ratios, limited time for personalized guidance, and resource constraints. Computer-aided systems can fill these gaps by offering tools that provide personalized support, streamline research processes, and enhance the overall quality of academic inquiry. The y also fosters skill development by exposing students to advanced tools and methodologies, preparing them for the demands of academia and the workforce. Particularly in Social Sciences, where research informs public plicy and societal interventions, these systems enhance the robustness,impact,and timeliness of research contributions.

Objectives of the Study:

The following are the Objectives of the Study.

1. To develop computer aided research guidance (CARG) software for P.G. Students.

2. To validate the effectiveness and applicability of Computer-Aided Research Guidance (CARG) software in facilitating research processes within the domain of Social Science.3. To analyze user feedback on the Computer-Aided Research Guidance (CARG) software to assess its usability, functionality, and overall user satisfaction

Hypothesis of the Study:

1. There will be significant positive reaction from users of Computer-Aided Research Guidance (CARG) software when conducting Experimental research
2. There will be a significant reaction from users of the Computer-Aided Research Guidance (CARG) software when conducting descriptive research
3. There will be a significant reaction from users of the Computer-Aided Research Guidance (CARG) software when conducting mixed-method research
4. There will be significant reaction from the users of Computer-Aided Research Guidance (CARG) software when conducting historical research.

Methodology:

The study adopts the New Product Development (NPD) methodology to design, develop, and validate the Computer-Aided Research Guidance (CARG) software for postgraduate research in Social Sciences. The process follows a systematic approach, ensuring that the software is both effective and practical for enhancing research guidance.

1. **Development of CARG software**: The initial phase involves analyzing the research needs of postgraduate students and faculty, followed by designing a user-friendly prototype. The development focuses on integrating tools for literature search, data management, research design, and real –time feedback, ensuring the software aligns with academic research requirements.
2. **Internal Product Validation**: After development, the software undergoes internal validation through rigorous testing by the development team and expert reviews by Social Science research specialists. Feedback from internal testers is collected to address technical flaws and refine user experience.
3. **External Product Validation**: The software is then piloted with the postgraduate students and faculties of M.Ed.The Data are collected and analyzed using Statistical
4. Techniques in terms of percentage analysis and interpreted with reference to the selected variables.
5. **Field absorption Capacity**: This phase evaluates the educational environment's readiness to adapt the CARG software. Institutional readiness is assessed, followed by training workshops for students and faculty. Continuous feedback is collected to ensure long-term adoption, with updates and support provided as needed.

Variables of the Study:

The following are the variables of the study

Independent Variable: Computer**-**Aided Research Guidance (CARG) software

Dependent Variables: Usability of CARG Software (user-friendliness,flexibility,and applicability).Perception of Students(male,female, rural and urban) regarding CARG software. Improvement in understanding and application of research methodology concepts.

Demographic Variables: Gender (male and female) and locality (rural and urban)

Sample of the Study:

The sample for this study will consist of M.Ed faculty members who meet the specified quality criteria within the population. These faculty members will be invited to participate in the use of Computer-

Aided Research Guidance (CARG) software. Among the interested faculty members, four method masters and their respective 15 students will be selected through a resampling process for the study. The research is designed to validate the software based on this specific sample. It is important to note that the findings of the study are limited to the described population and cannot be generalized to all method masters and students.

Tools used for the collection of the Data:

A Reaction Scale was employed as the data collection tool in this study to gather user feedback and assess the effectiveness of the Computer-Aided Research Guidance(CARG) software in supporting postgraduate students in their research within the field of Social Sciences

Procedure for Data Collection: Data for the study was collected by administering the Reaction Scale to selected samples by the investigator

Analysis and Interpretation of Data:

Table No.1. Percentage analysis of user-friendliness in relation to variable Gender

SI.No	Statement	Responses	Gender			
			Male		Female	
			Frequency	%	Frequency	%
1.	I feel this Software as user Friendly	Agree	3	20	12	80
		Disagree	-	-	-	-
		Strongly Disagree	-	-	-	-
2.	Finding the Options that I want in the menus and toolbars is easy	Agree	2	16.7	10	83
		Disagree	1	33	2	66.7
		Strongly Disagree	-	-	-	-
3.	User with no computer competency find it difficult to use	Agree	1	11.1	8	88.9
		Disagree	2	50	2	50
		Strongly Disagree	-	-	-	-
4	I will be able to learn how to use all that is offered in this Software	Agree	3	23.1	10	76.9

5	Navigating through the menus and toolbars is easy to do	Disagree	-	-	1	100
		Strongly Disagree	-	-	1	100
		Agree	2	16.7	10	83.3
		Disagree	1	33.3	2	66.7
		Strongly Disagree	-	-	-	-

Table No.1 It represents that 20% male and 80% female agree CARG software is user friendly, and 83% of females compared to 16% of males agreed it was easy to locate desired options. Both genders (50% each) disagreed that users without computer competency struggle with the software.Additionally, 76.9%of females and 23.1% of males found it easy to learn all offered features, while 83.3% of females and 16% of males agreed navigating menus and toolbars was straightforward.

