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Learning Style Preferences of Occupational Therapy, Physiotherapy and Speech Pathology Students: A Comparative Study

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ABSTRACT

Purpose: Educating future health care practitioners is an important role of universities. Optimal learning environments consider how students learn and utilise various teaching methods to tailor curriculum delivery to match specified student learning preferences. **Method:** This paper presents a comparative study examining the learning style preferences of first-year undergraduate occupational therapy (n = 116), physiotherapy (n = 60) and speech pathology students (n = 42) at one Australian university. Each student group completed the Kolb Learning Style Inventory (LSI) and the VARK Questionnaire during the first semester of year one of their courses. **Results:** Minimal significant differences were identified between the learning style preferences of the occupational therapy, physiotherapy, and speech pathology students using one-way ANOVA and t-tests. All three student groups reported a greater preference for kinesthetic learning, supporting case study and practical experience components of allied health education. As well, all four of Kolb's information processing styles were represented within each student group. **Conclusion:** The study findings support prior research, suggesting that a range of teaching methods are required to accommodate the variability of student learning styles enrolled in health science courses as well as to strengthen student learning modes in preparation for the complex demands of professional practice.

INTRODUCTION

While the learning styles and teaching implications for nursing students and health science students have been well researched in other countries,¹⁻³ less research has considered the learning styles and implications thereof for occupational therapy, speech therapy, and physiotherapy students in Australia. Learning styles research has been extensive.¹⁻⁶ Given the costs associated with occupational therapy, speech therapy, and physiotherapy education, it is imperative to optimise relevant learning opportunities in professional curriculum for efficiency and effectiveness. To optimise the learning opportunities, the learning styles and learning requirements of students need to be identified.¹ Given the potential value of such research, the purpose of this study was to identify and compare the student learning styles of three groups of first-year health science students enrolled at a university.

LITERATURE REVIEW

Learning Style Models

Learning is described as the process whereby knowledge is created through the transformation of experience.² Individuals use learning to adapt to and manage everyday situations, giving rise to different styles of learning. The concept of learning styles has received considerable attention in the empirical literature and many theories have been proposed in order to better understand the dynamic process of learning.¹ Learning styles have been categorised into levels, suggesting each individual's capacity for flexible and adaptable modal learning. Ranked in order of descending stability, these levels are listed as personality traits, information processing, social interaction, and instructional preference.^{3,4} From the baseline of personality traits, the different theoretical perspectives can be viewed as layers to an individual's learning style, with each influencing subordinate levels.^{4,5} Personality trait theories view learning style as a fixed characteristic, instead of the way that an individual may approach a learning task.⁵

The most common learning theory in allied health research is information processing, which considers personality theories and suggests four sequential stages during the learning process. The information processing theories are based on *Lewin's Cycle of Adult Learning*.² Lewin's cycle describes four stages that follow on from each other during the learning process. The first stage is concrete experience, which is followed by personal reflection on the experience. This is then combined with previous knowledge (abstract conceptualisation), and finally new ways of adjusting to experiences are explored (active experimentation).⁶ *Kolb's Experiential Learning Cycle* is one system based on Lewin's cycle and is the most commonly applied theory to health professionals.⁷ Kolb supports the concept of influences on learning style from personality traits.

In Kolb's Experiential Learning Cycle, ideally an individual would cycle through all four stages.² In reality, some stages may be skipped, or one stage may become the primary focus. As described by Kolb, preferences for the concrete experience stage of learning result in learning from specific experiences or from relating to people. When the reflective observation stage is preferred, careful observation and searching for meaning is likely to be evident.² A preference for the abstract conceptualisation stage will produce logical analysis and systematic planning.

The final stage of the cycle involves taking risks and pursuing activities or tasks, behaviours that are observed in an individual with a preference for active experimentation. Kolb takes the Lewin's original cycle a step further, proposing a specific learning style preference based on an individual's utilisation of the four learning stages.² The resulting learning styles are "accommodator", "diverger," "converger," and "assimilator."

An "accommodator" combines learning steps of active experimentation and concrete experience and is expected to prefer hands-on experience, with strengths in using others to solve problems rather than individual logic. Kolb postulates that this learning style profile is best suited to careers that influence others and exploit opportunities such as marketing or sales.⁸

A "diverger" combines the learning steps of concrete experience and reflective observation. A "diverger" is expected to view concrete situations from a range of perspectives through observation, with a preference for group work in learning situations. These characteristics are best suited to careers in social service (psychology, nursing, or social work), arts and communication.²

Individuals with a "converger" learning style prefer abstract conceptualisation and active experimentation. Characteristics associated with this learning style are a preference for practical problem solving rather than dealing with social issues, and a preference for laboratory exercises in learning situations. A career in technology, environment, or economics is suggested to be the most fitting for a "converger" learning style profile.²

