Exploring Content Knowledge Mastery Among Form Six Sports Science Students: A Case Study in Petaling Perdana District, Selangor.

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ABSTRACT

This study examines the mastery of basic sports science content knowledge among Form Six students in a college in Section 24, Shah Alam, Petaling Perdana District, Selangor, with a focus on gender differences. Student selection for the sports science stream is self-determined, without teacher-driven criteria. The study aimed to assess the initial knowledge level of new entrants. A sample of 21 students (8 males, 13 females) was selected using simple random sampling. Data collection used a multiple-choice Sports Science Basic Content Knowledge test covering four areas: Introduction to Sports Science, Anatomy and Physiology, Physical Fitness, and Sports Coaching. The instrument's content validity was r = .93, and its difficulty index was d = .60. Descriptive analysis showed that 62.5% of male students achieved a very good level, while 32.5% were at a good level. Among female students, 7.7% reached a very good level, 53.8% a good level, and 38.5% a moderate level. An independent t-test revealed a significant difference between male and female students' knowledge levels, $t(49) = 3.153$, $p = .003$. Male students had higher average scores ($M = 45.33$, $SD = 7.51$) compared to female students ($M = 37.68$, $SD = 9.42$). These findings highlight the importance of assessing students' foundational sports science knowledge before they enter the Form Six stream, helping teachers better support student development.

Keywords: content knowledge, Form Six, sports science, cognitive assessment

INTRODUCTION

Various advancements in the field of education can be achieved through improvements in academic achievement and reduction in learning dropout rates at all levels of education (Junaidy Mohamad Hashim, Syed Ahmad Ezahar Syed Ambon, Mohd Faze Md Nor, & Saidil Mazlan Abdul Razak, 2017). These achievements include students' ability to continue their studies at the Form Six level. The education level at Form Six represents a continuation of learning within the highest schooling system in Malaysia after students have completed the Sijil Pelajaran Malaysia (SPM) based on the established criteria (Ministry of Education Malaysia, 2015). In Form Six, the schooling process lasts for a year and a half, divided into three terms. The first term begins between May and November. The second term starts the following year, from January to May, while the third term starts from June to November. The Ministry of Education Malaysia (KPM) only issues offer letters to SPM graduates who are eligible to continue their studies at the Form Six level in two main streams, namely the Science stream and the Social Science stream.

The subject of Sports Science was introduced in Form Six education in 2005 and incorporated into the Malaysian Higher School Certificate (STPM) examination in 2006. In 2012, the curriculum was amended to enhance the quality and learning requirements for students taking this subject through the modular system. The

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Sports science is a field of study that applies scientific disciplines to understanding human movement in physical activities or sports. Today, sports science has become part of the national education curriculum, offered to students or athletes interested in improving their knowledge and performance in sports (Julismah Jani, Ong Kuan Boon, Mohd Sani Madon, Hishamuddin Ahmad, Nur Haziyanti Mohamad Khalid, and Yusof Ahmad, 2010). For Form Six students who choose the subject of sports science, they will be exposed to various disciplines within sports science. This includes sports sociology, sports management, leisure and recreation, and sports nutrition in semester 1. In semester 2, they will be involved in disciplines such as anatomy and physiology, physical fitness, and wellness. Meanwhile, in semester 3, students will delve into disciplines like sports psychology, sports coaching, motor skills, and sports injuries (Malaysian Examination Council, 2024).

According to Norlena Salamuddin and Mohd Taib Harun, (2003), students who wish to pursue studies in the field of sports science need to master the content knowledge of the sports science subject first. Content knowledge refers to the mastery of disciplines that encompass subjects in sports science such as physical fitness, anatomy and physiology, and several other disciplines as mentioned above. The physical education subjects studied by students in schools encompass the following 8 aspects: motor development, kinesiological anatomy, biomechanics, exercise physiology, health, sports pedagogy, sports psychology, and motor development and control (Lawson & Placek, 1996). However, although not explicitly stated in detail, it is evident that these disciplines have been integrated into the physical education and health education curriculum in Malaysia (Curriculum Development Center, 2024). The emphasis placed on physical education subjects only during school raises questions, as these subjects lack central-level measurement, testing, and assessment processes. If testing processes were implemented, they might only exist in certain schools, as there is no established rigorous cognitive measurement process.

