

Enhancing Foundational Digital Competencies: An Intervention-Based Study on MS Office Skills among Undergraduate Students

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Abstract- This study investigates the effectiveness of a 60-hour skill-based intervention in building the foundational proficiency of undergraduate students in the basics of Microsoft Office. A one-group pre-test/post-test design has been employed for a sample of first-year undergraduate students from Arts and Science stream. The results showed a significant increase in the basic Microsoft Office skills after the intervention, with a medium to large effect size. The findings of the study indicate that skill-based interventions can significantly assist in enhancing the digital literacy skills among the undergraduate students.

Keywords: Skill-Based Intervention, Undergraduate Students, Microsoft Office, Arts and Science, Digital Literacy

I. INTRODUCTION

Microsoft Office is a widely used software suite for documentation, organization, and presentation of academic and professional data. In fact, in the modern technological world, having skills in Microsoft Office, at least at the basic level, is highly required for academic and professional success. As an undergraduate student, proficiency in Microsoft Office is essential for creating editing and presenting academic documents, workbooks, and presentations. Despite being digitally literate and proficient in using smartphones, many undergraduate students surprisingly struggle with fundamental Microsoft Office skills.

Microsoft Office

Microsoft Office is a productivity software suite developed by Microsoft Corporation in order to assist individuals and organization in creating, managing and communicating information effectively. Its core applications - Word, Excel, PowerPoint, and Outlook - provide comprehensive solutions for word processing, data analysis, presentations, and email management. It has also introduced cloud-based solutions, AI-driven capabilities, and collaboration tools. It has altered the ways of how people work, learn, and communicate, signifying its widespread usage and influence. It has become a significant tool for individuals, organizations, and educational institutions across the globe for meeting the demands of the dynamic digital ecosystem by way of its extensive features, easy-to-use interface, and smooth integration. Microsoft Office, thus, has solidified its reputation as an archetype of work efficiency and collaboration in the digital era with its enhanced support for productivity, scalability, and flexibility.

Versioning and Platform-Independence

The Microsoft Office suite has continuously demonstrated its dedication to platform independence and versioning, guaranteeing smooth functionality and compatibility across diverse settings. The suite enables both forward and backward compatibility, allowing users to access and modify files created in earlier versions while adapting to future updates. Microsoft Office offers platform support in three primary modes: desktop-based (compatible with Windows and

macOS), mobile-based (compatible with Android and iOS), and web-based (through Office Online). Platform independence is further improved with Office 365, the suite's cloud-based infrastructure, which enables users to view and modify files on any device and from any location. Microsoft Office has strengthened its standing as a flexible and dependable productivity tool by offering versioning and platform independence, enabling individuals and organizations to operate productively with ease in the ever-changing digital landscape of today.

Microsoft Word

Microsoft Office is a software application used for processing text documents. It offers assistance to the users in creating, editing, formatting, and managing textual documents with multimedia features. In academic settings, it is highly useful for writing letters and assignments, creating reports, preparing and maintaining academic documents and papers, designing brochures, preparing resumes, citing references, tracking comments and document history, and collaborating with others effectively.

Microsoft Excel

Microsoft Excel is a software tool to work with spreadsheets. It enables the users to do mathematical operations and statistical analysis of datasets. It also provides options to generate charts and graphs thus representing data in pictorial formats. Further, it is a very good tool for organizing, and managing data in a simple way. In academic settings, it is highly useful for storing, managing, and analysing data, preparing reports, scientific research, and better collaboration and sharing.

Microsoft PowerPoint

Microsoft PowerPoint is a software application used for creating simple to complex slide presentations. It can be a great tool for the users to design visually appealing slides with multimedia presentations and animations. In academic settings, it is very useful for creating highly engaging and interactive presentations with multimedia, animations and transitions, knowledge sharing, student project presentations, and effective presentation of research findings. It plays as a great platform for communicating information and sharing ideas effectively with visually appealing informative presentation slides.

Microsoft Outlook

Microsoft Outlook is a software tool used for sending, receiving and managing emails effectively. It also offers support for managing contacts, scheduling and event management, tracking tasks and organizing to-do lists. In academic settings, it helps in effective communication and sharing of digital resources, instructional materials, and assignments and reports through emails. It also helps in tracking deadlines for tasks and collaborating with others efficiently.

