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Bridging Theory and Practice: A Multi-Disciplinary Approach to Language and Communication Development for Learners with Complex Disabilities in Morocco

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ABSTRACT: This paper is a qualitative case study analysis of two learners with two complicated neurodevelopmental disorders, namely profound intellectual disability and cerebral palsy, in a special education center in Beni Mellal, Morocco. This research uses the theoretical perspectives of the Sociocultural Theory and the Universal Design for Learning (UDL) as its theoretical framework to investigate the spurring up, implementation and effects of individualized, multi-disciplinary intervention programs. The dominant issue is the intersection of the special education and language teaching, i.e. how specific interventions related to communication, motor skills, and social interaction may contribute to developmental benefits. The competency assessment that was implemented based on initial and continuing competency assessments, individualized education plans (IEPs), and observation notes was the source of data that had to be gathered by a multi-disciplinary team. Results show that the essential domains of visual attention, simple academic skills, and social interaction have shown considerable improvement even though there are still issues with expressive language and motor coordination. The study is an addition to the current research on inclusive pedagogies, one that promotes adopting a competency-based model of holistic approach that incorporates principles of applied linguistics, occupational therapy and special education instead of adopting a deficit-based approach.

KEYWORDS: Special Education, Applied Linguistics, Multi-Disciplinary Approach, Intellectual Disability, Cerebral Palsy, Inclusive Pedagogy, Language Development, Morocco

1. INTRODUCTION

The learning of a learner with a complex disability has been considered a long-time challenge to educational systems in all countries across the world especially those of the low- and middle-income group as special resources are limited (World Health Organization, 2011). In Morocco, new legislative changes, such as the Law of the rights of the disabled 10.03, have required inclusive educational practice but the translation of policy into practice in the classroom is unequal, particularly regarding students with severe intellectual disability and those with cerebral palsy.

The question of the development of language and communication lies in the middle of this challenge. In the case of learners with complex neurodevelopmental conditions, the lack of communication is not just a side-effect but a major obstacle to social integration, educational achievement and quality of life (Romski & Sevcik, 2005). Competency-based, holistic models based on the potential of growth in the various developmental areas, slowly have supplanted traditional deficit-based models which focus on what the learners are unable to achieve (Thompson et al., 2014).

The present paper fills a serious gap in the Moroccan educational literature by detailing the effects of multi-disciplinary interventions on two different learners with completely opposite, yet equally complicated profiles, an 8-year-old child with profound intellectual disability and a 19-year-old young man with cerebral palsy and moderate intellectual disability. This study is based on the Sociocultural Theory of Vygotsky (1978) and the framework of the Universal Design of Learning (CAST, 2018), based on which individualized programs with collaborative efforts of special educators, speech therapists, and occupational therapists may positively influence the improvement of communication, motor abilities, and social interactions.

The following research questions guided this investigation:

1. What are the effects of multi-disciplinary, theory-based interventions in promoting communication and language achievement among learners with complex disabilities?
2. Which are the developmental progress and long-term obstacles of the advancement of the learners with intellectual disability and cerebral palsy in terms of the five months intervention period?
3. What are the ways of integrating principles of applied linguistics, occupational therapy, and special education to contribute to a context of holistic development in Moroccan contexts of special education?

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2. THEORETICAL FRAMEWORK

2.1 Vygotsky's Sociocultural Theory

Lev Vygotsky's (1978) Sociocultural Theory provides a foundational lens for understanding language and cognitive development as fundamentally social processes. At the heart of this framework is the reality of the concept of the Zone of Proximal Development (ZPD), which entails the gap between the real level of development of a learner as revealed by independent problem-solving and the level of potential development as revealed by the problem-solving with the supervision of an adult, or with peers of higher ability (Vygotsky, 1978).

The concept of ZPD is especially relevant when it comes to learners who possess complex disabilities. These students might exhibit very little self-functioning, but studies continue to support the idea that with the right form of scaffolding (such as augmented communication, environmental modifications and guided interaction) a high level of learning may be affected (Kozulin et al., 2003). In the current research, the individualized education plan (IEP) of each learner was then tailored to be functional within their respective ZPD and focused on the skills that the learners were not able to demonstrate independently but could with the aid of a structured plan.

