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Implementing Universal Design for Learning for Learners with Intellectual Disabilities: Evidence from Teachers' Practices and a Proposed Inclusive Education Framework

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ABSTRACT

This study examined the implementation of Universal Design for Learning (UDL) in teaching learners with intellectual disabilities. It focused on three UDL principles: multiple means of representation, multiple means of action and expression, and multiple means of engagement. A quantitative descriptive-correlational design was used with 125 teachers from three participating schools. Data were collected using a modified questionnaire based on UDL principles. All three UDL components were implemented, with engagement receiving the highest mean score. Age and gender were not significantly related to UDL implementation, while educational background and special education training showed significant relationships. Engagement was the most impactful UDL principle in teachers' practices. Based on the findings, the UDL-IDEA Framework was proposed to strengthen inclusive instruction for learners with intellectual disabilities.

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1. INTRODUCTION

Universal Design for Learning (UDL) offers an important framework for addressing learner diversity. UDL emphasizes the proactive design of goals, materials, methods, and assessments. Therefore, barriers are minimized before instruction takes place. The framework is commonly organized around three core principles: multiple means of representation, multiple means of action and expression, and multiple means of engagement. These principles encourage teachers to present information in different ways, allow learners to demonstrate understanding through varied modes, and sustain motivation through relevant and supportive learning experiences. For learners with intellectual disabilities, UDL is especially relevant because it supports access to content, communication, participation, and self-regulation. Multiple means of representation may include simplified language, visual aids, concrete examples, captions, graphic organizers, and vocabulary support. Multiple means of action and expression may include oral responses, pictorial outputs, performance tasks, assistive technology, checklists, rubrics, and guided practice. Multiple means of engagement may include choices, feedback, collaboration, predictable routines, and strategies for managing distractions. These practices can help learners with intellectual disabilities participate more actively and demonstrate learning in ways that match their strengths and needs (Al Rawi, 2021; Al Rawi and Al Kahtani, 2022; Almeqdad, 2023). UDL can improve accessibility, participation, and engagement when it is implemented consistently and supported by teacher training, accessible materials, and school leadership. However, research also indicates that many teachers apply UDL principles only at a moderate level because of limited professional preparation, lack of assistive resources, large class sizes, and insufficient institutional support (Al Rawi, 2021; Al Rawi and Al Kahtani, 2022; Almeqdad, 2023; Saini *et al.*, 2024). UDL should not be treated only as a teaching strategy. It should also be understood as a school-wide and system-supported approach to inclusive education.

In the Philippines, inclusive education has gained stronger policy attention through national efforts to support learners with disabilities. Policies on special education and inclusive learning have emphasized access, support services, and appropriate instructional responses for learners with diverse needs. However, policy commitment does not always translate into consistent classroom practice. Many teachers still need practical training, accessible teaching materials, assessment support, and guidance in applying inclusive pedagogies such as UDL. Teacher preparation and special education training are important factors in strengthening inclusive practice (Masongsong *et al.*, 2023).

Teacher competence is a critical factor in UDL implementation. While age and gender may describe the demographic profile of teachers, they do not necessarily determine inclusive instructional practice. Instead, educational background, special education training, professional development, and classroom experience are more closely related to teachers' ability to design accessible instruction. Teachers with stronger preparation in special education are more likely to use differentiated materials, varied response options, scaffolding strategies, and engagement supports for learners with intellectual disabilities (Masongsong *et al.*, 2023).

The three UDL principles may also differ in their level of implementation and perceived impact. Representation practices are often visible through the use of visual aids, examples, and simplified materials. Action and expression practices are reflected in flexible ways for learners to respond, complete tasks, and demonstrate understanding. Engagement practices are seen in strategies that promote motivation, collaboration, persistence, and positive

classroom climate. Engagement is particularly important for learners with intellectual disabilities because sustained attention, motivation, and emotional safety strongly influence participation and learning outcomes (King-Sears, 2023; Saini *et al.*, 2024).

Despite the growing relevance of UDL, there remains a need for more classroom-based evidence on how teachers implement UDL when teaching learners with intellectual disabilities. In particular, it is important to determine which UDL components are implemented more consistently, which areas need improvement, and whether teacher profile variables are related to implementation. Such evidence can help schools design more targeted professional development, improve inclusive classroom practices, and develop practical frameworks for supporting teachers.

