

Prevalence and Factors Associated with Learning Difficulties among University Students in Sarawak, Malaysia

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ABSTRACT

Background: University students must learn rapidly and handle complex academic concepts, making it crucial to understand the prevalence of learning difficulties in this population. This study determines the prevalence and factors associated with learning difficulties among university students.

Methods: This cross-sectional correlation study was conducted at Universiti Malaysia Sarawak and involved 546 undergraduate students using self-administered questionnaires. IBM SPSS version 28 was used for descriptive and multivariate analysis.

Results: The most common difficulties were in expression (33.3%) and general study (34.0%). Age positively correlated with all difficulties, while gender effects were statistically insignificant ($p > .05$). A positive attitude significantly reduced reading, writing, and calculation difficulties ($p < .001$), whereas a negative attitude increased expression and general study difficulties ($p < .001$). Individual factors notably affected the expression and general study, teacher-related factors impacted reading, writing, and calculation, and environmental factors increased difficulties across all domains ($p < .001$). Better previous academic performance was associated with fewer difficulties ($p < .05$).

Conclusion: The study recommends strategies to improve student attitudes, address individual, teacher-related, and environmental factors, and promote academic performance. Future research should explore different educational systems and the role of gender in learning difficulties.

Keywords: Attitude, Learning difficulties, Contributing factors, University

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INTRODUCTION

Learning difficulties among higher education students are increasingly concerning and have been extensively studied.¹ These challenges span multiple areas, including reading, writing, expression, and calculation², and are often rooted in complex factors involving students, educational settings, and educators³. Such difficulties can lead to poor academic achievement, elevated stress, and a higher likelihood of early school dropout.

Globally, the prevalence of learning difficulties varies. According to the DSM-5, learning disorders, including challenges in writing, reading, and calculation, affect between 5% and 15% of people worldwide.⁴ Most special education services in the USA target children with these issues.⁵ In Arab countries, approximately 15% of students experience learning difficulties⁶, while in the U.K., about 1.5 million people, or 2.16% of the population, have a learning disability⁷. In India, impairments in reading, written expression, and mathematics are reported at 12.57%, 15.6%, and 9.93%, respectively.⁸ Malaysia saw an increasing trend in learning disabilities among Year 3 schoolchildren from 2013 to 2016, followed by a decline.⁹

Learning disabilities often persist into adulthood, affecting various life aspects, including academic performance, work, and daily activities.¹⁰ Globally, nearly 240 million children with disabilities face educational and well-being challenges.¹¹ These statistics underscore the need for targeted interventions and support across different cultural and national contexts. In the U.S., over 51% of special education cases are related to learning difficulties¹², while in India, impairments in reading, writing, and math range from 9.93% to 15.6%⁸. Socioeconomic factors significantly impact these rates, with lower income and parental education correlating with increased learning disabilities.¹³ In Malaysia, higher education students face varied learning difficulties, including challenges in learning Spanish¹⁴, academic writing for non-native English speakers¹⁵, and ineffective conventional lectures, suggesting a need for self-learning supplements.¹⁶

The widespread occurrence and impact of learning difficulties in higher education require a comprehensive understanding of the demographic, socioeconomic, and institutional factors that contribute to these challenges. Given the multidimensional nature of learning difficulties, this study aims to provide an analysis of the relationships between these variables. The objectives include identifying the most common forms of learning challenges and exploring the interplay between these difficulties and variables such as age, sex, and academic achievement. This holistic perspective would provide valuable information to students, teachers, and decision-makers.

