

A Mix Method Study on the Effectiveness of Visual Topology Elements Used in Entrepreneurship Online Teaching and Learning Materials at Universiti Teknologi MARA

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Abstract

Malaysia's Ministry of Higher Education has instructed all public universities to make entrepreneurship a compulsory subject for all students. In online entrepreneurship learning, learning material such as PowerPoint (PPT) acts as the tools used by lecturers to simplify the communication process in transferring the message to students. Communication through visual design is one of the easiest ways to assist students in better understanding, focusing, and engaging more with the content. However, if the learning material is poorly designed, it distracts the students' learning process, making them more likely to stop. Therefore, to avoid these problems, this study analysed the effectiveness of visual topology elements in entrepreneurship teaching materials in the most prominent university and the pioneer of entrepreneurship education in Malaysia, Universiti Teknologi MARA.

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1.0 INTRODUCTION

Malaysia aspires to become a prosperous and advanced country, and in achieving this goal, Malaysia needs to be transformed into an entrepreneurial nation. Entrepreneurship is the key to improving economic growth by contributing to Gross Domestic Product (GDP), stimulating investment, and creating job opportunities. In addition, entrepreneurship is the catalyst for generating innovation and being a conduit for improving the socioeconomic community by providing economic opportunities to various sectors of society, especially the marginalised and the disadvantaged. Fortunately, in the labour market, the business grows initially (Kementerian Pembangunan Usahawan, 2019).

Since the early days, the government has focused on the entrepreneurship sector, especially when the importance of entrepreneurship to individuals, society, and its contribution to the country has been recognised. It was shown but multiple policies that have been introduced such as *Dasar Ekonomi Baru* for 1971-1990, *Dasar Pembangunan Negara* for 1990-2000, *Dasar Wawasan Negara* for 2001-2010 and *Model Ekonomi*

Baru for 2011-2020. Entrepreneurship has been identified as one of the main national agendas in *Rancangan Malaysia Kesebelas* (RMKe-11). Entrepreneurship is also an important element in 40 policies/master plans/action plans / national programs published by various ministries and agencies, implicating the importance of entrepreneurship in Malaysia (Kementerian Pembangunan Usahawan, 2019). Moreover, in Malaysia, Universiti Teknologi MARA (UiTM) has recently launched a five-year strategic plan called UiTM2025 (News Straits Times, 2020). The purpose of this UiTM2025 plan is to make UiTM the world's leading university in Malaysia by the year 2025, and entrepreneurship is one of the fields that have been included.

To materialise the entrepreneurship goals, everything needs to start from the grassroots, including entrepreneurship education for the younger generations. Therefore, a policy was introduced by the Ministry of Education for the Higher Education Institutions focusing on (1) application and exposure of entrepreneurial culture and values into the education system and (2) transformation of the mindset of students from job seekers

to job creators (Kementerian Pembangunan Usahawan, 2019). Furthermore, The Higher Education Ministry of Malaysia has made it compulsory for students to take entrepreneurship subjects at all public universities. At the same time, students of Higher Education Institutions are enticed into participating in more entrepreneurship activities at their universities, such as entrepreneurship short courses, events, training, seminars and conferences (Rahim, H. L., Kadir, M. A. B. A., Abidin, Z. Z., Junid, J., Kamaruddin, L. M., Lajin, N. F. M., and Bakri, A. A., 2015).

However, at the end of 2019, the world was shocked when the first infectious disease was identified in Wuhan of Hubei Province, China (Peng, P.W.H., Ho, P.L. and Hota, S.S., 2020). Coronavirus disease, also known as COVID-19, was initially considered a health crisis that has affected over 200 countries (WHO, 2020). This health crisis has turned into a COVID-19 pandemic by World Health Organization (WHO). It shows a growing human-to-human infection that led to the death of more than 200,000 people in the fast period (Qiu, W., Rutherford, S., Mao, A. and Chu, C., 2017). To prevent the spread of COVID-19, lockdown, travel restrictions, social distance, restricted movement orders, confinement, and quarantine have been implemented by most countries, including Malaysia. This has also resulted in disruptions in the policy objectives of the Ministry of Education and the UiTM2025 plan.