BACKGROUND/PREVIOUS STUDIES

New students entering Form Six will be given the opportunity to choose their stream based on their own interests without having to go through any formal selection process. This means they can choose the field they are interested in without being subject to any predefined selection mechanisms. According to Hanifah Mahat, Paulin Chang Poh Ling, Nasir Nayan, Mohmadisa Hashim, and Yazid Saleh (2017), interest does not show a significant relationship with students' achievements. Even though students may have an interest in a particular subject, this does not necessarily impact on their academic performance.

The study by Tan Peng Jeng (2006) indicates that students who took the Sports Science Knowledge subject in Form Four only achieved a passing grade. Researchers used end-of-year questionnaires to assess the students' performance. Based on the study conducted in one out of two Form Six Colleges in the Petaling Perdana District Selagor State, a total of 148 Sports Science students took the subject between 2013 and 2015. Of this number, only 13 students, approximately 7.7%, successfully continued their studies in the field of Sports Science at local universities.

The Form Six Sports Science subject involves a curriculum that includes physical activities and content that applies scientific discipline (Malaysian Examination Council, 2024). This discipline can be challenging for students who have limited foundation in sports science. Although this subject is a continuation of learning from the SPM level, which covers basic sports science knowledge, at the Form Six level, the choice of this subject is open to all students, regardless of whether they have a foundation in the field or not. The decision to take this subject depends on the school's decision whether to offer it or not. At present, there are no specific requirements imposed on students who wish to take this subject.

Therefore, the researchers intend to examine the achievement of students in the subject of sports science to assess their mastery level of basic sports science knowledge before they delve deeper into their studies. According to Nik Mohd Rahimi Nik Yusoff, Nurulhuda Hasan, and Mahat Afifi (2012), students aspiring to

pursue higher education must first grasp the content knowledge. At the college level, the division of classes or subject packages is determined. Various methods are introduced by each college to determine the classes or subject packages in Form Six. Among them, students are given the option based on their interests to choose the subject package they will study throughout Form Six. At present, there is no fixed mechanism in place for students to select the packages provided. The researchers aims to assess students' achievements in the field of sports science to determine the extent of their mastery of fundamental knowledge before progressing to deeper learning. According to Nik Mohd Rahimi Nik Yusoff, Nurulhuda Hasan, and Mahat Afifi (2012), students aspiring to pursue higher levels of education need to have a solid understanding of foundational content knowledge beforehand.

At the school level, the division of classes or subject packages has been determined. Various methods have been introduced by each school to determine classes or packages in Form Six. One of them is to provide students with the option to choose subject packages based on their interests to study throughout their time in Form Six. However, at present, there is no fixed mechanism for selecting students for the packages provided. According to Hanifah Mahat, Paulin Chang Poh Ling, Nasir Nayan, Mohmadisa Hashim, and Yazid Saleh (2017), students who do not have a positive attitude towards a particular subject may face difficulties in achieving success in that subject. Therefore, researchers strive to assess the level of achievement of students who choose sports science classes or packages in Form Six, considering this factor. Is it appropriate to develop a new mechanism to better assess students' levels before they pursue fields they are interested in.

Objective

Identifying the level of mastery of basic knowledge in sports science content among Form Six sports science students in Shah Alam, Petaling Perdana District, Selangor.

METHODOLOGY

Research Design

This quantitative study is in the form of a descriptive survey. This type of study allows the researcher to obtain information directly from respondents quickly (Ghazali Darusalam & Sufean Hussin, 2016; Chua Yan Piaw, 2006; Sabitha Marican, 2006). The study was conducted to assess the level of mastery of basic content in Sports Science among Form Six Sports Science College students. This study utilized a multiple-choice objective question instrument that was validated by a panel of ten appointed experts.