METHODOLOGY

Setting, population, and sample: The study was a cross-sectional correlational investigation at the Universiti Malaysia Sarawak (UNIMAS) to examine the link between learning difficulties and attitudes toward these challenges. It also assessed how widespread these learning difficulties are among university students and their correlation with demographic variables. The study aimed to include undergraduate students from year one to year five in all faculties at UNIMAS, without limitations on age, gender or nationality. All undergraduates who met these criteria were eligible to participate. However, those who opted out, along with post-graduate students, pre-university students, and faculty members, were not part of the study. The sample size was determined using a formula that took into account various elements like the margin of error, design effect, and the rate of nonparticipation. We used the finite population corrected formula for sample size calculations:

$$n = DE * \frac{z^2 * p(1 - p) * N}{d^2(N - 1) + z^2 * p(1 - p)}$$

Where p = Proportion of population having events, (here, p = 5%), q = Proportion of population having no events (1-p) = q; d = margin of error (in the proposed study, we set it at 5%), DE= Design effect (We set it as 1.5) and N= Average students in each faculty (We consider on an average 800). Starting with a foundational prevalence rate of 5% for learning difficulties¹⁷, it was calculated that 33 participants from each faculty would be needed. After making further adjustments for design effects and nonresponse rates (10%), the final sample size was 540. A multistage cluster sampling method was used to select participants. All ten faculties were selected and categorised in the first stage according to their corresponding academic programmes. In the second stage, an academic year was randomly selected from each faculty student. Students present in class during selection were used as a sample for the study. This chosen pool of 14-18 students through systematic random sampling.

Instruments and data collection procedure: The questionnaire was developed and modified based on different published scientific papers. It has several parts: (a) Perceived self-reported learning difficulties – This part used an adapted academic learning difficulties (ALD) tool to gauge reading, writing, expression, calculations, and general study difficulties. It used a 5-point Likert scale.¹⁸ Attitude toward Learning Difficulties – This section assessed student attitudes towards accommodating those with learning difficulties, using a 5-point Likert.¹⁹ Factors Affecting Learning – This section looked at various domains that could affect learning, such as individual, teacher, and environmental factors. It also used a 5-point Likert scale²⁰ and (d) Demographic characteristics – This section collected data on the age, gender, year of study, and previous academic performance of the

participant.

A questionnaire pre-test was conducted to examine its logical sequencing, comprehensibility, and average interview time. Minor changes were made based on the feedback of the respondents. Cronbach's alpha analysis evaluated the reliability of the questionnaire, with 0.7 considered reliable.²¹ Convergent and discriminant validity tests ensured model quality.²² The questionnaire was self-administered and bilingual (in English and Bahasa Melayu) to facilitate understanding. Before distributing it, the researchers provided a brief explanation to ensure that participants understood the objectives of the study. Consent forms were also obtained, and no personally identifiable information was recorded.

Measurement

Learning difficulties: Learning difficulties were evaluated in five dimensions: reading, writing, expression, calculation, and general study.¹⁸ Each dimension was explored through a series of statements, such as 9 for reading, 6 for writing, 7 for expression, 6 for calculation, and 6 for general study difficulties. Reading difficulties measure an individual's ability to read and memorise the alphabet and pronounce, substitute, or delete a character. Writing difficulties evaluate essay writing skills and grammar errors, including whole or incomplete sentences. Expression difficulties assess a person's ability to communicate and respond to others with more than one word. Calculation difficulties assess an individual's ability to perform computations such as writing equations and naming numbers or digits. General study difficulties assess performance, task completion, or concentration during classroom discussions. The item questions were presented using the 5-point Likert scale ranging from always applicable to non-applicable.

Factors that contribute to learning at university:

