

# Assessing The Effectiveness Of Moodle For In-Service Teacher Training In Hinterland Communities Of Guyana: A Study Of Access, Challenges, And Indigenous Contextual Relevance

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## **Abstract**

*This study evaluates the effectiveness of Moodle as a platform for in-service teacher training in hinterland communities of Guyana, focusing on access to professional development, user confidence, contextual relevance, and implementation challenges. Using a quantitative survey design, data were collected from 70 teachers across regions 1, 7, 8, and 9, representing diverse Indigenous groups. A descriptive analysis of 10 Likert-scale items indicates that Moodle is widely perceived as enhancing access to professional development, supporting self-paced learning, and positively influencing teaching practices, with many respondents willing to recommend its use. However, its effectiveness is constrained by significant structural and contextual barriers. Limited internet connectivity, inconsistent user support, and difficulties in completing training hinder optimal engagement. Furthermore, the limited integration of Indigenous knowledge highlights gaps in cultural relevance. While Moodle shows strong potential for expanding equitable professional development in remote areas, its impact depends on improved infrastructure, strengthened support systems, and the development of culturally responsive, context-specific training content.*

**Keywords:** Moodle; Teacher Training; Hinterland Education; Indigenous Education; Professional Development; E-learning; Digital Learning; Educational Technology; Remote Education; Guyana

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## **I. Introduction**

The integration of digital learning platforms has significantly transformed teacher professional development worldwide, enabling more flexible, accessible, and scalable approaches to continuous learning. Learning management systems (LMS) such as Moodle have become central to this transformation, facilitating self-paced learning, resource sharing, and collaborative engagement among educators (Bates, 2019; UNESCO, 2021). In the Global South, where geographical isolation, limited institutional capacity, and resource constraints often restrict access to traditional professional development, digital platforms have emerged as critical tools for expanding educational opportunities and promoting equity (Trucano, 2016; World Bank, 2020).

In Guyana, these challenges are particularly evident in the hinterland regions, which account for most of the country's landmass yet are characterised by low population density, limited infrastructure, and restricted access to educational services. Teachers in Regions 1, 7, 8, and 9 often face significant barriers to professional development, including long travel distances, high costs, and limited availability of in-service training (Ministry of Education, Guyana, 2021). In response, the Government of Guyana has increasingly prioritised integrating information and communication technologies (ICT) into education, including adopting platforms such as Moodle to support teacher training and capacity building. This aligns with broader regional and international efforts to leverage digital technologies to strengthen education systems in developing contexts (UNESCO, 2021; Caribbean Development Bank, 2020).

The COVID-19 pandemic further accelerated the shift toward digital and remote learning, forcing the education systems worldwide to adopt online platforms such as Moodle. While this transition created new opportunities for continuity in teacher training, it also exposed significant inequalities in access to technology and digital infrastructure, particularly in rural and hinterland regions (Hodges et al., 2020; UNESCO, 2021). In the Guyanese context, this shift highlighted the urgent need to strengthen digital learning systems to support teachers in geographically isolated communities.

This initiative is part of a broader national effort to advance digital transformation within the education sector. Government policies emphasise the integration of ICT to promote inclusive and equitable education; however, disparities in implementation, particularly between coastal and hinterland regions, raise important questions about the effectiveness and reach of these strategies in practice (Ministry of Education, Guyana, 2021).

While Moodle offers clear advantages in accessibility and flexibility, its effectiveness in hinterland settings is shaped by contextual realities well documented in Global South literature. Empirical studies highlight

persistent challenges, including inadequate internet connectivity, limited access to digital devices, and disparities in digital literacy among educators (Hodges et al., 2020; World Bank, 2020). In Guyana, these issues are further exacerbated by the digital divide between coastal and hinterland regions, where connectivity remains inconsistent and, in some areas, unreliable (Ministry of Education Guyana, 2021). As a result, Moodle's potential to support meaningful professional development may be constrained by infrastructural limitations that affect both access and sustained engagement.

These challenges also reflect broader issues of equity within the education system. Teachers in the hinterland and Indigenous communities, by extension, often face structural disadvantages that limit their access to training and resources. While the digital platforms such as Moodle have the potential to reduce these disparities, without adequate infrastructure and support, they may instead reinforce existing inequalities (Selwyn, 2016; World Bank, 2020).

Beyond infrastructural challenges, the issue of contextual and cultural relevance is particularly significant in the Guyanese hinterland, home to diverse Indigenous communities, including the Macushi, Wapishana, Patamona, Akawaio, and Arawak (Lokono). Research in Indigenous and rural education emphasises the importance of culturally responsive pedagogy, which integrates learners' cultural identities, knowledge systems, and lived experiences into teaching and learning (Gay, 2018; McKinley & Smith, 2019). However, digital training platforms are often designed using standardised frameworks that may not adequately reflect local realities, thereby limiting their relevance and effectiveness in Indigenous contexts (Burnett & Felsman, 2012; Jessop & Santos, 2021). In Guyana, empirical research remains limited on the extent to which Moodle-based training incorporates Indigenous perspectives or addresses the unique challenges faced by teachers in hinterland classrooms.

Furthermore, studies across the Caribbean indicate that although teachers generally hold positive attitudes towards technology integration, actual use and effectiveness are shaped by factors such as institutional support, training quality, and user confidence (Caribbean Development Bank, 2020; Layne, Jules, & Miller, 2021). This suggests that evaluating Moodle's effectiveness requires not only assessing access but also understanding teachers' experiences, perceptions, and challenges in using the platform.

Given these considerations, there is a critical need for context-specific research examining how digital learning platforms operate within the unique socio-cultural and infrastructural realities of hinterland education systems. This study, therefore, seeks to explore Moodle's effectiveness for teacher training in Guyana's hinterland communities by analysing teachers' perceptions of access to professional development, confidence in using the platform, the relevance of training content, and the challenges encountered. Additionally, the study examines the extent to which Moodle supports culturally responsive education and its overall suitability for continued use in remote and Indigenous contexts.

By situating the analysis within Guyanese and broader Global South contexts, this research contributes to ongoing discussions about equitable, inclusive, and context-sensitive approaches to digital teacher professional development. It also offers empirical insights to inform policy, practice, and future research on integrating e-learning platforms in underserved regions.

## **Research Question**

How effective is Moodle as a platform for teacher training in hinterland communities?

## **II. Literature Review**

### **Theoretical Framework**

This study is grounded in two complementary theoretical perspectives: the Technological Pedagogical Content Knowledge (TPACK) framework and the Community of Inquiry (CoI) model. Together, these frameworks offer a comprehensive lens for understanding how teachers use Moodle as a digital learning platform in hinterland contexts.

### **Technological Pedagogical Content Knowledge (TPACK)**

The TPACK framework, developed by Punya Mishra and Matthew J. Koehler, emphasises the integration of three core domains of teacher knowledge: technology, pedagogy, and content (Mishra & Koehler, 2006). Effective use of digital platforms such as Moodle requires teachers not only to understand the subject matter (content knowledge) and instructional strategies (pedagogical knowledge), but also to possess the technological skills necessary to navigate and utilise digital tools (technological knowledge).