The final profile is that of "assimilator," combining learning steps of reflective observation and abstract conceptualisation. An "assimilator" is likely to have a preference for abstract ideas and theory, favouring lectures and exploring models in learning situations. Careers that Kolb matches with the "assimilator" learning style profile are in the sciences and research fields.⁸

Another level of learning styles, and the most unstable, is instructional preference.⁹ An instructional preference theory is the VARK theory, originally developed by Fleming in 1987, which considers exclusively the instructional preference of individuals using the four categories of visual, aural, read/write, and kinesthetic.¹⁰ Previously, research into instructional preference centered on visual, aural, and kinesthetic characteristics (VAK); however, Fleming subdivided the visual mode into visual (images) and text to create the fourth modal preference of read/write.^{10,11} The VARK theory allows for individuals who prefer more than one type of learning, known as multi-modal learners.¹⁰

Learning Style Scales

A range of scales have been developed to identify an individual's preferred style of learning, transforming learning theories into measurable, practical tools for health professions educators. The most frequently used tool in allied health literature is the Kolb *Learning Style Inventory* (LSI).^{5,7,12-16} In allied health literature, four other scales have been utilized for the identification of student learning style preferences: the *Learning Preference Inventory* (LPI), the *Myers-Briggs Type Indicator* (MBTI) which is used to identify personality type,^{17,18} and two other instruments identified in the literature are based on Kolb's Experiential Learning Cycle, both of which are called the *Learning Style Questionnaire* (LSQ).^{19,20} Few studies reviewed considered instructional preference exclusively; instead, the majority incorporated instructional preference into information processing style.

The tools that are utilised in this study are the Kolb LSI (version 3) and the VARK Questionnaire.^{8,10} Many studies in allied health have already utilised the Kolb LSI.^{5,7,12-16} The VARK Questionnaire is the most recently developed instrument measuring instructional preference exclusively. It was assumed that using the VARK Questionnaire to measure instructional preference as well as the Kolb LSI would provide key evidence supporting and/or contrasting with the modal preferences that Kolb assigned to his information processing learning styles.⁸

Learning Styles of Health Science Students

Previous investigators have suggested that students from specific professional groups have particular learning style preferences, and that learning styles have an impact on academic success and student performance during the completion of clinical fieldwork education placements.²¹ The key issue arising in studies investigating the relationship between learning style and academic success is a lack of consistency in defining academic success. Measures of academic success have included problem solving ability, clinical performance in fieldwork, grade point average (GPA) and completion of academic course.^{15,16,21,22}

In a study where the relationship between learning style and academic success was investigated, Katz reported a relationship between matched learning-teaching styles and problem solving ability when GPA and verbal ability of the students were controlled.⁵ Katz then reported that "this holds true only when higher order cognitive outcomes are considered and not for variables such as the achievement outcome, which is on a basic knowledge level."⁵ When academic success is defined as competence in recalling and understanding curriculum content, no evidence of a relationship between learning style and academic success was found. In light of these findings, the hypothesis that matching learning-teaching styles optimises student learning may in fact be incorrect.

The current body of literature postulates that presenting material in a range of styles requires students to adapt to the presenting situation, assisting in the development of students' preferred and non-preferred learning styles.²¹⁻²³ In health care, strengthening non-preferred learning styles is important to meet the demands of professional practice that require individuals to be conducive to learning in a variety of ways and from various information sources. This is demonstrated in evidence-based practice where practice methods change as knowledge is expanded. The continued demand on professionals to increase their knowledge base indicates that a key component of their education must be to learn how to learn, through both preferred and non-preferred methods.^{9,13,21,22}

In order to direct teaching to strengthen students' non-preferred learning styles, their preferred learning styles must be identified. Previous studies of allied health students and professionals have reported a range of learning style preference for the professional groups. Occupational therapy students have been identified as "accommodators" or "convergers."^{2,7,14,23} Both "accommodators" and "convergers" are characterised by a preference for the active experimentation phase of the learning cycle, having preferences at either end of the concrete-abstract continuum. As "accommodators," students are likely to prefer "hands-on" experience, and demonstrate strengths in using and working with others to solve problems. The "converging" learning style would favour abstract conceptualization. As "convergers," occupational therapy students would be likely to prefer dealing with practical problem solving rather than social and interpersonal issues.⁸

The most dominant style of physiotherapy students is also "converger" with "assimilator" being the second most dominant learning style.^{14,15,24,25} "Assimilators" favour the reflective observation and abstract conceptualization learning stages. They are likely to have a preference for abstract ideas and theory over working with people. In contrast to these findings, Kolb reports that physiotherapy students are predominantly "accommodators."² Kolb's findings are based on data that was obtained over 20 years ago. This may reflect the changing roles of health professionals, selection processes at universities, or previous exposure to different learning experiences.