Online learning is one of the alternative methods in the education world. According to Amita (2020), about 95% of students say their lecturer uses the online teaching method to compensate for the loss of the traditional classroom. Online learning has been considered the best method of education during this COVID-19 pandemic. Online learning has become a new trend in the education sector during this COVID-19 pandemic, where it can give students a different chance to learn regardless of where they are and when they are available (Adeoye, I. A., Adanikin, A. F., and Adanikin, A., 2020).

In learning material, visual design is used to develop the relationship among users where it conveys messages between students and teachers. Communication through or with visual design elements is also one of the easiest ways to assist students in understanding the content and paying direct attention, hence increasing the likelihood that students will be able to memorise the information shared. If the information is poorly designed, it distracts

the students learning process, and they are more likely to stop. In the Information Technology (IT) field, multimedia packages are formed in detail to the educational arena in electronic form with a variety of visual design elements (S.K. Rajasekaran and Dr. S. Arulchelvan, 2017). Implementing visual design elements in online learning is significant and has a powerful impact. This notion was agreed by numerous previous studies (Vladimir Tomko and Larissa Zaitseva, 2009; Reyna J., 2013; Wang, 2015; Alshehri, A., Rutter, M., and Smith, S., 2019).

1.1 Research Problem

Even though many researchers agreed that the implementation of visual design elements in online learning is very significant in enhancing student's motivation, engagement and satisfaction (Vladimir Tomko and Larissa Zaitseva, 2009; Wang, Y., 2015; Alshehri et al, 2019), it has often been neglected by lecturers in the course development as it is considered insignificant, not being valued and lack of exposure on its purpose in learning (Vadsariya R, 2018; Sulaiman, S., Radzi, M. Q. A. N. A., Kamaruddin, N., and Ali, W. A. F. W., 2020), hence, little attention was given to the understanding on what are the factors and how these design might affect the student's motivation and engagement during the online learning process (Gedera, Dilani, Williams, P John, Wright and Noeline., 2015; S. H. Lee and D. H. Song, 2019).

According to numerous studies, students who tend to lose focus and their interest in the learning process may result in low grades (McClintic Gilbert et al., 2013; Schinske, J., and Tanner, K., 2014; Krawczyk, R. M., 2017). Today reality shows that the process of entrepreneurship learning is very tedious. Students tend to criticise the theory of entrepreneurship as tedious, dull learning material and tedious lecturers may cause the students to feel demotivated during the entrepreneurship course learning process (Yulastri, A., Hidayat, H., Ganefri, G., Edya, F., and Islami, S, 2018). Furthermore, the entrepreneurship learning provided by higher education institutions has been underestimated and not been considered necessary by the students (Rahim, I. H. A. and Muktar, D, 2021). The good or bad learning process is mainly determined by selection material (Yulastri, A., and Hidayat, H., 2017). It is hard for students to focus on the material if it is random, unplanned, disordered and poorly designed. Some

students pointed out that the non-designed learning material or only text-based or plain text is “dull”, which might not be well-received by the students (Ang, T. C., and Mohamad, M., 2014). Due to this reason, students might waste their time because they need to study all over again to aim the higher grade (Krawczyk and Roxanna M., 2017). Student time management plays a vital role in improving students’ academic performance (Nasrullah, S., and Khan, M. S., 2015). But, when students struggle with their time management to meet course deadlines, they will eventually stay up late to finish their work. This development can affect students' health as a result of the increase on the intensity of brain activities.

