

# Learning style preferences among clinical year physiotherapy students in Ghana

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**Background.** Learning style is the manner by which one learns. Every student has a different and unique learning style. However, the educational implication of learning style preferences has been a source of controversy among researchers and educators.

**Objectives.** To determine the learning style preferences of clinical year physiotherapy students.

**Methods.** This cross-sectional study was conducted in 82 undergraduate physiotherapy students from two universities in Ghana. A data-capturing form was used to obtain participants' sociodemographic information, while the Kolb learning style questionnaire was used to determine the learning style preferences of the students. The  $\chi^2$  statistic was used to determine the association between gender and learning style preferences, as well as between level of study and learning style preferences.

**Results.** The participants comprised 43 (52.4%) male students and 39 (47.6%) female students. Eight (9.8%) students preferred the accommodating learning style, 46 (56.0%) preferred the diverging learning style, 15 (18.3%) preferred the assimilating learning style and 13 (15.9%) preferred the converging learning style. There was a significant association between gender and preferred learning style ( $p=0.027$ ), but no significant association between level of study and preferred learning style ( $p=0.179$ ).

**Conclusion.** This study revealed that the diverging learning style was the most preferred style, followed by the assimilating learning style. However, there was no association between gender and learning style preferences, as well as level of study and learning style preferences. Further research should be conducted to find the association between the learning environments and the learning style preferences.

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Learning, as defined by Kolb,<sup>[1]</sup> is 'the process whereby knowledge is created through the transformation of experience'. The different types of learning is the result of people using learning to readjust and manage daily situations.<sup>[2]</sup> Thus, learning is determined by learning styles, where students who are able to employ multiple learning styles acquire a greater learning outcome.<sup>[2]</sup> While there is ample evidence to indicate that individuals differ with regard to how they prefer to understand, process and acquire new information, the educational implication of such preferences has been a source of great controversy among researchers and educators.<sup>[3]</sup> Each student's learning style tends to have an effect on their studies, their environment and even their reasoning.<sup>[4]</sup> Learning styles are an umbrella concept, bringing together various schools of thought that lie on a continuum, and are not necessarily based on one specific strategy.<sup>[5]</sup>

Kolb and Kolb<sup>[6]</sup> theorised learning styles into the following: diverging, assimilating, converging and accommodating. An individual with a diverging style is best at observing concrete situations from many different points of view and performs better in situations that call for the generation of ideas, such as brainstorming sessions. They are interested in people, are imaginative and prefer to work in groups. An individual with an assimilating style is best at understanding a wide range of information and putting it into concise, logical form. People with an assimilating style generally find it more important that a theory has logical soundness than practical value and prefer reading. An individual with a converging style applies ideas practically and prefers to deal with technical tasks and problems rather than with social and

interpersonal issues. Someone with an accommodating style has an ability to learn primarily from hands-on experience, and enjoys carrying out plans and involving themselves in new and challenging experiences.

An Australian study revealed that physiotherapy, occupational therapy and dietetics students most often preferred the converging style, while the diverging style was least preferred.<sup>[7]</sup> Zoghi *et al.*<sup>[7]</sup> indicated that nursing, midwifery and paramedic students preferred the assimilating learning style, while radiography students preferred the diverging style. In 2007, Osman and Halime,<sup>[8]</sup> in a Turkish study, reported that there were no significant differences among students between converging, assimilating and diverging learning styles, and that the accommodating learning style was least preferred. There was no significant association between gender and learning style.

In both classroom and clinical settings, differences in preferred learning styles contribute immensely to the ability of a student to obtain maximum benefit from learning.<sup>[9]</sup> Therefore, if students are not taught along the lines of their preferred learning styles, they may not obtain maximum benefit from tuition. It is even more important that clinical year students should be taught in line with their preferred learning styles<sup>[10]</sup> to ensure that they obtain optimum results from their tuition and consequently fully develop professional competence.<sup>[11]</sup> Lecturers have different ways of lecturing, while students have different ways of learning.<sup>[12]</sup> The lack of adequate information on students' preferred learning styles therefore negatively impacts teaching and learning, and subsequently affects the performance of students in examinations, as well as their professional competence.<sup>[13]</sup>

It is important to understand students and to be aware that they have different attitudes towards learning.<sup>[4]</sup> If students determine their learning styles, it could help them to know how to study and it could assist lecturers to know which teaching approach to use. Physiotherapy lecturers have expressed their enthusiasm in making teaching and learning easier and productive, especially for their students who are preparing to become practitioners. Hence, the aim of this study was to determine the learning styles of clinical year physiotherapy students.

