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## Holistic obstetrics and gynaecology mind maps teaching an easy-to-use tool provides equality of learning, teaching, and assessment

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### Abstract

**Aim:** A pilot study was conducted to evaluate the learning benefits of holistic Obstetrics and Gynaecology mind maps (HOGMMs) in acquiring a range of clinical skills, standardizing assessment, and teaching methods.

**Methodology:** HOGMMs were developed and had been used as a teaching tool for Year 3 medical students (n=113) for 6 months in between January and July 2016 as a tool to assist their learning during their Obstetrics and Gynaecology (OG) rotation. The HOGMMs were taught to all Year 3 medical students and a soft copy of the tool was shared with them as a reference for their use during their clinical placement in OG rotation. After the completion of their OG rotation, students were invited to complete a questionnaire assessing perceived benefits for skill acquisition, and standardizing assessment and teaching methods.

**Results:** The majority of students believed HOGMMs was a useful learning tool across a range of parameters (min = 59%; n = 96). Students who believed HOGMMs to be useful for standardising assessment were more likely to report mutual benefits in terms of student learning ( $\chi^2=35.836$ ;  $P=0.0005$ ) and standardising teaching methods ( $\chi^2=20.256$ ;  $P=0.0005$ ).

**Conclusion:** This study suggests that students' value our HOGMM's not only for developing clinical skills but also standardising assessment and teaching methods.

**Keywords:** Obstetrics and gynaecology, mind maps, equality of learning, teaching, and assessments

### Introduction

A wide body of literatures supported the benefits of mind maps as teaching tools, with most studies agreed that they improved student engagement, motivation, and implementation of curricula [1-3]. Current obstetrics and gynaecology mind maps mostly focused on certain conditions and diseases without providing the learner with a master tool for making diagnosis through constructed history, examination, and justified investigations [4-6].

The objective of this pilot study was to evaluate the benefits of learning holistic Obstetrics and Gynaecology mind maps (HOGMMs) as a holistic tool for acquiring a range of clinical skills, standardizing assessment, and teaching methods.

### Methodology

HOGMMs (Appendices I, II, III and IV) were developed and had been used as a teaching tool for Year 3 medical students (n=113) in Newcastle University Medicine Malaysia (NUMed) for 6 months in between January and July 2016 during their essential junior rotation in Obstetrics and Gynaecology (OG). The HOGMMs were taught to all Year 3 medical students and a soft copy of the tool was shared with them as a reference for their use during their clinical placement in OG rotation. Students were invited to complete an anonymous questionnaire (Appendix V) at the end of their OG rotation. Written informed consent was obtained prior to their participation in the study.

The HOGMMs tool and questionnaire were reviewed by five other Obstetrics and Gynaecologist specialists and the validity of the contents were ascertained. The questionnaire assessed the student's agreement ("yes" or "no") and perception of HOGMMs as a progressive teaching tool that provides equality of learning, teaching and assessments. Associations between pre-planned questions of interest were performed using Chi-squared tests, with P values were computed using Monte Carlo simulation. We set our significance ( $\alpha$ ) threshold at 5%.

**Results**

The majority of students agreed that HOGMMs was a useful tool in terms of clarifying clinical information (95%); enhancing critical thinking (91%); skill structuring (96%); practical engagement (95%); self-confidence in clinical practise (79%); self-motivation (74%); case interpretation (81%); case presenting (59%); case writing (64%); and synthesis of knowledge (91%). Slightly more than half students agreed (53%) that HOGMMs was easy to use on a smart phone or tablet (Figure 1).

Students who believed HOGMMs was a useful tool to unify teaching methods were significantly more likely to agree that HOGMMs can reduce diversity in student assessment ( $\chi^2 = 20.256$ ;  $P = 0.0005$ ). In addition, students who agreed that a mobile HOGMMs App would aid student learning were significantly more likely to agree that a mobile HOGMMs App would be useful for standardising assessment ( $\chi^2 = 35.836$ ;  $P = 0.0005$ ).

**Discussion**

Zipp *et al.* (2015) exploratory study showed mind maps were not used in many medical education programs mostly due to lack of awareness, but it became a useful tool if they understand the relevance of using mind maps as a teaching and learning strategy <sup>[1]</sup>.