All of the issues may and could harm the learning achievements. This may also lead to ineffective learning (Reyna J., 2013; Nasrullah, S., and Khan, M. S., 2015). Understanding and applying the right visual design element is very important for students' engagement, motivation, learnability, ease of use (Zaharias, P., 2009), and a successful learning process. Many studies have demonstrated that learning materials that use some visual design elements are more effective than just text-based only (Fish, K., Mun, J., and A'Jontue, R., 2016). According to Lanzilotti, Rosa, Ardito, Carmelo, Costabile, Maria and De Angeli, Antonella's (2006) proposal, text with visual elements inspires students to stay longer in online learning course and explore it further. Students may have captured a better and faster understanding with the great balance between the text and other visual elements. They will be able to differentiate between useful information and not so useful information.

1.2 Research Objectives

This study focuses on two objectives:

- a) To study the current practices of visual typography elements in entrepreneurship learning materials.
- b) To identify the students’ preferred visual typography elements to enhance the effectiveness of the entrepreneurship learning process.

2.0 LITERATURE REVIEW

2.1 Entrepreneurship

Entrepreneurship is widely recognised as one of the most important activities as well as a mechanism for economic development today. The global economic crisis

has created new trends and situations through job creation and innovation. It has revealed entrepreneurship as a strategic way to turn this into an economic cycle which provides social capital and development (Galvao, A., Ferreira, J. J., and Marques, C., 2018). Entrepreneurship is also a valid economic model and has the potential to increase employment, promote sustainable development, drive economic growth and social prosperity and constitute a key component in local and globalised market economies (Diaz-Garcia, C., Saez-Martinez, F., and Jimenez-Moreno, J., 2015). Moreover, entrepreneurs are insightful people who dream about new technologies and products and make them real. They are risk-takers who are always searching for opportunities on the market that would allow them to make a profit. If they succeed, their revolution will improve the economy and the standard of living. In short, in addition to making a lot of profit from their entrepreneurial efforts, they also create jobs and conditions for a flourishing society.

Thus, it is important that the education system can teach entrepreneurship to prepare young people, especially those in higher learning institutions, to have successful lives. They must be ready for all the possibilities, including working for others, starting their businesses, and contributing to their community (Yulastri, A., and Hidayat, H., 2017).

2.2 Online Learning

One broadly used educational technology in Malaysia during this pandemic of COVID -19 is online learning (Nadia Sullivan, 2020). Online learning has been frequently defined in terms of technology. According to Al-Busaidi, K. A. (2013), online learning is defined as the delivery of learning using the Internet and digital technology virtuously. As for Azhari, F. A., and Ming, L. C. (2015) statement, online learning is among the earliest web-based technology applications. Caroline Lawless (2018) adds that online learning delivers information or instruction related to education or training using electronic devices such as computers, tablets, and even cellular phones primarily connected over or through internet technologies. Sander Tamn (2019) also stated that online learning is an easy distance learning experience conducted by the Internet for students to learn and access their learning material at any place and time.

The functionality of online learning has extended to embrace all types of students, regardless of whether they are full-time students, part-time students, or distance

learners in higher education institutions (Azhari, F. A., and Ming, L. C., 2015). As of today, the reason is mainly the existence of pandemic COVID-19 (The Star, 2020). The pandemic COVID-19, which hits worldwide, has caused the sudden closure of all education sectors, including schools, colleges, universities, and other government institutions. During these challenging times, lecturers have been utilising online learning platforms to ensure the continuity of learning and prevent the risk of exposure and spreading of COVID-19 among students. All educational institutions from all over the world including Malaysia have shifted from face-to-face learning to online learning with technology and electronic devices as a moderator of communication to students from the comfort of their homes (Shahzad, A., Hassan, R., Aremu, A. Y., Hussain, A., and Lodhi, R. N; 2020, Malay Mail; 2020).

