# Perspective Evaluation for The Malaysia Northern Region Community College Convocation Mace Design

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## Abstract

As a ceremonial dignity and solemnity, a mace required evaluation of it's design. Design ideas from a few members may not accommodating the need for a good mace design. Hence, this paper aims to this study the relationships of potential user's mace design perspectives evaluation covering intangible, behavioural, and intangible levels – input parameters. The respondents are the academic staff in Manufacturing Technology Unit in Malaysia Community College. Score by these perspectives are accumulated to a value known as Perspective Score – output parameter. Based on the 77% response rate, the finding suggests that all responded data is statistically accepted – normality, validity, and reliability. In addition, to Regression Analysis and Pearson Correlation are used to analyse hypothesis relation and effect tests. The finding concludes the mace tangible level is very good (44%), following the intangible level (34%), and behavioural level (22%). The external appearance feature in tangible level suggests the best response and the lowest the background element applied to the mace. These three hypotheses are showing positive relation and positive effect for the studied parameters. By this finding, it is proposed to further this study once the finalised design fabrication is completed.

**Keywords**: Behavioural Level; Intangible Level; Perspective Evaluation; Tangible Level

## 1.0 Introduction

A graduation higher education convocation is always complimented by the ceremonial convocation mace. In higher education institution, it is a symbol that reflecting the dignity and solemnity of the ceremony (Universiti Teknologi Petronas, 2023). This physical symbol is a metal rod conceiving local's tradition design and form, and commonly furnished with other material, e.g. coated gold, copper, and or wood. In this line, a project for fabricating a new mace Community College (CC) for Norther Region of CC. The project is handling by Manufacturing Technology Unit at Kepala Batas CC and it is taken as ongoing project. Thus, further design perspective for modification and enhancement is highly appreciated. In order to measure the potential mace users' perspective, hence a micro-study is conducted. Therefore, through this study, it is expected the finding will assist in improving the mace design.

The user perspective can be evaluated based on its intangible, behavioural, and intangible levels (Huang et al. 2023). Halkos et al. (2024) suggests the tangible level determines the most influence weight in economic value of a design. Besides, Giglio et al. (2024), Ding et al. (2023), Halkos et al. (2024) suggest the development of tangible element required preventive mechanism to prevent damages in that cause by environment and mechanical effect, e.g. material use, coating, and protecting element. Furthermore, a study (Uhl et al., 2023) using tangible level in simulation mode, successfully exposes that tangible element is the key to a successful design. Behavioural level involved the functional and uniqueness or special craft appears on a design. Number of case studies conducted (Van Tonder et al., 2023; Erdmann et al., 2023, Conradie et al., 2023), suggested that by changing the design appearance has successfully expose user behavioural level. A study (Wang et al., 2023) found that at behavioural level the outcome may be pluralistic, hence this indicates this element the encounter multiple perspective views. For the third level, Zhang et al. (2024) suggests perspective toward intangible level is often misleading. This results the report is often ignored, though it has economic value (Cosmulese et al., 2021). As the result, study by Gaglio et al. (2024) and Cosmulese et al. (2021) proven that intangible level has significant economic value in their study. Furthermore, Ajour El Zein (2020) suggests intangible level has an important role in the product design. These literature findings suggest designing work should apply these three layers.

For Malaysian context, a convocation mace design influenced by multiple features. For instance, for tangible layer modern external appearance includes the coating colour and materials applied such as aluminium, stainless steel, or woods. In addition, for the behavioural level features by speciality craft and functionality in mace design covering its three sections tip, body, and tail (Universiti Teknology Petronas, 2023). These sections designed based of its functional applications, shown in figure 1(a) for the tip to be supported by a shoulder, figure 1(b) of the body for the first-hand support, and the tail in figure 1(c) for the second-hand handling. The mace holding techniques shown in Figure 1(d). For intangible level, comprise local background, emotional, and aesthetic features in the mace design.