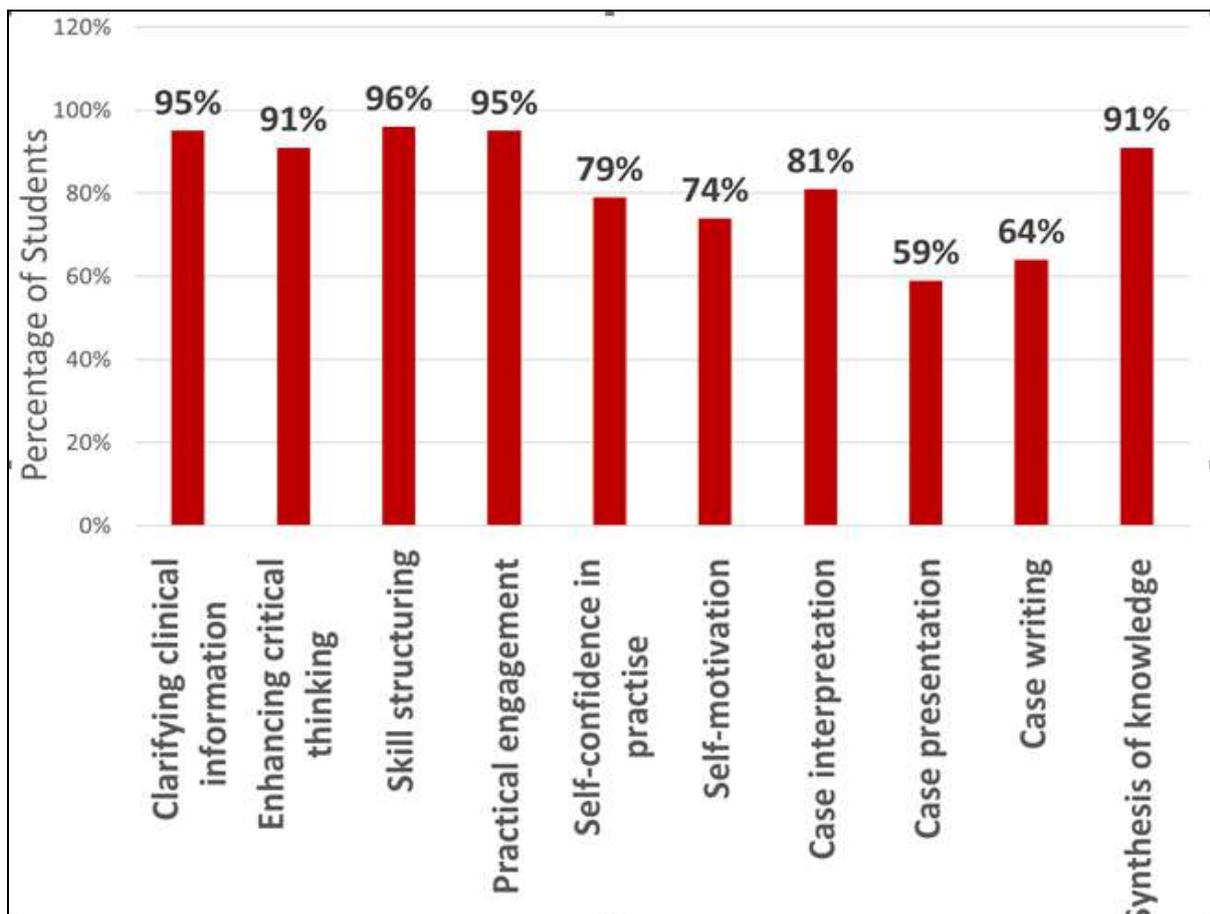
Pudelko (2012) believed that mind mapping was able to link information together and can support a deeper level of thinking <sup>[7]</sup>. Sonali *et al* (2017) stated that mind mapping was a valid tool to students and educators for multiple purposes which can help medical students to learn, organize

information faster and communicate their ideas quickly. It also assisted educators in monitoring and assessing students’ understanding efficiently. Mind maps can be a tool to aid strategies in active teaching and learning <sup>[8]</sup>.

Zipp *et al.* (2009) demonstrated that students’ perceptions on the mind mapping learning technique was effective in their organization, prioritization, and integration of course material <sup>[9]</sup>. Mind maps can conceptualize and assess competency. The tool also helped implications for practice. <sup>6</sup> In the past 5–10 years, a variety of software packages have been developed that enable the visual display of information, concepts, and relations between ideas. These mapping tools take a variety of names including: “concept mapping”, “mind mapping” or “argument mapping”. The potential of these tools for educational purposes is only now starting to be realised.