2.3 Online Learning in UiTM

The closure of educational institutions has pressured students and educators, especially Universiti Teknologi MARA (UiTM), the largest university in Malaysia, to implement online learning. In UiTM, Open Distance Learning (ODL), similar to online learning, has been introduced to facilitate the teaching and learning process. According to Musingafi, M.C.C, Mapuranga, B., Chiwanza, K., and Zebron, S. (2015), ODL is related to its flexibility, availability, reasonableness and life-based education opportunities. But for UiTM, ODL has been introduced to facilitate the teaching and learning process. Moreover, this ODL is related to flexibility, availability, suitability, and life-based educational opportunities. But, in UiTM, ODL is a teaching methodology where students complete their studies online without physically attending lecture sessions (Allam, SNS, Hassan, MS, Mohideen, RS, Ramlan, AF, and Kamal, RM, 2020). It has been recommended to provide students with independent and creative learning skills to ensure they do not lag behind current global trends, especially during this pandemic.

2.3 Visual Design in Learning

Visual design focuses on the beauty or the appreciation of beauty or aesthetics and its related materials by strategically implementing or communicating through placing the meaningful typography, persuasive colour, comforting spacing and

layout execution, suitable images such as illustrations or photography and many more (Reyna J., 2016).

In learning, visual design is used to ensure students achieve their goals in the learning process. A successful visual design does not take away from the content on the page, but it is meant to guide the student to focus on the learning. The first impression of visual design will lead the student's eyes to draw their attention to the important aspect or content since it could affect the student's emotions making them feel absorbed while creating meaning to the overall learning experiences (Christopher P. 2014). Along with its content, the design also plays a very important role in the competence and productivity of the student's study.

Visual design plays a vital role in communication. Besides crowding the learning material with text, visual design will help create effective communication of the learning materials. Visual design not only impacts students by making the material visually attractive but also simplifying difficult or complex topics using a common visual design (Graham L., 2011). There are tonnes of typefaces; however, there are two broad classifications of the typeface used for learning; serif and sans serif (Mohd Rezan and N. E. K., 2020). Serif is the font that looks as if it has hands and feet (Dressler E., 2019). This font is commonly used in books due to its readability and consider an old-fashioned font with a scholarly appearance. Some examples are Times New Roman, Rockwell, Georgia, and Baskerville. In contrast, San Serif is the font without the feet. This type of font typically looks cleaner, more modern and informal. Some examples are Arial, Helvetica, Calibri, and Franklin Gothic.

Figure 1: Serif vs Sans Serif

Comparing Serif Fonts to Sans Serif Fonts

Serif	Sans Serif
Times New Roman	Arial
Rockwell	Helvetica
Georgia	Calibri
Baskerville Old Face	Franklin Gothic

2.4 Type Size

Type size is traditionally measured in points. Font size also plays a vital role in encouraging and quickly deciding to read the content. For example, students will start

scanning the headlines. If it is larger, students can quickly decide if they want to read the material or not, and then they get into the smaller size for the body of the material. There are 72 points to an inch. The larger the point size, the larger the type size. Small point sizes such as 6, 8, 9, 10, 11, and 12 are considered body text sizes. In contrast, larger point sizes such as 14, 18, 20, and higher are considered headline or display sizes and can convey a stronger emotional connection (Mohd Rezan and N. E. K., 2020). Rello, L., Pielot, M. and Marcos, M. C. (2016) said that expanding the font size is an easy and skilful way to enhance access to textual information.

2.5 Type Colour

Colour gives meaning to the content. It is not difficult to use colour, but it is important to use the right colour (Nakilcioglu H.I., 2013). This is because the colour is considered a critical element that determines and influences student mood, emotion, and performance. (AL-Ayash, A., Kane, R. T., Smith, D., and Green-Armytage, P., 2016). According to Clarke and Costal (2018), the colours considered as cool, calm, comfortable, and relaxing are green, blue, and violet. In contrast, red, yellow, and orange have been considered warm and trigger colours, while neutral colours such as brown, white and black have less emotional content with low psychological impacts.