Moreover, Vygotsky has focused more on the role of social interaction in cognitive development as he stated that the emergence of higher psychological functions is initially on the social level (inter-psychological) and then on the individual level (intra-psychological). The intervention plans of both case studies were motivated by this principle, especially by the focus on responsive communication partners, joint attention, and structured social routines.

2.2 Universal Design for Learning (UDL)

Universal Design for Learning framework (CAST, 2018) is a practical proposal which supplements the Vygotskian theory by guidelines that help in designing flexible learning environments where the variations of individuals are considered. UDL revolves around three main principles: (a) multiple means of engagement (the why of learning), (b) multiple means of representation (the what of learning) and (c) multiple means of action and expression (the how of learning).

UDL provides a logical way of minimizing barriers to participation to learners with complex disabilities. Engagement strategies may involve providing choice, modifying challenges, and preferred activities; representation strategies may involve presenting information in visual, auditory and tactile formats; action and expression strategies may involve enabling alternative modes of responses, e.g., pointing, eye-contact or assistive-technology (Rose and Meyer, 2002).

The principles of UDL were implemented in the context of Moroccan assistive technologies, which could be scarce, by low-technological tools: visual schedules, solid manipulatives, gesture-based interaction, and altered task demands. This behavior conforms to global standards on inclusive education in the resource-deprived environment (UNESCO, 2017).

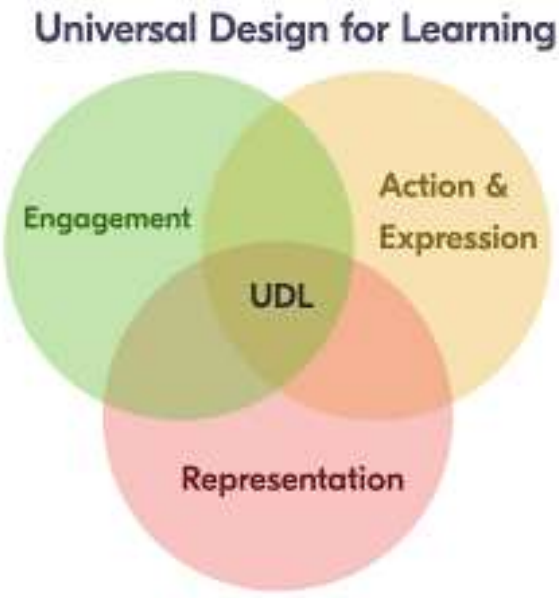


Figure 1. Universal Design for Learning

2.3 Integration: A Multi-Disciplinary Framework

By combining the Vygotskian theory and the principles of UDL, the intervention delivered offered a coherent approach to multi-disciplinary intervention. This paradigm views development as coming about at the dynamic relationship point between (a) the neurobiological makeup of the learner, (b) the social and material world, and (c) the quality of scaffolding established by educators and therapists, as shown in Figure 2.

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Figure 2. Conceptual framework integrating Sociocultural Theory and UDL for multi-disciplinary intervention

This is a unified framework that facilitated the evaluation process, planning, and execution of the current research. Preliminary evaluations were used to determine the current functioning of every learner in sensory, motor, cognitive, and communication areas; advocated IEPs seek to focus on the skills of each learner within his/her ZPD with UDL-based strategies; repeated, on-going observations realized the responses to the intervention, which allowed modifying the approach.

3. METHODOLOGY

3.1 Research Design

The research design used in this study was a qualitative case study design (Yin, 2018) to offer a contextual and comprehensive analysis of the progress of two learners over five months period (October 2024 to February 2025). This is mainly suitable in the case study method where a complex phenomenon is being studied in a real-life situation and demarcating the phenomenon and context boundaries are not clearly evident (Yin, 2018). A targeted sample was used to select the cases at a specialized educational center in Beni Mellal, Morocco, to demonstrate the implementation of a multi-disciplinary intervention model for the learners with different profiles of complex disability.

