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Development of an Inclusive Public Speaking Training Model for Individuals with Disabilities Based on the Zone of Proximal Development (ZPD) to Enhance Social Independence

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Abstract

This research aims to develop an inclusive public speaking training model for persons with disabilities based on the Zone of Proximal Development (ZPD) theory. The model is designed to strengthen social autonomy through adaptive communication strategies and responsive learning tailored to participants' needs. It addresses the urgent need for training that not only enhances speaking skills but also builds self-confidence and inclusive social participation. This study employs a mixed-methods approach with a sequential explanatory design. The initial phase conducts a quantitative analysis using Structural Equation Modelling–Partial Least Squares (SEM–PLS) to test construct validity, instrument reliability, and the relationships between variables. Subsequently, a qualitative analysis uses NVivo to explore participants' personal experiences, thereby allowing the statistical results to be interpreted more deeply and contextually. The results indicate that the scaffolding component provides the largest contribution to the increase in social autonomy (57%), comprised of 27% from individual exercises and 30% from collaborative exercises. The initial assessment serves as the foundation with a 49% contribution, functioning to map the participants' baseline abilities. The model demonstrates high predictive power (R^2 = 0.92). Qualitative data reveal that peer support fosters motivation, individual exercises enhance self-efficacy, feedback trains self-regulation, reflection deepens personal awareness, and gradual exposure builds readiness to perform in public spaces. This study yields an innovative ZPD-based public speaking training model, integrating initial assessment and scaffolding as the key to strengthening the social autonomy of persons with disabilities. This model can be applied in inclusive education to help persons with disabilities enhance their communication, self-confidence, and social participation.

Keywords: *Public Speaking, Inclusion, Zone of Proximal Development, Scaffolding, Social Independence.*

INTRODUCTION

The ability to speak in public has long been regarded as one of the most essential forms of communication competence. Public speaking has been widely recognized as a vital competency for academic, professional, and social success, yet confidence remains a significant barrier to

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achieving effective performance. This skill is not only related to the technical aspects of delivering ideas effectively but also plays a crucial role in building self-confidence, strengthening social relationships, and promoting active participation in societal life. In the context of modern communication development, public speaking is no longer merely considered an individual ability, but also a social necessity that enables a person to contribute actively in educational, professional, and community environments. Beyond its functional aspect, this ability increasingly reflects an individual's capacity for social integration in today's interconnected world

Mastery of speaking skills is an important prerequisite for effective communication. Public speaking apprehension emerged as a distinct dimension of L2 communication apprehension, capturing anxiety before speaking in front of a larger audience (Kuluşaklı & Genç, 2024). However, many individuals still face barriers related to self-confidence, anxiety when speaking, and difficulty providing constructive feedback (Urena-Rodriguez et al., 2025). For persons with disabilities, public speaking ability holds a broader and more profound dimension. This skill is not merely a tool for self-expression but also a medium for voicing aspirations, advocating for rights, and strengthening social integration in public spaces. Through the activity of speaking before an audience, individuals with disabilities can strengthen their agency, gain social recognition, and participate more equally in society.

Nevertheless, reality shows that persons with disabilities continue to face various systemic barriers in accessing communication training that is inclusive and adaptive to their needs. Challenges at the individual level are often related to limitations in communication skills, a lack of opportunities to participate in social training, and insufficient personal support. These factors can result in diminished self-confidence and can erode the self-worth of persons with disabilities (Saran et al., 2021).

According to a World Health Organization report, an estimated 1.3 billion people, or approximately 16% of the global population, live with a significant disability (Gréaux et al., 2023; WHO, 2023) . Disability is not solely a result of medical factors, but rather a consequence of the complex interaction between an individual's health condition, personal factors, and the social environment that restricts their full participation in societal life. This condition creates various challenges, particularly in the fields of education and social engagement, which indirectly affect opportunities for autonomous development.

One of the most evident barriers faced by persons with disabilities is the limited access to communication and public speaking training tailored to their needs. The scarcity of opportunities to participate in such training makes it difficult for many individuals with disabilities to build self-confidence and develop social autonomy. Existing public speaking training programs are generally designed for a general audience and focus on technical aspects such as vocal articulation, body language, and speech writing. Although these components are important, a predominantly technical approach often overlooks the psychosocial

dimension of the communication process, including the empowerment of marginalized groups and the enhancement of their social participation. Studies show that receiving appropriate communication support is strongly linked to higher levels of social engagement and independence, rather than mere technical proficiency (Iacono et al., 2019). This gap highlights the urgent need for a training model that integrates both technical and psychosocial aspects of communication to promote inclusive participation and social independence among persons with disabilities.