This study examined the level of implementation of UDL in teaching learners with intellectual disabilities. Specifically, it described the demographic and professional profile of teacher respondents, assessed the implementation of UDL in terms of multiple means of representation, action and expression, and engagement, examined the relationship between teacher profile variables and UDL implementation, and identified which UDL principle was most impactful in teachers' practice. Based on the findings, the study proposed a framework to strengthen UDL implementation and improve inclusive instruction for learners with intellectual disabilities.

2. METHODS

This study used a quantitative descriptive-correlational and predictive research design to examine the implementation of UDL in teaching learners with intellectual disabilities. This design was appropriate because the study described teachers' demographic and professional profiles, measured their self-reported level of UDL implementation, examined relationships between teacher profile variables and UDL implementation, and identified which UDL principle was most impactful in teachers' practices.

The study was conducted in three participating schools: Sisters of the Sacred Hearts of Jesus and Mary Learning Center for Young Adults with Intellectual Disabilities, Don Vicente Rama Elementary School, and Basak National High School. The respondents were teachers who handled learners with intellectual disabilities in inclusive or special education settings. The teacher population and sampling frame are presented in **Table 1**. A total of 125 teachers were selected from a population of 180 using proportional sampling. The sample represented the three participating schools based on their respective population sizes. This sampling procedure helped ensure that each school was proportionally represented in the study.

Data were collected using the modified questionnaire based on the UDL framework. The questionnaire consisted of two main parts. The first part gathered demographic and professional information, including age, gender, educational background, and number of special education trainings. The second part measured teachers' level of UDL implementation across three principles: multiple means of representation, multiple means of action and expression, and multiple means of engagement. Each principle consisted of seven items, giving a total of 21 UDL implementation items. The questionnaire used a four-point scale: 4 = Highly Implemented, 3 = Implemented, 2 = Less Implemented, and 1 = Not Implemented. The interpretation scale was as follows: 3.26-4.00 = Highly Implemented, 2.51-3.25 = Implemented, 1.76-2.50 = Less Implemented, and 1.00-1.75 = Not Implemented. The instrument was designed to capture concrete classroom practices related to accessibility,

learner expression, engagement, scaffolding, and support for learners with intellectual disabilities. The study was anchored on the UDL framework. UDL emphasizes the proactive design of instruction. Barriers to learning are reduced before they affect learner participation. The framework guided the development of the questionnaire items and the interpretation of the results. The UDL framework used in this study is presented in **Figure 1**.

Table 1. Population and sampling frame of teachers.

| CAMPUS | POPULATION | SAMPLE | PERCENT |
|--|------------|------------|-------------|
| Sisters of the Sacred Hearts of Jesus and Mary Learning Center for Young Adults with Intellectual Disabilities | 24 | 17 | 13.6% |
| Don Vicente Rama Elementary School | 90 | 62 | 49.6% |
| Basak National High School | 66 | 46 | 36.8% |
| Total | 180 | 125 | 100% |