Speech pathology students were represented in only one study found in the literature. McLeod and colleagues identified Australian speech pathology students predominantly as "reflectors," with "activists" as the second most dominant category.²⁶ The

categories of “reflector” and “activist” are from Honey and Mumford’s LSQ.²⁰ “Reflectors” are described as being thoughtful, expected to consider multiple perspectives before making conclusions. “Activists” are described as active and eager to experience new challenges. These are similar to the active-reflective continuum of Kolb’s experiential learning cycle, representing the possible existence of two distinct preferences of speech pathology students.

PURPOSE

The purpose of this study is to determine the preferred learning styles of three groups of undergraduate allied health students (occupational therapy, physiotherapy, and speech pathology), and to identify similarities and/or differences between the learning style preferences of occupational therapy, physiotherapy and speech pathology undergraduate students.

METHODS

Design

A cohort survey design using a convenience sample was used.

Participants

The participants of this study were first-year occupational therapy, physiotherapy, and speech pathology students enrolled in a Faculty of Health Sciences at an Australian university. Inclusion criteria for participants were being enrolled on a full time basis as a student in a health science program and consenting to take part in the study. The study was approved by the University Human Ethics Committee and informed consent was assumed for students returning completed surveys. Participation was voluntary and anonymous other than the program affiliation of the respondents.

Instrumentation

The *Kolb Learning Style Inventory (Version 3) (LSI)* and The *VARK Questionnaire* were used to measure individual learning styles.^{8,10} The participants also completed a demographic information sheet describing their age, gender and past educational experience.

The LSI is based on Kolb’s theory of experiential learning.^{2,8} It involves participants completing 12 questions that describe various learning contexts. Each question has four responses and participants are asked to rank these responses from which best describes their learning style (4) to which least describes them (1). Each potential response represents one of four learning phases of Kolb’s learning cycle: 1) concrete experience (CE), 2) reflective observation (RO), 3) abstract conceptualisation (AC), and 4) active experimentation (AE); and their responses indicate where their preference lies. The learning style results from a combination of these four approaches: converger, diverger, assimilator, and accommodator as summarised in Textbox 1.² The LSI is reported to be reliable with internal consistency and test-retest reliability.^{8,12,27} Its validity has been supported in many studies cross culturally in many countries.^{8,12,28}

Textbox 1: Kolb Learning Style Inventory^{8,12}

CONVERGER (AC and AE). Prefers practical application of ideas, are relatively unemotional preferring to deal with things rather than people.

DIVERGER (CE and RO). Have imagination and the ability to view concrete situations from many perspectives. Enjoys generating ideas and can be emotional.

ASSIMILATOR (AC and RO). Enjoys reasoning and the development of theoretical models. Is concerned with abstract concepts, but is less concerned with the practical use of theories.

ACCOMMODATOR (CE and AE). Prefers doing, risk taking and seeking new experiences and can adapt to specific immediate circumstances with little reliance on theory. Enjoys working with people but can be impatient.

The VARK Questionnaire generates a profile of participants’ learning preferences and measures the preferred way of gathering and utilising information through Visual, Aural, Read/Write and Kinesthetic means.¹⁰ The VARK Questionnaire was developed in New Zealand and consists of 13 questions. Participants are asked to choose from four responses that best represents their way of learning. More than one response can be selected if appropriate, or can be left blank if no responses apply. The number of responses selected corresponding to the different learning modalities is totalled and significance of differences is calculated to determine learning preference which may be uni-modal (single preference), bi-modal (two preferences), tri-modal (three preferences), or multi-modal if all four modes are preferred. The VARK Questionnaire has established reliability and validity and has been used with nursing students previously.^{10,11}

Procedures: Questionnaires were distributed to the physiotherapy and speech pathology student groups during the first week of the academic year and during the second week to occupational therapy students by a research assistant at the end of a scheduled lecture. Students were asked to complete the questionnaires, and the completed questionnaires were placed in a box

at the exit of the lecture theatre. Students were not allowed to take the questionnaires home and complete them. The data collection was completed at the beginning of the academic year for two reasons. First, since the study was investigating the learning styles of the individuals and the impact of this on professional education, surveying students at the beginning of their academic course meant that they had not already been exposed to teaching methods of the different professions that may influence their method of learning. Second, it was anticipated that a maximal response rate could be generated at the beginning of the academic year.

Data Management and Analysis: The demographic questionnaire, Kolb LSI, and VARK Questionnaire data was entered onto a SPSS database. Descriptive statistics were calculated for the demographic questionnaire, Kolb LSI, and VARK Questionnaire data. The learning style and learning preference data for the three student groups were compared using ANOVA and t-tests. Pearson's R correlations were calculated between the four VARK Questionnaire subscales (V, A, R, K) and four Kolb LSI subscales (CE, AC, AE, RO).

