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# Investigating Ghanaian Pre-Tertiary Teachers' Adaption of Differentiated Instructional Strategies

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**Abstract:** The emphasis on adapting learner-centric education and inclusive pedagogies to promote learning effectiveness is part of the paradigm shift in teaching. By maximizing variability, differentiated education methodologies ensure individualized instruction and equal academic success for all students. Based on this justification, this study sought to investigate Ghanaian pre-tertiary teachers' adaption of differentiated instruction strategies during the teaching and learning processes. Pre-tertiary teachers within the Kwahu Ridge of the Eastern Region of Ghana were sampled to respond to the close-ended questionnaire. A multi-pronged approach was employed in the data analysis. Respondents possessed knowledge of the differentiated instruction strategies. However, there were some disparities between first and second-cycle teachers. Significant factors influenced the range of diversity in the classroom and knowledge and experience, with the latter showing an unexpected negative influence, possibly due to experienced teachers' preference for traditional methods of teaching. Notwithstanding, a perfect alignment of instructional techniques, activities and assessment practices to accommodate the heterogeneity of students stimulate active participation, interest and readiness to learn. It is recommended that educational stakeholders should recognize the dynamic nature of the learning environment and better provide pre-tertiary teachers with the tools and support needed to employ differentiated instruction techniques successfully to ensure inclusive, individualized and intensive instruction in the classroom.

**Keywords:** Differentiated Instruction; Social Constructivism Theory; Zone of Proximal Development; Gardner's Theory of Intelligence; Pre-tertiary teachers

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## 1. Introduction

To address the diverse heterogeneous needs of learners, ensure inclusivity during instruction, intensify individualistic instructional assistance, and ensure flexibility in teaching and integration of technological resources, there is the need to ensure a paradigm shift in the focus of instruction to address the slow learning pace among students. This shift in the teaching paradigm emphasizes the adaptation of learner-centric instruction and inclusive pedagogies to stimulate the effectiveness of the instructional processes [1, 2]. Differentiated instruction (DI) strategies have a significant impact on the degree to which teachers can maximize the heterogeneity of the potential of all learners to access personalized instruction and equitable academic successes within learner-centred pedagogies [3, 4, 5]. Differentiated instruction is a teaching practice based on constructivist learning theory that promotes the adaptation of content to the unique environmental experiences, cognitive capacities, and learning styles of students [5, 6]. The DI teaching approach, as opposed to the prescriptive or banking approach, allows

learners to access the subject matter based on their skill level, motivation, and engagement [7, 8]. Depending on the student's aptitudes, preferences, and learning profiles, DI can be applied to the content, process, product, and learning environment [5, 9]. Teachers need to adjust the multifaceted nature of their subject matter to the intellectual level of the students, leverage varied learner-centred techniques (discussion, think-pair-share, brainstorming, demonstration, mind-mapping, and project-based technique) to facilitate instruction and employ several assessment techniques, particularly authentic or performance-based assessment to support students' learning process. Instead of keeping learning within the four walls of the classroom, the learning environment should be diversified to provide a place for authentic learning opportunities and real-world experiences. Field trips, nature walks, utilizing the services of resource personnel, and experimentation should all be permitted during instruction. The manifestations of differentiated instruction help develop the zone of proximal development of students and enable teachers to conceptualize their responses to the varying learning requirements of their students in mainstream classrooms [10, 11].

Many nations, including Canada, the United Kingdom, the United States, Norway, Sweden, Malaysia, Hong Kong, and Australia, have promoted the use of DI as a method of instruction and evaluation in various educational settings across early childhood education, primary, secondary, and post-secondary levels to diversify the presence of culturally diverse and mixed-ability learners [2, 4, 12]. Ghana's educational system has changed from an objective-based curriculum to one focused on standards, with the expectation that students will build their knowledge based on their own social, emotional, cognitive, and physical growth. The teaching and learning process must be relevant for students to develop into critical thinkers, problem solvers, creators, innovators, effective communicators, and collaborators. Additionally, students develop into internationally competitive citizens with vital interests in their personal growth who are digitally savvy, culturally sensitive, and lifelong learners. The Common Core Program's pedagogical approaches emphasize innovative and inclusive teaching methods based on cross-disciplinary and authentic inquiry-based learning, collaborative and cooperative learning, differentiated instruction, and holistic instruction [12, 14]. For Ghanaian teachers to effectively execute the demands (development of core competencies, pedagogical approaches, and assessment practices) of the Common Core Program, teachers need to adapt differentiated instruction strategies during instruction.