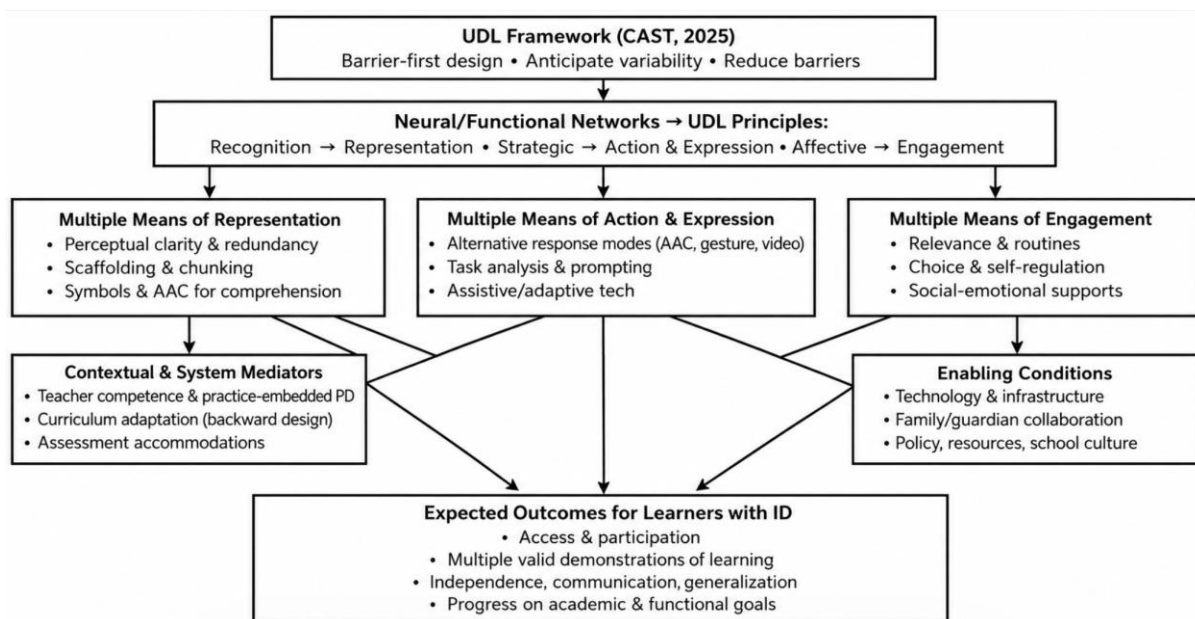


Figure 1. UDL framework.

The conceptual structure of the study followed an input-process-output model. The input consisted of teachers’ profile variables and their self-reported UDL implementation across the three UDL principles. The process involved questionnaire administration, data collection, scoring, and statistical analysis. The output consisted of the results on UDL implementation, the relationships between teacher profile variables and UDL implementation, the most impactful UDL principle, and the proposed framework for improving UDL implementation. The research paradigm is presented in **Figure 2**.

Before data collection, permission was secured from the concerned school authorities. The respondents were informed about the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. The questionnaire was administered either through printed forms or a secure online form, depending on school arrangements and respondent availability. Responses were checked, coded, and prepared for statistical analysis.

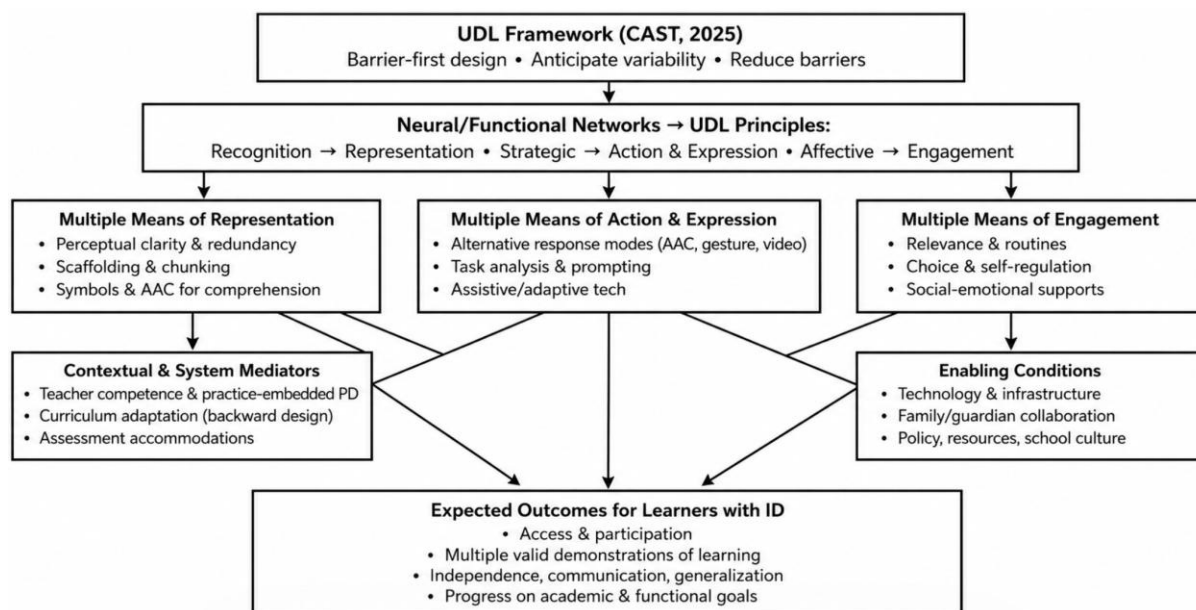


Figure 2. Research paradigm.