RESULTS

Questionnaires were distributed to 325 first-year occupational therapy (N=120), physiotherapy (N=120) and speech pathology (N=85) students. The response rate was 67% with a total of 218 completed surveys returned. The specific response rates were 116/120 occupational therapy, 60/120 physiotherapy, and 42/85 speech pathology students. Response rates were considered acceptable, though the percentage completing the instruments by profession was substantially higher for the occupational therapy students (97%) than either physiotherapy (50%) or speech pathology (49%).

Demographic data is presented in Table 1. The majority of respondents were between 17-21 years of age and female.

Raw scores were used to identify learning style or modal categories, and mean scores for subscales of the Kolb LSI and VARK Questionnaire are reported in Table 2. The two dominant learning style preferences for the occupational therapy student group as determined by the Kolb LSI were "diverging" (30.2%) and "converging" (28.4%). However, as shown in Figure 1, preferences were spread over all four learning styles ("accommodating" 19.0%, "assimilating" 22.4%).

Dominant instructional preference as measured by the VARK Questionnaire was kinesthetic learning (33%), followed by the multi-modal preference VARK (18.1%). Visual and aural categories that were either uni-modal, bi-modal, or tri-modal were the least preferred methods of learning indicated by occupational therapy students. Figure 2 illustrates the entire spread of VARK results.

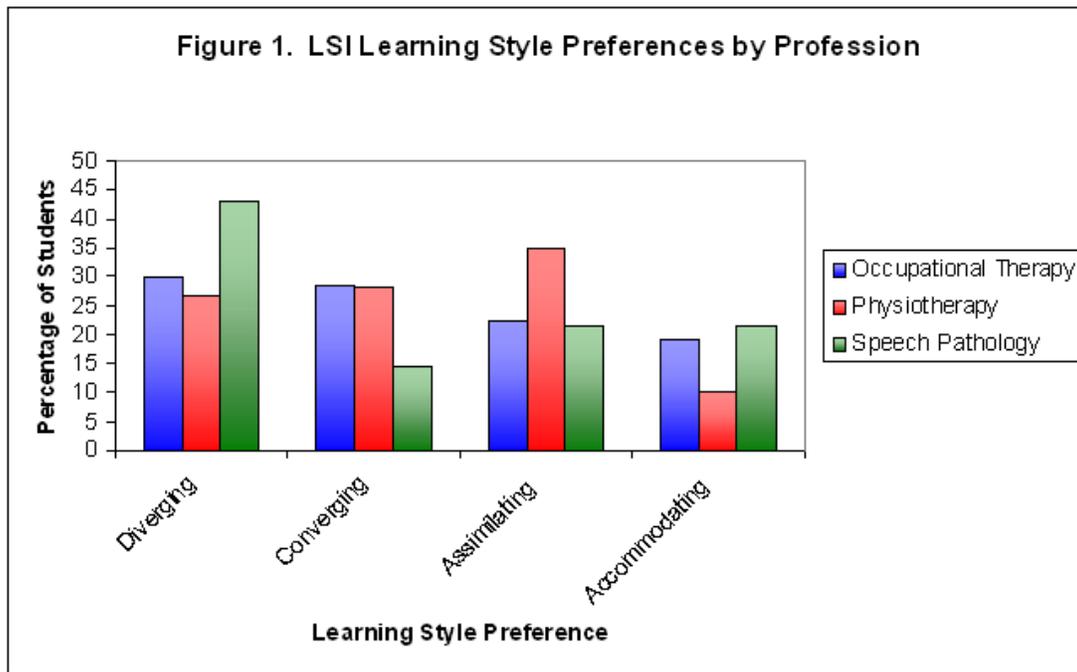
Table 1. Demographic information for the student professional groups