However, it has been demonstrated that implementing DI approaches in many educational settings is constrained, incompatible, and erroneous [15], as well as needing to be more time-consuming [16]. Studies have further shown that teachers' content knowledge, knowledge and perception of DI, sense of efficacy, and pedagogical and assessment literacy are key factors affecting teacher adaptation of DI strategies during instruction [5, 17, 18, 19]. The implementation of DI becomes more difficult due to instructors' lack of knowledge regarding its efficacy, efficiency, and effectiveness, the lack of necessary resources, and environmental constraints like the presence of large class sizes [2, 16, 20]. Furthermore, demographic variables such as level of teaching, sex, academic qualification and teaching experience influence the DI strategies adopted by the teacher during instruction [21, 22, 23]. Contextualizing DI barriers to Ghanaian teachers, they face difficulty in striking an appropriate equilibrium between their obligation to cover the subject matter in order to prepare students for standardized evaluations and the need to be responsive to students by aligning instruction, tasks, and assessments according to their learning readiness [7].

Coupled with these barriers, how are teachers adjusting strategies to guarantee the effective utilization of the DI, considering that Ghanaian teachers were not provided DI instruction during their teacher preparation programs at the various institutions of education and universities? [24] who advocate for providing sufficient practical training in teacher preparation programs, raising awareness through various academic events, and

offering refresher courses to help educators apply DI tactics effectively, share this viewpoint. Studies draw attention to the fact that there remain significant knowledge gaps which calls for continuous research to make firm conclusions about the efficacy and worth of various approaches to diversified instruction in the classroom [24, 25, 26]. Hence, this quantitative study sought to investigate Ghanaian pre-tertiary teachers' adaptation of differentiated instruction strategies during the teaching and learning process. This line of investigation enriches the understanding of the current pedagogical practices (DI strategies) within Ghanaian educational space and evaluates its alignment towards the provision of socially-driven instructional practices. The study's findings will contribute to how DI strategies can aid in the delivery of inclusive, individualistic and intensive instruction.

### **1.1. Research Questions**

The following research questions guided the study:

1. What are pre-tertiary teachers' knowledge of differentiated instruction strategies?
2. What are pre-tertiary teachers' adaptations of differentiated instructional (DI) strategies during instructional periods?
3. What factors influence pre-tertiary teachers' use of differentiated instructional strategies during instructional periods?

### **1.2. Theoretical Contextualisation of Differentiated Instruction Strategies**

To ensure that students learn successfully in contemporary learning environments, instructors must adapt their lesson plans to account for the complexity and diversity of their students [15]. This means that Gardner's idea of learning intelligence is the foundation for DI [21,22]. This necessitates using various teaching strategies that align with pupils' preferred logical, verbal, musical, visual, kinesthetic, interpersonal, intrapersonal, and natural intelligence. It assumed that students use these intelligences to find their motivation and readiness to learn. Additionally, the notion of permitting students to interact and learn by their intelligence, maturity, and preparation resonates with assessing students' present performance and identifying gaps to be remediated to promote learning (Zone of Proximal Development, or ZPD). Based on each student's level of material mastery, scaffolding is provided to maintain interest in and motivation for learning throughout time [9, 27]. The difficulties caused by the presence of mixed-ability classrooms get transformed into opportunities for strengthening education to enhance the quality of instruction based on [21, 22] theory and the social constructivism theory (ZPD). The relevance of these theories resonates with the expected instructional drive of the Ministry of Education, Ghana to support students to construct their own knowledge and competencies according to their abilities. In order to achieve equity, teachers may use divergent differentiation, distributing their efforts equally among all students to reduce the existence of low and higher-achieving students' competition [28, 29].

