

Visual accessibility of wayfinding signage in campus library for international student

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| ARTICLE INFO | ABSTRACT |
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| <p><i>Article history:</i> Received July 13, 2021 Received in revised form Aug. 10, 2021 Accepted December 15, 2021 Available online April 01, 2022</p> <p><i>Keywords:</i> Campus library Cultural difference Graphic design Wayfinding signage</p> <p>*Corresponding author: Mohd Akmal Harris Bin Zolkefil School of Housing, Building and Planning, Universiti Sains Malaysia Email: akmalm360@gmail.com</p> | <p><i>A campus library is an educational environment that has a wide range of academic activities that are organized and arranged according to hierarchy and activity requirements. When activity in the campus library increases, so does the intensity of a movement that does not correspond to the availability of compelling and wayfinding signage within the library. In fact, on campus there must be international students who are not fluent in speaking and reading the local language. The purpose of the study is to investigate a wayfinding signage issue in interpreting the information through visual graphic for international student in campus library. In this issue, it will examine the importance of visual graphic design used in wayfinding signage for interpreting information and determined the require component which help the topic incorporate a greater user experience through visual qualities such as graphic, text, color and size. Therefore, the (TWO) 2 objectives of this research paper are 1) To identify the current graphic design of the wayfinding signage in the campus library and 2) To determine the graphic design in interpreting information in the wayfinding signage. It will use a qualitative method by John Creswell in collecting the data at several proposed case studies place.</i></p> |

Introduction

When foreign students visit the campus library, they face several information challenges. Campus libraries can be large, complex structures with multiple levels, corridor, and hidden corners, among other difficulties that effect in wayfinding. These structures can be challenging to navigate on their own. According to [Kuliga et al. \(2019\)](#), Large-scale, multilevel structures, such as libraries, museums, airports, shopping malls, and hospitals, can be difficult to navigate. People visit all of these facilities to fulfil specific needs. Because of that, [Duran \(2016\)](#) stated that signs are tools that aid in navigation. In past studies, they are several researches more to improve oriental and navigation for human wayfinding in library. As a result, the majority of library wayfinding

research has been driven by the practical necessity to build libraries and signage systems that enable users to navigate across physical space, but only in one library at a time ([Sancar 1986](#)). According to [Mandel and LeMeur \(2018\)](#), Public library users may differ significantly from academic library users in important ways, such as being a more diverse population of people of various ages and educational backgrounds. The lack of research literature on graphic design and cultural differences may create a research gap for this study. Many visual factors influence how we as humans respond to space. Our perceptions are influenced by aspects of the natural and built environments, as well as social and cultural factors. As a result, this issue becomes a study that needs to be conducted to raise awareness about the importance of visuals graphic in interpreting

information for wayfinding without the limitations of difference background.

When language barriers become the primary source of problems in an organization or large-scale building environment, a variety of issues arise. Among the issues that can be seen are those that are closely related to the difficulty in providing and knowing information to navigate the direction that has occurred in large scale construction without having different cultural backgrounds. As described by [Lutfi Hidayetoglu, Yildirim, and Cagatay \(2010\)](#), because of the complete or partial absence of specified paths, low visual access, and complex spatial layouts, the institution center can be defined as a difficult environment for wayfinding. Visual graphic should be emphasized in understanding the information in wayfinding signage because it is able to give a clear picture and is easy to understand.

Evidence and previous studies gathered from literature reviews on wayfinding in more complex environments rely heavily on coded information and social practises of verbal instruction. According to [Arthur and Passini \(1992\)](#), the function of the environment's physical properties in transmitting wayfinding information to its visitors receives little attention. It also provides an insight into the invaluable role of physical properties (including visual and tactile). It proves that the need for the visual aspect is very important for distributing information. If interpreting the information is not achieved, then there is a problem of giving information for navigation in space. In fact, different cultural has differences of perception and cognitive ability that add to this problem.

The purpose of this study is to investigate a wayfinding signage issue in interpreting the information through visual graphic for international student in campus library. It depends on how easy it is to distinguish in the environment and how it can interpret the information in term of graphic design.

The following research questions were addressed in this study:

- Which specific visual features of the signage foster longer lasting memories?
- Does the form which information presented is easy to understand?
- Are the graphic visuals such as color, text height, and copy height on the signage capable of capturing attention?

