

# Learning style preferences for Hong Kong GPs recruited in a distance-learning course

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## Summary

**Objective:** To examine the learning style preferences of general practitioners in Hong Kong enrolled in a Diploma of Family Medicine course.

**Design:** Participants were invited to fill in the 40-item Honey and Mumford Learning Style Questionnaire. Data on instructional preference were gathered using a 47-item structured questionnaire developed for this study. Their assessment scores were also recorded for analysis.

**Subjects:** Students based in Hong Kong and enrolled in the distance learning Postgraduate Diploma of Family Medicine conducted by Monash University.

**Main outcome measures:** Students' attitudes and behaviours determining their preferences in learning.

**Results:** Forty two percent ( $n=41$ ) of 98 students took part in the study and completed the pre- and post- course subject questionnaires. The pre- course subject preferred learning style was "reflective" (32%) and the majority of students had only one preferred style (71%). The preferences did not show significant changes over the period of study of the 18-week semester.

**Conclusions:** The predominant learning style of general practitioners in Hong Kong in this postgraduate course was "reflective". These life long learners may wish to

consider their learning style preference when selecting future continuing medical education activities. Learning styles should be considered by course teams when revising instruction and teaching methods and assessments.

**Keywords:** General practice, continuing medical education, distance education, learning styles.

## 摘要

**目的：**研究正在修讀家庭醫學文憑課程的香港全科醫生對學習方式的喜好。

**設計：**參與者被邀請回答一份 40 項有關學習方式的問卷 (Honey and Mumford)。以特定的 47 項結構性問卷對傳授方法的喜好作資料搜集。他們的評核分數亦被紀錄以作分析。

**對象：**在香港選讀 Monash 大學家庭醫學遙距進修深造文憑課程的學員。

**測量內容：**以學員的態度及行為測定他們對學習方式的喜好。

**結果：**在 98 名學員中，四成二 ( $n=41$ ) 回應了學科前及後的問卷。在修讀學科前，以思考性的學習模式為多 (32%)，而多數的學員只偏好一種學習方式 (71%)。在完成十八個星期課程後，同類結果沒有明顯轉變。

**結論：**修讀這深造課程的香港全科醫生以思考性學習方式居多。這些需要終生進修人士可以考慮按其學習方式的喜好在將來選修課程。制訂課程者在修訂指引、教學方法及評核時也應對此加以考慮。

**詞彙：**全科醫學，持續醫學進修，遙距教育，學習方式

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## Introduction

General practitioners (GPs) recognise that they need to fill gaps in knowledge before they can undertake learning. Understanding what motivates the learner and how learners learn should enhance learning. Ward<sup>1</sup> identified that doctors appear to be “prototypical adult learners” as they have clinical problems, which span their careers, requiring new learning, to be solved effectively and efficiently. This is true for GPs who work in a problem-orientated environment – patients presenting with problems for which they usually expect a solution. It is not surprising that GPs often select continuing medical education activities that build on their previous knowledge.<sup>2</sup>

Learning style theory predicts that matching learning preference with learning style will enhance learning.<sup>3</sup> People are not necessarily limited to one particular learning style, but usually show dominance in one or two. Early studies conducted in general practice in the 1970s and 1980s utilised Kolb’s Learning Style Inventory.<sup>4</sup> Other studies in general practice have attempted to investigate GPs preferred learning styles using the Honey and Mumford Learning Style Questionnaire (LSQ).<sup>5</sup> This instrument “probes the attitudes and behaviours which determine preference with regard to learning.”<sup>6</sup> The LSQ is said to cover four preferred learning style preferences: **theorists** (adapt and integrate observations into complex, logistical theories – they think problems through step-by-step); **pragmatists** (like to try out new ideas, to see if they work in practice); **reflectors** (like to ponder experiences and observe them from different perspectives) and **activists** (involve themselves fulfilling in new experiences by taking action). (Adapted from Honey and Mumford manual).