## **2. Materials and Method**

Based on the paradigm of positivism, a quantitative approach provided a thorough description of the phenomena in their natural environment without changing any factors to portray the study's goal accurately [30]. In order to fully explain pre-tertiary teachers' comprehension, adaptation, and factors that influence their different instructional practices during instruction, the study used a descriptive research design. Ghana's Eastern region's pre-tertiary teachers comprised the study's target population. Within the Kwahu Ridge of the Eastern Region of Ghana, the accessible population at the time of the study was about 2326, with about 1480 teachers from the first Basic cycle and about 846 from the second cycle. As a result of the introduction of the Common Core Programme,

pre-tertiary teachers have directly or indirectly employed some differentiated instruction strategies to cater for students' diverse learning abilities and needs. Pre-tertiary teachers responded to the closed-ended questionnaire using the KoboToolbox from the Harvard Humanitarian Initiative via email, Telegram, and WhatsApp. The researchers' daily posting of the data collection link led to a higher return rate for the data-collecting tools. About 683 replies were obtained after four weeks of posting the data collection link on pre-tertiary teachers' social media platforms. A multi-pronged approach was adopted for data analysis to address the study's research questions. Mann-Whitney Wilcoxon was used to analyse research question 1, while research question 2 was analyzed using the probit regression model.

### 3. Results

#### 3.1. Pre-Tertiary Teachers' Knowledge of Differentiated Instruction Strategies.

The knowledge levels of differentiated instruction (DI) strategies among first- and second-cycle teachers. A cursory examination of [Figure 1](#) findings reveals **how** first- and second-cycle teachers' knowledge learning disparities. This implies they understand the value of contrasting ideas in speeding up comprehension and supporting critical thinking. In support of this, [\[31\]](#) underlined that students can better understand a concept by identifying its key components with the help of contrasting situations. In second-cycle schools rather than first-cycle institutions, the tiered assignments technique, which modifies task difficulty based on students' readiness, appears more prevalent. This discrepancy suggests that second-cycle teachers may be more aware of the diverse academic capacities of their pupils, which may explain why they employ this strategy more frequently.

Interesting outcomes were found for autonomous projects, inquiries, and independent studies in first-cycle schools. The constructivist learning paradigm, which promotes learner independence, is compatible with this predisposition, which emphasizes developing independent learning [\[3, 32\]](#). However, the desire for interest centres, interest groups, and learning stations was stronger in second-cycle schools. The consistency of frequency these tactics are used at higher grade levels since they necessitate complex organizing skills and independent learning from children who frequently switch between projects and settings [\[18\]](#). Underscoring the universally acknowledged importance of adaptable instructional modalities in meeting the different needs of students, it is noteworthy that tactics like flexible grouping and variable questioning maintained constant recognition across the board [\[15, 18\]](#).

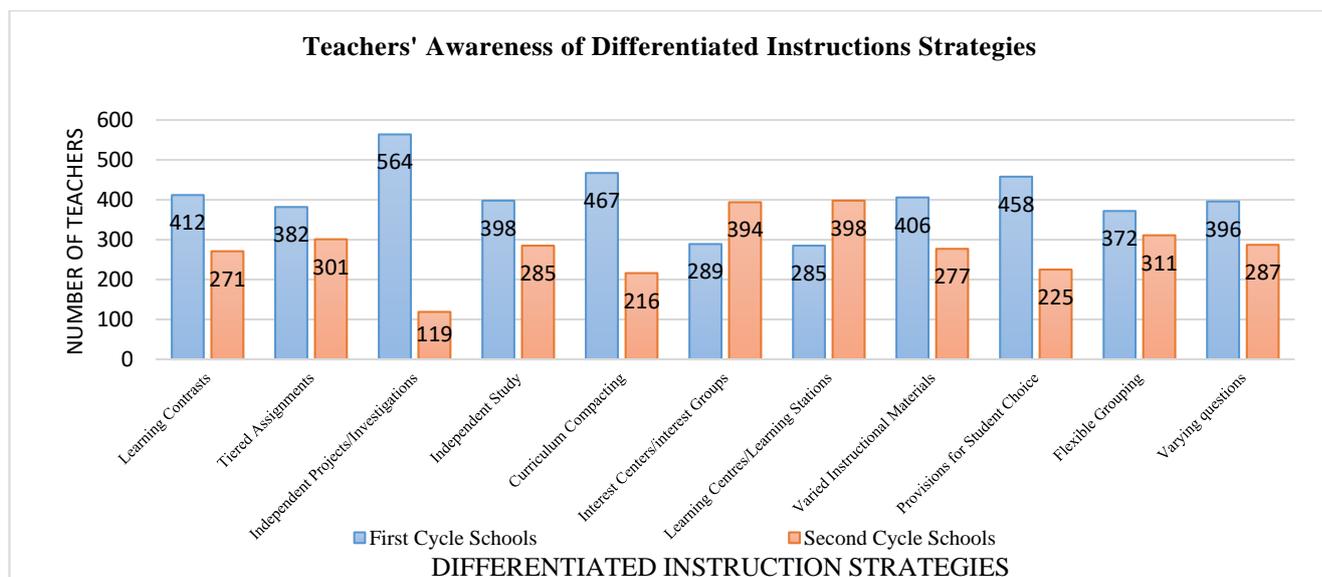


Figure 1. Teachers’ Awareness of Differentiated Instruction Strategies; Source: (Field Data, 2022)

In order to determine if the disparity in the knowledge (or familiarity) of DI strategies were significant, the Mann-Whitney and Wilcoxon rank test was used to ascertain the significance difference (See Table 1).