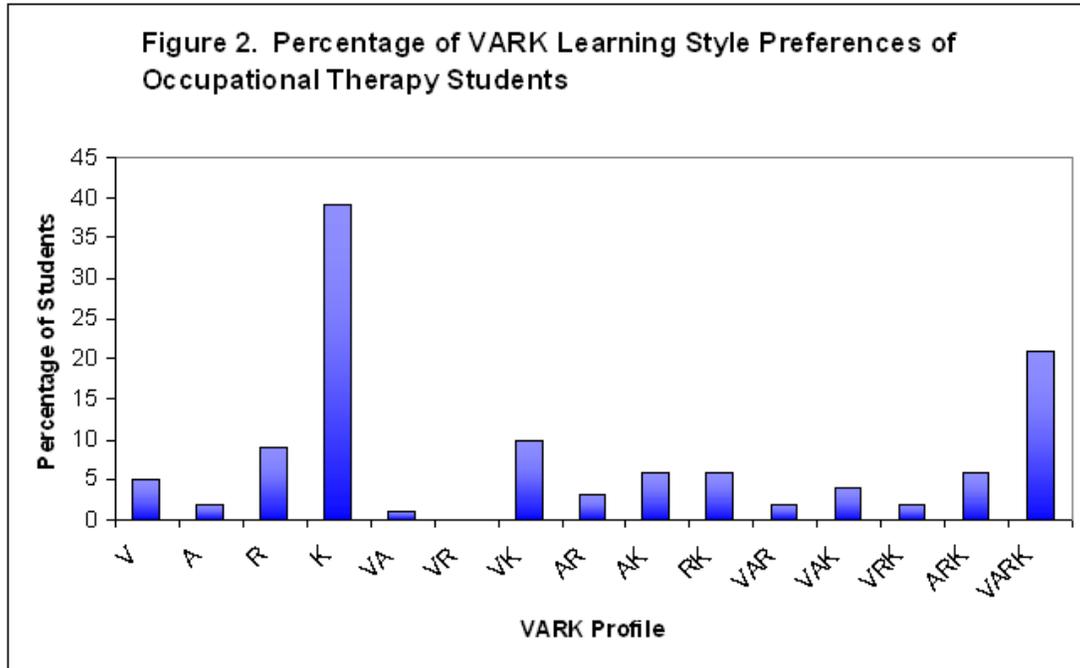
	Occupational Therapy (N=116)	Physiotherapy (N=60)	Speech pathology (N=42)
Age			
17-21 years	109	57	38
22-26 years	5	2	2
27-31 years	2	1	
32-36 years			
37-41 years			1
41 years & older			1
Gender			
Male	9	15	2
Female	107	45	40

Table 2. Mean scores for subscales of the KOLB LSI and VARK questionnaires

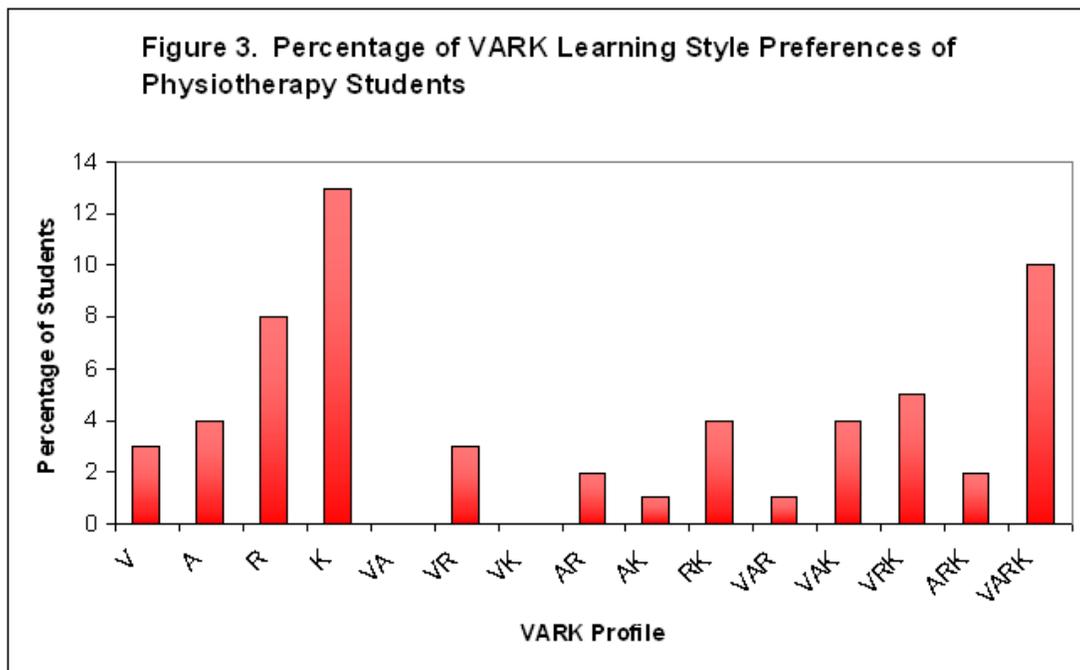
Table 2. Mean scores for subscales of the KOLB LSI and VARK questionnaires	Occupational Therapy (N=116)	Physiotherapy (N=60)	Speech pathology (N=42)
	Mean Score (SD)	Mean Score (SD)	Mean Score (SD)
LSI			
CE	27.38 (7.4)	26.50 (9.2)	28.69 (8.0)
AC	30.56 (6.2)	32.02 (6.8)	28.67 (6.9)
AE	32.26 (7.9)	31.93 (6.6)	31.24 (8.4)
RO	30.16 (8.4)	29.53 (7.0)	31.43 (6.7)
VARK			
V	3.32 (1.8)	2.97 (1.6)	2.71 (1.6)
A	3.14 (1.8)	2.95 (1.7)	3.26 (1.7)
R	3.26 (2.3)	3.53 (2.0)	3.67 (2.1)
K	5.29 (5.3)	4.23 (4.2)	4.64 (1.7)

