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FONT CLARITY: CANDIDATES' VIEWS



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Introduction

The MATSEC Support Unit has for long been interested in maintaining a standard in its examination papers. It is believed that this would allow candidates to get familiar with a single paper layout and reduce non-subject related knowledge that they are to get conversant with and apply throughout the process of national educational assessment. In 2015 the MATSEC Support Unit published a handbook for paper setters entitled *Paper Setting: Procedures and Good Practices* providing several guidelines for constructing an examination paper that is clear, fair, and free of bias. This document was updated in 2016 with more clear rules as related to examination paper format.

The question of which typeset to use for a written examination paper, although seemingly trivial, is compounded of several arguments and beliefs. Research is rather inconclusive as no single font is suggested across different websites and research reports. Suggestions include Arial, Comic Sans, Georgia, and Times New Roman. Moreover, the typeset used is expected to have a greater effect on candidates with dyslexia. Fonts suggested for these candidates are Helvetica, Courier, Arial, Verdana, and Computer Modern Unicode (Rello & Baeza-Yates, 2013). However, even here there is lack of agreement as the British Dyslexia Association (2015) suggests Comic Sans, Century Gothic, Trebuchet, and Calibri while other studies have divergent opinions. At present, examination papers of the MATSEC Examinations Board are written in Times New Roman with a font size of 12 pt.

The MATSEC Support Unit has, thus, decided to conduct a small research project aiming to shed more light on the issue of font size as experienced by Maltese candidates. The following research questions were tackled:

- From a selection of typesets, is there any one that is more preferred by past and future examination candidates?
- Are typesets preferred by dyslexic candidates different than those preferred by other candidates?
- Is there any other factor, such as gender and/or age, which might affect one's preference to a particular typeset?

Methodological Notes and Response Overview

<u>Part 1</u>

An online survey was sent to 3,000 candidates, 1,300 of which were candidates who had qualified for access arrangements for SpLD / Dyslexia in the years 2014, 2015 and 2016. The other 1,700 candidates were randomly selected from 2016 candidates for MATSEC examinations, at both SEC and MC level. Of these, 458 respondents (15.3%) responded of which 101 were candidates with SpLD / Dyslexia. This means that the response rate was much lower amongst candidates with dyslexia (7.8% as compared to 21%).



Figure 1: Respondents by Condition (Part 1)

Most of the respondents were female while more than 75% of candidates were 19 years old or less. This information is illustrated in the figures below.



Figure 2: Respondents by Gender (Part 1)



Figure 3: Respondents by Age (Part 1)

Following three introductory questions seeking information about age, gender and qualification for examination access arrangements, survey respondents were presented with nine questions each asking them to choose which of three texts, each written with a different font, was easiest to read. Three different texts (Text 1, Text 2, and Text 3) were written with each different font. Each typeset was given a font size of 12pt. The nine questions were structured in such a way that:

- each of the nine fonts selected for this study was presented to each respondent three times;
- two fonts only featured together in a question once;
- each text for each font was used only once. The following table shows the occurrence of fonts in the nine questions.

	Text 1	Text 2	Text 3
Times New Roman	Question 1, Option 1	Question 4, Option 1	Question 7, Option 1
Arial	Question 1, Option 2	Question 5, Option 1	Question 8, Option 1
Calibri	Question 1, Option 3	Question 6, Option 1	Question 9, Option 2
Cambria	Question 2, Option 1	Question 4, Option 2	Question 9, Option 3
Comic Sans	Question 2, Option 2	Question 5, Option 2	Question 7, Option 2
Century Gothic	Question 2, Option 3	Question 6, Option 2	Question 8, Option 2
Verdana	Question 3, Option 1	Question 4, Option 3	Question 8, Option 3
Tahoma	Question 3, Option 2	Question 5, Option 3	Question 9, Option 1
Trebuchet	Question 3, Option 3	Question 6, Option 3	Question 7, Option 3

Table	1:	Survey	Structure	(Part 1)
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For analysis, the number of times each font was chosen as the best one out of three were counted together.