Studies have shown that a range of learning styles exists. Lewis<sup>7</sup> found that GP trainees are predominantly “reflector-pragmatists”, compared with “reflector-theorists” for trainers and general practice tutors. Lesmes-Anel, Robinson and Moody<sup>3</sup> reported that GP registrars have a preference for “reflector-theorist”. Bennet and Danczak<sup>8</sup> reported that GPs tend to be “pragmatic” learners using both concrete experience and active experimentation. They are interested in learning by doing and in trying new things they believe can be applied and are practical. It is interesting that no learning style inventory has ever been validated in general practice and there is a paucity of data about the psychometric properties of these instruments in a diversity of cultural groups.

## Method

This was a descriptive study of 41 GPs in Hong Kong enrolled in a core subject – “Principles of General Practice”, of the Graduate Diploma of Family Medicine course. This subject is the first core subject in these courses and is taught over 14 sessions spread over 18 weeks, covering 14 topics as in **Box 1**. The courses, which have been offered by Monash University since 1992 by distance mode, have been described in detail elsewhere.<sup>9</sup>

### Box 1: Sessions in “Principles of General Practice”

1. The origins of general practice
2. Medicine as science
3. Medicine as art
4. Medicine as craft and technology
5. Aetiology, diagnosis and prognosis
6. Health and illness, sickness and disease
7. Concepts of healing
8. History and philosophy of general practice
9. Conceptual framework of general practice
10. Clinical decision making in general practice
11. Roles and tasks of the general practitioner
12. General practice in the community and community health
13. Future direction for general practice
14. Academic general practice

## The educational intervention

The course materials combined printed study guides, notes and collated references, with reflective activities and assessment questions posed throughout the study to stimulate the learner to be more active and to enhance learners’ understanding.<sup>10, 11</sup> CDs, which contained discussions between subject authors and facilitators, supplemented the printed materials and were used at the beginning of the sessions in order to engage the learner and introduced the learners to the subject authors. The use of multifaceted instructional techniques was based on the evidence from systematic reviews,<sup>12-15</sup> which showed that these could change doctor’s knowledge, attitude and practice.

In addition to the distance learning component, a residential weekend workshop was conducted early in the course subject. Approximately 80 percent of the enrolled GPs attended this workshop. The workshops are designed to discuss complex ideas associated with medicine as art and science.

The aims of this research study were to determine the preferred learning styles of GPs in Hong Kong enrolled in one core subject, "Principles of General Practice". This study investigated whether preferred learning style changes over the duration of the core subject and explored the correlation between GP preferences of educational activities used to facilitate learning in this core subject with preferred learning styles and sought to determine if an association existed between student's preferred learning style and performance on specific types of assessment activities.

### Data collection and analysis

The 40 item LSQ (Honey unspecified) was used to gather data about students' attitudes and behaviours which determined preferences with regard to learning. The LSQ is a popular instrument used in training and development to raise self-awareness of the learning styles concept at an individual and team level. The LSQ was scored using the score key provided in the Honey and Mumford manual – a 40-item learning styles questionnaire.

Data on instructional preference was gathered using an instrument developed for this study. Forty seven items rated on a seven point Likert scale covered preferred learning modes and were linked with the teaching methods utilized, and content, of the subject materials.

The data were collected in Hong Kong when students attended residential workshops in Hong Kong, in March 2003, at the beginning of the course subject; and in August 2004, after completion of the subject.

Assessment scores were recorded and data were categorized into 'high distinction (80-100%), distinction (70-79%), credit (60-69%) and pass (50-59%).

Data were entered into SPSS version 12.<sup>16</sup>

Descriptive and paired samples t-test, and correlation analysis were conducted. Chi squared was used to determine any relationship between preferred

learning style and assessment outcome. P value less than 0.05 was considered statistically significant.

Ethics approval was sought from the Monash University Human Ethics committee.

## Results

### The sample

41 out of 98 GPs enrolled in the course consented to participate in this study (42% response rate) and completed the pre- and post- course subject questionnaires.

The cohort consisted of 98 young GPs mostly in training, the average age was 27.4 (SD = 2.7 year) years (range 25-39 years). Most of the respondents were male (63%). The majority were born in Hong Kong (93%). Most graduated from undergraduate medical school between 2000 and 2002 (63%), and the majority had their medical education in Hong Kong (93%). A summary of participants and student cohort's demographic details is found in **Table 1**.

