Development of Lifelong Learning Skills among Medical Students

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Introduction

❖ Lifelong learning is an important graduate competency and it is a core component of medical professionalism. Accreditation standards for healthcare professions education require an emphasis on lifelong learning.

❖ In the International Medical University (IMU) learning model, self-directed lifelong learning with skills in information and resource management is one of the eight outcome domains. Hence, this is embedded in the curriculum of medical programme in IMU.

❖ **Objective:** To measure the orientation of medical students toward lifelong learning and also to determine the types of self-directed learning (SDL) activities within the curriculum that contribute towards students lifelong learning skills.

Methods

Study design: Cross-sectional study.

Study setting: International Medical University, Kuala Lumpur, Malaysia.

Study population: Year 1 to Year 5 medical students

Sample size and sampling technique: Everyone in the study population was invited to participate and those who gave consent were enrolled.

Study instrument: Jefferson Scale for Physician Lifelong Learning (JeffSPLL-MS) was adopted. It comprises of 14 items rated on a four-point Likert scale ranging from "strongly disagree" to "strongly agree", with total scores ranging from 14 to 56. A higher scores indicates stronger orientation toward lifelong learning.

14 items in 3 domains:
   ❖ **Domain-1: Learning belief and motivation**
        (C1, C2, C7, C8, C9, C11 & C14)
   ❖ **Domain-2: Attention to learning opportunities**
        (C4, C10, C12 & C13)
   ❖ **Domain-3: Technical skills in seeking information**
        (C3, C5 & C6).

Data analysis: Factor analysis (principal component factor extraction, correlations matrix and varimax) was performed to identify the underlying factors. The Cronbach alpha was calculated to determine the internal consistency of the questionnaire. Non-parametric Kruskal-Wallis test followed by post-hoc pairwise comparison was performed on samples, which showed significant difference across samples. Non-parametric Mann Whitney U test was carried out to evaluate differences between the mean ranks of preclinical and clinical students of medical programme. The types of SDL activities that contribute to lifelong learning skills were identified.

Results and Discussion
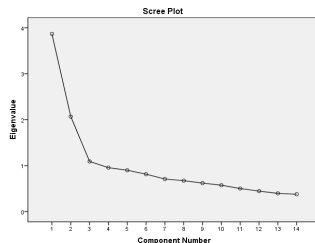

Fig 1: Scree plot for JeffSPLL-MS questionnaire

Fig 2: Types of SDL activities in medical curriculum contributing to preclinical and clinical students Lifelong learning
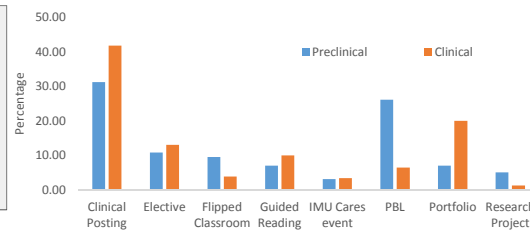
Table 1: : Descriptive Statistics

	Factor 1: Learning beliefs and motivation	Factor 2: Skills in seeking information	Factor 3: Attention to learning opportunities	Total JeffSPLL-MS Score
Year 1 (n =103)	23.45 ± 2.67	10.57 ± 1.88* ###	7.70 ± 1.79**##	41.72 ± 4.49
Year 2 (n =47)	23.72 ± 3.45	10.45 ± 2.11+ @@@	7.66 ± 1.77+ @	41.83 ± 6.02
Year 3 (n =48)	23.60 ± 2.19	11.44 ± 1.60	8.40 ± 1.53	43.44 ± 4.48
Year 4 (n = 76)	23.00 ± 2.29	11.46 ± 1.50* +	8.62 ± 1.31** +	43.07 ± 3.65
Year 5 (n =73)	22.86 ± 2.33	11.67 ± 1.50### @@@	8.52 ±1.30## @	43.05 ± 3.67

The values are expressed in Mean ± SD; * p < 0.05, ** p < 0.01 for comparison between Year 1 and Year 4 students; ## p < 0.01, ### p < 0.001 for comparison between Year 1 and Year 5 students; +p < 0.05, +++ p < 0.001 for comparison between Year 2 and Year 4 students; @ p < 0.05, @@@ p < 0.001 for comparison between Year 2 and Year 5 students.

Table 2: Descriptive Statistics, Reliability coefficients and Cohen's d-Effect size

	Factor 1: Learning beliefs and motivation	Factor 2: Skills in seeking information	Factor 3: Attention to learning opportunities	Total JeffSPLL- MS Score
Preclinical Students (n=150)	23.53 ± 2.94	10.53 ± 1.95***	7.69 ± 1.78***	41.75 ± 5.00**
Clinical Students (n=197)	23.10 ± 2.23	11.53 ± 1.52***	8.53 ± 1.36***	43.16 ± 3.85**
Cohen's d-Effect Size#	-0.16	0.57	0.53	0.32
Cronbach alpha reliability (n=347)	0.787	0.589	0.645	0.779

The values are expressed in Mean ± SD; ** p < 0.01, *** p < 0.001 for comparison between preclinical and clinical students.
Effect size: low = 0.20; medium =0.50 and large = 0.80

❖ Three-factor structure emerged from the factor analysis, with an eigen value greater than one. Factors 1, 2 and 3 were identified as learning beliefs and motivation, skills in seeking information and attention to learning opportunities, respectively.

❖ Increasing orientation towards lifelong learning with academic progression was observed. There was a significant difference (p< 0.01) between preclinical and clinical total and factor 2 scores.

❖ Problem-based learning (PBL), flipped classroom and research project were perceived by preclinical students to be effective in promoting lifelong learning skills, whereas clinical postings, portfolios and electives were perceived by clinical students to inculcate lifelong learning skills.

Conclusion

Medical students' lifelong learning skills develop progressively from preclinical to clinical years. Students in pre-clinical and clinical phases differ significantly in their orientation toward lifelong learning, especially in "skills in seeking information" and "attention to learning opportunity". Self-directed learning activities including clinical posting, PBL, electives, portfolio, guided reading, and projects were perceived to inculcate lifelong learning skills.

References

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❖ Wetzel, A.P. et al. ,2010. Measuring medical students' orientation toward lifelong learning: a psychometric evaluation. Academic Medicine, 85 (10), pp. S41-44.

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