The factors contributing to university learning were divided into three domains: individual, teacher-related, and environmental factors. The answer options were a 5-point Likert scale ranging from. Each statement was rated on a scale from 1 to 5, where 1 signifies 'Not applicable at all' and 5 represents 'Always applicable'. **Individual factors** measure the internal factors like fear of new subjects, lack of prior knowledge, insufficient practice, and disinterest, which can significantly hinder a student's ability to learn and engage with course material. These factors can stem from the student's learning style, personality, or previous academic experiences. **Teacher-related factors** measure the teacher's attitude, teaching methods, and willingness to interact with students can profoundly impact the learning environment. Negative attitudes, inappropriate examples, and unresponsiveness to student questions can create barriers to learning and discourage student participation. **Environmental factors** measure the physical environment (e.g., uncomfortable or noisy classrooms) and social environment (e.g., conflict at

home, lack of peer support) can significantly influence a student's ability to focus, feel safe, and engage in the learning process. These external factors can create distractions, stress, and feelings of isolation, making learning more challenging. The mean and standard deviation (S.D.) for each statement is provided to give a quantitative measure of the severity and variation of each factor among students²⁰.

Attitude towards learning difficulties: To assess university students' attitudes towards learning difficulties, a questionnaire consisting of 20 statements was administered. Students were asked to respond to each statement on a five-point scale ranging from 'strongly disagree' to 'strongly agree'. Eleven of the 20 statements, 11 were framed positively, while the remaining nine were phrased negatively.¹⁹ A composite mean score was calculated for each positive and negative attitude domain related to the integration of students with and without learning difficulties.

Data entry and analysis: The completed respondent data in Microsoft Excel underwent a validation check before being transferred to SPSS. The descriptive analysis presented frequency tables and graphs. A hierarchical linear regression analysis explores the relationship between several independent variables and five dependent variables - reading, writing, expression, calculation, and general study difficulties. Independent variables include age, sex (included in the first block), positive attitude, negative attitude, individual factors, teacher-related factors, environmental factors, and academic performance (included in the second block).

The five dependent variable models have varying degrees of fit. Model 1 for each dependent variable (reading, writing, expression, calculation, and general study difficulties) explains a small percentage of variance in difficulties ranging from 1% to 6%, and not all are statistically significant. This suggests a weak fit with limited predictive power. However, introducing additional predictors into Model 2 significantly improves the fit for all five dependent variables, as indicated by the increase in r^2 values and the statistical significance of each model. Model 2 explains 25%, 21%, and 22% of the variance for reading, writing, and expression difficulties, respectively. Model 2 explains a substantial 43% of the variance for the calculation difficulties. Lastly, model 2 explains 37% of the variance for general study difficulties. The improvements from model 1 to model 2 are all statistically significant, demonstrating the value of the additional predictors in explaining the variation in these types of academic difficulty. The collinearity statistics (VIF and tolerance) suggest that multicollinearity is not a concern in this model. All VIF values are below 5, and tolerance values are well above 0.1, indicating that the predictors are not highly correlated. A p-value of 0.05 defined significance.

Ethical Issues: The student's participation in this study was voluntary. Explicit guidelines were provided to prevent misunderstandings, and a dedicated

section allowed respondents to confirm their acknowledgement. Before answering, informed written consent was obtained, emphasizing the voluntary nature of participation and the confidentiality of personal information and identity. Ethical approval (FME 23/31) was obtained from the Medical Ethics Committee of the Faculty of Medicine and Health Sciences, UNIMAS.

RESULTS

Characteristics of the students: Table 1 illustrates the characteristics of 546 students. The majority are aged 20-21 (53.1%, n=290), followed by those aged 22-23 (39.6%, n=216), with a smaller percentage (7.3%, n=40) being 24 years or older. The mean age is 21.7 years, with a standard deviation of 1.2 and a range of 20 to 26 years. The sample is predominantly female (69.6%, n=380) compared to male (30.4%, n=166). The mean last CGPA score for the sample is 3.3, with a standard deviation of 0.4 and a range from 2 to 4.