II.LITERATURE REVIEW

The current era is grounded in information and digital technologies. This has made the lives of the digital natives to immerse in digital technologies. Further, information and communication technologies and digital tools have developed a great hold within educational settings post COVID-19 pandemic. Information literacy has been found to be significantly influencing the intention towards using digital technologies (Jang et al., 2021). Knowing to use personal computers, digital social media platforms, mobile technologies, GPS, and entertainment-based technologies are purely peer-driven for these individuals (Ito et al., 2008). However, the student community, in specific, lack adequate skills and strategies for utilizing these technologies in their educational pursuits and the process of their learning. In fact, they do not get to know about the educational technologies unless they are being exposed to (Ng, 2012). Microsoft Office suite is a highly recommended digital tool in educational institutions for managing daily tasks ranging from academic to administrative activities. It is highly essential to upskill the students with the basics of Microsoft Office which would be helpful for them in their academics for assignments, research works, presentations, resume preparation and many other tasks (Bawa et al., 2021). Further, more research works are required to explore the efficacy of interventions designed to impart foundational skills in Microsoft Office in diverse academic contexts.

III.STATEMENT OF THE PROBLEM

Even though, there is commendable support offered by Microsoft Office in academic and professional settings, many undergraduate students do not have

adequate proficiency in the basics of Microsoft Office, thus significantly impacting their academic performance, employability and digital literacy. The students have very little or lack familiarity in working with documents, spreadsheets, presentation slides, email management and collaboration tools. This acts as a great barrier for the students for managing data and information, communicating ideas and collaborating effectively with others. This demands for an intervention to upskill the undergraduate students with the basics of Microsoft Office. Hence, this study has been undertaken to design and measure the effectiveness of an intervention to impart the foundational skills in basics of Microsoft Office among undergraduate students.

IV.OBJECTIVES OF THE STUDY

This study has been undertaken with the intent of imparting foundational skills in basics of Microsoft Office for the first-year students pursuing undergraduate program under Arts and Science stream. The study has been carried out by evaluating the entry and exit level of the students in basics of Microsoft Office while offering learning opportunities through a well-designed intervention.

V.METHODOLOGY

This study has been carried out by employing quantitative method of data collection and analysis.

Participants:

A total of 132 female undergraduate students, within the age range of 18 to 22 years, have initially enrolled for the intervention designed to impart the foundational skills in Microsoft Office. However, only 92 students have undergone the complete 60 hours of intervention.

Research Design:

The study has employed a one-group pre-test/post-test experimental design for evaluating the effectiveness of the intervention designed to impart the foundational skills in Microsoft Office.

Intervention:

The intervention comprised of a comprehensive 60-hour skill-based training program that was carefully designed to impart foundational skills in Microsoft Office to the undergraduate students through the instructional modules as given in the table below.

Table: Instructional Modules

Content	Activity	No. of Hours	
		Theory	Practical
Introduction to Microsoft Office	<ul style="list-style-type: none"> ▪ Overview of Microsoft Office applications ▪ Understanding the interface and basic features 	1	2
Microsoft Word	<ul style="list-style-type: none"> ▪ Creating and editing documents ▪ Formatting text and paragraphs ▪ Working with tables and images 	1	6
Microsoft Excel	<ul style="list-style-type: none"> ▪ Basic calculations using formula ▪ Creating and editing charts and graphs ▪ Data analysis and visualization 	2	6
Microsoft PowerPoint	<ul style="list-style-type: none"> ▪ Creating and designing presentations ▪ Adding text, images, and multimedia ▪ Animations and transitions 	1	4
Microsoft Outlook	<ul style="list-style-type: none"> ▪ Managing email and calendar ▪ Creating and managing contacts ▪ Tasks and notes 	1	2
Introduction to Google Workspace	<ul style="list-style-type: none"> ▪ Overview of Google Workspace applications ▪ Understanding the interface and basic features 	1	3
Gmail and Google Calendar	<ul style="list-style-type: none"> ▪ Managing email and calendar ▪ Creating and managing contacts ▪ Tasks and notes 	1	3
Google Drive and Google Docs	<ul style="list-style-type: none"> ▪ Creating and editing documents ▪ Formatting text and paragraphs ▪ Working with tables and images 	1	6
Google Sheets	<ul style="list-style-type: none"> ▪ Basic calculations using formulas 	1	6