<u>Part 2</u>

Following analysis, answers were postulated for the research questions above. However, uncertainty remained as it was observed that exam papers occupied contrastingly different areas when the different typesets were used. Uncertainty is a normal outcome of social research which by nature leads to ambiguity (Mercieca, 2011; Coffey & Atkinson, 1996).

Thus a second, yet very similar, research tool was designed, this time taking into consideration the actual space occupied by typesets. The questionnaire could not be designed as an online survey in this case, and questionnaires were sent to all educational institutions in Malta. In total, there were 314 participants all aged 15-16 years old, except for one 17 year-old respondent. This time round, most participants (54.5%) were male while 10.0% had examination access arrangements. This latter value, though much smaller than that observed in the first part of the research, was expected since approximately 10% of the candidates sitting for SEC examinations have examination access arrangements (MATSEC Support Unit, 2016).



Figure 4: Respondents by Condition (Part 2)





Figure 5: Respondents by Gender (Part 2)



Figure 6: Respondents by Age (Part 2)

When designing the questionnaire, another condition was added to the three conditions set above. Since each typeset appears three times in the questionnaire, the survey was structured in such a way that each time the typeset appears as a different option number. This would minimize risks that respondents randomly tick the, for example, first option regardless of clarity. The table that follows summarizes the layout of the second research tool.

Table 2: Survey Structure (Part 2)

	Question	Option 1	Option 2	Option 3
1		Calibri	Times New Roman	Arial
Text 1	2	Century Gothic	Comic Sans	Cambria
	3 Verdana		Tahoma	Trebuchet
	4	Times New Roman	Cambria	Verdana
Text 2	5	Tahoma	Arial	Comic Sans
	6	Trebuchet	Century Gothic	Calibri
	7	Comic Sans	Trebuchet	Times New Roman
Text 3	8	Arial	Verdana	Century Gothic
	9	Cambria	Calibri	Tahoma

	Font Size (pt)
Times New Roman	12.0
Arial	11.5
Calibri	11.5
Cambria	11.5
Comic Sans	10.0
Century Gothic	10.5
Verdana	10.5
Tahoma	11.0
Trebuchet	11.0

Results

For the 458 participants taking part in Part 1 of this study, Verdana was the preferred typeset. This was followed by Century Gothic and Tahoma. Times New Roman, which is the font currently used in MATSEC examination papers, was the font that is least preferred by survey respondents.



Figure 7: Respondents preferred Typeset (All Respondents) (Part 1)

The results varied significantly for Part 2 of the research. Although Verdana was still the favourite typeset, Arial fared much better and the difference between the two decreased to 0.7%. The biggest difference on adjusting for font size, however, lies in the increased popularity of Times New Roman and the decreased popularity of Comic Sans.



Figure 8: Respondents preferred Typeset (All Respondents) (Part 2)

Gender differences were minimal and most observations hold irrespective of gender. Although in the second part of the study differences were more marked, analysis is compounded with the smaller number of participants. However, it seems that male candidates were more supporting for Arial and less apprehensive for Verdana than their female counterparts. Thus, increased male participation in Part 2 of the research might be an additional cause for the increased preference towards Arial.





Figure 9: Respondents preferred Typeset (by Gender) (Part 1)



Figure 10: Respondents preferred Typeset (by Gender) (Part 2)

On analysing the data obtained through Part 1 of the research, minor dissimilarities amongst the different age groups participating in this research were noted as 18-year old respondents seemed more positive towards Times New Roman and less positive towards Verdana when compared to other respondents. Nevertheless, even amongst 18-year old respondents, Verdana remained the font to be viewed most positively while Times New Roman remained the font to be viewed least so. Although differences in Part 2 were more marked, with 16 year olds showing first preferences for Arial, Century Gothic, and then Verdana

respectively, the fact that only nineteen twenty-four 16 year olds participated in this part of the study leaves room for much speculation.