Table 1: Characteristics of the students (n=546)

| Characteristics | Students (%) |
|------------------------------------|--------------|
| Age in years | |
| 20-21 | 290 (53.1) |
| 22-23 | 216 (39.6) |
| ≥24 | 40 (7.3) |
| Mean ± SD | 21.7 ± 1.2 |
| Min, Max | 20.0, 26.0 |
| Gender | |
| Male | 166 (30.4) |
| Female | 380 (69.6) |
| Last CGPA score (Mean ± SD) | 3.3 ± 0.4 |
| Min, Max | 2, 4 |

Prevalence of learning difficulties

Table 2 provides an overview of the percentage distribution of consolidated learning difficulties among 546 students in five domains: reading, writing, expression, calculation, and general study. Reading difficulties were 'sometimes applicable' for the highest proportion of students (34.6%), followed by 'seldom applicable' (28.2%). Writing difficulties were more commonly 'seldom applicable' (32.1%) or 'not applicable at all' (26.7%). In the domain of expression, the distribution was more evenly spread, with 'sometimes applicable' (29.1%) and 'always applicable' (15.0%) being noteworthy. Calculation difficulties were predominantly 'sometimes applicable' (48.0%), but interestingly none were categorised as 'seldom applicable'. The general difficulties of the study had a balanced distribution, with 'sometimes applicable' leading (32.6%) and 'always applicable' at 13.9%.

Table 2: Percentage of learning difficulties (n=546)

| Learning difficulties | Not applicable at all. | Seldom applicable | Sometimes applicable | Almost applicable | Always applicable |
|-----------------------|------------------------|-------------------|----------------------|-------------------|-------------------|
| Reading | 23.3 | 28.2 | 34.6 | 10.4 | 3.5 |
| Writing | 26.7 | 32.1 | 30.2 | 8.8 | 2.2 |
| Expression | 14.8 | 22.7 | 29.1 | 18.3 | 15.0 |
| Calculation | 34.4 | 0.0 | 48.0 | 13.0 | 4.6 |
| General study | 13.4 | 20.0 | 32.6 | 20.1 | 13.9 |

Figure 1 represents the percentage of undergraduate university students who reported experiencing various learning difficulties. The cut-off points are almost always applicable to learning difficulties as learning difficulties. Expression (33.3%) and general study (34.1%) are the most common learning difficulties reported by undergraduate university students, followed by calculation (17.6%), writing (11.0%), and reading (13.9%). The bar graph also shows that the percentage of students reporting expression and general study difficulties is higher than that of students reporting reading, writing and calculation difficulties. This suggests that expression and general study are the areas in which students are most likely to experience learning difficulties.

Factors affecting learning difficulties: Hierarchical linear regression analysis: Hierarchical linear regression analysis explores the relationship between several independent variables and five dependent variables: reading, writing, expression, calculation, and general study difficulties. Independent variables include age, sex (included in the first block), positive attitude, negative attitude, individual factors, teacher-related factors, environmental factors, and academic performance (included in the second block).

The analysis indicated that age appears to have a positive association with all dependent variables, indicating that as age increases, difficulties in reading, writing, expression, calculation, and general study also increase. However, no statistically significant association was found with dependent variables ($p > .05$). gender seems to have varying effects on the dependent variables; for reading, writing, and calculation, it appears that being male is associated with increased difficulties. On the contrary, being male is associated with a decrease in difficulties in expression and general difficulties in study. However, again, no statistically significant associations were found between sex and all dependent variables ($p > .05$). A stronger positive attitude is associated with a decrease in reading difficulties ($b = -0.19$; $p < .001$), writing ($b = -0.13$; $p < .001$), and calculation ($b = -0.24$; $p < .001$) difficulties, but it does not appear to affect expression and general study difficulties ($p > .05$).