3.2 Participants

Case Study One: Profound Intellectual Disability

Case study one concerns an 8-year-old child born on September 28, 2017, who presents with a severe and progressive intellectual disability. He lives with his parents and one sibling in Ouled Yaich, Beni Mellal. The child shows considerable problems in several areas during the first multidisciplinary examination, carried out at the beginning of the 2024/2025 social season. A sensory and motor assessment showed low attention to vision and eye contact, a low gross motor control (the inability to sit separately and not longer than several minutes), and poor fine motor skills (the lack of grasping patterns). Cognitive/communication demonstrations showed the lack of expressive language, low receptive language (inability to follow simple instructions) and numerous stereotyped behaviors.

This was found to prompt the development and implementation of an individualized home-based program, which was carried out through the multi-disciplinary team and the mother of the child working together as a joint team. The program was focused on four main areas:

1-	*Educational skills development*: Practice sitting on his back and having a 15-minute independent sitting time, a 10-second attention span, instructions based on one step and recall body parts, handedness and decrease stereotypic behaviors.
2-	*Communication and language development*: Establishing non-verbal communication (gestures, sounds), calling a name, sharing the necessities (hunger, discomfort), training the oral-motor muscles, and raising the level of social activity.
3-	*Motor skills development*: Miming of basic actions (hand clapping, walking), hand-eye skill exercises (pile of rings) and less advanced grasping and releasing things, as well as initial attempts at drawing (scribbling).
4-	*Pre-vocational learning*: To form the basic environmental awareness, introduction to the concept of the profession "doctor" was conducted.

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Case Study Two: Cerebral Palsy with Moderate Intellectual Impairment

Case Study Two discusses the case of a 19-year-old teenager born on September 28, 2005, with moderate motor and cognitive impairment due to cerebral palsy, which is right hemiparesis. His family resides in Beni Mellal, and he was admitted to the center based on the recommendation of a medical expert. Primary evaluation, which had been performed in the presence of his mother, reported having problems with social interaction and motor weakness on the right. After 1 month of adaptation, thorough testing showed that the teenager has other problems: both visual attention and perception are weak, on the right, gross and fine motor abilities, are limited, the child is very shy, he has poor memory (especially of sequential information), speech problems (unintelligible pronunciation of certain phonemes) and delays in academic, social and communication development. The individualized program that was created with this learner revolved around five areas of intervention:

1-	*Educational learning*: Body parts, animal, fruits, letters (ب، م، د), number (0-19) and colors, simple concepts.
2-	*Social development*: Instruction in values, national and religious events, and participation in group activities (songs, dances, and collaborative games).
3-	*Communication skills*: Speech improvement through targeted articulation practice and increased interactive opportunities.
4-	*Motor skills*: Enhancement of balance, mobility, and hand coordination, with particular attention to right-side functioning.
5-	*Vocational awareness*: Identification of common professions to support transition planning.

3.3 Data Collection

Data was derived from three sources of documentary evidence:

1- **Initial and Ongoing Competency Assessments**: Detailed evaluations of sensory, motor, relational, emotional, and cognitive abilities conducted by the multi-disciplinary team at baseline and monthly intervals.

2- **Individualized Education Programs (IEPs)**: Structured plans documenting objectives, intervention strategies, materials, and progress monitoring procedures. IEPs were reviewed and revised monthly based on learner progress.

3- **Observational Reports**: Systematic notes from the primary special educator and the multi-disciplinary team documenting learner responses to interventions, including frequency counts of target behaviors, qualitative descriptions of engagement, and incident reports of emerging skills.

3.4 Data Analysis

Data were analyzed using thematic analysis following the six-phase procedure outlined by Braun and Clarke (2006): (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report as illustrated in figure 3 below. Codes were derived inductively from the data while remaining sensitized to theoretical constructs from Vygotsky and UDL. and the researcher was able to cue 20% of the information himself to determine the inter-coder reliability (kappa = 0.84); disagreements were discussed.