Note: LSI: Learning Styles Inventory
 CE: concrete experience
 AC: abstract conceptualisation
 AE: active experimentation
 RO: reflective observation
 V: visual
 A: aural
 R: reading/writing
 K: kinaesthetic



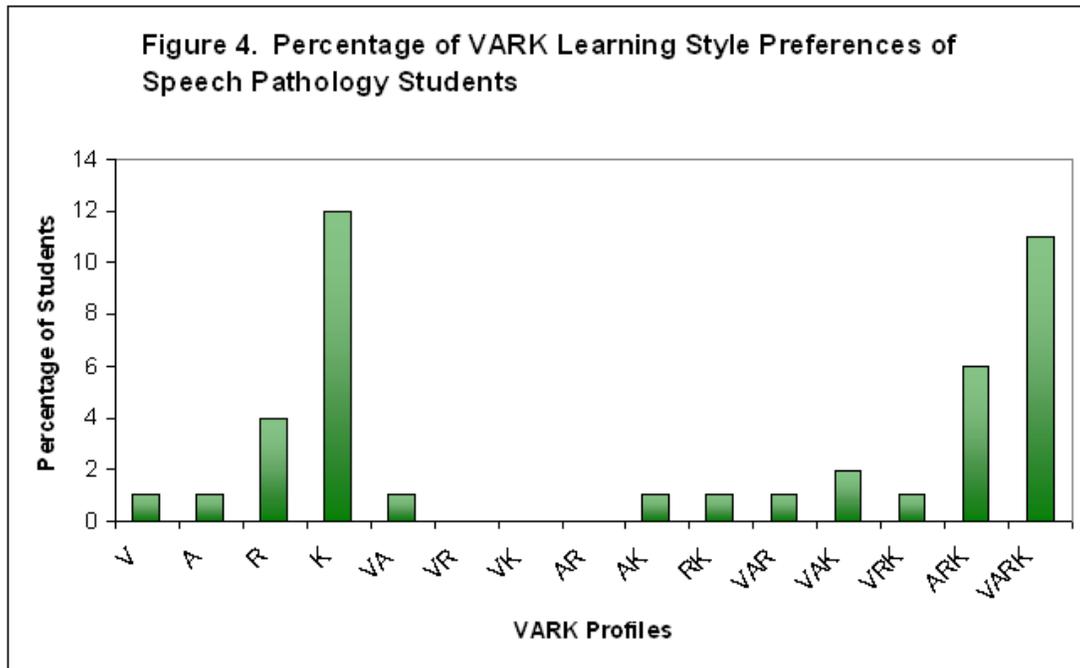


Physiotherapy students displayed a different trend in information processing learning style preference as measured by the Kolb LSI compared to occupational therapy students, with 35% preferring the “assimilating” style. Similar to occupational therapy students the “accommodating” style was the least preferred learning style among physiotherapy students (10%), as shown in Figure 1. Figure 3 illustrates physiotherapy student results. Physiotherapy students were also similar to occupational therapy students in their instructional preference, with 21.7% preferring kinesthetic learning, and the second most dominant instructional preference being the multi-modal VARK preference (16.7%).



Speech pathology students had the most well defined preferred Kolb LSI learning style preference, with 42.5% of students preferring the “diverging” style, as shown in Figure 1. The “accommodating” and “assimilating” styles were each preferred by

21.4% of students. "Accommodators" are more prevalent among speech pathology students than in either occupational therapy or physiotherapy student groups when comparing percentage frequencies. The instructional preferences for speech pathology students were similar to occupational therapy and physiotherapy students, with kinesthetic learning and the multi-modal VARK preference being the most dominant choices indicated (28.6% and 26.2% respectively), as represented in Figure 4.



The comparison between the three student groups was performed using a one-way analysis of variance (ANOVA) to detect if significant differences existed. *T*-tests were performed to determine between which student groups the differences existed. Table 3 summarises and compares the LSI subscales (CE, AC, AE and RO), indicating only one significant difference at the .05 significance level. Physiotherapy students (mean = 32.02) scored higher on the AC subscale than speech pathology students (mean = 28.67) which was significant through *t*-test calculations, $t(100) = 2.45$, $p = 0.04$. When considering the VARK Questionnaire preferences, the only difference that reached significance was between occupational therapy and physiotherapy students on the Kinesthetic subscale, $t(174) = 3.18$, $p = 0.00$. This can be observed in the mean values of kinesthetic responses by occupational therapy students (mean = 5.29) and physiotherapy students (mean = 4.23).