In this study, TPACK is particularly relevant for explaining variations in teachers' confidence and ability to use Moodle. The findings, which indicate moderate confidence levels and reported challenges, suggest that not all teachers have fully developed the integrated knowledge required for effective digital teaching. This aligns with existing research showing that gaps in technological knowledge can limit the pedagogical potential of e-learning platforms, particularly in developing contexts (Mishra & Koehler, 2006; Koehler et al., 2013).

Furthermore, TPACK emphasises the importance of contextual knowledge, which is critical in hinterland settings where infrastructural limitations and cultural diversity shape teaching practices. The need for culturally relevant content, as identified in the findings, underscores the importance of aligning technological tools with local pedagogical and cultural contexts.

### **Community of Inquiry (CoI) Model**

The Community of Inquiry (CoI) model, developed by D. Randy Garrison and colleagues, offers a framework for understanding online learning experiences through three interrelated elements: cognitive presence, social presence, and teaching presence (Garrison, 2017).

- Cognitive presence refers to the extent to which learners can construct and confirm meaning through reflection and interaction.
- Social presence involves participants' ability to engage and communicate meaningfully in an online environment.
- Teaching presence encompasses the design, facilitation, and direction of learning processes.

In this study, the CoI model helps explain how teachers experience Moodle-based training. For example, positive perceptions of self-paced learning and access to professional development suggest a degree of cognitive presence. However, mixed responses regarding support and challenges indicate potential gaps in teaching presence, particularly in facilitation and guidance. Similarly, the lack of consistent cultural relevance may limit social and cognitive engagement, especially for teachers in Indigenous communities.

The CoI framework also emphasises the importance of interaction and support in online learning environments. The findings, which show moderate levels of perceived support, suggest that strengthening teaching presence through improved facilitation, feedback, and technical assistance could enhance the overall learning experience.

### **Integration of Frameworks**

The integration of TPACK and CoI provides a robust theoretical foundation for this study. While TPACK focuses on teachers' knowledge and capacity to use technology effectively, the CoI model emphasises the quality of the online learning experience. Together, these frameworks highlight that the success of Moodle-based training depends not only on access to technology but also on:

- Teachers' ability to integrate technology into their pedagogy
- The quality of instructional design and support
- The extent to which learning environments are interactive, engaging, and contextually relevant

In Guyana's hinterland regions, these frameworks emphasise the need to address both individual competencies and systemic factors to ensure the effective implementation of digital learning platforms.

### **Digital Learning and Teacher Professional Development in the Global South**

The rapid expansion of digital learning technologies has significantly reshaped teacher professional development, particularly in contexts where access to traditional training is limited. Learning management systems (LMS) such as Moodle have enabled more flexible, scalable, and cost-effective approaches to teacher education by supporting asynchronous learning, collaboration, and resource sharing (Bates, 2019; Garrison, 2017). In the Global South, these platforms have become increasingly important for addressing disparities in access to professional development, especially in rural and remote regions where geographical isolation is a major barrier (Trucano, 2016; World Bank, 2020).

Empirical studies indicate that digital platforms can enhance teacher learning outcomes by promoting self-directed learning and continuous professional engagement (Means et al., 2013). Teacher training programs must therefore include comprehensive digital literacy components, ensuring that educators are not only equipped with the tools but also the skills to use them effectively.

However, the effectiveness of digital tools depends heavily on contextual factors such as infrastructure, institutional support, and user readiness. In many developing countries, limited access to reliable internet, inadequate technological resources, and gaps in digital literacy continue to constrain the adoption and effective use of e-learning systems (UNESCO, 2021; Hodges et al., 2020). These challenges underscore the need for context-sensitive approaches to digital teacher development in the Global South. Lee et al (2019) noted that without reliable internet access and modern devices, the potential of digital tools is significantly diminished. One study in which teachers had limited access to digital tools reported lower satisfaction with their training programme which further suggested that the introduction of digital tools is not sufficient but the implementation must be accompanied by efforts to address the digital divide in terms of access to Literacy and infrastructure.

In contexts where internet connectivity is limited, blended learning approaches that combine online and offline strategies are particularly effective. Providing downloadable materials, asynchronous content, and low-bandwidth solutions can enhance accessibility and ensure that teachers in remote areas are not excluded from professional development opportunities (Means et al., 2013; UNESCO, 2021).

### **Moodle as a Platform for Teacher Training**

Moodle, an open-source LMS, has been widely adopted in both developed and developing contexts for its flexibility, adaptability, and cost-effectiveness. It supports a range of pedagogical approaches, including constructivist and collaborative learning, by enabling interactive content delivery, discussion forums, and assessment tools (Dougiamas & Taylor, 2003; Garrison, 2017). Research shows that Moodle can enhance teacher engagement and facilitate professional learning communities, particularly when supported by appropriate training and institutional structures (Al-Ajlan & Zedan, 2008; Costa et al., 2012).

In developing contexts, Moodle has been used to extend professional development opportunities to teachers who would otherwise have limited access to training (Unwin et al., 2010).

A most prominent advantage of Moodle is that it costs less, in that, the teachers from the hinterland do not have to leave their regions or change his/her residence to suit the location of the training campus. According to Maria Rodriguez, Juan Perez, Clara Costa and Hans Müller (2025), “Digital tools offer teachers in remote and under-resourced areas the opportunity to improve their skills and knowledge without the need for extensive travel or expensive training programs.” In Guyana, the Cyril Potter College of Education (Teachers’ Training College) offers professional teacher training at the Turkeyen Pre-Service and at fourteen (14) In-Service Satellite Centres. Training is offered via Online mode, blended and face-to-face modes. (CPCE 2021)

However, studies also highlight challenges with usability, technical support, and user confidence. Teachers with limited experience of digital environments may struggle to navigate the platform effectively, resulting in reduced engagement and suboptimal learning outcomes (Mtebe & Raisamo, 2014). These findings suggest that, while Moodle offers significant potential, its success depends on adequate training, ongoing support, and a user-friendly design.

### **Infrastructure and the Digital Divide**

One of the most persistent barriers to the effective implementation of digital learning platforms in the Global South is the digital divide, particularly in internet connectivity and access to technological resources. Reliable internet access is a prerequisite for meaningful participation in online learning; however, in many rural and remote regions, connectivity remains inconsistent or unavailable (World Bank, 2020; UNESCO, 2021). This limitation is especially pronounced in hinterland regions, where infrastructure development often lags behind that of urban areas.

Beyond physical access, the digital divide also includes differences in digital skills and the ability to effectively use technology. This “second-level digital divide” highlights that access alone is insufficient; users must also have the competencies required to meaningfully engage with digital platforms (van Dijk, 2020).

In the Caribbean and Guyanese context, disparities in ICT infrastructure have been identified as a major constraint on the integration of digital learning into education systems (Caribbean Development Bank, 2020; Ministry of Education, Guyana, 2021). Teachers in hinterland communities frequently encounter challenges such as slow internet speeds, limited bandwidth, and a lack of access to devices, all of which hinder their ability to fully engage with platforms such as Moodle. As a result, the effectiveness of digital learning initiatives is closely tied to broader socio-economic and infrastructural conditions.

### **Teacher Readiness, Support, and Digital Competence**

Teacher readiness and digital competence are critical to the successful adoption of e-learning platforms. The Technological Pedagogical Content Knowledge (TPACK) framework emphasises the need to integrate technological, pedagogical, and content knowledge to use digital tools effectively in education (Mishra & Koehler, 2006). Teachers who lack confidence or experience with technology may struggle to navigate online platforms, which can undermine their engagement and learning outcomes. This struggle often leads to frustration and may sometimes cause teachers to “dropping out” or leave the programmes.