Consequently, generic training programs fail to provide adequate space for individuals with disabilities to achieve comprehensive communication competence while simultaneously developing social autonomy. This disparity indirectly reinforces existing patterns of social exclusion, where persons with disabilities continue to be frequently positioned as passive recipients of information rather than active subjects in public communication processes. Moreover, the link between disability and reduced social participation underscores the urgent need for training models that integrate both technical and psychosocial aspects of communication (Kim et al., 2024).

To address these barriers, this study introduces an inclusive public speaking training model founded on the theory of the zone of proximal development. The model integrates assessment, scaffolding, and reflective learning stages to ensure that training is both adaptive and empowering for persons with disabilities.

This research contributes an innovative pedagogical framework that bridges educational psychology and communication studies. By emphasizing adaptive scaffolding and participatory engagement, the proposed model not only enhances speaking competence but also fosters social independence and inclusion, offering a new direction for inclusive education and community development programs.

LITERATURE REVIEW

Public Speaking

Public speaking is generally defined as an individual's capacity to deliver messages orally to an audience with the intention of influencing, informing, or inspiring. This skill serves as a fundamental foundation across various life domains, from educational settings and professional environments to social interactions. This significance stems from how public speaking ability closely correlates with self-confidence, interpersonal relationship building, and sensitivity to social context. Aligning with (Recep Bilgin, 2022) perspective, public speaking is understood as the art of effectively delivering messages to audiences through careful consideration of content relevance, audience appropriateness, and communication structure.

One of the biggest challenges in public speaking is the emergence of communication apprehension, or the anxiety experienced when having to speak in public. This condition can diminish the quality of message delivery and affect the speaker's confidence level. Studies have found that

certain groups (e.g., women, non-binary individuals, and undergraduate students) show a higher prevalence of public speaking anxiety, which translates into lower performance in speaking tasks (Lintner & Belovecová, 2024). Psychological research also shows that fear of public speaking is a disabling condition with negative academic, occupational, and social consequences, affecting up to one-third of the population (Ebrahimi et al., 2019). Moreover, experimental studies indicate that repeated virtual-reality gaze exposure treatments can effectively reduce state anxiety during speaking contexts, emphasizing the need to address not only technical but also emotional and psychosocial aspects of public communication (Fehlmann et al., 2023). A number of prior studies have shown that speaking anxiety impacts not only self-confidence but also overall communication effectiveness(Daly et al., 1989). In other words, psychological factors significantly influence an individual's performance when speaking before an audience.

To overcome this barrier, various public speaking training programs are designed with a participatory approach that includes individual and group exercises, such as role-playing, simulations, and feedback provision. Interactive training methods prove effective because they allow participants to practice skills directly while gradually building self-confidence. Strategies like role-playing, peer feedback, and group discussions can reduce performance anxiety while enhancing public speaking ability (Steven A. Beebe & Susan J. Beebe, 2024). Similarly, studies in autism-focused public speech training reveal that combining virtual reality exposure with gradual feedback significantly improves participants' confidence and reduces communication anxiety (Kumazaki et al., 2020). Moreover, communication disability has been identified as a major global barrier to equal participation, particularly in low- and middle-income contexts where inclusive communication infrastructures and training remain scarce (Marshall et al., 2024).

This approach also provides participants with the opportunity to adapt their communication style to diverse audience characteristics. In the realm of inclusive education, public speaking holds a far deeper meaning. It functions not merely as a technical skill for delivering messages, but also as a vehicle for social empowerment that promotes active participation and equality. Individuals with disabilities often face communication barriers, making adaptive and inclusive training programs essential. Through training designed with principles of equality and social support, individuals with disabilities can develop communication skills while simultaneously strengthening their self-confidence and social autonomy. Therefore, inclusive public speaking is oriented not only toward communication performance but also toward the formation of a more independent and participatory social identity (Hill et al., 2025).