Table 1. Differences in Knowledge (Or Familiarity) of DI Strategies

Differentiated Learning Strategies	Mann-Whitney U	Wilcoxon W	Z	P-value
Learning Contrasts	1050	2325	-2.171	.030*
Tiered Assignments	950	2225	-2.722	.006**
Independent Projects/Investigations	1150	2425	-1.147	.251
Independent Study	1025	2300	-1.855	.064
Curriculum Compacting	1075	2350	-1.428	.153
Interest Centers/interest Groups	725	2000	-4.18	.000**
Learning Centres/Learning Stations	925	2200	-2.851	.004**
Varied Instructional Materials	1100	2375	-1.398	.162
Provisions for Student Choice	1175	2450	-0.672	.501
Flexible Grouping	1225	2500	-0.318	.75
Varying questions	1225	2500	-0.318	.75

Source: (Field Data, 2022)

\*Significance of 0.05

\*\*significance of 0.01

From Table 1, the Mann-Whitney U and Wilcoxon rank tests found significant differences in the knowledge of DI strategies between first-cycle and second-cycle teachers for learning contrasts (p = .030), tiered assignments (p = .006), interest centres/interest groups (p = .000), and learning centres/learning stations (p = .004). The other strategies did not significantly differ between the two groups, meaning the variations could have happened by chance. Table 3 presents the mean ranks for the significant system. This gives insight into the direction of the disparity, allowing us to understand better how the groups differ. In learning contrasts and tiered assignments, second-cycle teachers had higher mean ranks, suggesting they are more familiar with these strategies than first-cycle teachers. Conversely, for interest centres/interest groups and learning centres/learning stations, first-cycle teachers had higher mean ranks, indicating they are more familiar with these strategies than second-cycle teachers. The

findings underscore the disparities between first-cycle and second-cycle teachers in their familiarity with various DI strategies. This could affect the effectiveness of instruction and student learning outcomes.

**Table 2. Rank Difference between First Cycle Teachers and Cycle Teachers' Awareness of Differentiated Instruction**

Differentiated Instruction Strategies	Level of Teaching	Mean Rank	Rank
Learning Contrasts	First Cycle	46.50	2 <sup>nd</sup>
	Second Cycle	54.50	1 <sup>st</sup>
Tiered Assignments	First Cycle	44.50	
	Second Cycle	56.50	
Interest Centres/interest Groups	First Cycle	61.00	
	Second Cycle	40.00	
Learning Centres/Learning Stations	First Cycle	57.00	
	Second Cycle	44.00	

*Source: (Field Data, 2022)*

### **3.2. Pre-Tertiary Teachers' Adaptations of Differentiated Instructional (Di) Strategies During Instructional Periods**

The findings on the frequency of teachers' uptake of differentiated instruction strategies showed use or application of the DI strategies was mainly implemented once a week by most teachers in both first and second-cycle institutions (See Table 3). The findings provide insight into the frequency of teachers' use of different differentiated instruction (DI) strategies in both first-cycle and second-cycle schools in terms of learning contrasts second-cycle teachers appear to use this strategy more frequently, with a higher number of teachers reporting they always use it compared to first cycle teachers. However, a more significant proportion of first-cycle teachers sometimes use it. Research suggests contrasting learning benefits student comprehension and understanding, particularly in complex subject areas [33]. For tiered assignments, the data suggests that this strategy is utilized more often in first-cycle schools, with more teachers reporting using it sometimes. However, Second-cycle teachers are more likely to use it consistently, albeit at a lower frequency than first cycle teachers. Tiered assignments allow teachers to address different students' needs based on their readiness, making them a crucial part of DI [34].