Figure 11: Respondents preferred Typeset (by Age) (Part 1)



Figure 12: Respondents preferred Typeset (by Age) (Part 2)

There were also minor differences between candidates based on their condition. For the results obtained through Part 1, this observation holds most for the font Comic Sans which was viewed much less positively by candidates without any condition. Fonts Calibri and Cambria were viewed more positively by candidates without a condition. These trends were also observable in Part 2 of the study. However, while in Part 1 the overall hierarchy was maintained and Verdana remained judged as the most readable font and Times New Roman as the least readable one irrespective of respondents' condition, in Part 2 while candidates without examination access arrangements preferred Verdana, those with examination access arrangements showed preference for Arial.



Figure 13: Respondents preferred Typeset (by Condition) (Part 1)



Figure 14: Respondents preferred Typeset (by Condition) (Part 2)

Conclusions

For the 458 respondents participating in Part 1 of this study, Verdana was viewed as the most readable font while Times New Roman, which is the typeset currently used in MATSEC examinations, was viewed as the least readable one. These observations hold true irrespective of respondents' age, gender and condition as differences between respondents grouped using these factors were minimal. In Part 2 of this research, after correcting for font size in the research tool itself, Verdana remained viewed as the most readable typeset. However, candidates with a condition showed more preference for Arial rather than Verdana, and so did male candidates. On further investigation, however, it was noted that Arial fails to distinguish between the letter 'l' and capital letter 'i', as shown below.



Figure 15: Capital letter 'i', letter 'l' and number '1' in Arial and Verdana

The lower response rate amongst candidates with dyslexia in the first part of the study might suggest that the research tool was too taxing on such candidates. The amount of text portrayed in the survey might have put these individuals off. However, candidates with dyslexia in Part 1 of the research were candidates who sat for examinations not only in 2016, but in 2015 and 2014. As such, the preferred e-mail address provided by these candidates to the MATSEC Support Unit at the time of assessment might have changed. Interest to participate in research might also decrease with time as the research is seen less relevant to the persons' life.

Although initially the fonts were compared using the same text and font size (pt 12), it became evident that a font size for one typeset is not equivalent to the font size of another typeset. Thus, the fairness of the comparison was questioned in this regard as fonts like Times New Roman, Calibri and Cambria appear to be smaller than other typesets for the same font size. Verdana, Century Gothic, Arial and Comic Sans, on the other hand, seem to occupy a larger space for the same font size. Thus, on repeating the research but adjusting for font size, the outcomes of the study did change, although not as much to make those of the initial study irrelevant.

This report was formulated by Mr. Gilbert Zahra, Principal Assessment Research and Development Officer, MATSEC Support Unit, University of Malta in liaison with Mr. Dario Pirotta, Director, MATSEC Support Unit, and Prof. Frank Ventura, Chairman, MATSEC Examinations Board. Comments on this report and any recommendations on improving this or similar documents published by the MATSEC Support Unit are welcome. These are to be addressed to Mr. Gilbert Zahra on Tel: 2340 3965 or email: gilbert.j.zahra@um.edu.mt.



Table 4: Which font is easiest to read? (All candidates) (Part 1)						
	Question 1	Question 2	Question 3	SUM	%	
Times New Roman	24	27	41	92	2.23	
Arial	306	124	49	479	11.62	
Calibri	122	52	71	245	5.94	
Cambria	71	75	64	210	5.09	
Comic Sans	149	163	214	526	12.76	
Century Gothic	234	292	184	710	17.22	
Verdana	332	352	219	903	21.91	
Tahoma	80	165	319	564	13.68	
Trebuchet	38	108	200	346	8.39	

Data Tables

<u>Part 1</u>

Table 5: Which font is easiest to read? (15 year old candidates) (Part 1)					
	Question 1	Question 2	Question 3	SUM	%
Times New Roman	2	1	3	6	2.2
Arial	17	11	4	32	11.9
Calibri	11	6	11	28	10.4
Cambria	5	6	4	15	5.6
Comic Sans	9	10	15	34	12.6
Century Gothic	16	14	7	37	13.7
Verdana	22	23	19	64	23.7
Tahoma	6	9	15	30	11.1
Trebuchet	2	10	12	24	8.9