Data were analyzed using descriptive and inferential statistics. Frequency and percentage were used to describe the demographic and professional profile of the respondents. Weighted mean and standard deviation were used to determine the level of UDL implementation in terms of representation, action and expression, and engagement. Correlation analysis was used to examine the relationship between teacher profile variables and UDL implementation. Regression analysis was used to identify which UDL principle was most impactful in teachers' practice with learners with intellectual disabilities. The level of significance was set at 0.05.

Ethical considerations were observed throughout the study. Participation was voluntary, and respondents were allowed to withdraw at any time. No personal identifiers were reported in the results. Data were treated with confidentiality and used only for research purposes. The findings were reported honestly and presented in aggregate form to protect the identity of the respondents and participating schools.

3. RESULTS AND DISCUSSION

The demographic and professional profile of the teacher respondents is presented in **Table 2**. Most respondents were between 31 and 40 years old, followed by those aged 41 to 50. Many respondents were already in the mid-career stage of teaching. The respondents were predominantly female, which reflects the common gender pattern in the teaching profession. In terms of educational background, most teachers held either a bachelor's or a master's degree. The data also show variation in SPED training, with most respondents having attended 1-3 trainings, while 14.40% had no SPED training. The respondents had different levels of professional preparation for teaching learners with intellectual disabilities.

The level of UDL implementation in terms of Multiple Means of Representation is presented in **Table 3**. Multiple Means of Representation was generally implemented, with a composite mean of 3.20. Teachers reported strong implementation of visual aids, highlighting key ideas, presenting information in different formats, and providing multiple examples. These strategies are important for learners with intellectual disabilities because they reduce language load and support comprehension through concrete and visual forms. This finding is

consistent with studies showing that UDL-based representation supports access to content and improves participation among learners with disabilities (Al Rawi, 2021; Al Rawi and Al Kahtani, 2022; Almeqdad, 2023). However, some accessibility practices were less consistently implemented. Providing captions or transcripts had the lowest mean, followed by providing alternative text for images and diagrams. While teachers commonly use general visual and multimodal strategies, more technical accessibility supports are not yet fully embedded in classroom practice. This gap may be related to limited training, lack of accessible materials, or insufficient assistive technology support.

Table 2. Profile of the teacher respondents.

| PROFILE VARIABLE | CATEGORY | FREQUENCY (F) | PERCENT (%) |
|------------------------|------------------------|---------------|---------------|
| Age | 20-30 years old | 28 | 22.40 |
| | 31-40 years old | 46 | 36.80 |
| | 41-50 years old | 32 | 25.60 |
| | 51 years old and above | 19 | 15.20 |
| Gender | Male | 32 | 25.60 |
| | Female | 93 | 74.40 |
| | Total | 125 | 100.00 |
| Educational background | Bachelor's degree | 58 | 46.40 |
| | Master's degree | 55 | 44.00 |
| | Doctoral degree | 12 | 9.60 |
| | Total | 125 | 100.00 |
| SPED training | No training | 18 | 14.40 |
| | 1-3 trainings | 52 | 41.60 |
| | 4-6 trainings | 34 | 27.20 |
| | 7 or more trainings | 21 | 16.80 |
| | Total | 125 | 100.00 |

Table 3. Level of implementation of UDL in teaching learners with intellectual disabilities in terms of Multiple Means of Representation.

| STATEMENTS | WM | SD | VI |
|--|-------------|-------------|----------|
| 1. Present information using various formats, such as text, audio, and video | 3.42 | 0.65 | HI |
| 2. Provide alternative text for images and diagrams | 2.88 | 0.82 | I |
| 3. Offer multiple examples to clarify concepts | 3.36 | 0.71 | HI |
| 4. Provide vocabulary support and definitions for complex terms | 3.18 | 0.76 | I |
| 5. Highlight key ideas to help learners focus on important information | 3.44 | 0.63 | HI |
| 6. Use visual aids, such as charts and graphs, to present data | 3.52 | 0.59 | HI |
| 7. Provide captions or transcripts for all spoken information | 2.62 | 0.91 | I |
| Composite mean | 3.20 | 0.72 | I |

Note: 3.26-4.00 = Highly Implemented; 2.51-3.25 = Implemented; 1.76-2.50 = Less Implemented; 1.00-1.75 = Not Implemented.