- Are the visual features in the wayfinding signage able to give information?

This study has two (2) research objectives: the (TWO) 2 objectives of this research paper are (RO1) To identify the current graphic design of the wayfinding signage in the campus library and (RO2) To determine the graphic design in interpreting information in the wayfinding signage. We can then understand the needs of the user in terms of wayfinding in the build environment and provide information in wayfinding design for the reference of future space designers and the owners of facilities.

Studies on 30 different articles, journals, and website information were conducted to support the study. These researchers present the study main idea, which will be taken into account when developing a detailed framework with a close relationship between interior space and signage.

Wayfinding is referring as an ability to located or find it way to destination that it needs with the help of navigational tool or with the use surrounding natural environment. As [Symonds, Brown, and Lo Iacono \(2017\)](#) stated, wayfinding is often thought to be about finding the fastest or shortest path between two points. Wayfinding is almost never a strictly cognitive process that involves a single person, and it is almost always a process that is guided. It tells that, the process will consciously or unconsciously go through certain cognitive processes to pick the appropriate bits of information from a large number of stimuli. It extracts information from the environment, processes it, stores it, and recalls it when needed during the wayfinding activity. [Iftikhar, Asghar, and Luximon \(2020\)](#) also indicated that wayfinding has proven to be a very important thing inside a building which has a culturally different inside it. It mentions that Cross-cultural differences relied more on environmental familiarity, environmental information gathering, and signage understanding.

Signage

Signs provide environmental information by identifying where something is located, when and how frequently it is to occur, and by providing a description of the current situation. By reducing the seeming complexity of a facility, an excellent signage system can indicate rapid and efficient evacuation routes ([Zhang, Jia, and Qin 2017](#)). Although recognizing the importance of signage in wayfinding, he emphasizes that wayfinding in unfamiliar environments does not depend solely on it ([Ward \(2017\)](#); [Hananto \(2017\)](#)). Moreover, visual feature on signage also play an important role in navigating and locating ([Trisnawati and Sriwarno 2018](#)). Achromatic colour combinations were found to be more legible than chromatic colour combinations in a study by [Shi et al. \(2020\)](#). Furthermore, they discovered that different types of

signs and signs of varying heights had no effect on the legibility.

Graphic design

Graphic design is one of the means, methods, or languages of communication that uses various visual elements and ever-changing graphic techniques to communicate information and ideas to the public. Graphic design, on the other hand, is frequently used to add and construct values, meanings, and identities in addition to conveying information (Kong 2019). By increasing the user's knowledge of the space with a map, signs, and other (visual or otherwise) aids to reach the destination, signage includes visual 35 indicators for the mental picture of the environment (Jalees 2020). According to Kong (2019), Graphic design (graphic wayfinding design) is a powerful tool for locating a location, as well as a means of generating, reproducing, and spreading social attitudes, cultural beliefs, economic values, and political strategies, or confronting and resisting them.

Conceptual framework

The conceptual framework presents the studies main idea and will be used to develop a detailed framework of signage and navigation in interior space.

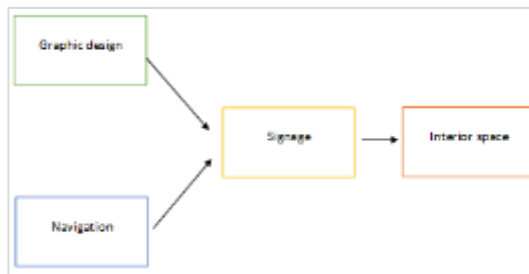


Figure 1. Conceptual framework

Method

In the study, methods taken from qualitative method by John Creswell to collect data for this research study (Creswell 2012). It will use a qualitative method in analysis of the data that will help the study. It will involve several phases, each with a particular purpose and outcome. The first phase will be a main case studies in actual site with the purpose of collecting the evident and data related to graphic design of wayfinding signage. Because the constrain Covid-19 pandemic in Malaysia, the case studies will conduct at Hamzah Sedut 2, University Sains Malaysia near the vicinity of pulau Pinang. The second phase will involve on several past case study that relevant with the first case study which can strengthen the outcome.

The case study will be using observation and secondary data which it will be accomplished using articles, website, and journals information that can be used with the purpose of collecting the evident and data related to graphic design of wayfinding signage.