**Table 1: Demographic data**

Variable	Surveyed students (n=41) n (%)	Student cohort (n=98) n (%)	X <sup>2</sup>	df	p
<b>Gender</b>					
- Male	26 (63)	70 (71)	1.44	1	0.23
- Female	15 (37)	28 (29)			
<b>Country of birth</b>					
- Hong Kong	38 (93)	84 (86)	6.22	1	<b>0.01</b>
- Other	3 (7)	14 (14)			
<b>Country of undergraduate medical education</b>					
- Hong Kong	38 (93)	74 (76)	11.03	1	<b>.00</b>
- Other	3 (7)	24 (24)			
<b>Year of graduation</b>					
- 2000 – 2002	26 (63)	33 (34)	17.30	2	<b>0.00</b>
- 1995 – 1999	14 (35)	46 (47)			
- before 1995	1 (2)	14 (14)			
<b>Years in general practice</b>					
- >4	1 (2)	10 (10)	43.51	2	<b>0.00</b>
- 2 – 4	13 (32)	57 (58)			
- < 2	27 (66)	13 (13)			
<b>Location of practice (n=29)</b>					
- Urban	28	80	1.79	1	0.18
- Rural	1	7			
<b>Postgraduate qualifications</b>					
- FRACGP	1 (2)	3 (3)	0.78	1	0.78
- Other	7 (17)	21 (21)			

*Dominant preferred learning style*

According to the LSQ the pre- course subject preferred learning style for these respondents was "reflective" (32%) and the majority had only one preferred style (71%). The post- course subject preferred learning style for these respondents was also "reflective" (34%) and the majority had only one preferred style (61%). A summary of pre- and post-learning style preferences is found in **Table 2**.

**Table 2: Learning style preference**

Dominant learning style preference	Pre-core subject preference n (%)	Post-core subject preference n (%)	t	P
Activist	0 (0)	0 (0)	-1.06	0.30
Theorist	6 (15)	3 (7)	0.52	0.61
Pragmatist	10 (24)	8 (20)	0.00	1.00
Reflective	13 (32)	14 (34)	0.32	0.75
Number of dominant styles				
one style	29 (71)	25 (61)		
two styles	10 (24)	12 (29)		
three styles	2 (5)	4 (10)		

*Correlation of learning styles and assessment*

The Pearson product-moment correlations between the four post learning style scores and the students' preferences for the learning and assessment activities are shown in **Table 3**. The significant correlations are in bold. There were 11 significant negative correlations between the "Activist" learning style score and the learning activities; six (five negative and one positive) with the "Pragmatist" score and the learning activities; three positive correlations with the "Theorist" score and the learning and assessment activities; and one positive correlation with the "Reflector" learning style score and the assessment activities.

**Discussion**

"Reflective" learning style dominated in this cohort of respondent GPs and this did not alter over the course of the semester. These results support the work of Lesmes-Anel, Robinson and Moody who identified that GP registrars have a "reflector-theorist" preferred style.

The results of the regression analysis showed that "activists" do not enjoy learning, as measured by the

items developed for this study. This finding may be related to the participants' age and stage of career. That is that over two thirds of them had less than one year experience in general practice and most (98%) had less than five years experience. It is not surprising that they did not enjoy clinical audit developing strategy plans and research-related activities as they may not see the relevance for these at their stage of their career as they were probably more concerned in uplifting their clinical skills and preparing for Fellowship examinations.

Reading can be a passive learning experience. To overcome this, reflective activities and assessment questions were posed throughout the subject material. These activities engaged the GPs and encouraged them to draw on past experience and existing knowledge in a context which was relevant and meaningful to their circumstance and environment. The assessment activities centred on concepts of the discipline of general practice, which the GPs found to be relevant to their work. Consequently, the content could be personalised and made relevant to their environment (phenomenology) whilst building on past experience (constructivism). The results of this study show that this cohort of practicing GPs were "reflectors" and confirmed that these educational principles support this preferred learning style.