Research in the Caribbean indicates that although teachers generally hold positive attitudes towards technology, their preparedness varies significantly with access to training and support (Layne et al., 2021). Continuous professional development, technical assistance, and peer support networks are therefore essential to building teacher capacity and confidence in using platforms such as Moodle. Without these support systems, even well-designed digital learning environments may fail to achieve their intended impact (Mtebe & Raisamo, 2014).

In addition, the Technology Acceptance Model (TAM) provides further insight into teachers’ adoption of digital platforms. According to Davis (1989), perceived usefulness and ease of use are key factors influencing whether individuals accept and use new technologies. In educational contexts, teachers are more likely to engage with platforms such as Moodle when they perceive them as beneficial to their teaching and easy to navigate (Venkatesh et al., 2003). This helps explain variations in confidence levels and willingness to use Moodle observed in this study.

### **Cultural Relevance and Indigenous Education**

The cultural relevance of educational content is a critical consideration in contexts with diverse Indigenous populations. Culturally responsive pedagogy emphasises the need to align teaching and learning materials with learners' cultural identities, values, and experiences (Gay, 2018). In Indigenous education, this includes integrating local knowledge systems, languages, and community practices into the curriculum (McKinley & Smith, 2019).

However, digital learning platforms are often built on standardised frameworks that may not adequately reflect local contexts, particularly in Indigenous communities (Burnett & Felsman, 2012). This lack of contextualisation can create a disconnect between training content and classroom realities, reducing the perceived relevance and effectiveness of professional development programmes. In Guyana, where Indigenous communities constitute a significant share of the hinterland population, there is a pressing need to ensure that digital training platforms such as Moodle incorporate culturally relevant content and pedagogical approaches.

Furthermore, scholars argue that the limited integration of Indigenous knowledge in digital learning environments reflects broader systemic biases within the global education systems. Addressing this requires more than surface-level inclusion; it involves actively incorporating Indigenous perspectives, languages, and community knowledge into the design of training programmes (Smith, 2012).

## **III. Synthesis and Research Gap**

### **Methodology**

The literature highlights the potential of digital learning platforms such as Moodle to expand access to teacher professional development, particularly in remote and underserved regions. However, it also emphasises the importance of contextual factors, including infrastructure, teacher readiness, institutional support, and cultural relevance. While existing studies provide valuable insights into e-learning in the Global South, there is limited empirical research examining how these factors intersect within Indigenous and hinterland contexts.

In the Guyanese context, research specifically focusing on Moodle-based teacher training in hinterland regions remains scarce, particularly from the perspective of Indigenous educators. Most existing studies address technology adoption or infrastructure challenges in isolation, with less attention to how cultural relevance, user experience, and systemic constraints interact. This study, therefore, addresses this gap by providing context-specific evidence on Moodle's effectiveness, with a focus on access, usability, challenges, and cultural responsiveness.

### **Research Design**

This study employed a quantitative descriptive survey design to examine teachers' perceptions of Moodle as a platform for professional development in hinterland communities. Quantitative descriptive designs are widely used to identify patterns, trends, and relationships in datasets, particularly when exploring attitudes and perceptions within a defined population (Creswell & Creswell, 2018). This approach was appropriate for analysing key variables, including access, usability, relevance, and challenges associated with Moodle-based training. Additionally, the design enabled the systematic collection and analysis of standardised responses across multiple variables, enhancing the objectivity and comparability of the findings (Bryman, 2016).

### **Participants and Sampling**

The study sample comprised 70 teachers from Guyana's hinterland regions, specifically Regions 1, 7, 8, and 9, with a small proportion from other areas. The regional distribution was relatively balanced, with Region 1 accounting for 28.6% of respondents, Region 8 for 25.7%, and Regions 7 and 9 each contributing 21.4%.

By gender, the sample was predominantly female (85.7%), with males comprising 14.3%. Participants also represented diverse Indigenous backgrounds, including Macushi, Patamona, Akawaio, Arawak (Lokono), Wapishana, and others, reflecting Guyana's hinterland population's multicultural composition. This diversity enhances the sample's representativeness in relation to the broader educational context (Ministry of Education, Guyana, 2021).

A purposive sampling technique was used to select participants, as the study targeted teachers with experience of using Moodle for professional development. Purposive sampling is appropriate when participants are selected for their knowledge or experience relevant to the research topic (Etikan et al., 2016). This approach ensured that respondents could provide informed and meaningful insights into Moodle's effectiveness.

### **Data Collection Instrument**

Data were collected via a structured questionnaire designed to assess teachers' perceptions of Moodle-based training. Structured questionnaires are widely used in educational research to efficiently gather standardised data across large samples (Creswell & Creswell, 2018).

**The instrument consisted of 10 items, each measured on a 5-point Likert scale, ranging from:**

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

Likert scales are widely recognised for their effectiveness in measuring attitudes and perceptions, as they yield ordinal data that can be analysed quantitatively (Likert, 1932; Boone & Boone, 2012).

The questionnaire addressed key dimensions of Moodle use, including:

- Access to professional development
- Confidence in navigating the platform
- Relevance of training to hinterland contexts
- Impact of internet connectivity
- Perceived support
- Self-paced learning
- Cultural relevance (Indigenous knowledge)
- Influence on teaching practices
- Challenges experienced
- Willingness to recommend Moodle

These dimensions were drawn from the existing literature on e-learning and teacher professional development in the Global South (UNESCO, 2021; World Bank, 2020).

### **Validity and Reliability**

To ensure content validity, the questionnaire items were developed from established literature on e-learning, teacher professional development, and digital education in developing contexts (UNESCO, 2021; Bates, 2019). Content validity is the extent to which an instrument adequately represents the construct it measures (Creswell & Creswell, 2018). Accordingly, the instrument was structured to align with key constructs, including access, usability, support, and contextual relevance.

Reliability was supported by using a standardised Likert scale, which promotes consistency in responses across participants (Boone & Boone, 2012). Additionally, the sample size ( $n = 70$ ) is adequate, contributing to the stability of statistical estimates (Field, 2018). Although formal reliability testing (e.g., Cronbach's alpha) was not conducted in this study, the consistency of responses across related items suggests a reasonable level of internal reliability.

### **Data Collection Procedure**

The questionnaire was administered to teachers who had participated in Moodle-based training. Participants were informed of the study's purpose and provided their responses voluntarily. Data collection followed standard survey administration practices, ensuring clear instructions and accessibility for respondents (Bryman, 2016).

Given the geographical challenges of hinterland regions, data collection methods were adapted to address connectivity limitations, ensuring that participants could complete the questionnaire with minimal barriers.

### **Data Analysis**

Data were analysed using descriptive statistical techniques, including:

- Frequencies and percentages to summarize response distributions
- Measures of central tendency (mean, median, and mode) to identify overall trends

Descriptive statistics are appropriate for summarising and interpreting survey data, particularly in studies focusing on perceptions and attitudes (Field, 2018). The analysis examined patterns across all ten items, identifying areas of strength (e.g., access and self-paced learning) and areas of concern (e.g., connectivity and challenges). This approach provided a comprehensive understanding of Moodle's effectiveness in hinterland contexts.