There were three main domains of organization of the themes, namely: (a) challenges observed at baseline, (b) strategies in place, and (c) outcomes obtained. Sub-themes adapted to domain-specific patterns (communication, motor, social, and academic) were developed within each of the domains.

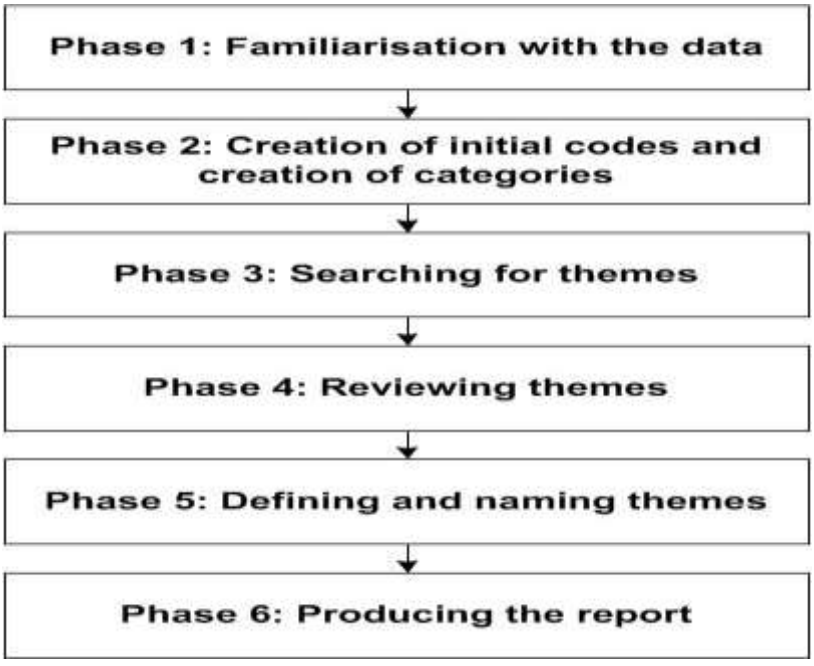


Figure 3. Thematic analysis phases (Braun & Clarke 2006)

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3.5 Ethical Considerations

The study has been carried out in line with the ethics of scientific research. The informed consent of both participants was obtained through the parents or legal guardians after total disclosure of the study procedures including the right not to be punished by any means in case of his or her withdrawal. Anonymity of participants comes in the form of case numbers and lack of identifying information.

4. RESULTS

Thematic analysis provided patterns that were different in each case, but certain prevalent themes were found in both learners on the essence of progress and unrelenting challenges.

4.1 Case Study One: Outcomes and Analysis

After a period of 5 months had elapsed implementing the home-based program, the 8-year-old participant showed significant gains in various aspects, as illustrated in Table 1.

Table 1. Summary of Outcomes for Case Study One (Profound Intellectual Disability)

Domain	Baseline Status	Outcome at 5 Months	Change
Sitting balance	Unable to sit independently	Independent sitting for 15 minutes	Significant improvement
Visual attention	No sustained eye contact	Eye contact when called; tracking of nearby stimuli (right, left, up, down)	Moderate improvement
Following instructions	Unable to follow one-step commands	Consistent response to one-step instructions	Significant improvement
Expressive language	Absent	Non-verbal communication (vocalizations, gestures)	Minimal improvement
Fine motor	No grasping	Improved hand grip; scribbling attempts	Moderate improvement
Stereotypic behaviors	Frequent	Reduced frequency	Moderate improvement

Communication and Language Gains: The greatest areas of improvement with regards to communication were made in receptive and non-verbal areas. The child acquired the skill to react to his name when called, which is a basic skill to acquire the ability of joint attention and interact with others (Mundy et al., 2007). The visual monitoring of the stimuli in the directions adjacent to them (right, left, up, down) improved significantly, which measured the visual attention and focus. Non-verbal communication developed as voluntary vocal, crudely gestures (reaching, pointing). Nevertheless, there was still no use of expressive language, and no significant words were emitted at the expiry of the study time.