The findings further indicated that independent study is utilized relatively evenly across both types of schools. However, more second-cycle teachers report using this strategy always or rarely compared to first cycle teachers. Independent study encourages autonomy and self-directed learning, essential skills for higher grades [35]. Curriculum compacting and interest centres/interest groups are used more frequently by second-cycle teachers, particularly on an always basis. This finding aligns with previous research suggesting that these strategies become more effective and applicable as students' advance to higher grades [36]. Varied instructional materials and provisions for student choice appear commonly used across both school cycles. However, more first-cycle teachers report using these strategies sometimes, whereas more second-cycle teachers report using them always or rarely. Research shows that using various materials and giving students a choice in their learning can improve engagement and motivation [37].

Flexible grouping is consistently utilized across both school cycles. This strategy aligns with the DI principle that calls for flexible instructional approaches to cater to student differences [34]. Regarding learning contrasts, second-cycle teachers use this strategy more frequently, with more teachers reporting they always use it than first-cycle

teachers. However, a more significant proportion of first-cycle teachers use it sometimes. Research suggests that contrasting learning benefits student comprehension and understanding, particularly in complex subject areas [33]. For tiered assignments, the data suggests that this strategy is utilized more often in first-cycle schools, with more teachers reporting using it sometimes. However, second-cycle teachers are more likely to use it consistently, albeit at a lower frequency than first-cycle teachers. Tiered assignments allow teachers to address different students' needs based on their readiness, making them a crucial part of DI [34, 38]. Varied instructional materials and provisions for student choice are commonly used across both school cycles. However, more first-cycle teachers report using these strategies sometimes, whereas more second-cycle teachers report using them always or rarely. [37] point out that providing a range of resources and giving students a say in their learning can boost engagement and motivation. Flexible grouping is consistently utilized across both school cycles. This strategy aligns with the DI principle that calls for flexible instructional approaches to cater to student differences [5]. Lastly, varying questions seem to be utilized more frequently by first-cycle teachers, particularly sometimes. The usage of varied questioning in teaching is backed by research, which suggests it is beneficial for critical thinking and deep understanding [39].

**Table 3. Frequency of Uptake of Differentiated Instruction Strategies**

DI Strategies	Frequency	Level of Teaching	
		First Cycle	Second Cycle
Learning Contrasts	Always	14	32
	Sometimes	68	30
	Rarely	16	24
	Never	2	14
Tiered Assignments	Always	12	14
	Sometimes	64	28
	Rarely	16	38
	Never	8	18
Independent Study	Always	10	16
	Sometimes	68	42
	Rarely	18	34
	Never	4	8
Curriculum Compacting	Always	18	34
	Sometimes	46	26
	Rarely	26	26
	Never	10	14
Interest Centers/interest Groups	Always	26	34
	Sometimes	48	24
	Rarely	20	24
	Never	6	18
Varied Instructional Materials	Always	22	34
	Sometimes	70	34
	Rarely	8	30
	Never	0	2
Provisions for Student Choice	Always	20	28
	Sometimes	54	28
	Rarely	22	34

	Never	4	10
	Always	36	30
Flexible Grouping	Sometimes	52	48
	Rarely	12	18
	Never	0	4
	Always	16	14
Varying questions	Sometimes	74	52
	Rarely	10	30
	Never	0	4

*Source: (Field Data, 2022)*

In determining the significant difference in the frequency of uptake of differentiated instruction strategies between first-cycle teachers and second-cycle teachers, the findings of the Mann-Whitney and Wilcoxon W revealed that there was a significant difference between first-cycle teachers and second-cycle teachers' frequency use of tiered assignments, learning centres/learning stations and varying questions. From [Table 4](#), there were significant differences in the frequency of uptake of DI strategies for tiered assignments, learning centres/learning stations, and varying questions where  $p < .005$ . The p-values indicate that the difference in the uptake of these strategies between the two groups of teachers is significant.

**Table 4. Difference in the Frequency of Uptake of Differentiated Instruction Strategies**

Differentiated Learning Strategies	Mann-Whitney U	Wilcoxon W	Z	P-value
Learning Contrasts	1197.5	2472.5	-0.39	.697
Tiered Assignments	891	2166	-2.499	.012**
Independent Study	1082.5	2357.5	-1.28	.201
Curriculum Compacting	1176	2451	-0.533	.594
Interest Centers/interest Groups	1149	2424	-0.728	.466
Learning Centres/Learning Stations	956	2231	-2.274	.023**
Varied Instructional Materials	1152	2427	-0.741	.459
Provisions for Student Choice	1133.5	2408.5	-0.849	.396
Flexible Grouping	1098	2373	-1.146	.252
Varying questions	970.5	2245.5	-2.242	.025**
Pre-assessment date to differentiate learning experiences	988.5	2263.5	-1.902	.057