### **Ethical Considerations**

Ethical standards were upheld throughout the study. Participation was voluntary, and respondents were assured of confidentiality and anonymity in line with established research ethics guidelines (Creswell & Creswell, 2018). No personally identifiable information was collected, and the data were used solely for academic purposes. Participants were also informed of their right to withdraw from the study at any time without penalty.

**Data Analysis**

The frequency table for gender distribution

Frequency Table 1: Gender of Respondents

Gender	Frequency (n)	Percentage (%)
Female	60	85.7%
Male	10	14.3%
<b>Total</b>	<b>70</b>	<b>100%</b>

Brief Interpretation

The data show a **strong predominance of female respondents**, who make up approximately **86%** of the sample, while males account for about **14%**. This suggests that the teaching workforce represented in this study, particularly in the hinterland regions, is largely female.

Frequency Table 2: Region of Respondents

Region	Frequency (n)	Percentage (%)
Region 1	20	28.6%
Region 7	15	21.4%
Region 8	18	25.7%
Region 9	15	21.4%
Other	2	2.9%
<b>Total</b>	<b>70</b>	<b>100%</b>

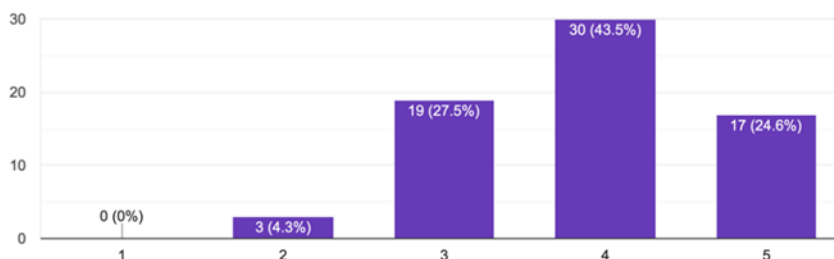
Brief Interpretation

The table shows that **Region 1** has the highest representation, followed closely by **Region 8**. Regions 7 and 9 have equal representation, while the “Other” category accounts for only a small proportion of respondents. This indicates a fairly balanced sample across the main hinterland regions, with a slight dominance by Region 1.

**Bar Chart 1: Showing improved access to PD opportunities**

1. Moodle has improved my access to professional development opportunities

69 responses



Frequency Table 3: The item was measured using a 5-point Likert scale:

Rating	Interpretation	Frequency	Percentage
1	Strongly Disagree	0	0%
2	Disagree	3	4.4%
3	Neutral	19	27.9%
4	Agree	29	42.6%
5	Strongly Agree	17	25.0%

**2. Statistical Summary**

- **Total Agreement (4 & 5): 67.6%**
- **Neutral Responses (3): 27.9%**
- **Total Disagreement (1 & 2): 4.4%**
- **Mean Score:**  $\frac{(2 \times 3) + (3 \times 19) + (4 \times 29) + (5 \times 17)}{68} = 3.88$

The mean score of approximately **3.88** indicates a **generally positive perception** of Moodle’s impact.

**3. Interpretation**

The findings suggest that most respondents perceive Moodle as improving their access to professional development opportunities.

- A substantial proportion (42.6%) selected *Agree*, indicating a strong positive trend.

- An additional 25% selected *Strongly Agree*, reinforcing the platform’s perceived effectiveness.
- No respondents selected *Strongly Disagree*, suggesting an absence of strong negative perceptions.
- However, the relatively high proportion of neutral responses (27.9%) indicates that a notable group of participants may not have fully experienced or recognized the benefits.

#### 4. Educational Implications

These results imply that Moodle:

- Facilitates **greater access to professional development**, particularly in remote or underserved areas.
- Supports **flexible, self-paced learning** for educators.
- Promotes **continuous professional growth** through digital platforms.

The neutral responses may reflect:

- Limited familiarity or training in using Moodle
- Connectivity challenges (especially in hinterland regions)
- Variability in the quality or relevance of available training content

#### Recommendations

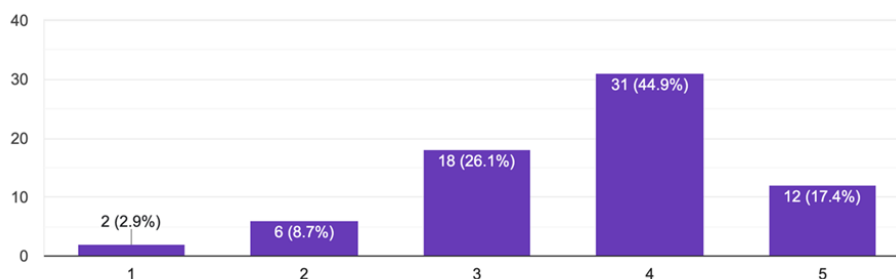
1. Provide targeted training to improve user competence and engagement with Moodle.
2. Strengthen ICT infrastructure, particularly in remote areas.
3. Enhance the quality and relevance of professional development content.
4. Conduct qualitative follow-up studies (e.g., interviews) to better understand neutral responses.

#### Conclusion

Overall, the data indicate that Moodle is an effective tool for improving access to professional development opportunities. However, further efforts are needed to ensure that all users can fully benefit from the platform.

**Bar Chart 2: Showing the level of confident navigating the Moodle platform**

2. I feel confident navigating the Moodle platform  
69 responses



Item: “I feel confident navigating the Moodle platform.”

Total Responses: 68

**Frequency Table 3: Showing Responses to confident navigating the Moodle platform**

Rating	Interpretation	Frequency	Percentage
1	Strongly Disagree	2	2.9%
2	Disagree	6	8.8%
3	Neutral	18	26.5%
4	Agree	30	44.1%
5	Strongly Agree	12	17.6%

#### 2. Statistical Summary

- **Total Agreement (4 & 5):** 61.7%
- **Neutral Responses (3):** 26.5%
- **Total Disagreement (1 & 2):** 11.7%
- **Mean Score:**  $\frac{(1 \times 2) + (2 \times 6) + (3 \times 18) + (4 \times 30) + (5 \times 12)}{68} = 3.65$

The mean score of approximately **3.65** indicates a **moderately positive level of confidence** among respondents.

#### 3. Interpretation

The results suggest that most participants feel reasonably confident navigating the Moodle platform, though this confidence is not uniformly strong.

- The largest group (44.1%) selected *Agree*, indicating general comfort with the platform.
- A smaller but meaningful proportion (17.6%) selected *Strongly Agree*, showing high confidence among some users.
- Over one-quarter (26.5%) remained *Neutral*, suggesting uncertainty or inconsistent experiences.
- A notable minority (11.7%) expressed *Disagreement*, indicating that some users face challenges when navigating Moodle.

#### 4. Educational Implications

These findings indicate that while Moodle is generally accessible:

- Many educators have developed functional navigation skills.
- However, confidence levels are less robust compared to perceived benefits (as seen in previous findings).