It is well acknowledged that assessment motivates learning,<sup>17</sup> so one could assume that there may be a relationship between learning style preference and assessment outcome. This study did not attract GPs in Hong Kong with a dominant "activist" learning style. The assessment activities are not suited to those with dominant "activist" and "pragmatist" learning style preferences. Those with a dominant preferred learning style of "reflector" scored significantly higher on the short essay assessment activity compared to those with other dominant learning styles. The "theorists" performed better on the integrated assignment which sought to examine their knowledge of all material covered in discussion of developments in general practice in the future with reference to morbidity patterns, training for practice, certification and continuing professional development, new technologies and treatments and professional and practice organisation compared to those with other dominant learning style preferences.

The LSQ 40 item instrument was chosen for this study in preference to a 80 item instrument which is targeting managers rather than learners. Unfortunately

**Table 3: Correlations between learning style and preferences for different types of learning activities**

Learning Activities	Post learning style scales			
	Activist	Reflector	Theorist	Pragmatist
I enjoy learning by reading printed materials on research in general practice	-.197	-.216	-.166	-.074
I enjoy learning by reading printed materials on philosophy related to general practice	-.196	-.102	-.016	-.123
I enjoy learning by reading printed materials on the epidemiology of disease	.016	-.082	.031	-.036
I enjoy learning by reading printed materials on the impact of patient conditions	.154	.099	.170	.085
I enjoy learning by reading printed materials on investigation and diagnosis of conditions	.157	-.149	.032	.074
I enjoy learning by reading printed materials on treatment of conditions	.040	-.013	.074	.024
I enjoy learning by reading printed materials on ethics issues related to practice	.024	-.137	-.130	-.056
I enjoy learning by listening to audiotape	-.117	.014	.012	.082
I enjoy learning by watching videotapes	-.024	-.027	.091	.035
I enjoy learning by participating in role plays	-.141	-.026	.059	.141
I enjoy learning by practicing my clinical skills	-.045	-.126	-.050	.070
I enjoy learning by practicing my communication skills	-.177	-.146	-.093	.161
I enjoy learning by doing a qualitative research project	-.233	.031	-.072	-.293
I enjoy learning by critically appraising journal articles	-.306 (p=.051)	-.056	-.127	<b>-.354*</b>
I enjoy learning by writing research protocol	.204	.224	.006	<b>-.310*</b>
I enjoy learning by developing a questionnaire	<b>-.401**</b>	.088	.179	-.140
I enjoy learning by presenting a medical topic to an audience	<b>-.367*</b>	-.057	.064	-.044
I enjoy learning by doing a literature review	-.205	.115	-.102	-.144
I enjoy learning by writing up a research grant proposal	<b>-.333*</b>	.103	.091	-.201
I enjoy learning by writing up an ethics committee application	<b>-.386*</b>	.037	.163	-.217
I enjoy learning by audio taping health promotion activities	-.149	.061	.000	-.172
I enjoy learning by developing a strategic plan for my practice	<b>-.455**</b>	.082	.054	.081
I enjoy learning by interpreting clinical data provided	-.169	.118	.095	.000
I enjoy learning by developing health promotion programs/materials for my practice	-.107	.069	.095	.054
I enjoy learning by interacting with peers	-.301	.002	-.040	.149
I enjoy learning by communicating with other health professionals	.072	-.046	-.128	.232
I enjoy learning by engaging in case discussions	-.277	-.181	-.172	.049
I enjoy learning by participating in teleconferences	<b>-.484**</b>	.006	<b>.363*</b>	-.071
I enjoy learning by attending weekend workshops	<b>-.448**</b>	.069	.286	-.130
I enjoy learning by reflecting on journal activities	-.183	.004	.045	<b>-.373*</b>
I enjoy learning by reflecting on reading materials	-.078	.052	-.006	<b>-.332*</b>
I enjoy learning by completing patient centred activities e.g. case discussions	.015	-.020	.024	.101
I enjoy learning by undertaking practice related activities	-.076	.010	.283	.111
I enjoy learning by preparing case reports based on my personal life	-.147	-.037	.213	.059
I enjoy learning by preparing case reports based on my professional practice	-.165	.282	.250	.141
I enjoy learning by preparing case reports on my patients	-.079	.226	.188	.045
I enjoy learning by completing written assignments that required critical appraisal	-.462**	.122	<b>.372*</b>	-.133
I enjoy learning by writing essays on philosophical aspects of the profession	<b>-.349*</b>	.063	.074	<b>-.343*</b>
I enjoy learning by writing essays on clinical aspects of the profession	<b>-.333*</b>	.080	.149	-.278
I enjoy learning by reviewing the written feedback from teachers on work I submitted	.090	-.148	.011	<b>.397*</b>
I enjoy learning by completing audits/log books of patient data	<b>-.318*</b>	-.140	.150	.172
I enjoy learning by studying by distance mode	-.300	.174	.157	-.084
I enjoy learning by listening to didactic lectures	-.238	.152	.055	-.056
I enjoy learning by watching skills demonstrations	-.169	.060	.207	.015
I enjoy learning by completing MCQ tests	.114	.095	-.067	.298
I enjoy learning by completing objective simulated clinical examination	-.211	-.062	-.086	.178
The core subjects that I enjoyed the most were principles of general practice	-.170	-.097	.128	.028
The core subjects that I enjoyed the most were ...introduction to research methods	-.130	.083	.100	-.129
The core subjects that I enjoyed the most were ...learning and teaching	-.364	-.127	.142	.079
The core subjects that I enjoyed the most were applied research	-.401	-.225	-.042	-.075
Short essay re s 1-5 (worth 30)	-.101	-.074	-.090	.049
Short essay re s 6-10 (worth 30)	-.073	<b>.358*</b>	.055	-.030
Integrated assignment re all sessions (worth 40)	-.148	.180	<b>.346*</b>	.072

