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Students' Perceptions of Written Examinations and Typed Examinations- A Comparative Study in Gulf University

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Abstract : Assessment is inevitable in any kind of formal education because it provides an idea of the amount of learning achieved to both the students and the instructors. Assessment has undergone a drastic change in its form and nature owing to the COVID-19 intervention. During the pandemic, most traditional assessments were reframed to suit to the online mode of conduct. Hence, the typed examinations came into picture replacing the written examinations. Though the students were not trained for the typing exams, they were enforced to take up typed examinations as there was no choice available during that time. This study intends to understand the students' perceptions with respect to written examinations and typed examinations to identify the preferred mode of giving the examinations. A survey questionnaire comprising closed ended questions on a 5-point Likert was used to get the inputs from the students at Gulf University, Bahrain. Descriptive statistics methodology was adopted after carrying out the Cronbach's alpha, Pearson's chi square tests and linear regression on the data. The Statistical Package for Social Sciences (SPSS) v21 was employed for data analysis. The results of the study suggest that the students prefer typing examinations for the ease of typing speed, proficiency in online reading skills, and typing function awareness. The scope of the study is to recommend bringing in the necessary changes in the policies and practices abiding the typing examinations to sustain the preferred mode in an ethical manner. Plus, it suggests addressing the challenges pertaining to the less preferred mode of examinations- handwritten examination for improvisation and further enhancement.

Keywords : students, written, typed, examinations, assessments, Gulf University

1. Introduction

An America-based businessman and philanthropist, Mr Henry Fischel is considered to be the man who invented examinations in the 19th century which laid the foundation for numerous examinations around the world. He established the first ever examination in China which is known as Imperial Examination. In India, the concept of examinations was introduced in the second half of the 19th century for the purpose of selection of the civil servants especially in the higher ranks. However, the conduct of the same in India happened way back in

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1922 (UPSC). Later, this was adopted in educational institutions, since then, the examinations have been taking various forms to assess the knowledge gained. After the invention of technology, the whole aspect of examinations has undergone a change. With the infusion of Learning Management Systems (LMSs), the academic process became digitally possible. As these kept evolving, there has always been debates on questioning its practical implementation, effectiveness, integrity etc. However, the 2020 witnessed the most significant upheaval in various fields globally including education.

With the emergence of COVID-19 pandemic, there came online teaching, learning, and assessments (Jha et al., 2022). Though this Emergency Remote Teaching (ERT) (Hodges et al., 2020; Milman, 2020; Rapanta, et al., 2020; UoPeople, 2020) served as a catalyst to resolve the burning issue during that time, it played havoc in the social wellbeing of the people involved in academics (Fluharty et al., 2021; Pierce et al., 2020). It has been identified that the online education and the pandemic restrictions imposed by the government had made the students devoid of physical activities, sleep, proper and timely diet (Burns et al., 2020; Savage et al., 2020; Savage et al., 2021). While (Son et al., 2020) sensed the high level of fluctuation in the sleeping patterns and dietary plans amidst the students, (Bánhidi & Lacza 2020; Dragun et al., 2020) acknowledged the mental wellbeing getting affected in the students, and (Sarris et al., 2020) proclaimed to assert that the wellbeing of general population was also affected. When the correlation between the mental wellbeing and academic performance is analysed (Pascoe et la., 2020), it became evident that the outcome achievement would be significantly low when a student's mental wellbeing is compromised (Sahu, 2020). Though (Dhawan, 2020; Fatoni et al., 2020) acknowledge the benefits like studying at own pace, easy and anywhere accessibility, immediate feedback to be beneficial, (Fernandes Cruz, 2020; Misca & Thornton, 2021) identified the coping with online mode of learning to be stressful (Adedoyin & Soykan, 2020; Jones et al., 2021). Added to this, even more challenging and stressful were the typing examinations instead of written examinations (Ahmed Fatima Rayan Awad et al., 2021; Al-Darbashi, 2021; Gorgani & Shabani, 2021; OECD., 2020), which is the focus of this study.