## Methods

This was a cross-sectional study conducted at the physiotherapy departments of the University of Ghana (UG) in Accra and the University of Health and Allied Sciences (UHAS) in Ho, the Volta region of Ghana. The study involved third- and fourth (clinical)-year physiotherapy students (i.e. level 300 and 400) from both universities. This group was selected because they are involved in classroom and clinical (theory and practice) education, while the first- and second (preclinical)-year students (i.e. levels 100 and 200) are not. These selections ensured that students' learning style preferences regarding practical and theoretical learning were covered. Purposive voluntary sampling was used to recruit participants for the study. A total of 98 students was registered in the third and fourth year in both universities. A minimum sample size of 79 was calculated using the Taro Yamane formula:  $n = N / [(1 + N(e)^2)]$ .<sup>[14]</sup>

### Instrument for data collection

The research instrument used for this study is Kolb's learning style questionnaire (Appendix 1: <https://www.samedical.org/file/1879>), which was developed in 2005 to establish learning styles of students. It is an 80-item self-administered questionnaire, comprising questions regarding the student's own learning habits, and takes ~8 - 10 minutes to complete. A data-capturing form was included to obtain participants' demographic information.

A participant scores 1 point for each item ticked. There are no points for items crossed or left blank. The number of ticked or circled responses is added in the totals. The total score for each learning style is circled to determine the strength of preference.

### Procedure for data collection

Students who agreed to participate signed the informed consent form after the aim and purpose of the study were explained to them. The Kolb learning style questionnaire was distributed to the physiotherapy students in their lecture halls or hostels to complete. Copies of questionnaires that were completed on the same day were retrieved. However, students who were unable to complete the questionnaire were given 2 weeks to complete them; these were retrieved later. Follow-up for retrieval of copies was done by calls, text messages by the researchers and visits to those who could not complete them at the time of the researcher's visit. Two research assistants were recruited for distribution and collection of copies of the questionnaire. Data collection commenced on 1 March 2019 and ended on 1 April 2019 (4 weeks).

### Data analysis

Data were analysed using SPSS version 23.0 (IBM Corp., USA). All the data obtained were entered into Microsoft Office Excel 2016 (Microsoft Corp., USA). Descriptive statistics of percentage calculation and frequencies were used to summarise the data. The  $\chi^2$  statistic was used to determine the

association between level of study and learning style preferences, as well as the association between gender and learning style preferences ( $p=0.05$ ).

### Ethical approval

Ethical approval (ref. no. SAHS-PT./10575347/8A/2018-2019) was obtained from the Ethics and Protocol Review Committee, School of Biomedical and Allied Health Sciences, College of Health Science, University of Ghana. Permission was also sought from the appropriate authorities of both universities and informed consent from participants. Confidentiality of the information obtained, as well as privacy and anonymity of participants, was ensured and safeguarded.

## Results

The questionnaire was distributed to 98 physiotherapy students at both universities; 82 (83.7% response rate) were retrieved. The respondents comprised 43 (52.4%) male and 39 (47.6%) female students. The results showed that 40 (48.8%) respondents were students of UG and 50 (61.0%) respondents were in level 300 (Table 1). Twenty-five (62.5%) students at UG and 21 (50%) at UHAS preferred the diverger learning style. The accommodator learning style was the least preferred among students at both universities. Figs 1 and 2 show the learning style preferences of students at the two universities.

Eight (9.7%) accommodators in the current study were male students, while more male ( $n=24$ ; 29.3%) than female students were divergers.

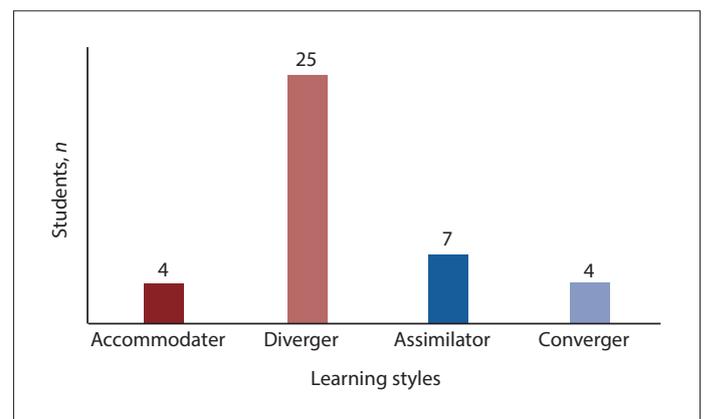


Fig. 1. Learning style preferences for University of Ghana students.

