**FACULTY OF DENTISTRY**

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**Title:** The Impact of Reconditioned Orthodontic Brackets on Bond Strength  
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Introduction: Orthodontic bracket bond failure is common during orthodontic treatment. Objectives: To evaluate the Shear Bond Strength (SBS) of new orthodontic brackets, and the SBS after reconditioning and repeating the reconditioning procedure for such brackets, with and without bonding; and to evaluate the bond failure rate of new and reconditioned orthodontic brackets during orthodontic treatment. Methods: A total of 120-extracted human premolar teeth and 120 premolar stainless-steel brackets were used and were randomly divided into six groups of 20 each. Five methods of reconditioning were used in each of the first five groups while the last group was used as a control. The six groups (I-VI) were subjected to shear force for half an hour until the brackets debonded. SBS was measured and the methods showing the highest SBS were selected. Two groups were selected and then reconditioned for a second time using the previous steps. The SBS of all subgroups were examined with and without the application of a primer. For the clinical experiment, a total of 60-patients were selected from the waiting list of the orthodontic clinic of the Faculty of Dentistry, UNIVERSITY TEKNOLOGI MARA, Malaysia. The patients were randomly divided into three main groups of 20-patients each. 60-sets of 3M Unitek™ Gemini Brackets were used. The first group was reconditioned using 50μm aluminium oxide particle grit-blasting before bonding, the second group was reconditioned using the Er,Cr3+:YSGG laser and the last was used as a control group. After polymerization, a .014 NiTi archwire was inserted within half an hour. Monthly follow up of all the patients were carried out for one year. The brackets’ bond failure rate was recorded and calculated by percentage of failure. The results were subjected to statistical analysis to identify differences in SBS and bond failure rate. ANOVA and Tukey's post hoc test were used to identify the differences. Results: There was a significant difference between the mean SBS of the Er, Cr3+:YSGG laser, grit-blasting and control groups and the means of the SBS of each of the other three methods. There was, however, no significant difference between the mean SBS of the new bracket and the mean SBS of reconditioned brackets using Er, Cr3+:YSGG laser or grit-blasting. The mean SBS of all sub-groups were higher than the recommended range. Brackets with primer showed slightly higher SBS compared to those of brackets without a bonding agent. The ARI scores (0 and 1) were more in the groups with higher SBS, and scores (2 and 3) were more in the groups with lower SBS. Clinically, there was no significant difference between the percentage of bond failure rate of the new brackets and that of the reconditioned groups (p>0.05). Conclusions: Reconditioned orthodontic brackets using grit-blasting and Er,Cr3+:YSGG laser can be used following bond failure as an alternative to new brackets.

**FACULTY OF ART & DESIGN**

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Malaysian Art has been overshadowed with western influence that leads to identity lost. Subsequently, through the National Cultural Congress in 1971, Malaysian art has promoted diverse types of artwork that captures the distinctiveness of Malaysian identity and one of it through Malay ornament design (MOD). However, a study related to ornament design practices, which addresses in fine art scale has not been conducted comprehensively. This study will emphasize on the usage of Malay ornament design in the Malaysian Modern Painting by Malaysian artist. The aim of the study is to identify types of Malay ornament design adapted by Malaysian painters, to gather appropriate samples as to classify the characteristic aspects that adapted through their creative visual art in painting and to analyse the samples of painting by using the visual analysis and trace the elements of ornament design as requested towards the national identity of Malaysia. The samplings are selected from two publications by National Visual Art Gallery (NVAG) permanent collections particularly focusing from year 1980’s until 2008. Twenty-nine paintings have been examined with Ragan (2000) analysis procedures and Sporre (2015) stylistic analysis approaches to investigate these paintings comprehensively. Visual formalistic aspects emphasizing on balance, repetition, space, line, shape and texture are observed in all of the samplings. These images are traced and drawn using Adobe Illustrator CS3 and Adobe Photoshop CS3 software’s. This study has identified two major categories of painting with the application of MOD, firstly with thirteenth artwork applied motif and pattern, eight of the samples have been recognized to use MOD with social activities scenery and another five paintings has utilized images or subjects that related to the Malay culture. The second categories consist of three paintings from Islamic design that has utilized geometrical motif and pattern. Mixed media, collage and silkscreen printing techniques are widely used in the composition to capture the uniqueness of ornament design element. This study has signified the application of Malay ornament design in Malaysian Contemporary Art and provides a guideline for fine art practitioners to solve problems in the process of producing artwork using ornament design.