Social Interaction Gains: Better eye contact upon being called by name enabled him to engage more in social interaction with family members and the special educator. Mother of the child noted that he currently instigates communication with looking and talking, in contrast to regularly exhibiting low levels of social awareness of partners in the past. Such gains are also in line with the focus of Vygotsky on social interaction as the origin of higher psychological functions (Vygotsky, 1978).

Persistent Challenges: Regardless of these gains, there were still numerous challenges. Still, the attention to distant stimuli remained low, which implied the persistence of the difficulties with visual search and selective attention. The lack of expressive language is a serious hindrance to self-expression of needs and wants. The motor skill deficits, especially fine motor abilities, remained after grasping and scribbling were improved.

4.2 Case Study Two: Outcomes and Analysis

The 19-year-old experimental participant, having cerebral palsy, showed expanded improvements in academic, communication, and social aspects as summarized in Table 2 below.

Table 2. Summary of Outcomes for Case Study Two (Cerebral Palsy)

Domain	Baseline Status	Outcome at 5 Months	Change
Academic skills	Delayed; no letter or number recognition	Recognition of letters (م ،ب ،د); numbers (0-19); body parts; animals; fruits	Significant improvement
Communication	Unclear pronunciation; limited interaction	Improved pronunciation; enhanced peer/staff interaction	Moderate improvement
Memory	Weak	Continued weakness; memorization of short Quranic chapters achieved with repetition	Minimal improvement
Motor skills	Right-sided weakness; poor balance	Improved posture; better coordination	Moderate improvement
Social participation	Shy; withdrawn	Participation in group activities (songs, dances); awareness of national/religious events	Significant improvement
Vocational awareness	Not assessed	Identification of common professions	Emerging

Academic and Cognitive Gains: The learner demonstrated significant improvement in academic skills, learning recognition of three letters (د، ب، م) and numbers up to nineteen. This is noteworthy considering the assessment done at the beginning showing that the person did not have any

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previous literacy skills or numeracy skills. Also, the learner has been able to memorize short chapters of the Quran, which illustrates that through systematic repetition; the verbal memory can be engaged despite weaknesses in memory. Development of vocabulary was characterized by identifying body parts, animals and fruits which suggest a higher level of categorization and semantic knowledge.

Communication and Language Gains: Clarity of speech was also enhanced but articulation problems remained. More importantly, the participant showed improved readiness to be involved in communicative exchange with peers and the staff. This was augmented social initiative combined with enhanced pronunciation, which allowed participation in group communication activities (songs and collaborative games), which were more effectively done. According to Vygotskian approach, these peer experiences were probably the scaffolding experiences that enabled the subsequent language development (Kozulin et al., 2003).

Motor and Postural Gains: The learner showed better posture and coordination and as of standing and walking, showed better balance. Weaknesses on the right side persisted, but the development of compromise mechanisms (left hand and fine motor control) developed spontaneously. These motor gains, in turn, aided in communication, as it was possible to position the face-to-face talking mode.

Social Integration Gains: The greatest returns were in the social field. The participant who was reported to be shy and withdrawn started to participate actively in group activities such as singing, dancing and the group learning activities. He showed that he was aware of the events related to the nation and religion (e.g. national holidays, Ramadan), which means that the material of social studies was successfully integrated into the curriculum. Such gains measure the efficacy of arranged social learning opportunities, which get themselves in line with UDL principles of multiple means of engagement (CAST, 2018).

Persistent Challenges: The weakness in memory was still of immense limitation especially in sequential information and new vocabulary. The participant needed a lot of repetition to memorize Quranic chapters, as well as the long-term retention was not tested. Although decreased, shyness still inhibited spontaneous communication in new situations. The recurrent difficulties brought forth a need to have continuous, longitudinal intervention.

4.3 Cross-Case Comparison

Table 3 provides a comparison of the results in the two cases, by developmental domain.