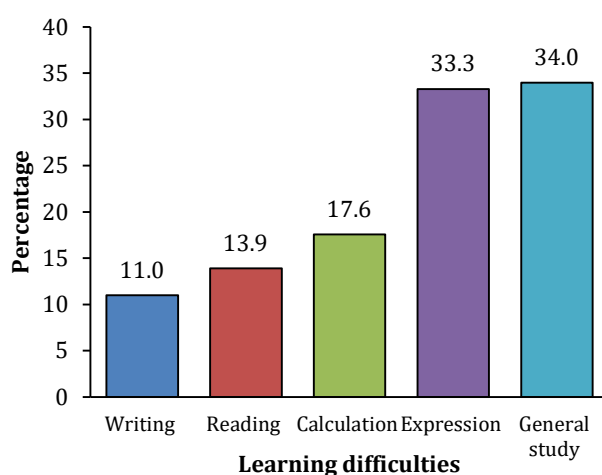


Figure 1 Percentage of learning difficulties (n=546)

The decrease in reading, writing, and calculation difficulties with an increased positive attitude is statistically significant at the $p < .001$ level. However, an increase in negative attitude appears to be associated with an increase in the difficulties of expression ($b = 0.13$; $p < .001$), calculation ($b = 0.18$; $p < .001$), and general study ($b = 0.16$; $p < .001$) difficulties but does not significantly affect the difficulties of reading and writing. The increase in the study's expression, calculation, and general difficulties with an increased neg-

ative attitude is significant at the $p < .001$ level.

Regarding contributing factors, increased individual factors appeared to be increased difficulties in expression ($b = 0.21$; $p < .001$) and general study ($b = 0.31$; $p < .001$), while it did not significantly affect reading, writing, and calculation difficulties ($p > .05$). The increase in expression and general difficulties in the study with increased individual factors is statistically significant at the $p < .001$ level. However, high teacher-related factors seem to increase difficulties in reading ($b = 0.30$; $p < .001$), writing ($b = 0.17$; $p < .001$), and calculation ($b = 0.28$; $p < .001$) but decrease difficulties in the general study ($b = -0.12$; $p < .01$). They do not significantly affect expression difficulties. The increase in reading, writing and calculation difficulties and the decrease in general study difficulties, with increased teacher-related factors, are statistically significant ($p < .001$ for reading and calculation, $p < .01$ for general study, $p < .05$ for writing). The analysis also found that increased environmental factors increase the difficulties in all dependent variables. The standardised beta coefficient varies from 0.19 to 0.39. This effect is statistically significant at the level of $p < .001$ level for all dependent variables. Previous academic performance is associated with decreased difficulties in all dependent variables. This decrease is statistically significant at $p < .05$ for all dependent variables except reading and expression difficulties ($p > .05$).

Table 3: Factors affecting learning difficulties: Hierarchical linear regression analysis

| Parameters | Reading | Writing | Expression | Calculation | General study |
|-----------------------------|----------|----------|------------|-------------|---------------|
| Intercept ^a | 1.14* | 0.95 | -0.16 | 0.51 | -0.15 |
| Demographics | | | | | |
| Age in years | 0.04 | 0.05 | 0.07 | 0.05 | 0.06 |
| Gender (Male-Female) | 0.01 | 0.06 | -0.11 | 0.04 | -0.11 |
| Attitude | | | | | |
| Positive attitude | -0.19*** | -0.13*** | -0.01 | -0.24*** | -0.02 |
| Negative attitude | 0.05 | 0.05 | 0.13*** | 0.18*** | 0.16*** |
| Factors Contributing | | | | | |
| Individual | 0.04 | 0.11* | 0.21*** | 0.02 | 0.31*** |
| Teacher-related | 0.30*** | 0.17*** | -0.01 | 0.28*** | -0.12** |
| Environmental | 0.19*** | 0.22*** | 0.28*** | 0.35*** | 0.39*** |
| Academic performance | | | | | |
| | -0.04 | -0.08* | -0.04 | -0.07* | -0.07* |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

DISCUSSION

Understanding the challenges undergraduate university students face in their academic journey is crucial for both the Ministry of Higher Education and universities to develop effective strategies to mitigate these issues. University students' academic success, crucial for their future, can be hampered by various learning difficulties, leading to stress and hindering performance.²³ A novel approach lies in investigating the interplay between these difficulties, attitudes towards inclusivity in class, and student performance.