Table 6: Which font is easiest to read? (16 year old candidates) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	5	8	11	24	2.3
Arial	74	32	15	121	11.4
Calibri	38	15	15	68	6.4
Cambria	19	20	19	58	5.5
Comic Sans	43	40	54	137	12.9
Century Gothic	55	62	44	161	15.2
Verdana	79	89	58	226	21.3
Tahoma	28	44	83	155	14.6
Trebuchet	9	39	52	100	9.4

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	2	5	7	14	1.9
Arial	57	25	9	91	12.0
Calibri	23	8	14	45	6.0
Cambria	10	11	8	29	3.8
Comic Sans	25	24	36	85	11.2
Century Gothic	48	56	39	143	18.9
Verdana	62	67	34	163	21.6
Tahoma	13	34	62	109	14.4
Trebuchet	6	19	40	65	8.6

 Table 7: Which font is easiest to read? (17 year old candidates) (Part 1)

Table 8: Which font is easiest to read? (18 year old candidates) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	7	9	12	28	3.9
Arial	47	22	11	80	11.1
Calibri	24	14	12	50	6.9
Cambria	18	19	14	51	7.1
Comic Sans	25	34	37	96	13.3
Century Gothic	35	44	35	114	15.8
Verdana	53	51	33	137	19.0
Tahoma	13	23	53	89	12.4
Trebuchet	12	21	31	64	8.9

Table 9: Which font is easiest to read? (19+ year old candidates) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	8	4	8	20	1.5
Arial	111	34	10	155	11.8
Calibri	26	9	19	54	4.1
Cambria	19	19	19	57	4.3
Comic Sans	47	55	72	174	13.2
Century Gothic	80	116	59	255	19.4
Verdana	116	122	75	313	23.8
Tahoma	20	55	106	181	13.8
Trebuchet	9	19	65	93	7.1

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	5	6	4	15	1.7
Arial	71	16	4	91	10.0
Calibri	23	5	18	46	5.1
Cambria	9	13	11	33	3.6
Comic Sans	46	47	62	155	17.1
Century Gothic	45	69	46	160	17.6
Verdana	73	82	50	205	22.6
Tahoma	20	37	72	129	14.2
Trebuchet	6	26	35	67	7.4

Table 10: Which font is easiest to read? (SpLD / Dyslexia) (Part 1)

Table 11: Which font is easiest to read? (No Condition) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	16	20	34	70	2.5
Arial	203	97	42	342	12.1
Calibri	90	46	50	186	6.6
Cambria	58	57	45	160	5.7
Comic Sans	85	98	126	309	11.0
Century Gothic	168	192	119	479	17.0
Verdana	225	233	148	606	21.5
Tahoma	56	114	215	385	13.7
Trebuchet	27	71	151	249	8.8

Table 12: Which font is easiest to read? (Other Condition) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	3	1	3	7	1.8
Arial	32	11	3	46	11.6
Calibri	9	1	3	13	3.3
Cambria	4	5	8	17	4.3
Comic Sans	18	18	26	62	15.7
Century Gothic	21	31	19	71	17.9
Verdana	34	37	21	92	23.2
Tahoma	4	14	32	50	12.6
Trebuchet	5	11	14	30	7.6

	Question 1	Question 2	Question 3	ŚUM	%
Times New Roman	10	9	16	35	2.8
Arial	91	38	20	149	12.1
Calibri	36	13	15	64	5.2
Cambria	18	19	20	57	4.6
Comic Sans	48	55	67	170	13.8
Century Gothic	71	90	50	211	17.1
Verdana	100	109	66	275	22.3
Tahoma	23	44	101	168	13.6
Trebuchet	13	34	54	101	8.2

Table 13: Which font is easiest to read? (Male respondents) (Part 1)

Table 14: Which font is easiest to read? (Female respondents) (Part 1)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	14	18	25	57	2.0
Arial	215	86	29	330	11.4
Calibri	86	39	56	181	6.3
Cambria	53	56	44	153	5.3
Comic Sans	101	108	147	356	12.3
Century Gothic	163	202	134	499	17.3
Verdana	232	243	153	628	21.7
Tahoma	57	121	218	396	13.7
Trebuchet	25	74	146	245	8.5