In 2017, when the renowned Cambridge University of the UK came up with a thought of replacing the over 800-year-old practice of handwritten exams with typing examinations using laptops because of the poor handwriting, a serious heed was given in this regard. The academicians opine that the students tend to rely more on the smart devices for taking class notes and so writing by hand is losing its charm (Hindustan Times). In this context, a Faculty at Cambridge University, Dr Sarah Pearsall, recalls "Fifteen or twenty years ago students routinely have written by hand several hours a day — but now they write virtually nothing by hand except exams (Hindustan Times)." She further added that they have been witnessing a downward trend in the legibility of the handwritten scripts as the students have not cultivated the habit of writing by hand on a day-to-day basis. This makes academicians' task of examining the scripts tougher as at times they may have to call the students to read out the script to them during their holidays. Tough Tracey Trussell from British Institute of Graphologists insisted that Cambridge University should "make sure that students continue to write by hand, particularly in lectures, Dr. Pearsall refutes thus, "Certainly with social media, iPads, and all the rest of it, people do clearly use keyboards much more than they would hand write (Hindustan Times)."

Based on this, in this study, the focus is to investigate the preference of the students with respect to writing or typing and to find out the reasons for the same. The survey questionnaire used for the purpose emphasized on the following aspects of the handwritten examinations namely comfort, satisfaction, recalling of information, stress levels of writing by hand, legibility of the handwriting and its impact on the scores. It stressed on the following aspects of typing examinations namely the availability of the digital features, typing speed, editing facility, and the difficulty in drawing diagrams, flowcharts, and calculative examinations. It, henceforth, embarks onto find out the preference of the students with the respective set of reasons. The findings of the study throw light on the challenges pertaining to the paradigm shift towards digitalised examinations to a greater extent.

2. Literature Review

With COVID-19 pandemic surfacing the globe, the normal life of people globally was disrupted. The sudden indefinite closure of educational institutions was not an easy affair to handle. The education scenario was in a state of flux and the instructors as well as students were in a state of shock as to how to

cope with the situation (Durak et al., 2020). The instructional materials were meant for face-to-face teaching and so the application of these has had an adverse effect on the teaching-learning process (Cakin & Akyavuz, 2020). Most specifically, the subjects dealing with numerical application was a Herculean task owing to the lack of availability of appropriate materials suitable for imparting through online mode of delivery (Akinci & Piskin, 2021). This intensified the stress associated with the process greatly. The early 2020s seemed to have unleashed the challenges of digitalisation in the field of education (Iivari et al., 2020; Zhong, 2020).

After a point of time, when the pandemic was overpowering, the instructors were left with no choice but to accept the prevailing context and adopt the available e-resources to impart online classes effectively (Alli et al., 2023). In this regard, (Dayakar, 2018) expresses, "The relevance for teaching is not exhaustive but a teacher's ability will determine how efficiently the e-resources can be exploited enhance teaching." In addition, (Boticki et al., 2019) propose that, "E- books have become a popular medium for content delivery and are being widely accepted," which is in line with the findings of (Alfiras & Bojiah, 2020) whereas (Abuloum et al., 2019) found out that the e-books can be no match to printed books owing to its touch and feel good factor- the debate continues till date. In the perspective of (Engbrecht, 2018), "Using more multimedia in their presentations and incorporating digital resources such as academic games and interactive websites into lesson plans," were expected of the instructors nationwide. The traditional classes facilitate the social interaction and promote the development of social skills which are indispensable to create a harmonious society. Nevertheless, the advanced cybernation, changing social mores, and the exposure to the online classes are unavoidable phenomena as acknowledged by (Hariadi et al., 2019; Suartama et al., 2019).

The intervention of technology into education has taken education to the next level as confirmed by (Karabatzaki et al., 2018) as it commands intense student engagement (Nagi & Bojiah, 2020). Contributing to this, are the availability of varied range of smart devices and Internet packages with unique sets of digital features that are truly cost-effective, consistent flow of hi-speed Internet, and the availability of free e-resources. The tech-savvy students of today who according to (Reich et al., 2019) is called "digital natives" are ready to adopt technology and explore digital tools (S´anchez-Caball´e, et al., 2021) as (Makwanya & Oni, 2019) opine thus, "Individuals are now used to producing, writing, storing and retrieving documents electronically on a wide range of electronic devices." This aspect of typing out the examinations instead of writing out comes with a lot of connotations that needs further probing. The written exams have been in practice since times immemorial. The handwritten examinations are stressful because they are time-consuming, their grading needs laborious manual operation, they could be misplaced, and there is a chance of different evaluators marking differently. However, typing out the examinations also come with certain problems like anxiety associated with the lack of speed in typing, prevalence of technical errors, time constraints, scree time issues, security compromises etc.