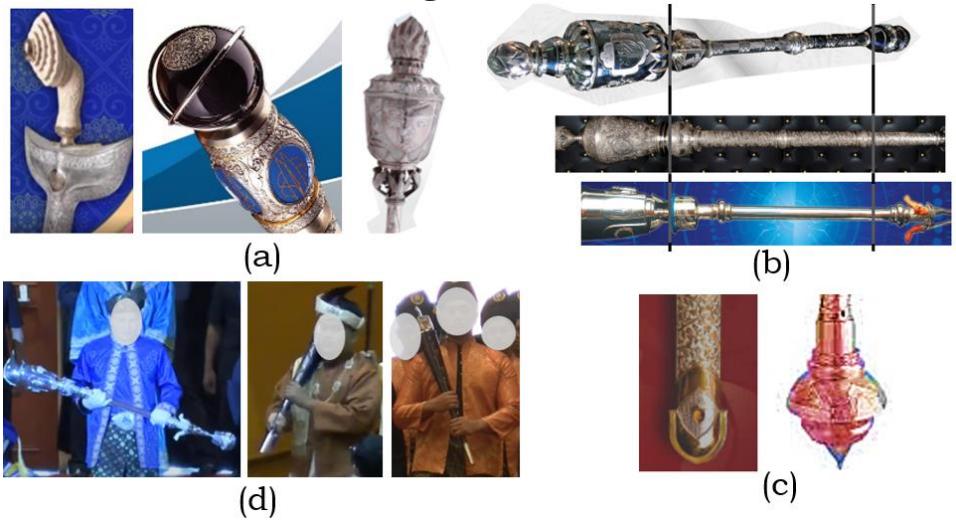


Figure 1. The Mace Sections and Holding Techniques

By literature review, between 2025 and 2023, there is no research attempt to conduct a convocation mace design evaluation study. This is predictable due to the design commonly evaluated by the education institution executive. However, for the case of CC, the sharing of ideas is needed due to the sharing use of the fabricated mace for certain zoning states of Malaysia. Consequently, the sharing ideas are expected to satisfy the design needs of these CCs. Hence, the issue backs to conducting the study.

Based on these ideas and finding, the prime objective of this study the relationships of potential user's perspective toward the mace design features covering intangible, behavioural, and intangible levels. Both intangible and behavioural appeared to be important features to influence the user perspective. The cumulation of the respondent's score for each question is known as Perspective Score (PS). Hence, this study interest in knowing the relationship between the tangible level – PS and behavioural – PS. The mace intangible feature suggests unknown factor in influencing the user's perspective to the mace design. For instance, Shi et al., (2021) suggests intangible can develop minor behavioural level flaws. Besides, Kumari & Mishra (2021) claim that intangible level is insignificant for a design. However, Yoon et al. (2020) suggests that the level helps in developing a positive perspective of a design. This contradiction ideas, required to measure the effect of intangible level towards PS.

## 2.0 Methodology

For this time, the proposed design generated via Inventor AutoDesk 2020 software, shown in figure 2(a) is just complete. Thus, any changes required, the design can be modified. However, due to technical constrained in fabricating the tip section as shown in figure 2(a), hence machining modified to a simpler model shown in figure 2(b). Then, for the appearance the logos representing Community College are applied at the middle and Ministry of Higher Education logo is applied at tip section. Figure 2(a) and 2(b) are shown partially complete fabricated model. The following fabrication work in needed with modified design based on this finding study to complete the work that encompasses the gathered ideas.

The online survey question asked regarding the features shown in Table 1. Besides, this survey questionnaire contains two divisions questionnaires – Demographic and Perspective Survey. Moreover, this quantitative questionnaire is a fully structured and a one-time cross-sectional data using Google Form platform and disseminated through Telegram social media group entitled "SMN SeMalaysia". The group is selected because they were the ones is given authority to prepare the mace design and fabrication by the CC executive. The group member number is 48 employees from the Manufacturing Technology Unit of Malaysia CC. It turned out that only 46 out of 48 persons participated in answering the questions and submitting the

online form. The participation of participants for this survey is voluntary – no interference such as influencing and forcing the participants is involved.