Previous research explored a potential link between age and learning challenges in undergraduates.²⁴ As

students progressed, they reported increased difficulties, suggesting a seemingly straightforward association. However, age alone tells only part of the story. Other studies indicate learning difficulties, not age, might be linked to superficial learning approaches, impacting various academic areas.²⁵ Additionally, while acknowledging potential age-related cognitive decline, Robertson et al.²⁶ emphasise individual variability and the crucial role of lifestyle and health factors. Our study, though not finding an association, highlights the potential importance of these factors, along with individual differences and the brain's own adaptability.

Our analysis found that among the most common

challenges reported were issues in general study and verbal expression, both critical to organisational and communication skills. Calculation difficulties were also significant, with potential root causes in cognitive architecture.¹⁸ Reading difficulties were less common but involved challenges such as phonemic distinction, characteristics of dyslexia, and visual processing problems.²⁷ Writing issues mainly revolved around syntax and grammar, indicative of struggles in transcribing from reading to writing. The problem could be related to dysgraphia and dyslexia.²⁸ Expression difficulties were mainly in verbal communication, echoing findings among Turkish students.²⁹ The calculation difficulties were experienced by nearly 20% of the students and could be influenced by various cognitive, behavioural, and biological factors, including teaching methods and learning environments.³⁰

Various individual and environmental factors can influence learning difficulties among university students, affecting their academic performance. Internal factors such as age, gender, and individual attitude were statistically significant.³¹⁻³⁴ Similarly, teacher-related factors and classroom variables, both internal and external, play a role but require further investigation.³⁵⁻³⁷ Environmental factors such as infrastructure, family dynamics, and social conditions also contribute to learning difficulties.³⁸⁻⁴³ Student attitudes toward inclusive education can further affect learning outcomes, with a positive attitude linked to reduced learning difficulties and better academic performance.⁴⁴⁻⁴⁶ There is a negative correlation between learning difficulties and academic performance; students with learning disabilities generally score lower than their counterparts without such challenges.^{47, 48} The relationship between learning difficulties and academic performance is likely bidirectional and influenced by multiple factors. This underscores the need for early interventions that target internal and external contributors to learning difficulties.

The study has several limitations that affect its applicability and validity. These include its restriction to a single university, reliance on self-reported data, and a cross-sectional design that precludes establishing cause-and-effect relationships. The lack of cross-validation by clinical psychologists and the exclusion of some students due to logistical issues further compromise the comprehensiveness of the study. Despite these limitations, the study sample size is robust enough to provide reliable analysis and establish internal validity. Its focus on university students offers valuable insight specific to higher education settings. Survey methodology allows for a broad data collection on various factors that impact learning difficulties, enriching our understanding of the experiences and struggles of students. Overall, the study provides meaningful but limited information on the factors contributing to learning difficulties in higher education.

CONCLUSION

The study concluded that expression (33.3%) and general study (34.1%) were the most common learning difficulties, while reading, writing, and calculation were less common. Strong correlations between learning difficulties suggested that struggles in one area often extended to others. Regression analysis showed that better academic performance led to decreased difficulties, in contrast, positive attitude and environmental factors were associated with increased learning difficulties. However, age and gender had no significant impact on learning difficulties. The study recommends that students receive targeted workshops and be made aware of the available resources. Universities must provide comprehensive academic and psychological support, train staff in early identification, and foster conducive learning environments. Policies must ensure equal educational opportunities through accommodations, regular assessments, and evidence-based interventions.

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AUTHORS' CONTRIBUTION

The authors delineate their respective contributions to the manuscript as follows: MMR was responsible for the conceptual framework, research methodology, data analysis, and initial writing and subsequent revisions of the draft. MSJ, MS, RI, and Vaishnavi contributed by gathering data, curating the dataset, and participating in reviewing and editing the manuscript. All contributing authors have reviewed and consented to the final version for publication.

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