Typed examination involves a smart device and the Internet or intranet to carry out a time-bound submission involving digital technologies (Eltahir et al., 2019). A study by (Elsalem et al., 2021) confirms that typed examinations are conducted through online with the use of Learning Management System (LMS) where the students are given questions with the necessary assessment rubric, time allotted, and the word count expected. The findings of (Baran, 2020; Bashitialshaaer et al., 2021; C wil, 2019; Chirumamilla & Sindre, 2021; IsauAdewole et al., 2018; Khan et al., 2021) suggest that the students prefer multiple-choice or true/false kind of questions as these facilitate immediate grading and feedback to make them understand the intensity of learning (Raman et al., 2021; Shraim, 2019). From the instructor's point of view, these objective types of questions are easy to prepare as well as grade and at the same time, they proved to be very effective in measuring even higher level of understanding (Dossetto, 2021; Weimer, 2021). When the assessment focuses on in-depth description and detailing, where the students should compile a report assessing some data or an essay originally (Ar, 2019), it becomes complex (Neuert et al., 2021). The major challenge with respect to typing exam is the security issue (Can, 2020; Dendir & Maxwell, 2020; Turani et al., 2020). Bilen & Matros (2021) notified that the students copy from Google search engine and (Best & Shelley, 2018) notified that the students indulge in cheating using social media platforms which question the reliability of the assessments (Akdemir & Kılıç, 2020).

The studies of (Alsalhi et al., 2019; Liguori & Winkler, 2020) indicate that there are many benefits and significant challenges with respect to typing examinations. Numerous analyses encapsulate that the typing exams are eco-friendly and efficient enough to save cost, time, and efforts. This study aims to find out the best attributes of both written examinations and typed examinations as well as intend to investigate the preference of the mode by the selected students at Gulf University, Bahrain. The results will play a significant role in recommending to the governing body the preferred mode so that the policies and procedures could be reframed and refined accordingly.

3. Methodology

The study was conducted using a self-designed questionnaire divided into four sections: Section A: Demographic Profile; Section B: Typing Exam; Section C: Written Exam; Section D: Important Factors. The questionnaire was based on a 5-point Likert scale, where respondents ranked their level of agreement with five representing parameters: 5 - strongly agree, 4 - agree, 3 - neutral, 2 - disagree and 1 - strongly disagree. The data were collected from the students at Gulf University, Kingdom of Bahrain from five different programs. For collecting data, a convenience sampling technique was used. There were 175 respondents, and all responses were considered for the study.

The Statistical Package for Social Sciences (SPSS) v21 was employed for data analysis. Firstly, the reliability of the scales has been established with the help of reliability statistic, Cronbach's alpha. In the next step, the descriptive statistics have been used to determine the most preferred mode of exam by the respondents. Pearson's chi-square test has been employed to determine the preferred mode of exam based on the demographic characteristics. Pearson's chi-square test has also been employed for determining the importance associated with various factors and their relationship with the preferred mode of exam. Furthermore, to determine the most important factor associated with typing and handwritten exams, linear correlation analysis has been conducted.

Sample Profile Description

The final sample consists of 175 students and their profile descriptions are furnished in the Table 1.

Table 1: Profile Descriptions of the Samples

N=175	Number of Respondents	Percentage
Gender		
Male	63	36%
Female	112	64%
Age		
Less than 20 years	15	8.6%
20-25 years	102	58.3%
25-30 years	35	20%
30-35 years	15	8.6%
35 & above years	8	4.6%
Year of Study		
1st Year	36	20.6%
2nd Year	33	18.9%
3rd Year	47	26.9%
4th Year	55	31.4%
Multiple	4	2.3%
Program		
Bachelor in Human Resource Management	95	54.3%
Bachelor in Accounting & Financial Science	26	14.9%
Bachelor in Electrical & Electronic Engineering	13	7.4%
Bachelor in Mechanical Engineering	12	6.9%
Bachelor in Interior Design Engineering	28	16%
Multi-disciplinary	1	0.6%

Research Objectives

- Objective 1: To determine the most preferred mode of exam by the respondents.
- Objective 2: To determine the preferred mode of exam based on the demographic characteristics.
- Objective 3: To determine the importance associated with various factors and their relationship with the preferred mode of exam.
- Objective 4: To determine the most important factor associated with typing and handwritten exams.