Table No.2. Percentage analysis of flexibility in relation to variable Gender

SI.No	Statement	Responses	Gender			
			Male		Female	
			Frequency	%	Frequency	%
1.	This Software is flexible	Agree	2	22.2	7	77.8
		Disagree	-	-	1	100
2.	This Software is providing facility to put all digital material at fingertip in classroom	Strongly Disagree	1	50	1	50
		Agree	3	21.4	11	78.6
		Disagree	-	-	1	100
3.	There should be training programme for use of such software	Strongly Disagree	-	-	-	-
		Agree	2	15.4	11	84.6

4	It enhances self evaluation among users	Disagree	1	100	-	-
		Strongly Disagree	-	-	-	-
5	It provides the other resources rather than textbook	Agree	2	15.4	11	84.6
		Disagree	-	-	1	100
		Strongly Disagree	1	100	-	-
		Agree	2	15.4	11	84.6
		Disagree	1	100	-	-
		Strongly Disagree	-	-	1	100

Table No.2. It depicts a majority of females(77.8%) compared to males(22.2%) agree on its flexibility, and 78.6% of females versus 21.4% of males find it effective for accessing digital materials in the classroom.Additionally,84.6% of females and 15.4% of males emphasize the need for training, its role in enhancing self-evaluation, and its provision of resources beyond textbooks

Table No.3. Percentage analysis of Applicability in relation to variable Gender

SI.No	Statement	Responses	Gender			
			Male		Female	
			Frequency	%	Frequency	%
1.	I feel confident to use if given an opportunity	Agree	2	14.3	12	85.7
		Disagree	1	100	-	-
		Strongly Disagree	-	-	-	-
2.	Discovering new Feature is Easy	Agree	2	15.4	11	84.6
		Disagree	1	50	1	50

3.	Content and syllabus coverage will be very easy with such software	Strongly Disagree	-	-	-	-
		Agree	2	15.4	11	84.6
		Disagree	-	-	-	-
4	It is easy for administration to implement such programme	Strongly Disagree	1	100	-	-
		Agree	1	10	9	90
		Disagree	2	40	3	60
5	This is more or same as any computer other computer software	Strongly Disagree	-	-	-	-
		Agree	3	42.9	4	57.1
		Disagree	-	-	8	100
		Strongly Disagree	-	-	-	-

Table No.3. It depicts, a majority of females(85.7%) compared to males(14.3%) feel confident using the software, and 84.6% of females versus 15.4% of males find discovering new features and syllabus coverage easy.Furthermore,90% of females and 10% of males agree on the ease of administrative implementations, while 57.1% of females and 42.1% of males find it comparable to other software .

Table No.4.Percentage analysis of User-friendly in relation to variable Locality

SI.No	Statement	Responses	Locality			
			Rural		Urban	
			Frequency	%	Frequency	%
1.	I feel this software as user friendly	Agree	3	20	12	80
		Disagree	-	-	-	-
		Strongly Disagree	-	-	-	-
2.	Finding the options that I want in the Menus and toolbars is easy	Agree	2	16.7	10	83.3
		Disagree	1	33.3	2	66.7

3.	User with no computer competency find it difficult to use	Strongly Disagree	-	-	-	-
		Agree	1	11.1	8	88.9
		Disagree	2	50	2	50
4	I will be able to learn how to use all that is offered in this Software	Strongly Disagree	-	-	-	-
		Agree	3	23.1	10	76.9
		Disagree	-	-	1	100
5	Navigating through the Menus and toolbars is easy to do	Strongly Disagree	-	-	1	100
		Agree	3	25	9	75
		Disagree	-	-	3	100
		Strongly Disagree	-	-	-	-

Table No.4. It depicts, a majority of urban students (86.7%) and 13.3%of rural students find the software user-friendly. Additionally, 83.3% of urban and 16.7% of rural students agree that finding options in the menus and toolbar is easy. Both the urban and rural students (50% each) disagree that users with no computer competency face difficulty. Furthermore,76.9% of urban and 23.1% of rural students find the software easy to learn, while 83.3% of urban and 16% of rural students agree navigating the menus and toolbars is straightforward .