	<ul style="list-style-type: none"> ▪ Creating and editing charts and graphs ▪ Data analysis and visualization 		
Google Slides	<ul style="list-style-type: none"> ▪ Creating and designing presentations ▪ Adding text, images, and multimedia ▪ Animations and transitions 	1	6
Google Hangouts & Collaboration	<ul style="list-style-type: none"> ▪ Collaborating and communicating using Google Hangouts ▪ Sharing and collaborating on documents 	1	4
Total Theory and Practical Hours		12	48
Total Hours		60	

The program encompassed of two primary components:

- *Instructor-led Lectures:* The theoretical part of the program spanned 12 hours, where knowledgeable instructors delivered lectures on the fundamental concepts and the basic features of Microsoft Office applications.
- *Hands-on Practice Activities:* The practical part of the program was more extensive, spanning 48 hours of hands-on training wherein the students were offered the learning opportunities through practice activities in par with the theory classes.

The curriculum for this program has been carefully designed and organized based on the validation of the instructional content by the subject matter experts, thereby ensuring its educational standards.

Instrumentation

Standardized pre-test (MS Office Basic Aptitude – I) and post-test (MS Office Basic Aptitude – II) have been employed for data collection. Parallel form reliability for the instruments has been established using Cronbach alpha. The reliability values have been found to be 0.87 for the pre-test instrument and 0.91 for the post-test instrument indicating a very good and excellent reliability respectively.

Procedure

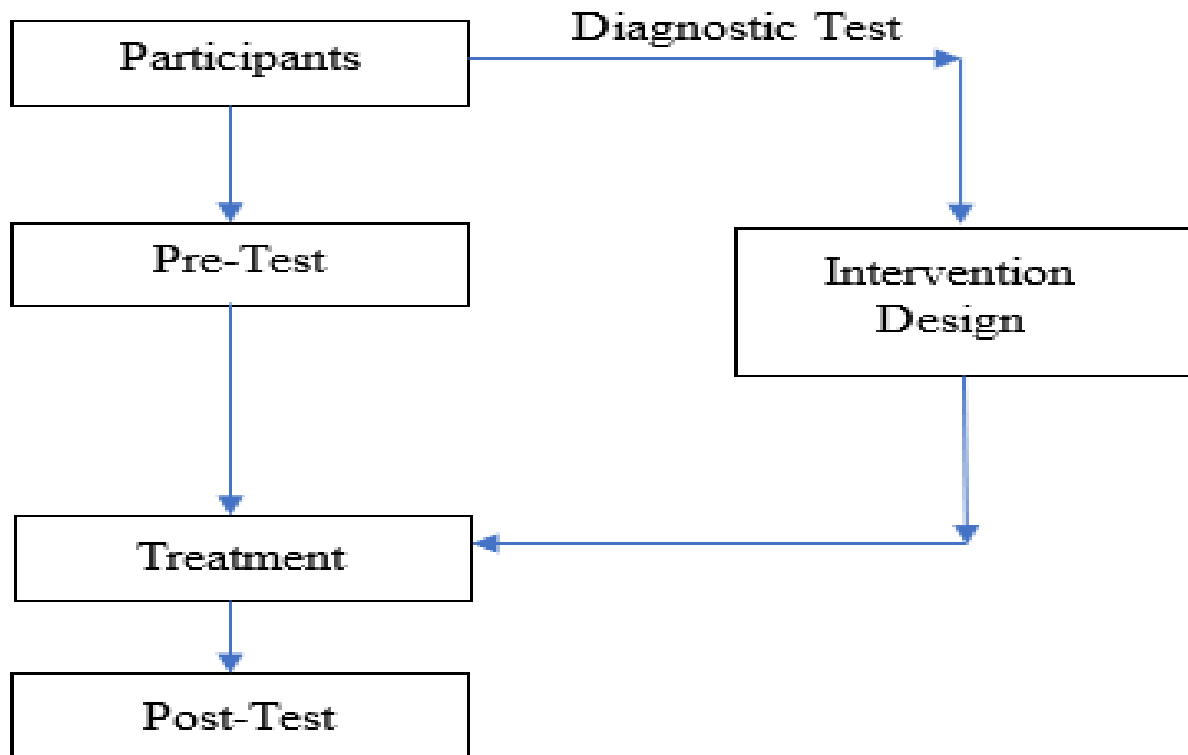
As depicted in the figure below, the procedure in carrying out this study comprised of the following key steps:

- *Administration of Diagnostic Test:* Initially a diagnostic test was administered to evaluate the entry level knowledge and skill level in Microsoft

Office and its results gave insights towards designing the customized intervention for the participants.

- *Formulation of the Intervention Design:* The diagnostic test findings served as the foundation for the intervention design. The instructional curriculum has been meticulously planned and structured along with validation of the instructional content by subject matter experts so as to address the specific needs of the participants. The intervention covered the foundational learning content and skills in Microsoft Office.
- *Administration of the Pre-test:* Before the commencement of the intervention, the participants were given the pre-test to establish the baseline measurement of their entry level knowledge and skill in Microsoft Office. This test has been used as the reference point for evaluating their progress and the effectiveness of the intervention.
- *Treatment:* The participants were then subjected to the 60-hour comprehensive intervention carefully designed to impart foundational skills in Microsoft Office to the participants. Participants were offered engaging and inquisitive educational experiences by way of 12 hours of instructor-led theory sessions and 48 hours of practice sessions.
- *Administration of the Post-test:* The participants were subjected to the post-test immediately after the completion of the intervention. This test was conducted to evaluate their learning attained through the intervention. The scores of the pre-test and the post-test were used to measure the effectiveness of the intervention.

Figure: One Group Pre-Test/Post-Test Experimental Design



VI. DATA ANALYSIS

The data has been found to be non-normally distributed. So, Wilcoxon Signed-Rank Test has been employed for pre-test and post-test comparisons and the effect size of the intervention has been calculated using Cohen’s d value.

Results

Table 1: Wilcoxon Signed-Rank Test Statistics

	N	Mean	Std. Deviation	Z	p-value
Pre-Test	92	14.22	5.277	3.421	0.001
Post-Test	92	17.09	6.219		

@99% Level of Significance

The average score has increased from 14.22 (before taking the intervention) to 17.09 (after taking the intervention). The Wilcoxon Signed-Rank test has revealed a significant improvement in the basic skills in Microsoft Office from pre-test to post-test ($p=0.001 < 0.05$). The test statistics ($Z = 3.421$) indicates a medium increase in scores. Also, the data analysis has revealed a Cohen’s d value to be 0.54, falling within

the medium to large range ($0.5 \leq d \leq 0.8$), demonstrating a significant effect size.

VII. FINDINGS

The results indicate a substantial enhancement in student performance, with scores demonstrating a statistically significant increase from pre-intervention to post-intervention. Also, the intervention showed a medium to large effect size indicating a significant impact on the student learning.

VIII. DISCUSSION

The findings support the effectiveness of the skill-based intervention in imparting the foundational skills in the basics of Microsoft Office. The statistical findings indicate that the intervention has been highly effective for the students.

IX. CONCLUSION

This study proves empirical evidence for the effectiveness of the skill-based intervention in

imparting the foundational skills in the basics of Microsoft Office among the undergraduate students.

X.IMPLICATIONS

Although undergraduate students of today are highly comfortable with smartphones and digital gadgets, a notable gap exists in the proficiency with Microsoft Office tools, highlighting the need for targeting intervention. Hence, educational institutions should integrate skill-based interventions into curricula to bridge such gaps.

XI.RECOMMENDATIONS

The intervention for imparting basics skills in Microsoft Office offered in this study is highly recommended for undergraduate students who lack the foundational knowledge and skills in Microsoft Office.

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