*Source: (Field Data, 2022)*

The results from the Mann-Whitney U test further provide noteworthy insights into the frequency usage of significant DI strategies. For the strategy of tiered assignments, while first-cycle teachers secured a mean rank of 43.32, their counterparts in the second-cycle demonstrated a more pronounced frequency of usage with a higher mean level of 56.82. Similarly, first-cycle teachers had a mean rank of 44.62 for the learning centres and learning stations strategy, whereas second-cycle teachers surpassed this with a mean level of 56.38. This suggests that Senior High School teachers might have greater exposure or inclination towards using learning centres and stations during instruction. The strategy of varying questioning further reinforces this trend. First-cycle teachers had a mean rank of 44.91, while second-cycle teachers showcased a higher mean level of 56.09. This could indicate that varying questions to cater to diverse student needs is a more commonly employed tactic in the senior high school setting.

**Table 5. Rank Difference between First and Second-cycle Teachers Frequency of Uptake of Differentiated Instruction**

Differentiated Instruction Strategies	Level of Teaching	Mean Rank	Rank
Tiered Assignments	First Cycle	43.32	2
	Second Cycle	56.82	1
Learning Centres/Learning Stations	First Cycle	44.62	2
	Second Cycle	56.38	1
Varying questions	First Cycle	44.91	2
	Second Cycle	56.09	1

Source: (Field Data, 2022)

These findings have significant implications for teacher professional development and instructional design. Suppose second-cycle teachers more frequently utilise DI strategies like tiered assignments, learning centres/learning stations, and varying questioning. These strategies might be more applicable or practical in second-cycle schools. However, it also implies that first cycle teachers might need additional training or resources to implement these strategies more effectively. Research supports the benefits of these strategies. For instance, tiered assignments allow teachers to cater to different student readiness levels, enhancing student engagement and learning outcomes [34]. Learning centres/stations offer student-centred learning and peer interaction opportunities, promoting student engagement and fostering a deeper understanding of content [40]. Lastly, varying questioning can stimulate critical thinking and accommodate students' learning levels [39].

### 3.3. Factors influence pre-tertiary teachers' use of differentiated instructional strategies during instructional periods

Table 6 presents the probit regression model analyzing factors influencing pre-tertiary use of differentiated learning strategies.

**Table 6. Factors Influencing DI Strategies Uptake**

Variable	Coefficient	Std. Error	Marginal Effect	p-value
const	0.662009	0.388022		.088 *
Administration school leadership	-0.169039	0.499190	-0.0673410	.734
Range of diversity in the classroom	1.65167	0.526971	0.579676	.001 ***
Availability of materials	-0.284000	0.383635	-0.112692	.451
Parent expectation	0.850844	0.485296	0.320692	.079 *
Support of other staff	0.685536	0.459885	0.266261	.136
Amount of planning time	0.787845	0.468040	0.306354	.092 *
Knowledge and experience	-2.02045	0.581660	-0.589595	.000 ***
Staff development opportunities	-0.864624	0.452477	-0.329899	.056 *

Prob>chi= .0001

Waldchi<sup>2(9)</sup> = 33.8119

Logpseudolikelihood = -52.32874

PseudoR<sup>2</sup> = .244183

Source: (Field Data, 2022)

From Table 6, two variables stood out as statistically significant: range of diversity in classroom" and knowledge and experience. The coefficient of the range of diversity in the classroom is positive and statistically significant, which implies that increased diversity in the classroom significantly influences the teachers' use of differentiated instruction

strategies. This aligns with studies showing that in more diverse classrooms, teachers are more likely to utilize differentiated instruction to meet their students' varied learning needs and styles [26]. The coefficient of knowledge and experience is negative and statistically significant, indicating that the more knowledge and experience a teacher has, the less likely they are to use differentiated learning strategies. This might seem counter-intuitive, as one might expect experienced teachers to employ a broader array of teaching strategies. However, this implies that experienced teachers are more comfortable with traditional teaching methods and may be less inclined to adapt differentiated strategies. This finding suggests a need for professional development that targets new teachers and experienced ones to bring them up to date with innovative teaching methods like differentiated instruction [32]. The parent expectation, amount of planning time, and staff development variables have p-values close to 0.05, suggesting potential statistical significance if the sample size were larger or under a slightly higher significance level. They indicate that parents' expectations and the available planning time may influence differentiated instruction, and current staff development programs may not effectively promote these strategies [19]. Overall, the model has an R<sup>2</sup> value of .244183, meaning the predictive variables can explain approximately 24.4% of the variation in pre-tertiary teachers' adaptation of differentiated learning strategies.