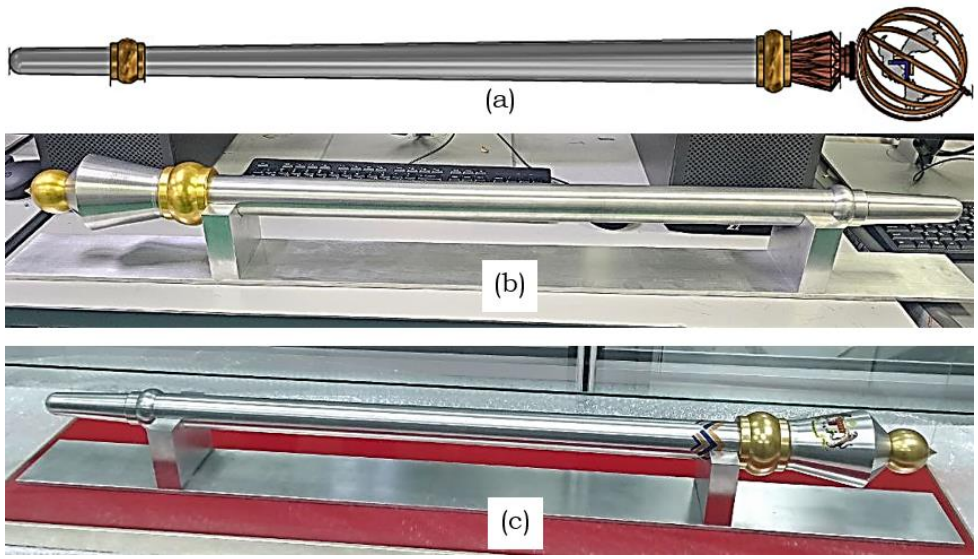


Figure 2: The Design and Fabricated Mace

The Demographic Section consists data of gender, age, experience in solid modelling and machining work, with all answered Perspective Survey. Eight perspective questions are reflecting the level and features shown in Table 1 and Table 2 in symbol of Q1-Q8. Furthermore, the questionnaire is designed with two extremes, in the form of 5-point Likert scale selection. The scales used in the study measures specific things in deeper detail and represents as follows: 1 (very dissatisfied), 2 (dissatisfied), 3 (neutral), 4 (satisfied), to 5 (very satisfied).

Table 1. Level and Features Measurement (Modified: Huang et al. 2023)

| **Level (Symbol)** | **Features** |
|---|---|
| Tangible (TL) | Colour, External Appearance, Material |
| Behavioural (BL) | Specialty Craft, Function Feature |
| Intangible (IL) | Stories or Background, Emotional Quality, Aesthetic Taste |

Though, rationally the functionality is not assessable without usage or consumption. Therefore, the perspective evaluation is not accessible without the physical mace model. Hence, this suggested the proper evaluation cannot be achieved. Conversely, Góral et al. (2024), Goddard et al. (2024), and Cole, Samuel, & Eacott (2022) suggested that that users habitually have the ability to assess the perspective of a model from just seeing them. Hence, it is acceptable that respondent will provide their views on the three levels based on the observation from 3D and 2D object images. This observation is possible due to the mace is design using Inventor Autodesk 2020 – a modeller software accessible for 2D and 3D views. In addition, partially complete fabricate mace digital image is supporting the simulation image is used in this study. Based

on these images, the respondents required to response their perspective.

Due to the project design stage is to leave ongoing and partially completed fabrication stage, hence the evaluation up to these stages. Therefore, the evaluation is based on the mace digital images. The images disseminated via online, to evaluate the design based on perspective by the three levels.

Based on the study objective of the hypothesizes is set as stated following. The three levels make the product appeal a design to the user, hence makes these levels are allied together (Cropley & Kaufman, 2019). On the basis of the literatures, these three levels are the prime element evaluation.