Case studies

Main case study

Hamzah Sedut 2, Universiti Sains Malaysia

The library was established in 1969 and initially operated out of borrowed space at the Malayan Teachers Training College in Gelugor. The library was located in a heritage building that is now the Universitys Museum and Gallery until USM moved to its own permanent campus at Minden in 1971. In 1979, the main library was relocated to its current three-story structure (Perpustakaan Hamzah Sedut 1), and in 1996, a second library (Perpustakaan Hamzah Sedut 2) was constructed. The Main Library was renamed Hamzah Sedut Library on December 10, 2004, after Tan Sri Hamzah Sedut, the first Vice Chancellor of USM.



Figure 2. Hamzah Sedut 2, Universiti Sains Malaysia

Past case study

Campus University of Education Indonesia (UPI Campus), Indonesia

The University of Education Indonesia (UPI campus) is an educational environment that houses a variety of lecture activities and academic activities that are organised and arranged according to activities needs. Because activities on campus, as well as the intensity of movement within the campus area continue to increase, it is resulting in an imbalance in the provision of signage system facilities (signage) in an effective and informative campus environment. One case study already investigates the fundamental principles of signage design as part of the wayfinding process, as well as the designs

suitability to the aesthetic value of signage as part of environmental graphic design.



Figure 3. Campus University of Education Indonesia (UPI Campus), Indonesia



Figure 4. Library of University of Education Indonesia (UPI Campus), Indonesia

Drake University Harmon Fine Arts Center (FAC), USA

Drake University is a private, coeducational university in Des Moines, Iowa, USA. The studies in ethnographic research methods have been conducted in an effort to understand the relationship between the interior space of the Harmon Center for Fine Arts and its impact on wayfinding. Based on research on people with mobility or physical disabilities, they were able to create a wayfinding system which based on visual graphic on wayfinding signage. The findings of their ethnographic research were used to make decisions about the placement of wayfinding signage. Color, typography, and icons were inspired by interviews as well as current signage design trends.

Result and discussion

With the data collected from the research method that has been made, all data and observations from

the study will be analyzed to find the correct solution. understanding, problems, and data can be recorded to produce solutions in interpreting information in term of graphic of wayfinding signage in complex environments. Understanding cultural differences and wayfinding signage also will help to solve many problems related to navigation and information comprehension when there are language barriers. Thus, from the visual, architectural, and environmental aspects, methods and solutions can be implemented to ensure the ability to understand information. In this study, we will learn about the suitability of graphics, color, text, and graphics in achieving the visual information of wayfinding signage in the built environment.

There are several findings was found in the case study conducted for this study. This finding is based on observation data from image sources as well as actual site observations. Based on the observations made, some information can be obtained and analysed.

Graphic colour stimuli

The use of colour in graphic signage has strong eye-catching implications and therefore we must know about the effect of colour on users to see the effect in accordance with their expectations and reach more users. In the library hamzah sendut, there are two types of colour combinations: blue graphics on a white background (achromatic) for direction and white graphics on a black background (chromatic) for information and place. It has been discovered that the 70% colours used on signage in the site primarily use blue and black to provide information and the type of place. This primary colour can be seen in the typography and background signs used on signage and 30% other colours are used to differentiate the graphic signage.



Figure 5. Shows blue graphics on a white background (achromatic)



Figure 6. Shows white graphics on a black background (chromatic)

According to the observations made, the colours used are not able to attract attention and have thus been excluded from the current design trend. Colors, graphics, and typography that have become outdated or unappealing are no longer useful for navigating the space; in fact, there are issues that have historically made this building difficult to navigate, resulting in a confusing, disorienting, and frustrating experience of the space. Given the thousands of available colours, the number of colours that designers can use to create an effective color-coding system in wayfinding is surprisingly limited. This is largely due to the fact that only colours with agreed-upon names should be used. This requirement implies that there are only eight suitable colours, which are black, white, and grey. While the exact colours used can vary, designers should not use two variants of the same colour, such as dark green and light green.

Based on field observations, there are many color variations on the background of identity markers. Color plays an important role in signage design, as demonstrated by the case study at the UPI campus.

They conducted tests with international students to assess the efficacy and efficiency of their wayfinding systems and discovered that signage typography and colour were simple to understand and coordinate if the existing floor colours of the building were the same colour. It is easily located and knows which direction you want to go.