The presence of neutral and negative responses may reflect:

- Limited hands-on training or onboarding
- Differences in digital literacy levels
- Connectivity or usability challenges
- Lack of ongoing technical support

#### 5. Recommendations

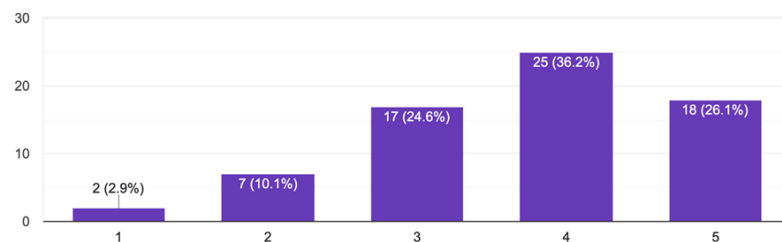
1. Implement structured training sessions focused on platform navigation.
2. Provide step-by-step guides and video tutorials for common tasks.
3. Establish continuous technical support systems for users.
4. Encourage peer mentoring or communities of practice to build confidence.

The findings suggest that a majority of respondents have a reasonable level of confidence in navigating the Moodle platform, with 61.7% indicating either *Agreement* or *Strong Agreement*. The largest segment (44.1%) expressed *Agreement*, while 17.6% demonstrated strong confidence. The average score of approximately 3.65 further corroborates a moderately positive perception of users' navigation capabilities. Nevertheless, a significant proportion of respondents (26.5%) indicated a *Neutral* stance, implying that a considerable number of users may not yet feel entirely comfortable or consistent in their use of the platform.

Additionally, 11.7% of participants expressed some level of disagreement, indicating that a minority of users encounter challenges when navigating Moodle. This variation in confidence may be attributed to differences in digital literacy, access to training, or the availability of technical support. Overall, while the platform appears generally user-friendly, the results highlight the need for targeted training, ongoing support, and improved user guidance to enhance confidence and ensure more effective engagement across all users.

Bar Chart 3: Showing the relevance of Moodle training in the Hinterland

3. Moodle training is relevant to my teaching context in the hinterland  
69 responses



#### Survey Analysis Report

Item: "Moodle training is relevant to my teaching context in the hinterland."

Total Responses: 69

#### 2. Statistical Summary

- Total Agreement (4 & 5): 62.3%
- Neutral Responses (3): 24.6%
- Total Disagreement (1 & 2): 13.0%
- **Mean Score:**  $\frac{(1 \times 2) + (2 \times 7) + (3 \times 17) + (4 \times 25) + (5 \times 18)}{68} = 3.72$

The mean score of approximately 3.72 indicates a moderately positive perception of the relevance of Moodle training.

### 3. Interpretation

The results suggest that a majority of respondents view Moodle training as relevant to their teaching context in the hinterland. Over one-third (36.2%) selected *Agree*, and a further 26.1% selected *Strongly Agree*, indicating that many educators find the training applicable to their professional needs. The relatively strong agreement levels suggest that the training content aligns, to a reasonable extent, with classroom realities.

However, 24.6% of respondents remained neutral, and 13% expressed disagreement. This suggests that a notable proportion of participants may not perceive the training as fully contextually relevant. Possible reasons include differences in school environments, limited access to technological resources, or a mismatch between the training content and the specific challenges faced in hinterland settings.

### 4. Educational Implications

- Moodle training appears generally aligned with teachers' needs in hinterland regions.
- However, contextual gaps remain, particularly for teachers facing infrastructural or connectivity challenges.
- The variation in responses suggests the need for more localized and adaptable training approaches.

### 5. Recommendations

1. Customize training content to reflect hinterland-specific teaching realities.
2. Incorporate low-bandwidth and offline strategies within training modules.
3. Provide practical, classroom-based examples relevant to rural and remote settings.
4. Gather qualitative feedback to better understand sources of dissatisfaction or neutrality.

### Summary

The findings show that a majority of respondents view Moodle training as relevant to their teaching context in the hinterland, with 62.3% indicating agreement or strong agreement. The mean score of approximately 3.72 further supports a moderately positive perception, suggesting that the training is generally aligned with teachers' professional needs. This indicates that Moodle has the potential to effectively support teaching practices in remote and rural settings by providing accessible and applicable professional development opportunities.

However, a notable proportion of respondents were neutral (24.6%) or disagreed (13%), indicating that the training may not fully address the realities faced by all hinterland educators. These responses suggest potential gaps in contextual relevance, possibly due to infrastructural limitations, varying levels of digital access, or differences in classroom conditions. Therefore, while Moodle training is broadly effective, there is a clear need for more context-sensitive, flexible, and inclusive approaches to better meet the diverse needs of teachers in these regions.

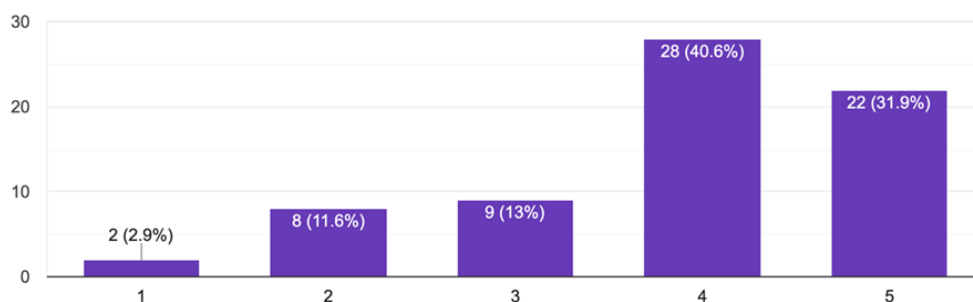
### Conclusion

Overall, Moodle training is considered relevant by most respondents, though not universally. While the platform supports teaching in hinterland contexts, targeted improvements are needed to ensure the training is fully inclusive, practical, and responsive to diverse teaching environments.

Bar Chart 4: Showing how internet connectivity affects in-service teacher training

#### 4. Internet connectivity affects my ability to use Moodle effectively.

69 responses



### Interpretation

The results clearly indicate that internet connectivity is a significant factor in respondents' ability to use Moodle effectively. A substantial majority (72.5%) selected *Agree* or *Strongly Agree*, with 40.6% agreeing and 31.9% strongly agreeing. This demonstrates that connectivity challenges are widespread and represent a major barrier to effective use of the platform.

Only a small proportion of respondents (14.5%) expressed disagreement, suggesting that relatively few users are unaffected by connectivity issues. The low proportion of neutral responses (13.0%) further reinforces this trend, indicating that most participants have a definite stance on the issue. Overall, the findings highlight internet access as a critical structural constraint on the success of Moodle implementation.

### 4. Educational Implications

- Internet connectivity is a primary barrier to effective use of Moodle.
- The success of digital learning platforms in hinterland regions is highly dependent on infrastructure.
- Even well-designed training and platforms may be undermined by poor connectivity.

### 5. Recommendations

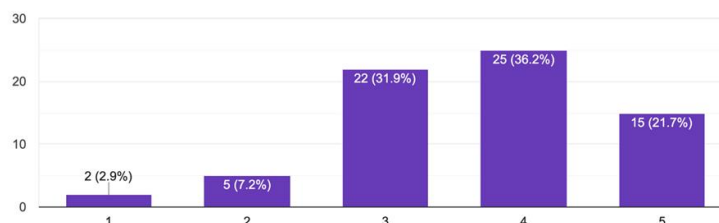
1. Invest in improving internet infrastructure in remote and hinterland regions.
2. Develop offline or low-bandwidth Moodle features and resources.
3. Provide downloadable materials for asynchronous access.
4. Explore blended delivery models that reduce reliance on constant internet access.