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	53	61	111	225	8.0
Arial	156	129	193	478	16.9
Calibri	60	38	51	149	5.3
Cambria	66	53	86	205	7.3
Comic Sans	38	40	41	119	4.2
Century Gothic	187	98	58	343	12.1
Verdana	200	89	207	496	17.6
Tahoma	138	81	199	418	14.8
Trebuchet	160	160	33	353	12.5

<u>Part 2</u>

Table 15: Which font is easiest to read? (All candidates) (Part 2)

Table 16: Which font is easiest to read? (15 year old candidates) (Part 2)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	51	56	104	211	8.2
Arial	143	117	177	437	17.1
Calibri	55	37	47	139	5.4
Cambria	59	47	82	188	7.3
Comic Sans	34	37	32	103	4.0
Century Gothic	168	86	51	305	11.9
Verdana	184	85	189	458	17.9
Tahoma	134	72	183	389	15.2
Trebuchet	151	146	32	329	12.9

Table 17: Which font is easiest to read? (16 year old candidates) (Part 2)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	2	5	7	14	6.6
Arial	11	12	14	37	17.5
Calibri	5	1	4	10	4.7
Cambria	7	6	4	17	8.0
Comic Sans	4	3	9	16	7.5
Century Gothic	17	11	7	35	16.5
Verdana	14	4	16	34	16.0
Tahoma	3	9	14	26	12.3
Trebuchet	9	13	1	23	10.8

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	4	4	6	14	8.8
Arial	9	5	14	28	17.6
Calibri	1	2	3	6	3.8
Cambria	3	3	3	9	5.7
Comic Sans	3	5	4	12	7.5
Century Gothic	10	6	4	20	12.6
Verdana	11	3	12	26	16.4
Tahoma	8	5	11	24	15.1
Trebuchet	9	8	3	20	12.6

Table 18: Which font is easiest to read? (SpLD / Dyslexia) (Part 2)

Table 19: Which font is easiest to read? (No Condition) (Part 2)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	45	55	97	197	8.2
Arial	131	115	160	406	16.9
Calibri	55	34	44	133	5.5
Cambria	58	45	74	177	7.4
Comic Sans	32	30	33	95	4.0
Century Gothic	166	84	50	300	12.5
Verdana	180	82	179	441	18.3
Tahoma	118	64	171	353	14.7
Trebuchet	138	138	26	302	12.6

Table 20: Which font is easiest to read? (Other Condition) (Part 2)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	2	0	3	5	5.2
Arial	5	4	10	19	19.6
Calibri	1	0	0	1	1.0
Cambria	1	0	2	3	3.1
Comic Sans	2	2	3	7	7.2
Century Gothic	7	6	4	17	17.5
Verdana	6	1	9	16	16.5
Tahoma	4	5	9	18	18.6
Trebuchet	5	6	0	11	11.3

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	34	33	61	128	8.4
Arial	107	65	103	275	18.1
Calibri	35	21	27	83	5.5
Cambria	40	28	63	131	8.6
Comic Sans	22	18	18	58	3.8
Century Gothic	90	44	25	159	10.4
Verdana	100	35	109	244	16.0
Tahoma	85	51	106	242	15.9
Trebuchet	97	85	20	202	13.3

Table 21: Which font is easiest to read? (Male respondents) (Part 2)

Table 22: Which font is easiest to read? (Female respondents) (Part 2)

	Question 1	Question 2	Question 3	SUM	%
Times New Roman	19	28	50	97	7.7
Arial	49	64	90	203	16.1
Calibri	25	17	24	66	5.2
Cambria	26	25	23	74	5.9
Comic Sans	16	22	23	61	4.8
Century Gothic	97	54	33	184	14.6
Verdana	100	54	98	252	19.9
Tahoma	53	30	93	176	13.9
Trebuchet	63	75	13	151	11.9

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