Zone of Proximal Development (ZPD)

The concept of the Zone of Proximal Development (ZPD) was first introduced by Lev Vygotsky as a foundation for understanding how

optimal learning occurs. According to Vygotsky, learning becomes more effective when participants receive support or assistance (scaffolding) in completing tasks they cannot yet manage independently. This scaffolding can take the form of guidance, step-by-step instruction, or collaboration with more capable individuals. Through such support, learners can accomplish tasks that were initially beyond their independent ability, leading to a gradual internalization of knowledge and skills until they ultimately achieve mastery (van de Pol et al., 2010) .

From a theoretical perspective, an inclusive training approach requires a learning design that is adaptive and responsive to participants' needs, rather than merely the delivery of uniform instruction. It is here that the ZPD concept provides a crucial contribution as a conceptual foundation. The basic principle of scaffolding providing structured support from facilitators or peers enables participants to undertake challenging tasks while gradually developing learning autonomy. As emphasized by Faber (Faber et al., 2024) adaptive scaffolding allows learners to perform challenging tasks with gradually reduced support, which fosters self-regulation and promotes the development of independent learning skills. The provision of scaffolded support that gradually fades as learners gain competence is central to adaptive learning environments and supports social interaction and autonomy (Ertugruloglu et al., 2023). Tailored scaffolding in inclusive design contexts empowers individuals with learning disabilities by structuring tasks into manageable steps and promoting peer-mediated support (Guedes et al., 2024). This approach creates a collaborative space where social interaction functions as the primary medium for achieving individual progress.

Previous studies also indicate that mentoring for individuals with disabilities focuses not only on providing technical assistance but also on considering the interconnection between participants' identities, environmental contexts, and available support structures. The success of the mentoring process depends heavily on the synergy between personal and systemic factors that influence the social participation of persons with disabilities (Taylor et al., 2025). When this scaffolding concept is applied in public speaking training, individuals with disabilities can develop their communication skills through graduated stages, progressing from intensive guidance to full independence.

The ZPD perspective views the learning process as a social activity involving active interaction between participants and their environment. Therefore, this approach is highly relevant in the context of inclusive public speaking training, where success is measured not only by the improvement of speaking skills but also by the extent to which participants can strengthen their social autonomy. Unfortunately, the application of ZPD-based scaffolding principles in inclusive communication training is still rarely found in academic literature. Studies on public speaking generally focus on pedagogical strategies for the general population, whereas adaptations for persons with disabilities

and their psychosocial impacts remain relatively limited and have not been extensively researched.

This research is conducted in response to the conceptual and empirical gap in applying inclusive learning approaches for individuals with disabilities. The study proposes the development of a public speaking training model based on the Zone of Proximal Development (ZPD) theory as an innovative effort to address these limitations. The proposed model integrates scaffolding strategies through role-playing activities and collaborative exercises, designed to enhance communication skills while simultaneously strengthening participants' social independence.

In this context, social skills training is viewed as a form of therapeutic intervention that emphasizes the mastery of verbal and non-verbal behaviors required for social interaction processes (Saran et al., 2021). Through gradual support and repeated practice, participants are encouraged to build self-confidence, hone their adaptability, and expand their capacity to participate in social environments.

The novelty of this research lies in its effort to bridge developmental theory, rooted in Vygotsky's thinking, with communication training practices oriented toward the real-world needs of individuals with disabilities. Consequently, this study not only contributes to expanding the application of ZPD theory into the realm of communication training but also offers a practical contribution in the form of an inclusive, adaptive, and applicable training design. This model is expected to be implementable across various educational and social empowerment contexts, thereby promoting the creation of a more equitable and participatory learning process.

Inclusive Communication and Social Participation

The concept of inclusive communication refers to the process of conveying messages in a way that is accessible, understandable, and involves the participation of all individuals without exception, including those with disabilities. Inclusive public health communication defined as health-related messaging that includes and prioritizes neurodivergent populations in public health preparedness and response reflects the growing recognition that inclusivity in communication must address diverse cognitive and social needs (Hotez et al., 2023).

Furthermore, as Grech emphasizes, inclusive communication also involves the use of respectful, person-first and identity-first language to ensure that no individual or group is marginalized in the communicative process, reinforcing that language choice itself is an essential component of accessibility and equality in interaction (Grech et al., 2024).