Population And Sampling

Population consists of a group of individuals, families, groups, organizations, communities, events that are studied by researchers (Sabitha Marican, 2022). Whereas a sample is a part of the population that is studied by researchers (Chua Yan Piaw, 2006). The population in this study consists of all Form Six sports science students who are new to schools offering the subject. Colleges offering sports science subjects at Form Six in the Petaling Perdana District, Selangor State, comprise only four Colleges with a total of 100 sports science students. The researcher used simple random sampling method to determine the study sample (Chua Yan Piaw, 2006; Sabitha Marican, 2006). The researcher selected a sample from one of the six schools in Kedah which had 21 students. According to Ghazali Darusalam and Sufean Hussin (2016), if the population is large, 10% is considered as the sample size, but if the population is small, 20% is taken as the sample size. Therefore, in this study, the researcher selected a sample from a randomly chosen school, comprising 8 male students and 13 female students. Refer to Table 1.

Table 1: Number of Form Six Sports Science student samples based on gender in College Form Six Shah Alam Petaling Perdana, Selangor.

Gender	Number of students (n)
Male	8

Female	13
Total	**21**

Instruments

The researcher used an assessment instrument for basic sports science content knowledge developed based on the objectives and curriculum of the sports science subject, and its content validity has been verified by field experts. This instrument consists of multiple-choice objective questions (Lacy, 2011; Baumgartner, Jackson, Mahar, & Rowe, 2007; Bhasah Abu Bakar, 2006). The instrument will be used to measure the cognitive level of new students who choose sports science subjects in Form Six. This instrument consists of 40 multiple-choice questions divided into four main areas: introduction to sports science, anatomy and physiology, physical fitness, and sports coaching. The content validity of this instrument has been confirmed by ten experts in the field of sports science, with an average validity coefficient of r = .93. According to Ahmad Hashim (2004: 2015), the reliability of a written test depends on the content of teaching materials and units within the teaching objectives. The reliability value of this instrument using Kuder Richardson (KR21) analysis is r = .65. The researcher has analyzed the difficulty index for the overall average of 40 questions and found d = .60. According to Lacy (2011) and Baumgartner, Jackson, Mahar, and Rowe (2007), this difficulty index refers to the level of students' ability to correctly answer questions. Based on the findings of the difficulty index, this instrument is obtained at a good level, meaning it is neither too easy nor too difficult, with values between .25 and .75 (Lacy, 2011; Baumgartner, Jackson, Mahar, & Rowe, 2007). The researcher administered this instrument to students at the beginning of the first semester, while they were registering and in the process of selecting sports science classes.

FINDINGS AND DISCUSSION

The researcher utilized descriptive statistical analysis, leveraging minimum values and standard deviations to comprehensively analyze the data. The determination of grades or levels was based on guidelines found in the book "Motor Fitness Measurement" by Ahmad Hashim, (2004), and "Efficient Data Analysis Guide" by Ahmad Hashim, (2014).

ANALYSIS OF RESEARCH FINDINGS

Table 2 Descriptive analysis of the level of basic knowledge of sports science content overall among Form Six sports science students in Shah Alam, Petaling Perdana District, Selangor.

Gender	**(n)**	**Min**	**SD**
Male	8	44.00	5.58
Female	13	33.23	7.42

Table 2 shows the results of descriptive statistical analysis for the mastery of basic knowledge of sports science content overall for male and female Form Six sports science students at Shah Alam Sixth Form College in the Petaling Perdana District, Selangor state. This mastery level is assessed using a grading method based on mean and standard deviation (Ahmad Hashim, p. 77, 2004; p. 16, 2014). The minimum score for the basic knowledge level of sports science content for 8 male students is 44.00 with a standard deviation of 5.58. Meanwhile, the minimum score for 13 female students is 33.23 with a standard deviation of 7.42.

Table 3 Overall mastery level of basic content knowledge based on gender

Norm	Level	Gender			
		Male		Female	
		n	%	n	%
54 and aboves	Excellence	0	0	0	0

45 – 53	Very good	5	62.5	1	7.7
32 – 44	Good	3	32.5	7	53.8
22 – 31	Moderate	0	0	5	38.5
21 and below are weak		0	0	0	0
Total		8	100	13	100

Table 3 shows the overall mastery level of basic content knowledge of Sports Science for male students evaluated using norms generated by researchers. The analysis indicates that among Form Six male Sports Science students at Shah Alam Sixth Form College in the Petaling Perdana District, Selangor, there are 3 students or 32.5% at a good level. 5 students are at a very good level, representing 62.5%. No male student has reached an excellent level. Additionally, there are no students at weak or moderate levels. The overall mastery of basic content knowledge of Sports Science for male students at a good to very good level is 100%.