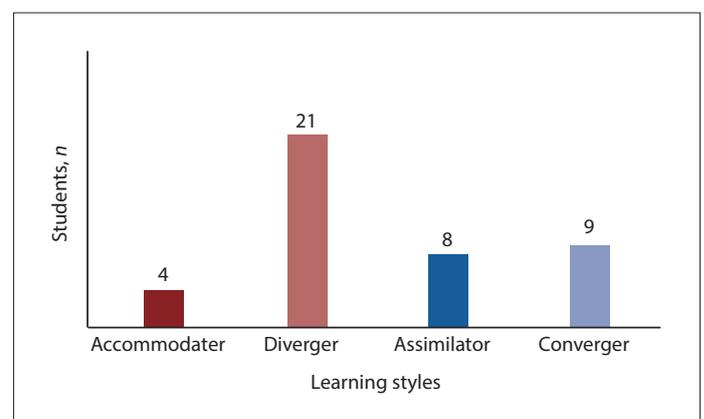


Fig. 2. Learning style preferences for University of Health and Allied Sciences students.

There was a significant association between gender and preferred learning style (Table 2). Thirty (60%) level 300 students and 16 (50%) level 400 students who took part in the study were divergers. There was, however, no significant association between level of study and preferred learning style. The results are shown in Table 3.

## Discussion

This study showed that the diverger learning style was most preferred by participants. Contrary to this finding, final-year physiotherapy students in an Australian university indicated that their preferred learning style was spread uniformly among converging, assimilating and accommodating, while the diverging style was the least preferred.<sup>[9]</sup> In a similar study among allied health students, also conducted in Australia, the converging style was the most preferred learning style of physiotherapy students,<sup>[7]</sup> which differs from the finding in this study.

In our study, there was a significant association between students' gender and their learning style preferences. Previous research related to learning style inventory tests by Smith and Kolb<sup>[15]</sup> showed that males were more abstract than females on 'the perceiving dimension' and that there were no significant gender differences on the 'processing dimension.' Similarly, Brew,<sup>[16]</sup> in 2002, found that the learning style inventory is sensitive to gender, which corroborates with the finding in the current study. Brew argued that for male students, a preference for concrete experience was not mutually exclusive from a preference for abstract conceptualisation, as it was for the female sample.<sup>[16]</sup> However, the current study showed that there was an association between learning styles and gender for physiotherapy students. The outcomes of a study conducted in Iran among first-year students of medicine, pharmacy, dentistry, nursing and health services management corroborate the findings of the current study, as it showed

that there was a significant difference between male and female students regarding preferred learning styles.<sup>[2]</sup>

There seems to be a dearth of information on the relationship between learning style preference and level of study. In the current study, there was no significant association between learning style preference and level of study, irrespective of the different learning structures among third- and fourth-year students of the two universities.

## Conclusion

The results of this study indicate that clinical educators may need to restructure classroom and clinical instructional strategies to ensure that students appreciate the available learning opportunities in the course of their education, especially their clinical education experience. Educators should appreciate the needs and strengths of various types of learning styles, while understanding differences, which could develop and enhance the different teaching methods available to meet the needs of different learning styles of students.

Most previous studies appear to have reported generally on the relationship between gender and learning style preferences among health students, while our study focused on physiotherapy students and the relationship between levels of study and learning style preferences. Hence, the knowledge obtained from this study about the learning styles used by physiotherapy students at both universities is valuable and would help to solve learning problems among the students, allow them to become better learners and possibly improve their academic performance.

Further research to find the association between the clinical learning environment and learning style preferences could be conducted.

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**Author contributions.** DBA and JQ contributed to the study design and collected the data. DBA, JQ and SK contributed towards the data analysis, wrote the manuscript and reviewed it for important intellectual content. DBA, JQ and SK revised the draft and approved the final version of the manuscript for submission.

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**Conflicts of interest.** None.

**Table 1. Demographic profile of students (N=82)**

Variable	Male, n	Female, n	Total, n (%)
Level			
300	22	28	50 (61)
400	21	11	32 (39)
Total	43	39	82 (100)
Institution			
UG	23	17	40 (48.8)
UHAS	20	22	42 (51.2)
Total	43	39	82 (100)

UG = University of Ghana; UHAS = University of Health and Allied Sciences.

**Table 2. Association between gender and learning style preference**

Gender	Accommodator, n	Diverger, n	Assimilator, n	Converger, n	$\chi^2$	p-value
Male	8	24	6	5	9.206	0.027
Female	0	22	9	8		
Total	8	46	15	13		

**Table 3. Association between level of study and learning style preference**

Level	Accommodator, n	Diverger, n	Assimilator, n	Converger, n	$\chi^2$	p-value
300	2	30	10	8	4.905	0.179
400	6	16	5	5		
Total	8	46	15	13		

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