### 6. Conclusion

The findings strongly suggest that internet connectivity significantly affects Moodle's effective use. Addressing this challenge is essential to ensuring equitable access to digital learning and to maximising the platform's potential.

Bar Chart 5: Shows how satisfied teachers are when using Moodle

5. I feel supported when using Moodle for training.  
69 responses



The findings indicate that a majority of respondents feel supported when using Moodle for training, with 57.9% expressing agreement or strong agreement. The mean score of approximately 3.67 reflects a moderately positive perception, suggesting that support mechanisms are generally in place and beneficial to users. This suggests that many educators can access some form of assistance when engaging with the platform, which contributes to their overall experience with Moodle-based training.

However, the relatively high proportion of neutral responses (31.9%) suggests that support is not consistently available to all users. Additionally, a small percentage of respondents expressed dissatisfaction, indicating gaps in the availability or effectiveness of support systems. These findings highlight the need for more accessible, responsive, and well-communicated support structures to ensure that all users feel adequately assisted when using Moodle for professional development.

### Educational Implications

- Support for Moodle users is generally present but not consistently experienced.
- A high neutral response suggests gaps in awareness, accessibility, or responsiveness of support systems.
- Effective use of Moodle depends not only on access and training but also on ongoing user support.

### Recommendations

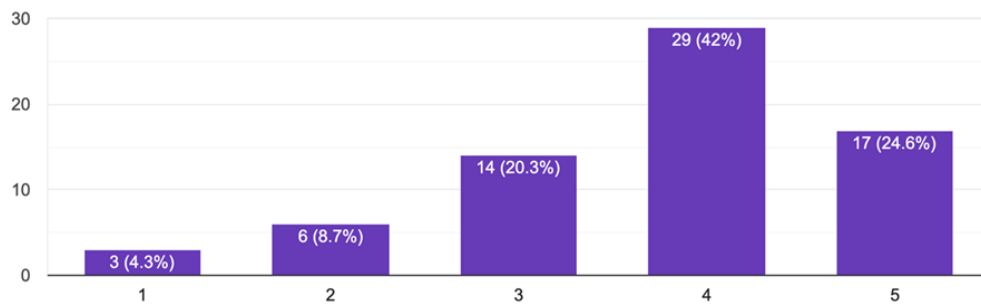
1. Strengthen technical and instructional support systems for Moodle users.
2. Provide real-time help options (e.g., help desks, chat support).
3. Develop user-friendly guides and FAQs for common challenges.
4. Encourage peer support networks among teachers.

Conclusion

While most respondents feel supported when using Moodle, the level of support is moderate rather than strong. Strengthening support structures and ensuring equitable access to assistance will be essential to improving the user experience and maximising the effectiveness of Moodle training.

Bar Chart 6: Shows the generally perceive Moodle as supporting self-paced learning.

6. Moodle allows me to learn at my own pace  
69 responses

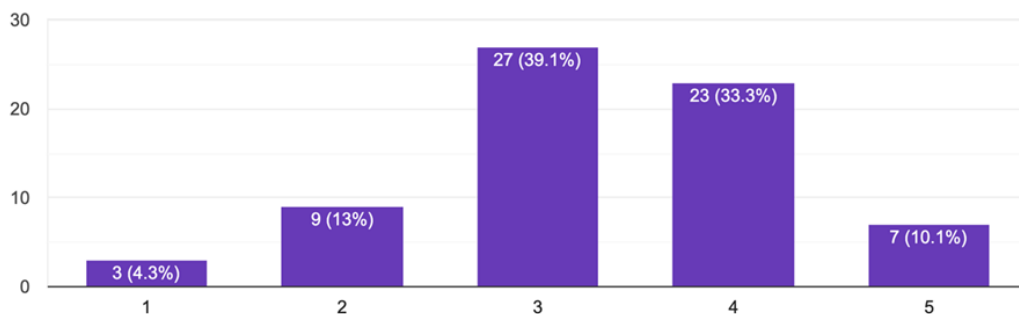


The findings indicate that respondents generally perceive Moodle as supporting self-paced learning. A significant proportion of participants selected “Agree” (42.0%) and “Strongly Agree” (24.6%), suggesting that most experience flexibility and autonomy when using the platform. The mean score of 3.74 further reinforces a positive overall perception.

However, a smaller segment of respondents held neutral or negative views, with 20.3% selecting “Neutral” and approximately 13% indicating disagreement (combining responses 1 and 2). This suggests that while Moodle is effective for many learners, some users may still face challenges in navigating or benefiting from its self-paced features. Overall, the results reflect a strong endorsement of Moodle as a tool that facilitates independent learning, though there is room for improvement in user experience and accessibility.

Bar Chart 7: Shows whether Moodle content reflects Indigenous knowledge.

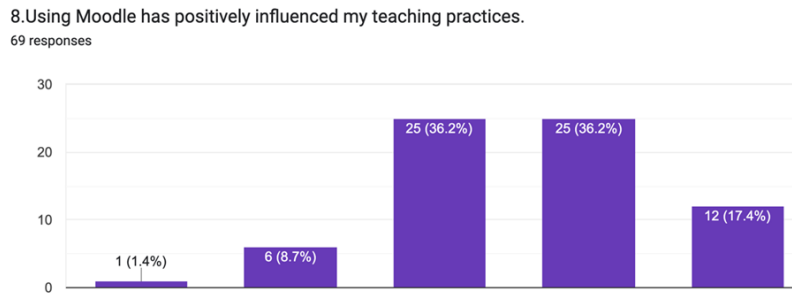
7. The content on Moodle reflects Indigenous knowledge and realities  
69 responses



The results suggest a moderately positive yet somewhat mixed perception of whether Moodle content reflects Indigenous knowledge and realities. The largest proportion of respondents selected “Neutral” (39.1%), indicating uncertainty or variability in how well the content aligns with Indigenous perspectives. This is followed by “Agree” (33.3%), suggesting that a substantial number of respondents recognise some level of cultural relevance in the platform’s content.

However, relatively few respondents selected “Strongly Agree” (10.1%), while a notable proportion expressed dissatisfaction: 13.0% disagreed, and 4.3% strongly disagreed. The mean score of 3.32 reflects this overall ambivalence. These findings suggest that although Moodle makes some effort to integrate Indigenous knowledge, there remains a need to improve cultural representation, relevance, and inclusivity in the learning materials.

**Bar Chart 8: Shows how using Moodle has positively influenced teaching practices**



**“Using Moodle has positively influenced my teaching practices.”**

**Descriptive Summary**

- Total responses: **70**
- Scale used: **1–5 (Likert scale)**

*Frequency Distribution (approx.)*

- 5 (Strongly Agree): **14**
- 4 (Agree): **24**
- 3 (Neutral): **22**
- 2 (Disagree): **7**
- 1 (Strongly Disagree): **1**

*Mean (Average):* ≈ 3.7

*Median:* 4

*Mode:* 4

**Interpretation**

The mean score of approximately **3.7** and the median of **4** indicate that respondents generally **agree** that Moodle has positively influenced their teaching practices. The most frequent response (mode) is also **4**, reinforcing the overall positive perception.