4. Data Analysis

The reliability statistic, Cronbach's alpha, of both handwritten and typing exams scales, as indicated in Table 2, suggest that both scales are reliable with the value of Cronbach's alpha exceeding 0.7.

Table 2: Reliability Analysis of Scales

S. No.	Scale	Number of Items	Cronbach's Alpha
1	Handwritten (HW)	6	.844
2	Typing Exam (TE)	6	.703

In order to determine the most preferred mode of exam by the respondents, i.e., the objective 1, the descriptive statistics has been utilized, the results of which have been indicated in Table 3 and Figure 1. These suggest that there are a few respondents (4.6%) who have equal preference for both handwritten and typed exams. However, typed exam has been considered the most preferred mode of exam (66.9%) as they tend to type more and better which is in line with the findings of (Hillier & Lyon, 2018; Kim et al., 2018). Another interpretation for the preference of typing instead of writing is that it facilitates the chance of rereading and editing hassle-free which is the same as the results of the study conducted by (Kohler, 2015) which was refuted by (Hillier, 2015a & 2015b) that even hand-writers could reread several times and edit before submission.

Table 3: Descriptive Statistics for the most preferred mode of exam

N=175	Number of Respondents	Percentage
Preferred Mode of Exam		
Handwritten Exam	50	28.6%
Typed Exam	117	66.9%
Both	8	4.6%

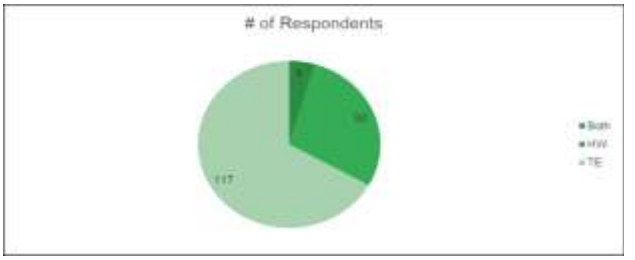

Fig. 1: Overall Preferred Mode of Exam

To attain the second objective, Pearson's chi-square tests were conducted to examine the relationship between the demographic variables and the preferred mode of exam, both of which are categorical variables. The results of this analysis have been presented in the Table 4. As there are four demographic variables included in the study (gender, age, year of study, and program), four Chi-square tests have been conducted to assess each of their relationships with the preferred mode of exam. The results of these four tests have been presented as four rows of Table 4, with the first column (Relationship) indicating the variables included in each of these tests. The second column indicates the value of the Chi-square statistic, while the third and fourth columns indicate the degrees of freedom (df) and p-value, respectively. Finally, the last column indicates whether the relationships between the variables under examination are significant or not.

The table 4 indicates the values Pearson's chi-square = 5.535 and p = .063 for the relationship between gender and the preferred mode of exam. This suggests that there is no statistically significant association ($p>0.05$) between gender and preferred mode of exams, i.e., both males and females equally prefer the mode of exam. It also indicates the values Pearson's chi-square = 8.972, p = .345 for the relationship between age and the preferred mode of exam. This suggests that there is no statistically significant association ($p>0.05$) between age and preferred mode of exams. Similarly, the table indicates the values Pearson's chi-square = 10.310, p = .244 for the relationship between year of study and the preferred mode of exam. This suggests us that there is no statistically significant association ($p>0.05$) between year of study and preferred mode of exams. Also, the table indicates the values Pearson's chi-square = 13.207, p = .212 for the relationship between program and the preferred mode of exam. This implies that there is no statistically significant association ($p>0.05$) between program and preferred mode of exams. Hence, it can be stated that, overall, the preferred mode of exams has no significant relationship with the demographic variables.