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Martin Davies (2011) mentioned that many software packages were developed to enable visualization of information, concepts and relating ideas. Mind maps had been realised to be an effective teaching tool for education. Processing of verbal and pictorial information helped learning with the use of more than one modality <sup>[2]</sup>.



**Fig 1:** Percentage of student’s perception of learning benefits of HOGMMs, n=113, NUMed, 2016

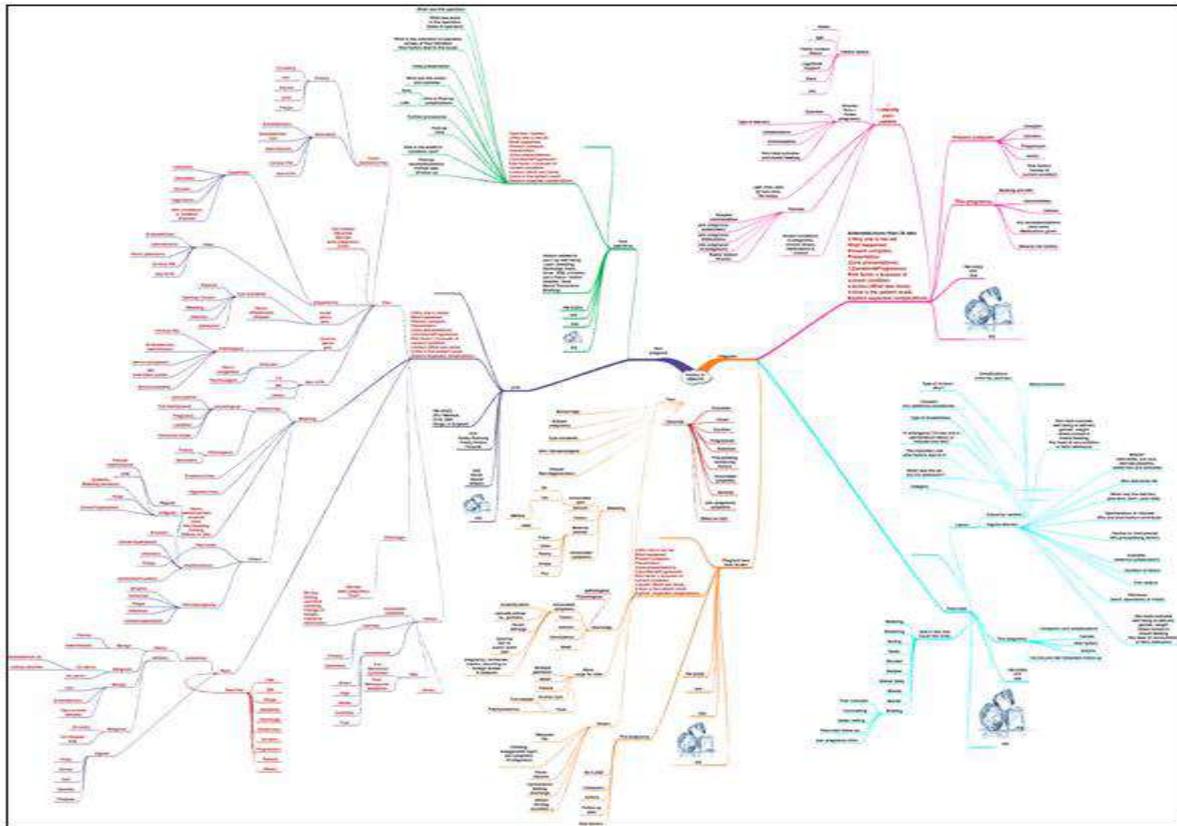


Fig 2: OG History Mind Map

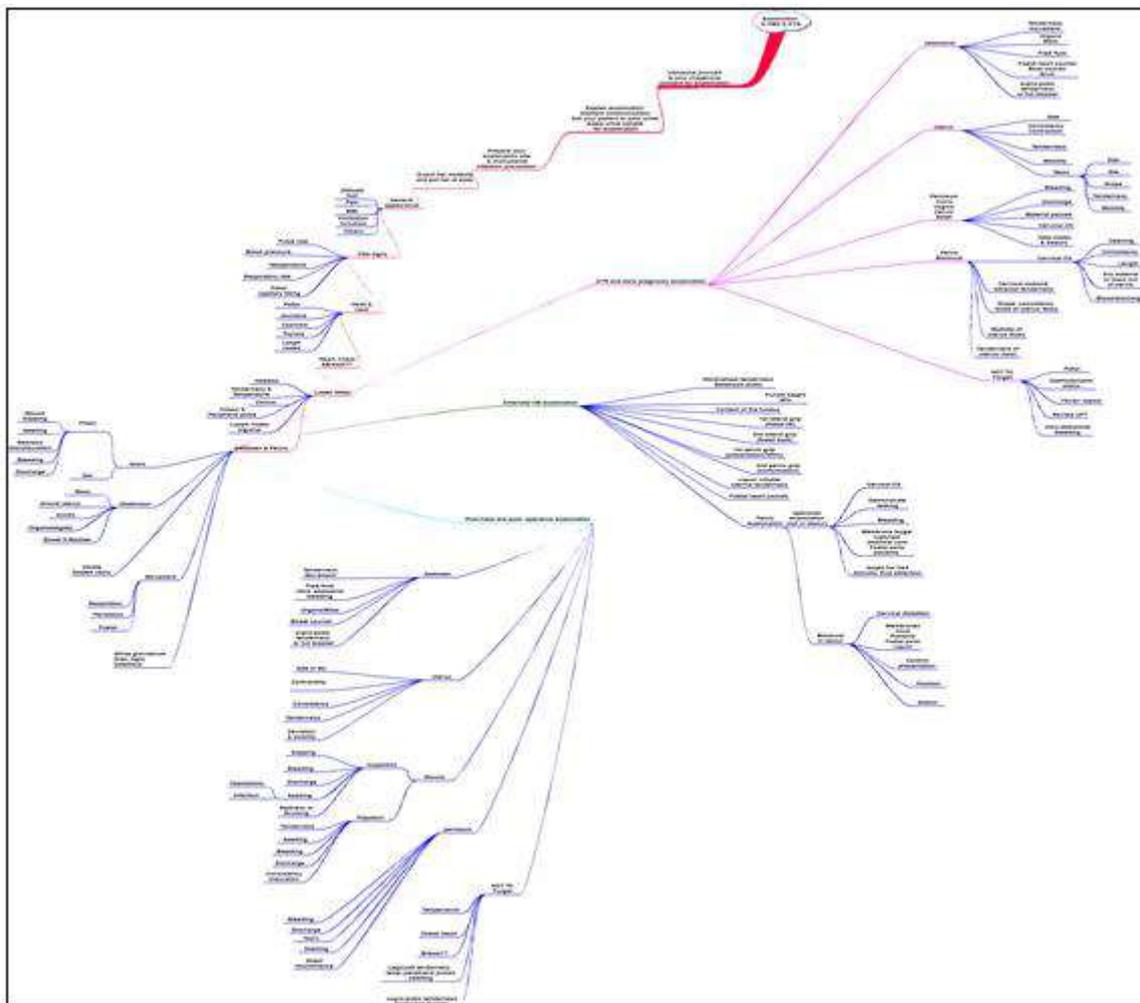


Fig 3: OG examination Mind Map



**Conclusions**

There was a consensus that our medical students found HOGMMs to be a useful teaching, learning and assessment tool. Future work should aim at addressing this technique by developing a user friendly HOGMMs App.

**Acknowledgments**

We are thankful to our colleagues in OG specialty Dr John Eldred, Dr Azuan Ayub, Dr. Ehab Helmi, Dr Angela Chin and Dr Mya Pwint Phyu, who had provided their expertise that greatly assisted the research in reviewing HOGMMs and the questionnaire. Our thanks extended to NUMed students who participated in the study.

**Appendix 1: Questionnaire and consent form**

Holistic obstetrics and Gynaecology Mind Maps Questionnaire – Study Information and Consent Form  
 This Page Requires You To Sign A Consent Statement  
 It Will Be Colected and Stored Separate From The Completed Questionnaires.  
 This questionnaire should take less than five minutes to complete.

**Aims of study:** To evaluate the significance of using Holistic Obstetrics and Gyaecology Mind Maps (HOGMMs) in practical teaching and learning of MBBS students.  
 To evaluate the perceived learning benefits of HOGMMs for acquiring a range of clinical skills and standardizing

assessment and teaching methods.