Table No.5. Percentage analysis of Flexibility in relation to variable Locality

SI.No	Statement	Responses	Locality			
			Rural		Urban	
			Frequency	%	Frequency	%
1.	This Software is flexible	Agree	2	22.2	7	77.8

2.	This Software is providing facility to put all digital material at fingertip in classroom	Disagree	1	25	3	75
		Strongly Disagree	-	-	-	-
3.	There should be training programme for use of such software	Agree	3	21.4	11	78
		Disagree	-	-	1	100
		Strongly Disagree	-	-	-	-
4	It enhances self evaluation among users	Agree	3	23.1	10	76
		Disagree	-		1	100
		Strongly Disagree	-	-	1	100
5	It provides the other resources rather than textbook	Agree	3	23.1	10	76
		Disagree	-	-	1	100
		Strongly Disagree	-	-	1	100
		Agree	3	23	10	76
		Disagree	-	-	1	100
		Strongly Disagree	-	-	1	100

Table No.5. It represents that Urban Students (77.8%) and rural students(22.2%) agree the software is flexible, while 78% of urban and 21.4% of rural students find it effective for assessing digital materials in the classroom.Aditionally,76% of urban students and 23.1%of rural students emphasize the need for a training program for using the software.

Table No.6. Percentage analysis of Applicability in relation to variable Locality

SI.No	Statement	Responses	Locality			
			Rural		Urban	
			Frequency	%	Frequency	%
1.	I feel confident to use if given an opportunity	Agree	3	21.4	11	78.6
		Disagree	-	-	1	100
2.	Discovering new Feature is Easy	Strongly Disagree	-	-	-	-
		Agree	3	23.1	10	76.9
3.	Content and syllabus coverage will be very easy with such software	Disagree	-	-	2	100
		Strongly Disagree	-	-	-	-
		Agree	3	21.4	11	78.6
4	It is easy for administration to implement such programme	Disagree	-		-	-
		Strongly Disagree	-	-	1	100
5	This is more or same as any computer other computer software	Agree	3	30	7	70
		Disagree	-	-	1	100
		Strongly Disagree	-	-	-	-
		Agree	2	28.6	5	71.4
		Disagree	1	12.5	7	87.5
		Strongly Disagree	-	-	-	-

Table No.6. depicts that a majority of urban students (78.6%) and 21.4% of rural students feel confident using the software and operating it effectively. Additionally, 76.8% of urban and 23.1% of rural students

find discovering new features easy, while 78.6% of urban and 21.4% of rural students agree the software simplifies content and syllabus coverage. Furthermore,70% of urban and 30% of rural students agree on the ease of administrative implementation, with similar perceptions across both groups regarding its comparability to other software.

Findings of the Study:

It is found that;

1. The study revealed that CARG software is considered user-friendly by both male and female students
2. A comparative analysis of male and female responses indicates that CARG software is flexible to operate
3. Both male and female students agree that CARG software is easy to apply in practical contexts.
4. Rural and Urban students collectively perceive CARG software as user-friendly
5. The Software's flexibility to operate is consistently supported by rural and urban students
6. Rural and urban students agree that CARG software is easily applicable for academic purposes.

Educational Implications of the Study:

The study highlights several educational implications for integrating Computer-Aided Instruction (CAI) into postgraduate research methodology courses:

1. CAI can be effectively utilized to enhance teaching and learning in research methodology
2. Incorporating CAI in research methodology supports novice researchers in steering their research in a constructive direction.
3. The application of research-oriented software improves users' understanding of various aspects of the research process
4. Software like CARG can offer practical exercises to guide users through the steps of conducting research.
5. CARG software provides access to valuable referencing materials, including PPT's, videos, and PDFs, facilitating comprehensive learning

Conclusion:

The development of Computer-Aided Research Guidance (CARG) for postgraduate courses in Social Science demonstrates significant potential to enhance research education. The findings of the study indicate that CARG Software is user-friendly, flexible, and easy to apply, as perceived by both male and female students, as well as rural and urban learners. Its integration into research methodology courses can support novice researchers in navigating the complexities of research, improve understanding of key concepts, and provide practical tools for conducting studies. Furthermore, the software's ability to offer interactive exercises and access to diverse referencing materials such as PPTs, videos, and PDFs highlights its value as a comprehensive learning aid. By bridging theoretical knowledge with practical application, CARG software contributes to the development of critical research skills and supports the academic growth of postgraduate students in Social Science.

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