Table 4 : Summary of Pearson's chi-square test: relationship between demographic characteristics and the preferred mode of exam

Relationship	Chi-square	df	P-value	Significance
Gender * Preferred mode of exam	5.535	2	.063	Not significant
Age * Preferred mode of exam	8.972	2	.345	Not significant
Year of Study * Preferred mode of exam	10.310	8	.244	Not significant
Program * Preferred mode of exam	8.972	8	.212	Not significant

The Pearson's chi-square analysis was also employed to determine the relationship between importance associated with various factors and the preferred mode of exam (Objective 3), the results of which have been enlisted in Table 5. As there are six variables pertaining to importance factors included in the study (handwriting, spelling/grammar, ease of idea drafting/rough work, typing speed, online reading skills. and typing function awareness), six Chi-square tests have been conducted to assess each of their relationships with the preferred mode of exam. The results of these six tests have been presented as six rows of Table 5, with the first column (Relationship) indicating the variables included in each of these tests. The second column indicates the value of the Chi-square statistic, while the third and fourth columns indicate the degrees of freedom (df) and p-value, respectively. Finally, the last column indicates whether the relationships between the variables under examination are significant or not. The table 5 indicates values Pearson's chi-square = 12.490 and p = .000, suggesting a statistically significant association ($p<0.05$) between importance assigned to correct handwriting and preferred mode of exams.

The Table 5 also indicates values Pearson's chi-square = 2.075 and p = .150, suggesting a statistically non-significant association ($p>0.05$) between importance assigned to correct spelling/grammar and preferred mode of exams. Further, the values of Pearson's chi-square = 10.920 and p = .001, suggest a statistically significant association ($p<0.05$) between importance assigned to ease of idea drafting/rough work and preferred mode of exams. Moreover, the values of Pearson's chi-square = 10.196 and p = .001, suggest a statistically significant association ($p<0.05$) between importance assigned to typing speed and preferred mode of exams. Furthermore, the values of Pearson's chi-square = 15.310, p = .000 indicate the existence of a statistically significant association ($p<0.05$) between importance assigned to online reading skills and preferred mode of exams. A statistically significant association ($p<0.05$) between importance assigned to typing function awareness and preferred mode of exams was also found with values Pearson's chi-square = 11.087 and p = .001.

Overall, the results signify that if respondents do not give importance to good handwriting, ease of idea drafting/rough work, they are choosing typed exams as preferred mode, and, if the respondents give high importance to typing speed (Kohler, 2015; Mogey & Fluck, 2015), online reading skills, and typing function awareness, their preferred mode of exam is typed exam. It is worthy to recall the observation of Kohler (2015) who has some serious concerns with respect to typing function awareness thus:

... lack of fluency in lower order cognitive processes such as keyboarding or handwriting constrain higher order cognitive processes ... To this end, it might make sense that less fluent typists would be forced to spend more time on lower order processes as opposed to higher order processes that have to do with the content and organization of their ideas in essays. (140–141)

To determine the most important factor associated with typing and handwritten exams (Objective 4), correlation analyses have been conducted, the results of which, have been indicated in Table 6.

As there are six variables pertaining to importance factors included in the study (handwriting, spelling/grammar, ease of idea drafting/rough work, typing speed, online reading skills. and typing function awareness), six Pearson correlation analyses have been conducted to assess each of their relationships with the preferred mode of exam. The results of these six tests have been presented as six

Table 5: Summary of Pearson's chi-square test: relationship between importance associated with various factors and the preferred mode of exam

Relationship	Chi-square	df	P-value	Significance
Handwriting * Preferred mode of exam	12.490	2	.000	Significant
Spelling/Grammar * Preferred mode of exam	2.075	2	.150	Not significant
Ease of idea drafting/Rough work * Preferred mode of exam	10.920	2	.001	Significant
Typing Speed * Preferred mode of exam	10.196	2	.001	Significant
Online reading Skills * Preferred mode of exam	15.310	2	.000	Significant
Typing function awareness * Preferred mode of exam	11.087	2	.001	Significant

Table 6: Relationships between independent variables (factors) and dependent variable (handwritten and typed exams)

Factors	Metrics	Handwritten	Typed
Handwriting	Pearson Correlation	.333**	-.049
	Sig. (2-tailed)	.000	.523
	N	175	175
Spelling/ Grammar	Pearson Correlation	.217**	.107
	Sig. (2-tailed)	.004	.158
	N	175	175
Ease of idea drafting/Rough work	Pearson Correlation	**.382****	-.135
	Sig. (2-tailed)	.000	.075
	N	175	175
Typing speed	Pearson Correlation	-.219**	.479**
	Sig. (2-tailed)	.004	.000
	N	175	175
Online reading skills	Pearson Correlation	-.289**	.472**
	Sig. (2-tailed)	.000	.000
	N	175	175
Typing function awareness	Pearson Correlation	-.236**	**.488****
	Sig. (2-tailed)	.002	.000
	N	175	175

** Correlation is significant at the 0.01 level (2-tailed).

blocks of Table 6, with the first column (Factors) indicating the independent variables included in each of these tests. The second column indicates the metrics being calculated, while the third and fourth columns indicate the values of these metrics for each of the independent variables of handwritten and typed exams respectively.