The level of UDL implementation in terms of Multiple Means of Action and Expression is presented in **Table 4**. Multiple Means of Action and Expression was also implemented, with a composite mean of 3.21. The highest-rated practice was allowing learners to respond orally, in writing, or through other media. Teachers also highly implemented scaffolding, peer collaboration, and learner choice in demonstrating knowledge. These practices are important because learners with intellectual disabilities may need varied response modes to show understanding beyond traditional written outputs. Flexible expression, guided practice, and

alternative response modes can help learners with intellectual disabilities demonstrate competence more effectively (Frolli *et al.*, 2020; Al Rawi, 2021; Al Rawi and Al Kahtani, 2022).

The lowest mean was recorded for providing flexible options for physical movement during learning activities. Checklists, rubrics, and tools for composition and problem-solving were also implemented, but not at a highly implemented level. Teachers already provide some expressive flexibility, but more support is needed in integrating movement options, self-monitoring tools, and assistive learning resources.

Table 4. Level of implementation of UDL in teaching learners with intellectual disabilities in terms of Multiple Means of Action and Expression.

| STATEMENTS | WM | SD | VI |
|--|-------------|-------------|----------|
| 1. Allow learners to choose how they demonstrate their knowledge | 3.28 | 0.74 | HI |
| 2. Offer various tools for composition and problem-solving | 3.16 | 0.78 | I |
| 3. Provide scaffolds to guide learners through complex tasks | 3.34 | 0.69 | HI |
| 4. Allow learners to respond orally, in writing, or through other media | 3.46 | 0.61 | HI |
| 5. Provide opportunities for peer collaboration on projects | 3.40 | 0.68 | HI |
| 6. Offer checklists and rubrics to help learners monitor their progress | 3.08 | 0.85 | I |
| 7. Provide flexible options for physical movement during learning activities | 2.74 | 0.92 | I |
| Composite mean | 3.21 | 0.75 | I |

Note: 3.26-4.00 = Highly Implemented; 2.51-3.25 = Implemented; 1.76-2.50 = Less Implemented; 1.00-1.75 = Not Implemented.

The level of UDL implementation in terms of Multiple Means of Engagement is presented in **Table 5**. Multiple Means of Engagement had a composite mean of 3.25, indicating that engagement-related strategies were implemented and were close to the highly implemented range. Teachers highly implemented effort-based feedback, collaborative learning, positive classroom climate, and learner autonomy. These strategies are particularly important for learners with intellectual disabilities because motivation, emotional safety, and predictable classroom support can influence participation and persistence. Studies on UDL and intellectual disabilities emphasize that engagement is central to sustaining participation and improving learner independence (King-Sears, 2023; Saini *et al.*, 2024). However, teachers implemented distraction-management strategies and varied challenge levels less consistently. These areas require attention because learners with intellectual disabilities often benefit from structured routines, self-regulation supports, and carefully adjusted task difficulty. Strengthening these practices may help improve learner focus, persistence, and classroom participation.

The overall level of UDL implementation across the three components is presented in **Table 6**. All UDL components were implemented at a generally consistent level. Engagement had the highest mean, followed by Action and Expression, while Representation had the lowest mean. The overall mean is 3.22. Teachers were already applying UDL principles, but implementation had not yet reached a highly implemented level. UDL is present in teachers' practice, but further support is needed to strengthen consistency, accessibility, and fidelity.

The relationship between teacher profile variables and UDL implementation is presented in **Table 7**. Age and gender were not significantly related to teachers' level of UDL implementation. Demographic characteristics alone did not determine how teachers applied UDL principles in teaching learners with intellectual disabilities. Educational background

showed a significant positive relationship with UDL implementation. Teachers with higher educational attainment tended to report stronger UDL implementation. The number of SPED trainings also showed a highly significant positive relationship with UDL implementation. This was the strongest relationship among the profile variables. Professional preparation matters more than demographic characteristics in strengthening inclusive instructional practice. Teacher training, self-efficacy, and inclusive education preparation are important predictors of UDL and inclusive classroom practice (Masongsong *et al.*, 2023; Woodcock *et al.*, 2022; Woodcock *et al.*, 2023).