Therefore, wise colour choices for types and backgrounds are essential to ensure a successful learning process because choosing the right colours can improve the readability of text on the screen and has the added benefit of minimising external cognitive load and enhancing learning retention (Richardson, RT, Drexler, TL, & Delparte, DM, 2014). Like pictures, which have caught the initial interest of the eyes, colour also significantly influenced eye movements. After looking at the photo, the reader is usually attracted by the colour. If there is no picture, the eyes usually focus on the colour (Nakilcioglu H.I.,2013).

2.6 Type Contrast

Contrast also helps to show the viewer what's important in your design and creates emphasis, and gives the design some meaning and impact. The principle of contrast states that visual elements on a page should show distinction, where contrast in typeface, size, colour and weight can impact the message (Graham, L., 2012).

3.0 RESEARCH DESIGN

The researcher has applied the exploratory research design using a mixed-method approach. Qualitative

The researchers analysed the entrepreneurship learning material in a PowerPoint Slide Presentation. The three entrepreneurship subjects chosen are Fundamentals of Entrepreneurship (ENT 300), Principles of Entrepreneurship (ENT530) and Technology of Entrepreneurship (ENT600). The PowerPoint slides were visually analysed based on the visual typography elements.

3.1 Quantitative

Convenience sampling was employed on UiTM students in the Selangor campus who took one of the three entrepreneurship subjects. They were given a set of questionnaires through an online google form, which was disseminated by entrepreneurship lecturers. Questions were constructed to understand the students' preferences in regards to visual typography elements for entrepreneurship materials. The questions were developed from a discussion with four creative industry and academic experts. One hundred twenty-eight valid responses were gathered.

4.0 ANALYSIS

4.1 Qualitative – visual analysis

The visual analysis was employed to meet the study's first objective, which is to study the current practices of visual typography elements in entrepreneurship learning materials. The observation was guided by the element retrieved from the archival data.

4.2 Quantitative – survey

Table 4 depicts the demographic information of the respondents of this study.

Table 5 depicts the visual typography elements preference by the respondents of this study

Table 1: Type Analysis

Type Classification		ENT 300	ENT 530	ENT 600
Typeface	Serif	/	/	
	Sans Serif		/	/
	Decorative			
Size	Extra Small(<10)	/	/	
	Small (11pt - 19pt)			/
	Medium (20pt - 29pt)		/	/
	Large (30pt – 39pt)	/	/	/
	Extra Large (>40)	/	/	
Style	Bold	/	/	/
	Italic	/		
	Underline	/	/	

Table 2: Colour Analysis

Colour		ENT 300	ENT 530	ENT 600
Background	Cool Colour			
	Warm Colour			
	Neutral	/	/	/
Type	Cool Colour			/
	Warm Colour			/
	Neutral Colour	/	/	/

Table 3: Contrast Analysis

Contrast	ENT 300	ENT 530	ENT 600
Size / Colour	/	/	/

Table 4: Demographics of the respondents

No	Description	Type	N	%
1	Entrepreneurship Course	ENT300	44	34
		ENT530	33	26
		ENT600	51	40
2	Gender	Male	52	41
		Female	76	59
3	Age	Below 21	44	34
		22-25	45	35
		Above 26	39	31
4	Level of Study	Diploma	44	34
		Degree	84	66
5	Cluster	Science	51	40
		Social	77	60