According to their ethnographic research findings, interior wayfinding and signage must have the same elements as readability and legibility when viewed from a distance, such as word size, colour, colour combinations, and line length. Furthermore, colour contrast on

wayfinding systems should be at least 60%, and it is preferable to be 70%. Also, colour contrast between foreground and background sign elements can improve wayfinding sign visibility. All of these factors contribute to visually appealing and smooth graphic signage.



Figure 7. Show the signage color resonated with the floor color

Graphic form in cue-searching

There are numerous objects to see in the visual environment. People must choose what information to take in order to find a place or destination by seeing and focusing on the elements that can aid in the process of location searching. The study found that during wayfinding, the people focused their attention on the textual sign.

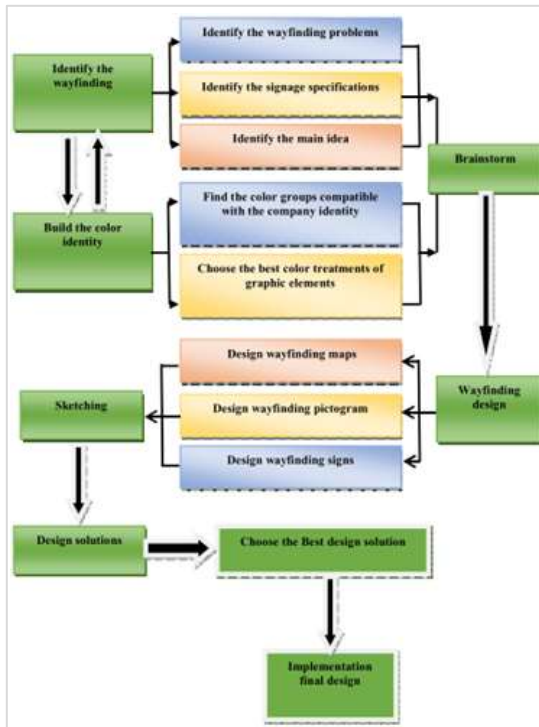


Figure 7. A proposed strategy for using color in design of wayfinding systems

This study can assess the visual accessibility of graphics in providing stimuli and understanding in providing direction based on the observations made. To evaluate graphic accessibility in signage, graphic capabilities in terms of colour and shape combinations are considered. According to observations, the combination of colour and shape is unable to attract the attention of those present, and even the graphics in the signage there are unable to pique the interest of those present and are very out of date. Furthermore, based on the discussions and literature reviews, the combination of colours and combinations of shapes such as numbers and pictorials must be considered.

Conclusion

In conclusion, to ensure the effectiveness of the search and navigation experience, visual criteria and the graphics of wayfinding signage that influence the performance of the search and navigation task should be considered. In the case of campus library, factors such as signage, visual accessibility, and building configuration should be considered to ensure users from diverse

backgrounds understand information when searching for a path. Color also plays an important role in ensuring navigation success. When navigating unfamiliar large-scale environments, people with cultural differences rely on spatial arrangement. This aids in path finding strategies, path finding tasks, and survey knowledge acquired while searching for specific locations. Moreover, Culture has an effect on decision-making and navigational behavior. The amount of interaction, the amount of difficulty, and the amount of visual usability have all been discovered to be important factors in the built environment that influence information and thus wayfinding. The investigation could be expanded to include other complex environments with fused facilities in order to gain a better understanding of wayfinding behavior.

References

- Arthur, P., and R. Passini. 1992. 'Wayfinding: People, Signs, and Architecture'. *Choice Reviews Online* 30 (03): 30-1301-30-1301. <https://doi.org/10.5860/CHOICE.30-1301>.
- Creswell, John W. 2012. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Edited by Third Edition. Sage Publications, Inc. California: SAGE Publications, Inc. <https://doi.org/10.1111/1467-9299.00177>.
- Duran, Idil Esen. 2016. 'The Influence of Familiarity and Signage on Wayfinding in Academic Libraries: The Case of Bilkent University Library'. İhsan Dođramacı Bilkent University Ankara. <http://repository.bilkent.edu.tr/bitstream/handle/11693/32315/10125929.pdf?sequence=1&isAllowed=y>.
- Hananto, Brian Alvin. 2017. 'Tahapan Desain Sistem Tanda Interior Mini Mart (Studi Kasus: Wayfinding & Placemaking Signage FMX Mart)'. *Jurnal Dimensi DKV Seni Rupa Dan Desain* 2 (2): 135-50. <https://doi.org/10.25105/jdd.v2i2.2185>.
- Iftikhar, Hassan, Salman Asghar, and Yan Luximon. 2020. 'The Efficacy of Campus Wayfinding Signage: A Comparative Study from Hong Kong and Pakistan'. *Facilities* 38