**H1:** Is the TL has a relationship toward the PS?
**H2:** Is the BL statistically correlated to the PS?
**H3:** Is the IL has an effect regarding PS?

## 3.0 Results and Discussion

In according with the 34 returned respondents' perspective data, the result of Demographic Survey is shown the Histogram Chart in Figure 3. The gathered data consists of gender, age, experience in solid modelling and machining work. The composition between Male and Female in participating the survey is 76%: 24%. Besides, majority of the respondents fall into the age between 31-40 years old or at 44%. Based on the experience in related fields, the majority of the respondents' participant falls in 11-15 years of experience, i.e. 47% in Modelling and 41% in Machining.

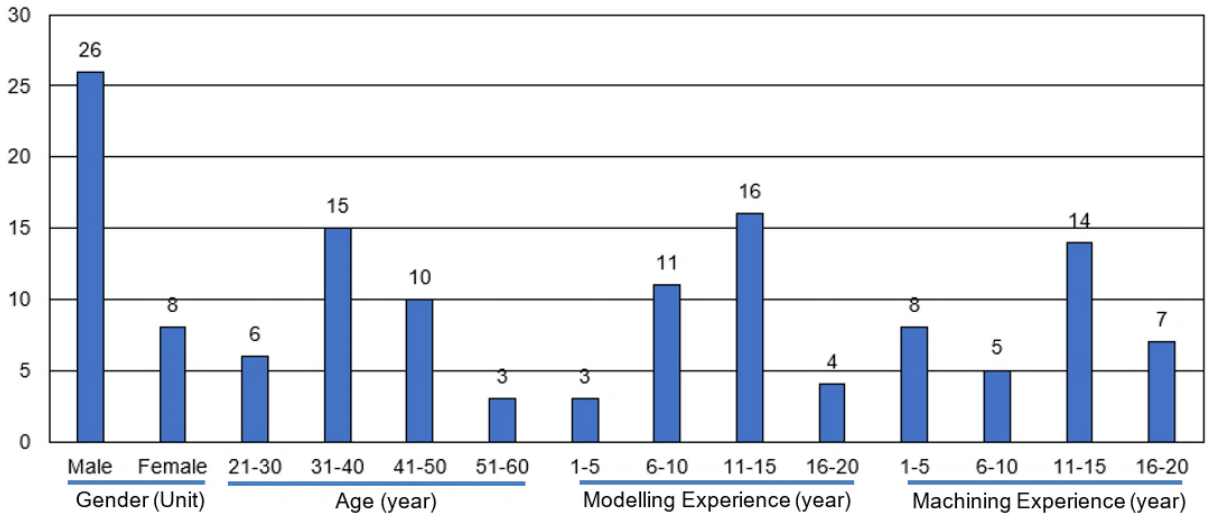


Figure 3. The Demographic Result

In this Preliminary Analysis stage, the collected data is evaluated based on three conditions: statistically accepted data distribution, a valid data, and produces a consistent statistical result. In this study, Indexing Rank is used to calculate correlation percentage that determined the data normality. Based on the all of the data collected is Q1 to Q8 as shown in Table 2. The data

resulted indexing rank value is between 0.78 – 0.84 (or 78 – 84%). This value statistically represents a strong level of normal data distribution. In addition, Bivariate Validity Test (BVT) using 5% (0.514) with correlation significant from R Table (rTable) is used to check the data validity. Based on BVT, the calculated correlation significance (rCount) is for Q1 to Q8 data is between +0.5343 to +0.5721. This rCount value about 0.5 represents the moderate strength of the data validity. The finding suggests the limited number of samples, i.e. 34, influence the strength at the moderate value. For the third test, a well-known test is applied to determine the data reliability - Cronbach's Alpha ($\alpha$). All questions asked data calculated $\alpha$ value between 0.73 – 0.78 that represents acceptable internal consistency or reliability of data. Though, the three tests value are not excellent, but they are statistically at a satisfactory level.