Table 5: Visual topology preferences of the respondents

No	Elements	Description	Variable	N	%
1.	Typeface	The typeface that enhances your readability in entrepreneurship learning material?	San Serif	97	76%
			Serif	31	24%
2.	Typeface	How many typefaces can enhance your readability and avoid confusion in entrepreneurship learning material?	1 Typeface	87	50%
			2 Typeface	35	33%
			3 Typeface	6	17%
3.	Type Size	Which is the most suitable size for readability and legibility in entrepreneurship learning material to enhance your readability?	Small : (15 to 20) Medium: (21 to 30) Large: (31 to 40)	25	33%
			Small : (24 to 26) Medium: (34 to 36) Large: (44 to 46)	58	50%
			Small : (27 to 29) Medium: (37 to 39) Large: (47 to 49)	17	17%
4.	Type Style	Which style is most suitable for entrepreneurship learning material for better and faster understanding?	Bold, Italic & Underline	74	58%
			Bold & Italic	43	33%
			Bold	11	9%
5.	Background Colour	Which background colour is the most suitable to improve your attraction, readability and engagement in entrepreneurship learning material?	Warm	0	0%
			Cool	28	22%
			Neutral	100	78%
6	Type Colour	Which type of colour is the most suitable to improve your attraction, readability and engagement in entrepreneurship learning material?	Warm	0	0%
			Cool	28	22%
			Neutral	100	78%
7.	Contrast	Do you agree that contrast with size and colour is most suitable for improving your readability in entrepreneurship learning material?	Yes	97	76%
			No	31	24%

5.0 DISCUSSION

Table 6 portrays the comparison of the current practice and preferences of the students in terms of the usage of visual typography elements for entrepreneurship materials.

The analysis shows that ENT300 and ENT600 both achieved 5 out of 7 while ENT530 is lacking by achieving 4 out of 7.

ENT300 is lacking in terms of not using san serif typeface, while ENT600 for not using the remaining typestyle (Italic and underline) and ENT530 for using too many typefaces and not using Italic typestyle. All subjects failed to use the preferred type size (Small: 24 to 26, Medium: 34 to 36, Large: 44 to 46). Other than that, all of the entrepreneurship subjects fared quite well in using the preferred visual topology.

ENT530 may be lacking because this subject is the youngest of the three and did not undergo rigorous revision reviews.

Though the entrepreneurship materials of UiTM fared very well, there is still room for improvement and should not be taken lightly by the educators. This is because entrepreneurship subject is a compulsory subject that needs to be taken by all of UiTM's students regardless of their courses, and if the teaching materials are not presented effectively, this may cause a lack of interest as they consider it is a subject unrelated to their study.

Furthermore, as online learning has its limitation and students are required to focus more on PowerPoint slides as the primary learning material. The findings are even more valuable for educators to accentuate the visual typography elements in preparing online teaching and learning materials.

Theoretically, this study has contributed to the literature by studying two different areas of study, namely visual and entrepreneurship, which was rarely done.

Practically, academic institutions and relevant parties can benefit from this study in terms of understanding what, where, and how visual typography can be used properly to improve students reading ability, engagement, motivation, and satisfaction regarding online teaching and learning materials.

Table 6: Comparison of visual topology preferences and current practice

No	Elements	Preferred	ENT 300	ENT 530	ENT 600
1.	Typeface	San Serif		/	/
2.	Typeface	1 typeface	/		/
3	Type Size	Small : (24 to 26) Medium: (34 to 36) Large: (44 to 46)			
4	Type Style	Bold, Italic & Underline	Bold, Italic & Underline	Bold, & Underline	Bold,
5	Background Colour	Neutral	/	/	/
6	Type Colour	Neutral	/	/	/
7	Contrast	Use of contrast	/	/	/

6.0 CONCLUSION

This study hopes to study a different angle of entrepreneurship education by looking at the teaching and learning material's visual design topology instead of focusing on the content as many other researchers did. This study will give educators a better understanding of what, where and how visual typography can be appropriately used to ensure students reading ability, engagement, motivation and satisfaction. It is recommended that future studies be applied to other courses or fields with a bigger scale of study.

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Siti Nur Diyana : Conceptualization, writing, editing, original draft preparation

Ghazali Daimin : Checking, conceptualisation, supervision

Hardy Loh Rahim : Conceptualisation, data collection, final write up

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