**Consent**

All information you provide in this questionnaire is strictly anonymous and will only be used for research purposes. You have the right not to take part in this study. Refusal to participate or withdraw from this study will incur no penalty or loss of rights and benefits. The study personnel retain the right to withdraw your participation at any time. Further information about the study may be obtained from Dr Hassan Karali (hassanfadhil.hussainkarali@newcastle.edu.my)  
 I hereby give consent for the information provided in this questionnaire to be used for research purposes, including publications  
 • please tick box if you wish to give consent.

Signature..... Date  
 .....

**Mind Map Questionnaire**

**Section 1: Background information**

ID: \_\_\_\_\_ DOB (DD/MM/YYYY) \_\_\_\_\_  
 Academic year: \_\_\_\_\_  
 Stage: \_\_\_\_\_  
 Ethnicity: • Chinese • Indian • Malay • Other  
 Gender: • Female • Male • Unspecified  
 Did you pass your end rotation MOSLER • YES • NO

**Section 2:** Questionnaire For each of the following questions, please indicate by ticking the box, whether you agree or disagree. A: Your ideas about HOGMMs

Question No.	Question	YES	NO
1	A description session is necessary to understand how to use HOGMMs?		
2	Did the HOGMMs clarify your clinical information?		
3	Did the HOGMMs enhanced your critical thinking?		
4	Did OGMMs structured your skills towards history taking, perform examination and justify investigations?		
5	Did HOGMMs helped you to engage in OBST &GYN practical learning		
6	Did HOGMMs improve your self confidence in clinical practice?		
7	Did HOGMMs improve your self-motivation?		
8	Do you think HOGMMs gives a fluent approach for clinical practice?		
9	Did you used HOGMMs in your course training?		
10	Did HOGMMs help you to pass your MOSLER?		
11	Did HOGMMs help you in case presentation?		
12	Did HOGMMs help you in your case writing?		
13	Did HOGMMs help you to synthesis your knowledge?		
14	Did HOGMMs help you to interpret your cases?		
15	Did HOGMMs help you in your revision?		

**B: About HOGMMs**

Question No.	Question	Yes	No
1.	Was your approach using HOGMMs accepted by your lecturers?		
3.	Was HOGMMs factually, correct?		
4.	Was HOGMMs detailed?		
5.	Was HOGMMs Objective?		
6.	Was HOGMMs easy to use?		
7.	Was HOGMMs easy to remember?		
8.	Did the colours of HOGMMs make it easier to apply?		
9.	Was HOGMMs easily used on a smart phone or tablet?		
10.	Was HOGMMs easily obtained from learning resources?		

**C: Explanatory session (Es)**

Question No.	Question	YES	NO
1.	Was the Es informative?		
2.	Was the Es interactive?		
3.	Was the Es motivating?		
4.	Do you think that Es can be replaced by pre- learning handout?		
5.	Did Es help you to understand HOGMMs?		
6.	Did Es help you to apply HOGMMs?		
7.	Did Es help you to consolidate your knowledge?		
8.	Did Es improve your critical thinking?		
9.	Did Es improve your self-confidence?		
10.	Did Es help you in your revision?		

**D: Future plans**

Question No.	Question	Yes	No
1.	Do you think that teaching using HOGMMs can replace traditional teaching in practical OBS & GYN?		
2.	Do you think Teaching using HOGMMs better to be used side by side with traditional teaching of practical OBS & GYN?		
3.	Do you think HOGMMs is useful learning tool for MBBS students?		
4.	Do you think it should be taught earlier rather than later during coarse teaching?		
5.	Do you think using HOGMMs can reduce errors of diagnosis in clinical practice?		
6.	Do you think HOGMMs is suitable to be used as guideline for clinical practice?		
7.	Do you think HOGMMs should be included in textbooks?		
8.	Do you think HOGMMs is a good tool to standardise student's assessment?		
9.	Do you think HOGMMs is a good tool to uniform the teaching methods?		
10.	Do you think HOGMMs can reduce diversity in student's assessment?		
11.	Do you think that HOGMMs can be extended to include outlines of management?		
12.	Is HOGMMs a good template that helps not to miss aspects in case writing?		
13.	Do you think HOGMMs can be changed to a smart App.?		
14.	Do you think if HOGMMs used as an App, it will help student's learning?		
15.	Do you think if HOGMMs used as an App can help to standardise assessment?		

Thank you for your time in completing this questionnaire!!!

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