The core principle of inclusive communication is not merely clarity in speech, but also encompasses efforts to create strategies, use media, and build supportive environments so that every individual has an equal opportunity for self-expression. Technology provides a way forward to bringing improvements in every sphere of life, and the results generated illuminate the potential benefits of digital technologies for disabled

persons (Malik et al., 2024). During public health crises, accessible-information providers report concrete obstacles in producing inclusive materials, underscoring the need for funding, logistical support, and rigorous content checks to guarantee inclusive communication (Meltzer et al., 2025). In line with this, Dunan et al found that ICT-based empowerment programs for people with disabilities significantly enhance social inclusion by strengthening communication skills and expanding participation opportunities across multiple social sectors (Dunan et al., 2025).This approach emphasizes the importance of accessibility and diversity in communication as part of fundamental social rights. Moreover, recent evidence shows that health systems often fail people with disabilities and must remove communication barriers and ensure accessible information to achieve equity (Kuper et al., 2024).

Various studies have affirmed that inclusive communication plays a significant role in the empowerment process of persons with disabilities. As noted by Kearns, Jagoe, and Stockdale, “those with communication disabilities or differences can face many barriers to social participation, inclusion, and potential financial implications (Kearns et al., 2025). The World Health Organization (WHO, 2023) states that communication barriers are a leading cause of social exclusion among people with disabilities. Therefore, implementing adaptive and inclusive communication strategies is a crucial step in expanding their participation across various sectors of societal life. An inclusive communication approach not only opens avenues for equitable interaction but also strengthens the social position of persons with disabilities within the broader social system.

In the context of public speaking, the principle of inclusivity becomes increasingly vital as it provides opportunities for individuals with disabilities to hone their speaking abilities, build self-confidence, and express their identities in public spaces. Research conducted by (Paju et al., 2022) demonstrates that inclusion-based communication programs not only enhance public speaking skills but also strengthen a sense of social autonomy and expand participants' engagement within their communities. Thus, inclusive communication can function as an empowerment tool that fosters transformation from being mere message recipients into active participants in the public communication process.

Conceptually, inclusive communication also serves as a crucial foundation for developing public speaking skills based on the Zone of Proximal Development (ZPD) theory. Through this approach, individuals with disabilities not only learn the technical aspects of speaking before an audience but also experience a social process that enables them to participate actively, independently, and meaningfully within society. Consequently, inclusive communication plays a dual role as both a learning strategy and a social mechanism—paving the way toward social independence and the full integration of persons with disabilities into public life

METHOD

Research Design

This study employs a mixed-methods design with a sequential explanatory approach. The explanatory sequential mixed methods approach refers to a research design in which the quantitative phase is implemented first, and its results form the basis for conducting the qualitative phase, which aims to deepen the meaning of the numerical findings (Christodoulou, 2025). In this study, the quantitative stage is used to obtain an empirical overview of the influence of scaffolding strategies on social autonomy, while the qualitative stage is conducted to explore participants' experiences in the training more deeply.

The selection of this approach is based on the conviction that combining quantitative and qualitative data can provide a more comprehensive understanding of the phenomenon under investigation. Quantitative data serve to identify causal relationships between variables objectively, while qualitative data enrich these results with context, meaning, and deeper interpretation. Thus, this design enables the researcher to obtain robust empirical evidence alongside a reflective narrative that explains the processes behind the numbers.

Philosophically, the mixed-methods approach is rooted in the pragmatism paradigm, which emphasizes selecting methods based on their suitability for the research objectives rather than on specific epistemological preferences. In the context of inclusive and special needs education research, this design provides space for researchers to capture both the breadth of quantitative data and the depth of qualitative experience, thereby yielding a more comprehensive understanding of complex educational realities (Love et al., 2022).

In the quantitative phase, analysis is conducted using Structural Equation Modeling–Partial Least Squares (SEM–PLS). This analysis aims to test the measurement model, which includes convergent validity, reliability, and discriminant validity, as well as the structural model comprising path coefficients, R^2 values, and significance between variables. Data are collected through questionnaires developed based on the main constructs of the Zone of Proximal Development (ZPD) theory, encompassing initial assessment, individual practice, collaborative practice, and the outcome variable of social autonomy.

Meanwhile, in the qualitative phase, data are collected through in-depth interviews and analyzed using NVivo software. This analysis aims to explore participants' subjective experiences, their perceptions of the training process, and the reasons behind the effectiveness of various training components. This approach enables the emergence of insights inaccessible to numerical data, such as the emotional, motivational, and social aspects underlying behavioral change.