Table 3. Cross-Case Comparison of Outcomes

Domain	Case 1 (8 years, Intellectual Disability)	Case 2 (19 years, Cerebral Palsy)
Receptive language	Improved (follows one-step instructions)	Improved (follows multi-step instructions)
Expressive language	Minimal (non-verbal only)	Moderate (improved speech clarity)
Social interaction	Improved (eye contact, name response)	Significantly improved (group participation)
Motor skills	Moderate improvement (sitting, grasping)	Moderate improvement (posture, coordination)
Academic skills	Not applicable (pre-academic)	Significant improvement (letters, numbers)
Memory	Not assessed	Minimal improvement (persistent weakness)

There are a few patterns which are developed out of this comparison. To begin with, there was betterment of both receptive language and social interaction in both instances, indicating that such spheres can be highly sensitive to the intervention across the multi-disciplinary approach even with the severe disability as it is. Second, expressive language reflected a gradient in results, whereby the younger learner who was more severely impaired had little improvements and the older learner who was moderately impaired had moderate improvement. Third, academic skills were achievable by the learner only when the factor of higher cognitive functioning was achieved, which is the promotion of the importance of individualized goal setting in correspondence to that of the learner in terms of his/her ZPD.

5. DISCUSSION

5.1 Theoretical Implications

This study findings lead to conclude that previous concepts in special education support the application of both the Sociocultural Theory of Vygotsky and the principles of UDL to aid in delivering effective education. The two learners showed improvement when the necessary interventions were provided in their respective Zones of Proximal Development, i.e. when tasks were challenging enough to stimulate development but easy enough to allow the achievement of success (Vygotsky, 1978). In the case of the 8-year-old severely intellectually disabled child, the ZPD included the basic attending and motor skills, whereas, in the case of the 19-year-old with cerebral palsy, it was limited to literacy and numeracy activities.

More importantly, ZPD turned out to be dynamic, as opposed to a static concept. As children mastered target skills, ZPD grew to involve more challenging goals. This observation is consistent with dynamic assessment methods in special education (Lidz, 2003) and indicates that continuous and responsive assessment of the problem is the key to effective intervention.

Multiple means of representation is another UDL concept that was especially relevant to both participants. Access to instruction was facilitated using visual supports (pictures, objects, gestures) in the case of the non-verbal 8-year-old, whereas memory and learning in the case of 19-year-old teenager was facilitated with the help of visual-auditory-tactile. Resource constrained systems like Morocco showed low-tech UDL applications to be effective and practicable, as it is in other low- and middle-income nations (Johnstone and Chapman, 2009).

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5.2 Practical Implications for Language and Communication Development

Special attention should be paid to the differences in the results of expressive and receptive language. Both participants improved more in receptive language (understanding) as compared to expressive language (production). This trend can be compared to the general body of literature related to the development of language in intellectual disability, which indicates the general tendency whereby receptive abilities tend to be faster than expressive abilities (Abbeduto et al., 2007).

Practitioners have significant implications towards this finding. To start with, language assessment on receptive abilities should not be presupposed based on the expressive skills; non-speaking learners can still be able to comprehend significantly more than they can generate. Second, receptive language should be the focus of intervention since it will form the basis of future expression. In the current experiment, tasks involving compliance with instructions, responding to name, and visual tracking developed receptive skills which could ultimately help to achieve expressive benefits.

The multi-disciplinary methodology was very critical in touching the intricate and composite needs of both learners. Communication development could not be dissociated with motor development (e.g., positioning for eye contact, oral-motor activities to produce speech), social development (e.g., being encouraged to communicate), and cognitive development (e.g., memory for vocabulary).