Table 5. Level of implementation of UDL in teaching learners with intellectual disabilities in terms of Multiple Means of Engagement.

| STATEMENTS | WM | SD | VI |
|---|-------------|-------------|----------|
| 1. Provide choices to increase learner autonomy | 3.30 | 0.72 | HI |
| 2. Create collaborative learning opportunities | 3.42 | 0.67 | HI |
| 3. Design activities that are personally relevant to the learners | 3.18 | 0.77 | I |
| 4. Use feedback that encourages effort and persistence | 3.48 | 0.59 | HI |
| 5. Foster a positive classroom climate to build trust and safety | 3.40 | 0.66 | HI |
| 6. Provide flexible ways for learners to manage distractions | 2.86 | 0.88 | I |
| 7. Vary the levels of challenge to maintain learner interest | 3.12 | 0.81 | I |
| Composite mean | 3.25 | 0.73 | I |

Note: 3.26-4.00 = Highly Implemented; 2.51-3.25 = Implemented; 1.76-2.50 = Less Implemented; 1.00-1.75 = Not Implemented.

Table 6. Level of implementation of UDL in teaching learners with intellectual disabilities.

| UDL COMPONENT | COMPOSITE WM | OVERALL SD | VI |
|---|--------------|-------------|----------|
| Multiple Means of Representation | 3.20 | 0.71 | I |
| Multiple Means of Action and Expression | 3.21 | 0.75 | I |
| Multiple Means of Engagement | 3.25 | 0.73 | I |
| Overall mean of all UDL components | 3.22 | 0.73 | I |

Note: 3.26-4.00 = Highly Implemented; 2.51-3.25 = Implemented; 1.76-2.50 = Less Implemented; 1.00-1.75 = Not Implemented.

Table 7. Teachers' profile variables and their assessment of UDL implementation.

| SOURCES OF VARIATION | R VALUE | P VALUE | DECISION | REMARKS |
|--------------------------|---------|---------|-----------|--------------------|
| Age | 0.12 | 0.180 | Accept Ho | Not significant |
| Gender | -0.08 | 0.320 | Accept Ho | Not significant |
| Educational background | 0.21 | 0.020 | Reject Ho | Significant |
| Number of SPED trainings | 0.38 | 0.001 | Reject Ho | Highly significant |

The regression analysis identifying the most impactful UDL principle is presented in **Table 8**. All UDL principles significantly contributed to teachers' reported practice with learners with intellectual disabilities. Engagement emerged as the strongest predictor, with the highest beta value. Teachers perceived engagement-related strategies as the most impactful in their teaching practice. These strategies include promoting motivation, offering choices, giving effort-based feedback, creating collaborative opportunities, and building a positive classroom climate. Action and Expression also significantly predicted teachers' practice. Flexible response options and scaffolds are important for learners with intellectual disabilities.

Representation was also significant. It had the smallest beta value among the three predictors. All UDL components matter, but engagement may have the most visible impact because learners with intellectual disabilities often need sustained motivation, emotional support, and structured participation to remain involved in learning activities.

Table 8. Regression table showing teachers' reports on the most impactful UDL principle for learners with intellectual disabilities.

| PREDICTORS | B | STANDARD ERROR | BETA (β) | t-VALUE | p-VALUE | DECISION |
|-----------------------|------|----------------|------------------|---------|---------|--------------------|
| Constant | 1.12 | 0.28 | — | 4.00 | 0.000 | Significant |
| Representation | 0.18 | 0.09 | 0.19 | 2.02 | 0.045 | Significant |
| Action and Expression | 0.22 | 0.10 | 0.21 | 2.20 | 0.030 | Significant |
| Engagement | 0.36 | 0.11 | 0.33 | 3.27 | 0.001 | Highly significant |

Based on the results, this study proposes the UDL-IDEA Framework, which stands for UDL-Improving Delivery, Engagement, and Accessibility for Learners with Intellectual Disabilities. The framework is presented in **Table 9**. The UDL-IDEA Framework translates the study findings into practical actions for teachers, school administrators, and education stakeholders.