For female students, no student achieved an excellent level. One student among the sample was at a very good level, representing 7.7%. The good level was represented by 7 students or 53.8%, while 5 students or 38.5% represented the moderate level. There were no students at the weak level.

The analysis shows that 8 female Sports Science students mastered the content knowledge from good to very good level, which is 61.5% of the total sample size. This is compared to 5 female students who mastered the basic content knowledge at the moderate level.

Table 4 Independent samples t-test inference analysis between male and female students.

Gender	**(n)**	**Min**	**SD**
Male	8	44.00	5.58
Female	13	33.23	7.42

		Levene's Test for Equality of Variances		Minimum equation for t-test	
	f	Sig	t	df	Sig. (2 Tailed)
Basic content knowledge of sports science	1.150	.297	3.525	19	.002

Table 4 shows the results of an independent samples t-test inference analysis between male and female students in the level of achievement of basic content knowledge in sports science overall. An independent samples t-test analysis was used to compare the minimum scores of the level of achievement of basic content knowledge in sports science overall between male and female Form Six sports science students. The test yielded a t-value of (49) = 3.153, $p = .003$, where $p < 0.05$ is significant. The test results indicate a significant difference in the level of achievement of basic content knowledge in sports science overall between male students ($M = 45.33$, $SD = 7.51$) and female Form Six sports science students ($M = 37.68$, $SD = 9.42$).

DISCUSSION

The research findings indicate that many students, both male and female, are still at a good level. Not a single student, whether male or female, has achieved an excellent level. These findings align with a study conducted by Junaidy Mohamad Hashim (2014), which demonstrates a significant difference between male and female trainee teachers in the Physical Education major at the Teacher Training Institute regarding the mastery of sports science content. The study also shows that gender factors influence students' preparedness levels for content knowledge based on their intelligence. Students who choose to pursue studies in sports science need to make careful preparations and arrangements from an academic perspective. The education system in Form Six

is significantly different compared to mainstream education. This study indicates that good early preparation is the key factor in producing quality and effective learning processes. Research findings confirm that early preparation and good planning are the keys to achieving objectives and goals and can enhance quality.

Before students are given the option to choose fields they are interested in within the courses or packages provided in Form Six, mastery of this content knowledge needs to be emphasized early on. A good mastery of content will ease students' grasp of related knowledge in greater depth. Coinciding with Nik Mohd Rahimi Nik Yusoff, Nurulhuda Hasan, and Mahat Afifi (2012), who explained that students need to master this content knowledge before continuing their studies to higher levels so that their mastery becomes better and more profound. Emphasis on the use of examinations as a tool to select students for sports science courses needs to be implemented to motivate students to always be prepared before making choices regarding the majors they want to pursue in Form Six studies. This selection process can also produce quality students, which is a mechanism that has not been utilized by any schools in the country. Therefore, it is appropriate for the Ministry of Education Malaysia (MOE) through the Malaysian Examinations Council or the School Division to enforce this mechanism so that students in Form Six can focus more on fields that are suitable for their interests and abilities.

CONCLUSION

The important information regarding the level of achievement of basic content knowledge among Form Six sports science students in Form Six College Shah Alam in Petaling Perdana district Selangor has been generated by this entire study. Based on the findings of this study, the researcher suggests that the basic sports science content knowledge assessment and achievement standards can be utilized as guidance for teachers in Form Six Colleges, especially those offering sports science subjects in Petaling Perdana district Selangor, as an initiative to assist students in making appropriate choices for themselves. Assessment of basic content knowledge among Form Six sports science students has never been conducted in this country. This study is a step towards ensuring the ability of students who choose this field in Form Six to master the basic content knowledge related to sports science subjects. Mastery of this knowledge will assist students in pursuing their studies more effectively during Form Six and subsequently at higher levels. This step aligns with the views of Tang Keow Ngang and Tham Yoke Mei (2015), who stated that through learning in Form Six, we can produce quality university students who are independent, competent, and ready to face challenges in Higher Education Institutions.

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