5.3 The Moroccan Context

This study contributes to the limited but growing literature on special education in Morocco. Although policies in the country mandate inclusive education, the implementation has great barriers, among which there are insufficient teacher training, lack of specialized materials, as well as limited awareness among families (Kadiri, 2022 & Arssi, 2024). The current paper shows that it is possible to make meaningful progress even under these restrictions if interventions are theoretically, systematically, and learner centered. A unique feature of the Moroccan context is the presence of the religious and cultural contents in the curriculum. In case study two, Quranic chapters memorization was used as a religious education objective as well as a cognitive-linguistic intervention. Such a combination of culturally desirable content can increase family involvement and motivation, and this is a key point that should be researched as part of cross-cultural special education.

5.4 Limitations and Future Directions

There are several limitations on the study that must be noted. First, limited generalizability due to small sample size (N=2) even though this is a limitation of the qualitative case study design. Second, the five-month period of study is quite limited to record the progress first but is not long enough to investigate the long-term outcomes and maintenance of gains. Third, the lack of standardized assessment tools (there are none available in this context) makes it harder to compare it with other studies. Fourth, although the multi-disciplinary team comprised of special educators and therapists, no formal inter-rater reliability of observational data was determined except in the thematic analysis coding.

To eliminate these limitations, future studies should apply longitudinal designs, larger samples, and in as many cases as possible, standardized outcome measures. Comparative analyses of effectiveness of multi-disciplinary projects and single-discipline interventions would offer resources allocation decision-making. Also, studies that examine family-mediated interventions, as an extension of the home-based program (in case study one) may help locate scalable options to access learners unable to participate in center-based interventions.

5.5 From Deficit to Competency: A Paradigm Shift

This research changes the paradigm shift towards deficit models of disability towards competency models of disability. Both participants, however, with severe and persistent disability, showed quantifiable improvement when given suitable support. The 8-year-old that could not sit independently at the baseline learnt to sit longer (15 min), the 19-year-old that knew no letters at baseline learnt and remembered three letters and numbers up to eighteen. These are not superficial gains but quality of life and functional gains that are significant.

Accounting a competency approach does not deny that disability exists and challenges will prevail. The two learners were still confronted with great challenges to communicate and participate. But deficits only serve to hide the possibility of growth and demotivate educators, learners and families. The most consistent with the evidence and the most likely to result in further development would be a middle ground that would recognize the challenges and competencies in equal measure.

6. CONCLUSION

This paper investigated the application and the results of theory-based interventions, multi-disciplinary, in two cases of learners who were experiencing complex disabilities in Morocco. Based on the Sociocultural Theory of Vygotsky and the Universal Design of Learning, a five-month program was created and introduced, based on the needs and requirements of the learners. The 8-year-old who had a sophisticated intellectual disability displayed improvements in sitting balance, visual attention, instructions following, and non-verbal communication, but the former did not have expressive language at all. The young 19-year-old individual with cerebral palsy showed improvements in academic functioning (letters and numbers), speech articulation, social activities, and motor control, with weaknesses in memory remaining.

The findings provide the global body of knowledge about special education and language development in various ways. To begin with, they offer empirical evidence on adopting a sociocultural and universal design-based approach to intervention planning. Second, they show that learners with the most severe disabilities can achieve meaningful gains when their interventions are individualized and implemented in systemic manner. Third, they emphasize how communication, motor, social, and cognitive domains are interdependent and multi-disciplinary approaches should be implemented as opposed to siloed ones. Fourth, they can provide an example of how inclusive education can be conducted in resource-poor conditions, and low-tech UDL applications can be practical and successful.

To the Moroccan educational system, this analysis provides evidence that the policy commitments towards inclusion can be put into effective practice, although much work still should be done. Multi-disciplinary collaboration, UDL principles, and competency-based assessment training should be included in teacher preparation programs. Investment should be considered in special materials and assistive technologies but must not slow down implementation of those strategies that are low-tech and readily available. In its essence, teachers should be ready to accept the fact that everyone can grow, despite the development of disability.

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With the international community striving towards Sustainable Development Goal 4 (inclusive and equitable quality education), research findings like this one are thrilling and at the same time creating a roadmap. That is not an easy process given the distance between theory and practice, but it is nevertheless a process to be undertaken as the two learners in this study have witnessed.

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