The positive values of the Pearson correlation coefficients with significant values less than 0.05 indicate a significant and positive association between the dependent and the independent variables, while the negative values of the Pearson correlation coefficients with significant values less than 0.05 indicate a significant and negative association. The significant values greater than 0.05 indicate a non-significant association between the variables irrespective of the value of the Pearson correlation coefficient. Table 6 indicates positive relationships of importance assigned to handwriting, spelling/grammar and ease of idea drafting/rough work with the handwritten exams and negative relationships of importance assigned to typing speed, online reading skills and typing function awareness with handwritten exams. Among all other factors, the strength of the correlation with handwritten exams is the highest for ease of idea drafting/rough work, signifying it as the most important factor associated with the handwritten exams.

Similarly, the Table 6 also indicates no significant association of handwriting, spelling/grammar and ease of idea drafting/rough work with the typed exams. However, the association of typing speed, online reading skills and typing function awareness exhibited a positive association with the typed exams. Typing speed goes complementary with the familiar smart devices and the study by (Walker & Handley, 2016) differentiates "digital proficiency – reflected in the effective day-to-day use of technology for learning (e.g. from email to essay writing) – and IT proficiency for assessment, reflected in the capability to use unfamiliar technology under time pressure in computer-based exams." (Masterman & Fresen, 2017; Masterman, 2018) suggest the students to use their own familiar devices for typing the exams but this brings in security issues and academic integrity with respect to the conduct of the examinations.

Weigelt-Marom & Weintraub (2018) opines that over a period, the students will obviously become well-versed in typing. Further, the findings recommend the retention of handwriting habit parallelly. Another point to note here is whether it is handwritten or typed, marking is highly influenced by the length of the composition (Hillier & Lyon, 2018) and (Kohler, 2015) warns that the typed script is prone to more visibility of errors than handwriting which still has the back door to escape owing to its illegibility. Among all other factors, the strength of the correlation with handwritten exams is the highest for typing function awareness, signifying it as the most important factor associated with the typed exams.

6. Conclusion

The COVID-19 pandemic has resulted in the incorporation of online or typed mode of exams as a feasible mode of exams. This study also indicates that the Gulf University students are giving more preference to the typed exams over the handwritten exams, irrespective of year of the study and the program they are enrolled in. This preference to the typed exams is also irrespective of age and gender.

The importance these students attach to good handwriting, spelling/grammar, and ease of idea drafting/rough work are less as compared to the importance they attach to typing speed, online reading skills, and typing function awareness, resulting in typed exams as the most preferred mode.

The results of the study highlight the advantages of typed exams over the handwritten exams as perceived by the students making them the preferred mode of exams over the handwritten exams. With the typed exams, the students are relieved of the stress of illegibility of handwriting leading to misinterpretation and low grades compared to the handwritten exams, thus, leading them to attach less importance to handwriting. Typed exams also make it easy to search, edit, rearrange, and revise text using digital tools as compared to handwritten exams. The students, therefore, tend to attach less importance to grammar/spelling in typed exams than in handwritten exams. Moreover, typing function awareness is the most important factor associated with the typed exams by the students, and ease of idea drafting/rough work the most with the handwritten exams. Reich et al. (2019) discuss how students in today's era are tech-savvy and typing function awareness poses no impediments for the students. This also suggests that if more ease of idea drafting and rough work can be introduced in the typed exams, the students are further prone to prefer typed exams over handwritten exams.

Limitations and Recommendations for Future Studies

- Like any other study, this study has its own limitations. This study has included the students from a single university for the scope of the analysis. A comparative study with the same objectives across different universities will be more interesting and will also help ensure the generalization of the findings.

- The amount of composition carried out by a student in handwriting mode and typing mode within the same time frame needs serious probing. This may give an idea about the exact role played by the typing proficiency in the achievement of the tasks and the marks.

- A study could be carried out on investigating the marking discrepancy with reference to the handwritten script and typed out script.

- MS Word could be analyzed in terms of idea drafting technology to provide same kind of ease that a student derives employing idea drafting strategy in handwritten script.

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