\* Significant at the 0.05 level (two-tailed)

\*\* Significant at the 0.01 level (two-tailed)

## Key messages

1. The preferred learning style of a cohort of 41 general practitioners (GPs) enrolled in a distance learning programme was “reflective” and this did not change over the duration of the semester.
2. The majority of GPs had one preferred learning style.
3. GPs may wish to consider their learning style preference when selecting future continuing medical education activities.
4. Learning styles should be considered by course teams when revising instruction and teaching methods and assessments.

there is no published data about the psychometric properties of this version of the LSQ.

Labelling and generalizing about types of students may inhibit pedagogic development. The results of this study are suggestive rather than conclusive. The measurement of learning style preference was based on subjective responses of students.

The results of this study have to be interpreted in its context due to the small sample size. In addition, some of the cohort had English as their second language, although each student was required to provide evidence of a high level of written and oral command of English to gain entry into this course, which was delivered in the English language. This study did not explore other variables that had an impact on learning, such as the influence of undergraduate education and the institution attended.

Distance education theory emphasises the importance of extensive feedback to students on their assignments.<sup>18</sup> The results of this study identified that those with a dominant “pragmatist” learning style preference enjoyed receiving written feedback compared to those with other dominant learning style preferences.

## Conclusion

In this paper we explored preferences of learning styles in a cohort of GPs in Hong Kong enrolled part time in a subject conducted via distance education. The

predominant learning style preference was “reflective” and this did not change over the five month duration of the course. This timeframe may not have been sufficient to detect a statistically significant change in such a small sample. These participants were “established” learners and it may take longer than this time to observe a change, if any. In clinical practice it is acknowledged that behaviour is difficult to change and it often takes a long time. The researchers are currently considering a follow-up study of the participating GPs on completion of their whole Diploma course.

We do not advocate classifying learners and developing course ware to match preferences but learning styles should be considered by course teams when revising instruction and teaching methods and assessment.

The results show that adult learning principles are appropriate approaches to underpin course ware development, for this cohort of students studying via distance education. Unfortunately this study does not contribute clear evidence towards sufficiently mapping learning styles and teaching strategies.

Adult learning theories are increasingly used to facilitate continuing medical education. GPs, as life long learners, may wish to consider their learning style preference when selecting future CME activities. Future studies should explore how learning style preference interacts with other learner attributes.

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