Table 9. Proposed UDL-IDEA Framework for improving UDL implementation.

| FRAMEWORK COMPONENT | BASIS FROM FINDINGS | KEY ACTIONS | EXPECTED OUTCOME |
|--|--|--|--|
| Teacher capacity development | Educational background and SPED training are significantly related to UDL implementation | Provide structured SPED and UDL training, coaching, mentoring, and professional learning communities | Stronger teacher competence in inclusive instruction |
| Strengthening representation | Representation was implemented, but it had the lowest composite mean | Improve multimodal materials, captions, transcripts, alternative text, visual aids, and vocabulary support | Better access to content for learners with intellectual disabilities |
| Strengthening action and expression | Action and Expression significantly predicted teaching practice | Provide varied response modes, checklists, rubrics, scaffolds, assistive tools, and task supports | More valid ways for learners to demonstrate understanding |
| Strengthening engagement | Engagement had the highest mean and the strongest predictive effect | Provide choices, collaboration, feedback, positive classroom climate, distraction-management strategies, and varied challenge levels | Increased motivation, participation, persistence, and learner confidence |
| Classroom environment and resource support | Some accessibility and movement supports were less consistently implemented | Provide assistive technology, visual organizers, flexible learning spaces, and accessible resources | More inclusive and responsive classroom environments |
| Continuous monitoring and reflection | UDL implementation was steady but not yet highly implemented | Use UDL observation tools, teacher self-assessment, progress monitoring, and periodic review | Sustained improvement and stronger UDL fidelity |

The framework begins with teacher capacity development because professional preparation and SPED training were significantly related to UDL implementation. It then strengthens the three UDL principles by addressing the specific areas where teachers showed both strengths and gaps. Since Engagement was the most impactful principle, the framework emphasizes motivation, autonomy, emotional safety, and learner participation. However, Representation and Action and Expression remain essential because they support access to content and valid demonstration of learning.

UDL implementation among teachers of learners with intellectual disabilities is already present but still needs strengthening. Teachers are using UDL-aligned strategies, especially those related to engagement, collaboration, feedback, and flexible expression. However, additional support is needed in accessibility tools, captions, alternative text, self-regulation strategies, movement accommodations, and structured progress-monitoring tools. Strengthening professional development, school resources, and continuous monitoring can help move UDL implementation from an implemented level to a highly implemented and sustainable inclusive education practice. These findings also support broader discussions on inclusive education, accessible learning environments, and community-based support for learners with special needs ([Ashurova et al., 2026](#); [Al Soud and Al-Shar'ah, 2026](#); [Gil Jr., 2025](#); [Faddillah et al., 2022](#)).

Based on the findings, schools should strengthen the implementation of Universal Design for Learning by providing continuous professional development for teachers, especially training focused on special education, accessibility, assistive technology, and UDL-based lesson planning. Since educational background and SPED training were significantly related to UDL implementation, school administrators should prioritize teachers with limited training opportunities and provide mentoring, peer coaching, and professional learning communities to support classroom application. Teachers should also be encouraged to improve the use of accessibility features such as captions, transcripts, alternative text, visual organizers, checklists, rubrics, and flexible response options. In addition, schools should improve classroom resources by providing assistive tools, accessible learning materials, and flexible learning spaces that support movement, engagement, and self-regulation. The proposed UDL-IDEA Framework may be used as a guide for school-based planning, classroom observation, teacher self-assessment, and continuous monitoring of inclusive teaching practices. Future studies may include classroom observation, learner performance data, and longitudinal analysis to examine how UDL implementation affects participation, independence, and learning outcomes among learners with intellectual disabilities.

4. CONCLUSION

UDL was implemented by teachers in teaching learners with intellectual disabilities, but its application had not yet reached a highly implemented level. Among the three UDL principles, Engagement had the highest implementation and was the strongest predictor of teachers' practice, followed by Action and Expression and Representation. Age and gender were not significantly related to UDL implementation, while educational background and SPED training were significant factors. Therefore, strengthening UDL implementation requires sustained professional development, accessible instructional resources, assistive tools, school-based coaching, and continuous monitoring. The proposed UDL-IDEA Framework can support teachers and schools in improving inclusive instruction for learners with intellectual disabilities.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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