Table 3. One-way ANOVA of subscales of KOLB LSI and VARK questionnaires between student professional groups

	Df	Mean Square	F	Sig.	Effect Size
LSI					
CE	2	59.29	0.92	0.40	0.09
AC	2	138.79	3.30	0.04*	0.17
AE	2	16.12	0.28	0.76	0.05
RO	2	45.05	0.75	0.47	0.08
VARK					
V	2	6.44	2.25	0.11	0.14
A	2	1.30	0.43	0.65	0.06
R	2	3.17	0.68	0.51	0.08
K	2	23.62	5.76	0.00*	0.23

Note: LSI: Learning Styles Inventory

CE: concrete experience

AC: abstract conceptualisation

AE: active experimentation

RO: reflective observation

V: visual

A: aural

R: reading/writing

K: kinaesthetic

Pearson's correlations between the four VARK Questionnaire subscales (V, A, R, K) and four Kolb LSI subscales (CE, AC, AE, RO) ranged from -0.08 to 0.01. Weak correlations between subscales indicate little or no relationship,²⁹ with none reaching the specified 0.05 significance level. Subscales within each inventory were also analysed for correlations. Upon reviewing the correlation analysis results within instruments, the following variables were significantly correlated with each other based on their p value being at the 0.05 level. Within the VARK Questionnaire, significant negative correlations were observed between the Visual and Read/Write subscales ($r = -0.22$, $p = 0.001$), Aural and Kinesthetic subscales ($r = -0.18$, $p = 0.01$), and the Read/Write and Kinesthetic subscales ($r = -0.33$, $p = 0.00$). Within the Kolb LSI were negative correlations between CE and AC ($r = -0.51$, $p = 0.00$), CE and AE ($r = -0.46$, $p = 0.00$), CE and RO ($r = -0.16$, $p = 0.02$), AC and RO ($r = -0.25$, $p = 0.00$), AE and RO ($r = -0.47$, $p = 0.00$).

DISCUSSION

The demographics of this sample group are similar to those described in previous studies.^{7,15,25} The number of females was at least three times that of males in all three student groups which is representative of the proportion of males and females currently enrolled in each professional course. Participant age was not reported in most previous studies and those who did report ages used the data of students in different year levels.^{7,15,25} Wessel and Williams reported the average age of first-year physiotherapy students as 24.4 years.²⁵ Categorical data collection did not allow for calculation of average age in this study; however, the majority of students (93.5%) were aged between 17 and 21 years. The sample size of each student group in the current study was greater than those identified in the literature with the exception of longitudinal studies or studies utilising a multi-year level sample group.^{7,15}

The Kolb LSI results of the current study revealed that all four information processing learning styles are represented in each student group.⁸ Physiotherapy and speech pathology students' results indicated one dominant learning style type each, "assimilator" and "diverger" respectively, and occupational therapy students' results indicated two dominant learning style types, "converger" and "diverger." A "converger" prefers active experimentation and abstract conceptualisation.⁸ Characteristics of a "diverger" are described as being imaginative and understanding people with a preference for concrete experiences and reflective observation. The "converger" and "accommodator" preferences have been acknowledged as the dominant learning styles of occupational therapy students in previous research.^{2,7,14,23} Both "accommodators" and "convergers" are characterized by a preference for the active experimentation phase of the learning cycle, having preferences at either end of the concrete-abstract continuum. As "accommodators," students are likely to prefer hands-on experience, and demonstrate strengths in using and working with others to solve problems.⁸ This reflects some of the learning experiences that occupational therapy students often encounter while completing clinical fieldwork education placements and practical skills classes taught as part of students' academic learning.

In contrast to previous research, the current study found “accommodator” to be the least dominant learning style for occupational therapy students.^{2,14,23} The method by which the results were obtained may account for the differences observed. The current study determines learning style preference for all students individually, however previous studies used mean subscale raw scores (CE, AE, AC and RO) to identify an overall learning style preference.^{2,14} The results of the current study were recalculated in this manner to adjust for potential bias, but the same dominant learning style emerged.

Geography may be a determinant in contrasting study results as different educational systems and requirements between countries may favour one learning style over another.³⁰ Although several studies completed in the United States have been reported,^{7,13,14,16,23,24} no other Australian studies have been identified that determine the learning style preference of occupational therapy students.