- (11/12): 871–92. <https://doi.org/10.1108/F-04-2020-0035>.
- Jalees, Dania. 2020. 'Design Thinking in the Library Space: Problem-Solving Signage like a Graphic Designer'. *Art Libraries Journal* 45 (3): 114–21. <https://doi.org/10.1017/alj.2020.17>.
- Kong, Lingqi. 2019. 'A Critical Analysis of Local and Global Cultural Factors in Graphic Wayfinding Design : A Case Study of Beijing A Critical Analysis of Local and Global Cultural Factors in Graphic Wayfinding Design - A Case Study of Beijing Supervisor : Dr Robert Harland'. Loughborough University. https://repository.lboro.ac.uk/articles/thesis/A_critical_analysis_of_local_and_global_cultural_factors_in_graphic_wayfinding_design_a_case_study_of_Beijing/9333029.
- Kuliga, Saskia F., Benjamin Nelligan, Ruth C. Dalton, Steven Marchette, Amy L. Shelton, Laura Carlson, and Christoph Hölscher. 2019. 'Exploring Individual Differences and Building Complexity in Wayfinding: The Case of the Seattle Central Library'. *Environment and Behavior* 51 (5): 622–65. <https://doi.org/10.1177/0013916519836149>.
- Lutfi Hidayetoglu, M., Kemal Yildirim, and Kubulay Cagatay. 2010. 'The Effects of Training and Spatial Experience on the Perception of the Interior of Buildings with a High Level of Complexity'. *Scientific Research and Essays* 5 (5): 428–39. https://academicjournals.org/article/article1380624780_Hidayetoglu_et_al.pdf.
- Mandel, Lauren H., and Kelly A. LeMeur. 2018. 'User Wayfinding Strategies in Public Library Facilities'. *Library & Information Science Research* 40 (1): 38–43. <https://doi.org/10.1016/j.lisr.2018.04.001>.
- Sancar, Fahriye Hazer. 1986. 'Wayfinding in Architecture'. *Landscape Journal* 5 (1): 71–73. <https://doi.org/10.3368/lj.5.1.71>.
- Shi, Yuqi, Yi Zhang, Tao Wang, Chaoyang Li, and Shengqiang Yuan. 2020. 'The Effects of Ambient Illumination, Color Combination, Sign Height, and Observation Angle on the Legibility of Wayfinding Signs in Metro Stations'. *Sustainability* 12 (10): 4133. <https://doi.org/10.3390/su12104133>.
- Symonds, Paul, David H.K. Brown, and Valeria Lo Iacono. 2017. 'Exploring an Absent Presence: Wayfinding as an Embodied Sociocultural Experience'. *Sociological Research Online* 22 (1): 48–67. <https://doi.org/10.5153/sro.4185>.
- Trisnawati, Suranti, and Andar Bagus Sriwarno. 2018. 'Visual Perception of the Depiction of Human Figures in Pictorial Signage of Public Toilets'. Edited by Lincoln Geraghty. *Cogent Arts & Humanities* 5 (1): 1553325. <https://doi.org/10.1080/23311983.2018.1553325>.
- Ward, Neil. 2017. 'Accessible Wayfinding: Empathy, Human-Centered Design, and a Blank Slate'. *Interdisciplinary Journal of Signage and Wayfinding* 1 (2): 81. <https://doi.org/10.15763/ijsw.v1i2.11>.
- Zhang, Zhe, Limin Jia, and Yong Qin. 2017. 'Optimal Number and Location Planning of Evacuation Signage in Public Space'. *Safety Science* 91 (January): 132–47. <https://doi.org/10.1016/j.ssci.2016.07.021>.

Author(s) contribution

Mohd Akmal Harris Bin Zolkefil contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Roslan Bin Hj Talib contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