#### 4. Discussion

The findings of this study illuminate critical aspects of pre-tertiary teachers' use of differentiated instruction (DI) strategies in Ghana, revealing disparities in knowledge and implementation of these strategies. The one-size-fits-all approach did not, however, have an impact on kids' learning because each student receives the same teaching regardless of level. Additionally, respondents from the Basic school acknowledged that their tasks were based on students' ZPD proficiency levels. The research results highlight the respondent's knowledge of the use of learning contrast, independent projects, varied instructional materials and techniques, and flexible grouping are consistent with those of [41], who found that individualized instruction improved students' academic performance despite differences in school subjects. Additionally, the results of this study agreed with [22] in that differentiated instruction not only improved student achievement but also lessened diversity in the classroom. Lastly, the outcomes are consistent with [13], whose studies demonstrated that varying the content, procedure, and output increases students' accomplishment statistically. Our quantitative results are analogous to the studies of [17, 42] where teachers with philosophical perspectives aligning in line with the fundamental principles of DI create flexible instructional and assessment strategies that take into account the diversity in the readiness, interests, and preferences of the students within the learning environment. The findings highlight Gardner's learning intelligence (DI) framework, through which teachers modify lesson plans to account for the complexity and diversity of their students. This entails adopting instructional techniques that cater to students' preferred intelligence, enabling them to interact and learn by their aptitude, development, and readiness [43, 44]. Teachers can remediate individual students' areas for improvement, thereby extending students' (ZPD) [45, 44]. Here, amidst large class sizes and mixed-ability, classrooms are transformed into learning possibilities raising the calibre of instruction.

#### 5. Conclusion

It can be concluded that pre-tertiary teachers within Kwahu Ridge of the Eastern Region of Ghana knew DI strategies such as learning contracts, tiered assignments, independent projects, interest centres, varied instructional materials, flexible grouping and varying questions. However, learning contrasts = .030), tiered charges (p = .006),

interest centres/interest groups ( $p = .000$ ), and learning centres/learning stations were significant. Differentiated instruction (DI) strategies provided valuable insights, revealing significant disparities between first and second-cycle teachers' knowledge and application. Distinct differences exist in the understanding and use of specific strategies like learning contrasts, tiered assignments, interest centres/interest groups, and learning centres/learning stations, which may be attributed to differing educational demands and developmental stages of learners. Significant influencing factors were the range of diversity in the classroom and knowledge and experience, with the latter showing an unexpected negative influence, possibly due to experienced teachers' preference for traditional teaching methods. It essentially consists of the ethos of DI instructors to adopt reflective and re-adjustment perspectives to review, re-evaluate, and possibly reconsider their instructional techniques, teaching and learning activities and assessment practices because the predictive variables of this study explained approximately 24.4% of the variation of-tertiary teachers' adaptation of differentiated learning strategies. As a result, a perfect alignment of these components (expected learning outcomes, instructional techniques, teaching and learning activities, learners' experiences and assessment practices) will whip students' active participation, stimulating their interest and readiness to learn.

## 6. Recommendations

It is crucial to note that instructional practices do not take place in a vacuum; the pace and nature of instruction are influenced by the teaching philosophy, educational orientation, professional development, and teachers' individual qualities, content knowledge, and pedagogical skills. As a result, it is critical to design professional development initiatives to increase first-cycle teachers' capacity to understand students' readiness so they can adapt instruction accordingly. At the same time, amidst the presence of large class sizes, second-cycle teachers should be encouraged to adopt strategies that encourage independent learning among students. Second, educational stakeholders must recognise the dynamic nature of the learning environment and better provide pre-tertiary teachers with the tools and support they need to employ DI techniques in a range of classroom settings successfully. Finally, the predictive variables of this study explained approximately 24.4% of the variation of-tertiary teachers' adaptation of differentiated learning strategies, studies should be conducted on other potential influential variables to increase the overall adaption and efficient use of DI techniques within the pre-tertiary landscape in Ghana.

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