The sequential explanatory design possesses several methodological strengths. First, this design prioritizes quantitative evidence as an empirical foundation, subsequently strengthening it through qualitative interpretation that answers the "why" behind the numerical results. This approach is also effective for explaining

unexpected findings or outliers through in-depth exploration in the qualitative stage (Toyon, 2021). Second, this design enables cross-validation between the two data sources—numbers and narratives—making the research conclusions more comprehensive and justifiable both theoretically and practically. Consequently, this method not only yields robust empirical data but also provides a profound understanding of the social and psychological processes occurring within the ZPD-based inclusive public speaking training.

Conceptually, this study is grounded in the pragmatic paradigm, which posits that research validity is formed through a combination of empirical data and participants' subjective experiences. This paradigm aligns with mixed-methods literature stating that pragmatism enables a balance between positivist (quantitative) and interpretivist (qualitative) approaches, thereby allowing the complexity of phenomena to be better captured (Dawadi et al., 2021).

Research Participants

The study involves 33 respondents with disabilities from the Difabel Slawi Mandiri (DSM) community in Tegal Regency Indonesia, which oversees 10 inclusive villages. Participants are selected using purposive sampling based on their active involvement in the community, an age range of 15–55 years, and basic communication abilities. Participant profiles encompass variations in disability type (physical, sensory, or combined), educational background, and communication experience, all documented in detail for analysis purposes.

This purposive sampling technique is employed to ensure the respondents possess genuine relevance to the research objective, namely the development of an inclusive public speaking model. A similar method is also used in other studies examining disability, for instance, in the Support Needs Assessment Tool for People with Disability by (Hill et al., 2025), , where participants were selected based on the research team's professional networks due to their involvement in the disability community.

Research Instruments

The research instruments are developed with reference to communication theory and public speaking literature, comprising: (1) a survey questionnaire to measure aspects of self-confidence, articulation, body language usage, and message structure; (2) an observation sheet for assessing verbal and non-verbal interaction, as well as audience adaptation; (3) an interview guide to explore participants' experiences, barriers, and motivations; and (4) an FGD guide for obtaining collective reflective data. Instrument validation is conducted through expert judgment by specialists in communication and inclusive education, followed by a limited pilot test to ensure reliability.

Research Procedures

The research procedure begins with an initial assessment conducted through questionnaires, interviews, observations, and FGDs. The intervention stage is implemented over three months (30 hours) with the following components: (a) scaffolding through role-play, peer tutoring, and gradual feedback; (b) collaborative practice in the form of small group discussions, joint presentations, and reflection; and (c) progressive autonomy through reduced guidance and increasingly broader audience exposure. Each training session is facilitated by the research team alongside peer tutors from the DSM community. Evaluation is conducted through pre-test and post-test assessments to measure improvement in communication skills and social autonomy.

This study utilizes a Participatory Action Research (PAR) approach, focusing on community (in this case, respondent) participation to foster transformative change through the research process. Respondents are selected using purposive sampling based on their active involvement in the inclusive community. Respondents complete a pre-test using a survey questionnaire to assess their public speaking skill level prior to the intervention. The intervention implements the Zone of Proximal Development (ZPD) principle, consisting of three (3) stages: (a) Providing scaffolding (peer tutoring, role-playing, and gradual feedback); (b) Collaborative-based practice (peer group discussions, reflection); and (c) Gradual autonomy (phased reduction of scaffolding and gradual exposure).

Data Analysis

Quantitative data analysis is conducted using SEM-PLS, which includes assessments of the measurement model (outer model) and the structural model (inner model), as well as evaluations of convergent validity, discriminant validity, construct reliability, R^2 values, effect size, and path significance through bootstrapping. According to Hair et al. (2022), this procedure is standard practice in PLS-SEM to ensure that indicators, constructs, and structural paths can be statistically validated (e.g., analysis of outer loadings, composite reliability, average variance extracted, and bootstrapping)(Hair & Alamer, 2022). Qualitative analysis utilizes NVivo through the subsequent steps: (1) transcription of interview and focus group discussion data, (2) open coding to discern preliminary themes, (3) axial coding to classify themes, and (4) selective coding to create a conceptual framework of participant experiences. Results integration is achieved through methodological triangulation, where quantitative findings are explained in greater depth using qualitative data, yielding meta-inferences that form the basis for training model development.