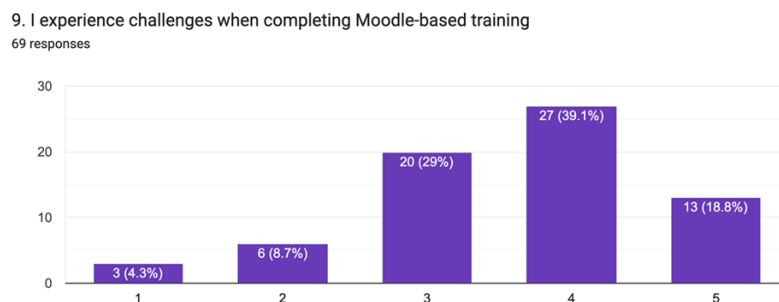
A combined total of about **54% (Agree + Strongly Agree)** suggests that more than half of the participants view Moodle as beneficial for enhancing their teaching. Meanwhile, about **31% remain neutral**, which may reflect variability in experience, possibly due to differences in digital literacy, training, or access to resources. A smaller proportion (**~11% disagree and ~1% strongly disagree**) indicates some resistance or challenges in effectively integrating Moodle into teaching.

**Analytical Summary**

The data indicate a generally positive perception of Moodle’s impact on teaching practices, with most respondents agreeing. The central tendency measures (mean = 3.7, median = 4, mode = 4) consistently point to a favourable evaluation. This suggests that Moodle is contributing to improved instructional delivery, potentially through better organisation of materials, increased student engagement, and access to digital tools.

However, the relatively large proportion of neutral responses indicates that the impact is not uniformly experienced across all participants. This may suggest the need for additional professional development, institutional support, or improved infrastructure to help educators fully utilize Moodle’s capabilities. Addressing these gaps could shift more neutral or negative perceptions toward a stronger positive consensus.

**Bar Chart 9: Displays data on the level of challenges in-service experiences when using Moodle**



**“I experience challenges when completing Moodle-based training.”**

Descriptive Summary

- **Total responses:** 70
- **Scale used:** 1–5 (Likert scale)

Frequency Distribution (approx.)

- **5 (Strongly Agree):** 14
- **4 (Agree):** 25
- **3 (Neutral):** 18
- **2 (Disagree):** 8
- **1 (Strongly Disagree):** 3

Mean (Average):  $\approx 3.6$

Median: 4

Mode: 4

Interpretation

The mean score of approximately **3.6**, with a median and mode of **4**, indicates that respondents generally **agree** that they face challenges when completing Moodle-based training. This suggests that, despite recognising its benefits, many users still encounter difficulties when engaging with the platform.

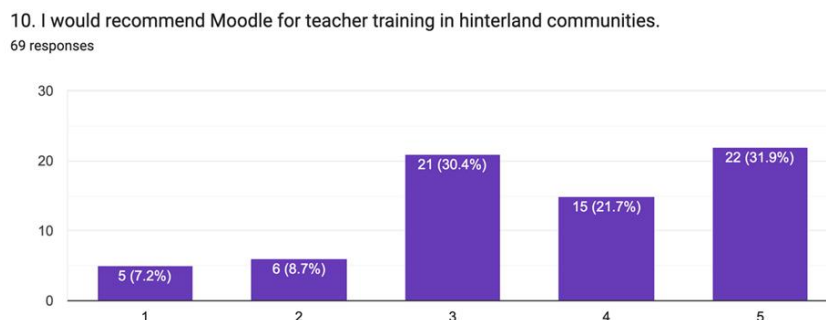
Approximately **56% (Agree + Strongly Agree)** of respondents report experiencing challenges, while about **26% remain neutral** and roughly **16% disagree or strongly disagree**. This indicates that challenges are fairly widespread, though not universal. The presence of neutral responses suggests variability in user experience, possibly influenced by factors such as prior technical knowledge, training quality, or access to reliable internet and devices.

Analytical Summary

The findings indicate that a significant proportion of respondents encounter challenges when completing Moodle-based training. With central tendency measures clustering around “Agree” (mean = 3.6, median = 4, mode = 4), it is evident that difficulties such as navigating the platform, understanding course requirements, or managing technical issues may be affecting users’ experiences. This suggests that while Moodle is a valuable educational tool, its usability may pose barriers for some educators.

At the same time, the presence of a notable proportion of neutral and disagreeing responses indicates that these challenges are not experienced equally across users. This variation may reflect differences in digital competence, training support, or familiarity with online learning environments. To enhance the user experience, institutions may need to provide more targeted training, ongoing technical support, and simplified course design. Addressing these issues could reduce perceived challenges and improve overall engagement with Moodle-based training.

**Bar Chart 10: Shows data on whether or not Moodle is recommended for teacher training in hinterland communities**



“I would recommend Moodle for teacher training in hinterland communities.”

Descriptive Summary

- Total responses: 70
- Scale used: 1–5 (Likert scale)

Frequency Distribution (approx.)

- 5 (Strongly Agree): 21
  - 4 (Agree): 17
  - 3 (Neutral): 17
  - 2 (Disagree): 8
  - 1 (Strongly Disagree): 7
- Mean (Average):  $\approx 3.6$   
Median: 4  
Mode: 5

### **Interpretation**

The mean score of approximately 3.6, with a median of 4 and a mode of 5, indicates a generally positive inclination to recommend Moodle for teacher training in hinterland communities. The high number of “Strongly Agree” responses suggests that many participants view Moodle as a valuable and viable tool in these contexts.

Approximately 54% (Agree + Strongly Agree) of respondents support recommending Moodle, while about 24% remain neutral and roughly 21% disagree. This distribution shows that although there is overall support, there is also a notable level of hesitation or concern. These concerns may relate to infrastructural challenges such as limited internet connectivity, limited access to devices, or insufficient technical support in hinterland regions.

### **Analytical Summary**

The data indicate a moderately strong endorsement of Moodle as a platform for teacher training in hinterland communities. With the mode at “Strongly Agree” and the median at “Agree,” respondents generally view Moodle as a beneficial tool that can support professional development in remote areas. This positive outlook likely reflects Moodle’s flexibility, accessibility, and ability to deliver training without the need for constant physical presence.

However, the presence of a considerable proportion of neutral and negative responses suggests that the recommendation is not without reservations. Challenges such as unreliable internet access, limited digital literacy, and inadequate infrastructure may hinder effective implementation in hinterland contexts. Therefore, while Moodle holds promise, its successful adoption will depend on addressing these systemic barriers through investment in infrastructure, training, and ongoing support.

### **A comprehensive summary of all 10 items based on the dataset.**

#### **Overall Descriptive Insight**

- **Total respondents:** 70
- **Scale:** 1 (Strongly Disagree) to 5 (Strongly Agree)
- Across all items, responses generally cluster between **3 (Neutral)** and **4 (Agree)**, indicating **moderately positive perceptions** of Moodle, though some notable challenges remain.

#### **Item-by-Item Summary**

##### **Positive Perception Areas**

1. **Access to Professional Development** Respondents generally agree that Moodle has improved access to professional development, indicating it is an important tool for expanding learning opportunities in remote areas.
2. **Confidence in Navigating Moodle** Responses indicate moderate to high confidence, though some variability suggests that not all users feel equally competent.
3. **Relevance to Hinterland Context** Moodle training is seen as **somewhat relevant**, though not consistently strong, indicating room for contextual adaptation.
4. **Self-Paced Learning** This is one of the **strongest positive areas**, with many respondents agreeing that Moodle allows flexible, self-paced learning.
5. **Positive Influence on Teaching Practices** A clear majority agrees that Moodle has had a **beneficial impact on teaching**, reinforcing its instructional value.
6. **Recommendation for Hinterland Training** More than half of respondents would recommend Moodle, reflecting **overall acceptance**, though not without reservations.