Table 2 shows the full results of the survey based on the Likert scale scored by the respondents. Based on the total sore, the highest score is the external appearance at 170 (21%) and the lowest score is the local background applied to the design at 57 (7%). Besides, the highest score for the TL at 44%.

Table 2. The Perspective Score (PS) by Question and Level

| **Level** | **Features** | **Ques -tion** | **PS** | **PS - Question (%)** | **PS – Level (%)** |
|---|---|---|---|---|---|
| Tangible (TL) | Colour | Q1 | 104 | 13 | 44% |
| | External Appearance | Q2 | 170 | 21 | |
| | Material | Q3 | 81 | 10 | |
| Beha -vioural (BL) | Specialty Craft | Q4 | 97 | 12 | 22% |
| | Function Feature | Q5 | 81 | 10 | |
| Intangi -ble (IL) | Stories or Background | Q6 | 57 | 7 | 34% |
| | Emotional Quality | Q7 | 81 | 10 | |
| | Aesthetic taste | Q8 | 138 | 17 | |

Correlation Analysis resulted a statistical measure in coefficient value. The value quantifying the degree of a linear relationship between two variables (Ikhwan et al., 2024). This study coefficient value falls between independent parameters, i.e. TL and BL, and dependent variables, i.e. PS. The result of the analysis shown in Table 3. These values interpreted as the relation between TL and PS, and BL and PS is high positive according to Kim & Kwon (2024) article. In responding to the hypothesis, the relationship between TL and PS, and BS and PS is good and statistically significant.

Table 3. Pearson Correlation Result

| Hypothesis | Result |
|---|---|
| **H1:** Is the TL has a relationship toward the PS? | +0.7269 |
| **H2:** Is the BL statistically correlated to the PS? | +0.7002 |

For the H3, based Regression Analysis, the result show as in Table 4. The table filled with coefficient, standard deviation, and p-value. The coefficient for IL in relation to PS score is shown an upward relation. Besides, this test is based on the R-square value at 1 and p-value below than 0.05. The calculated result indicates IL value positively effective PS value. In addition, the test Standard Deviation (SD) represents the data dispersion is close to the population value – SD is low value. Hence, these findings supporting H3.

Table 4. Regression Analysis Result

| Hypothesis | Coefficients | SD | p-value |
|---|---|---|---|
| **H3:** Is the IL has an effect regarding PS? | +0.593 | 0.551 | Below 0.05 |

## 4.0 Conclusion

The finding shows that demographically the respondents are well experienced in the field of modelling and machining. Besides, the gathered data also found that majority of the respondents are male and at the age of 31-41 years old. Primary analysis in this study exposes that the gathered data is normality, validity, and consistency of the collected data is statistically accepted. It is proven that the appearance influenced the positive perspective regarding to the mace design. Besides, though the score for intangible level is at the second place, but the in percentage the score is statistically significant. Furthermore, the aesthetic taste question obtained a high score, this should be the element to be considered in modifying the existing design. In addition, behavioural level shows the lowest score suggests attention to the mace design should enhancing the functional feature.

Moreover, this finding show respondent is expecting better quality of craftsman work with better special craft. Based on Pearson Correlation analysis, the result discovers that both Tangible Level and Behavioural Level are in positive relation to Perspective Score at reasonable value. In addition, Regression Analysis concludes that Intangible Level is statistically has a positive effect toward Perspective Score. Moreover, collecting data through questionnaires may not accessing the full scale of gathering the perspective response. Hence, the future researches are encouraged to handle an interview session with the respondents to obtain more comprehensive and rich information.

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**Author Contributions**
**S. A. Mohd Hashim:** Conceptualization, Abstract, Introduction, Analysis, Results, Discussion, Conclusion; **N. S. Sholahuddin:** Methodology, Analysis; **S. R. Rahamad:** CAD 3D Modeller, Image Editing; **M. A. I. Affendey:** Editing and Writing-Reviewing.

**Conflicts Of Interest**
The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its Submission and declare no conflict of interest in the manuscript**.**

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