Kolb LSI results of first-year physiotherapy students in the current study indicated one dominant learning style preference.⁸ Over one third of the physiotherapy students prefer the “assimilating” learning style. This implies a preference for theoretical problem solving and abstract concepts. “Assimilating” has previously been reported as the learning style preference of physiotherapy students and physiotherapy practitioners.^{14,15,25} Previous studies examining physiotherapy students also reported the “converging” style as being dominant.^{14,15,23,25} In this study, however, the “converging” style only emerged as dominant when considering physiotherapy students who had selected physiotherapy as their first preference for university baccalaureate level study. This difference encourages new dialogue regarding the correlation between learning styles of individuals and career choice.

The least dominant learning style of physiotherapy students in the current study was “accommodating.” This is in contrast to Kolb who reported “accommodating” as the dominant learning style of both physiotherapy and occupational therapy students.² These discrepancies may be due to the time and location of studies, and score calculation methods as has previously been hypothesised in relation to results of an occupational therapy student cohort.

The “diverging” Kolb LSI category was the most dominant learning style preference of speech pathology students in the current study. Only one study was found that investigated the learning style preferences of speech pathology students McLeod et al used the LSQ to identify Australian speech pathology students as “reflectors” or “activists.”²⁶ The ‘reflector’ category shares some characteristics with Kolb’s “diverger,” as a “diverger” combines both reflective observation and concrete experience. “Activists” are considered the polar opposite of “reflectors” by Kolb on the active-reflective continuum, indicating a discrepancy between findings of McLeod et al. and the current study. This may be indicative of a theoretical discrepancy between the two inventories.

The VARK Questionnaire results were also similar for the three student groups. There was a significant difference between occupational therapy and physiotherapy students on the kinesthetic subscale. Although occupational therapy students preferred kinesthetic learning more than the physiotherapy students, all three student groups preferred kinesthetic and multi-modal instructional preference, indicating a partiality for learning through practice or simulations.

The current study identified very few significant differences in learning style preferences of occupational therapy, physiotherapy, and speech pathology students. This result may indicate similar learning styles for all health profession students. Results obtained using the Kolb LSI indicated no significant differences between occupational therapy and physiotherapy students, nor occupational therapy and speech pathology students’ learning style preferences.⁸ In contrast, physiotherapy students preferred learning in a way that is significantly more abstract than speech pathology students. One significant difference was found within the VARK Questionnaire subscales, where occupational therapy students preferred kinesthetic learning more than physiotherapy students.¹⁰ Previous studies investigating the learning style preferences of students from more than one profession also identified different learning style preferences for each student group, however the learning style preferences identified varies between the studies.^{14,23}

Each student group consisted of a range of learning styles, indicating that even less prevalent learning styles must be accommodated within each student group. It must also be noted that the strength of an individual’s preference is not indicated in Kolb LSI results because of the categorical nature of the instrument. It may be in fact that all students fall close to the center of the grid when plotted on the concrete-abstract and active-reflective axes. Previous studies also acknowledged a range of learning style preferences in each student group.^{7,14,15,23,25,26}

Limitations of the study include small sample size, a sample limited to one educational setting with implications for the generalisation of results to other participant groups and non-compulsory survey completion. Claims cannot be made about the influence of learning styles on the academic success of participants in their educational program as this data was not obtainable since students had just started in their professional program. As well, the occupational therapy group had a higher response rate compared to the physiotherapy student and speech therapy student groups. This could have led to a slight bias in the results due to a larger sample size.

Possible bias from course curriculum and fieldwork placements was minimized by sampling students at the beginning of their university undergraduate studies. We have uniquely considered information processing and instructional preference, providing further evidence for the existence of two distinct layers of learning styles. Lastly, this study further highlights the need to explore motivators that direct study and career choices amongst students.

In the theoretical literature, it is postulated that presenting material in a range of styles requires students to adapt to the presenting situation, assisting in the development of students' preferred and non-preferred learning styles.²¹⁻²³ In healthcare, strengthening non-preferred learning styles is important to meet the demands of professional practice that require individuals to be adaptive for learning in a variety of ways and from various information sources. This is demonstrated in evidence-based practice where practice methods change as knowledge becomes redundant and is replaced. The continued demand on professionals to update knowledge and skills through lifelong learning strategies indicates that a key component of their education must be to learn how to learn through both preferred and non-preferred methods.^{9,27,30}

CONCLUSION

Gaining knowledge and insight into the learning style preferences among allied health students may result in improved methods of teaching students to optimise their learning experiences in general. This study provides pertinent information regarding the range of learning styles reported by three allied health profession student groups. Although a consistent learning profile of occupational therapy, physiotherapy, and speech pathology students cannot be determined from this study, the findings suggest that each profession attracts students with a range of learning styles. This study highlights the need to investigate correlations between learning styles, instructional methods used, and academic performance of students in the health professions.

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