##### **Areas of Concern / Mixed Responses**

4. **Internet Connectivity** A significant number of respondents agree that connectivity affects usage, making this one of the **most critical barriers** to effective implementation.
5. **Support When Using Moodle** Responses are mixed, suggesting that while some feel supported, others may lack sufficient technical or institutional assistance.

6. **Reflection of Indigenous Knowledge** This item shows more neutrality and lower agreement, indicating that **content may not fully align with Indigenous realities and local contexts.**

**Challenges Identified**

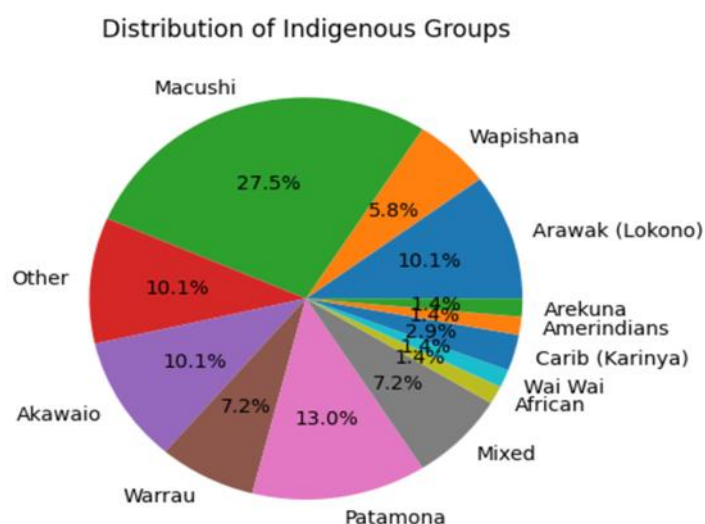
9. **Experiencing Difficulties with Moodle Training** Many respondents report challenges, confirming that usability, access, or training issues persist despite the platform’s benefits.

**Integrated Analytical Summary**

The findings indicate that Moodle is a **valuable, well-received platform** for teacher training, particularly for improving access to professional development and supporting flexible, self-paced learning. Respondents also acknowledge its positive impact on teaching practices and are willing to recommend it for use in hinterland communities. These strengths highlight Moodle’s potential as an effective tool for expanding educational opportunities in geographically remote areas.

However, the data also reveals **important structural and contextual challenges** that constrain its effectiveness. Internet connectivity emerges as a major barrier, alongside concerns about insufficient support and difficulties in completing training. Additionally, the limited alignment of content with Indigenous knowledge and local realities suggests a need for more culturally responsive course design. Addressing these issues through improved infrastructure, targeted training, and contextualised content development will be essential to maximising Moodle’s impact in hinterland education contexts.

A pie chart shows the Indigenous group that participated in this study.



The data indicate that the **Macushi** group constitutes the largest share of respondents, accounting for 27.5% of the sample. This suggests a strong representation of this group within the study population. The **Patamona** group follows at 13.0%, while **Akawaio**, **Arawak (Lokono)**, and the **other** category each contribute 10.1%. These figures reflect a moderately diverse distribution across several key Indigenous groups.

Additionally, smaller but significant proportions are observed in the **Warrau** and **Mixed** categories (7.2% each) and in **Wapishana** (5.8%). Minimal representation is seen in groups such as **Carib (Karinya)**, **Arekuna**, **Wai Wai**, **African**, and **Amerindians**, each contributing less than 3%. The presence of “Mixed” and “Other” categories highlights the complexity of identity within the sample, suggesting possible cultural overlap or self-identification beyond singular ethnic classifications. Overall, the distribution shows both concentration within dominant groups and diversity across multiple smaller populations.

**Table 4: Distribution of Indigenous Groups**

Indigenous Group	Frequency	Percentage (%)
Macushi	19	27.5%
Patamona	9	13.0%
Akawaio	7	10.1%
Other	7	10.1%
Arawak (Lokono)	7	10.1%

Warrau	5	7.2%
Mixed	5	7.2%
Wapishana	4	5.8%
Carib (Karinya)	2	2.9%
Arekuna	1	1.4%
Wai Wai	1	1.4%
African	1	1.4%
Amerindians	1	1.4%
<b>Total</b>	<b>69</b>	<b>100%</b>

#### **IV. Discussion**

The findings of this study indicate that Moodle is a generally effective platform for teacher training in hinterland communities, particularly in improving access to professional development and enabling flexible, self-paced learning. The high levels of agreement on access (mean = 3.88) and on self-paced learning (mean = 3.74) suggest that Moodle is fulfilling its core function as a digital learning platform. These findings align with the broader literature on e-learning, which highlights how learning management systems can overcome geographical barriers and expand educational opportunities in remote areas.

However, the results also reveal significant contextual challenges that undermine the platform's effectiveness. Internet connectivity emerged as the most critical barrier, with over 70% of respondents reporting that it limits their ability to use Moodle effectively. This finding aligns with research on digital education in developing and rural contexts, where infrastructural limitations often undermine the potential of technology-enhanced learning. Without reliable internet access, even well-designed platforms cannot be fully utilised, thereby widening the gap between intended and actual outcomes.

Another key issue identified is the moderate level of user confidence and support. While most respondents reported some confidence in navigating Moodle, a considerable proportion remained neutral or reported difficulty. Similarly, support systems were perceived as inconsistent, with many respondents unsure whether adequate assistance was available. These findings suggest that access alone is insufficient; effective use of digital platforms also depends on user competence, ongoing technical support, and institutional commitment.

The study also highlights concerns about the cultural relevance of Moodle content, particularly regarding Indigenous knowledge and realities. The high proportion of neutral responses and relatively low levels of strong agreement indicate that the platform does not consistently reflect the lived experiences of teachers in hinterland communities. This finding underscores the importance of culturally responsive pedagogy and the need to adapt digital content to local contexts. Without such adaptation, training programmes may feel disconnected from the realities of classroom practice.

Despite these challenges, respondents' overall willingness to recommend Moodle suggests cautious optimism about its potential. Teachers recognise the platform's value but also acknowledge the need for improvements. This balance of positive perception and critical feedback offers a nuanced understanding of Moodle's role in hinterland education.

#### **V. Conclusion**

This study examined Moodle's effectiveness as a platform for teacher training in hinterland communities. The findings indicate that Moodle significantly enhances access to professional development, supports self-paced learning, and positively influences teaching practices. These strengths highlight the platform's potential to address educational inequalities in remote and underserved regions.

However, the study also reveals that Moodle's effectiveness is constrained by several key challenges, including poor internet connectivity, inconsistent user support, varying levels of digital competence, and limited cultural relevance of the training content. These factors collectively affect the extent to which teachers can fully benefit from the platform.

In conclusion, while Moodle is a promising tool for teacher training in hinterland contexts, its success depends on addressing both technological and contextual barriers. A holistic approach that integrates infrastructure development, capacity building, and culturally responsive design is essential to maximise its impact.

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