The primary focus of this research is the development of an inclusive public speaking training model based on the Zone of Proximal Development (ZPD) theory, aimed at enhancing social autonomy for individuals with disabilities. This focus includes:

1. Identifying participants' initial abilities and zones of proximal development.
2. Examining the effect of scaffolding strategies on improving social autonomy.
3. Exploring participants' experiences, barriers, and perceptions regarding the inclusive public speaking training process.

Formulating a new, adaptive training model that can be implemented across various educational and social empowerment contexts.

RESULTS AND DISCUSSION

The quantitative phase of this research begins with an evaluation of the measurement model. The primary objective of this stage is to ensure that the research instruments are truly reliable and capable of accurately measuring the constructs. If the instruments are not valid or reliable, the research results will not provide an accurate representation. Therefore, testing for validity and reliability constitutes a crucial step in the SEM-PLS approach.

Table 1. Convergent Validity and Reliability

Construct	Outer Loadings (>0.60)	AVE (>0.50)	Cronbach's Alpha (>0.70)	Composite Reliability (>0.70)
Initial Assessment	0.72 – 0.85	0.61	0.81	0.87
Individual Practice	0.68 – 0.80	0.59	0.78	0.85
Collaborative Practice	0.70 – 0.83	0.64	0.82	0.88
Social Autonomy	0.74 – 0.88	0.66	0.86	0.90

The convergent validity test results indicate that all indicators used meet the feasibility requirements. This is evidenced by outer loading values all being above the 0.60 threshold, meaning each indicator consistently reflects the measured construct. Furthermore, AVE values support this finding, indicating that the indicator variance is better explained by the construct than by measurement error. Thus, overall, this model can be considered to have good convergent validity and is suitable for further analysis.

In addition to convergent validity, discriminant validity is also tested to ensure each construct is truly distinct from others. Testing using HTMT shows results remaining within acceptable limits, below 0.80. Although some values approach the threshold, this does not pose serious concerns as they don't exceed critical values. This finding indicates that while relationships exist between constructs, each maintains uniqueness and can be distinguished both conceptually and empirically.

Table 2. Discriminant Validity (HTMT)

Constructs	Initial Assessment	Individual Practice	Collaborative Practice
Initial Assessment	-	0.71	0.76
Individual Practice	0.71	-	0.74
Collaborative Practice	0.76	0.74	-
Social Autonomy	0.79	0.72	0.77

Construct reliability also receives important emphasis. The Cronbach's Alpha values for all constructs exceed 0.60, while Composite

Reliability values surpass 0.70. This demonstrates that the instruments used are consistent and stable, making the measurement results reliable. In other words, if this study were repeated, the results would likely remain similar due to the high consistency of the instruments.

After confirming that the measurement model meets validity and reliability requirements, the analysis proceeds to the structural model to examine the relationships between variables in this study. The test results show an R^2 value of 0.92 for the social autonomy construct. This figure is considered exceptionally high and is rarely found in social research, as most studies in social sciences typically explain only about 40-60% of variance.

Table 3. Path Coefficients and R^2

Path	β	T-value	p-value	Significance	Interpretation
Initial Assessment → Social Independence	0.49	2.87	0.004	Significant	Provided the largest contribution; instructor guidance at the outset determined the learning trajectory.
Individual Exercises → Social Independence	0.27	2.15	0.031	Significant	Built participant confidence through an internalization process.
Collaborative Exercises → Social Independence	0.30	2.64	0.009	Significant	Social support reinforced courage and social participation.
R^2 Social Independence	0.92	–	–	Very Strong	The model was able to explain 92% of the variance in social independence.

Note: β = path coefficient.

These findings indicate that 92% of participants' social autonomy is influenced by three key factors in the model: initial assessment, individual practice, and collaborative practice. In other words, the ZPD-based public speaking training model designed in this study possesses exceptionally strong predictive power. This model not only provides theoretical explanation but is also empirically reliable for enhancing social autonomy in individuals with disabilities.

This finding is significant as it demonstrates that the factors designed into the model are genuinely relevant to participants' needs. The initial assessment helps participants understand their baseline capabilities, individual practice provides opportunities to build self-confidence, while collaborative practice offers social support that strengthens courage in real-world contexts. These three components complement each other, thereby able to explain nearly all changes occurring in participants' social autonomy.

Thus, an R^2 value of 0.92 is not merely a statistical figure, but empirical evidence that the ZPD-based approach can make a substantial contribution in the context of inclusive education. This result reinforces that when training strategies are structured progressively—from initial ability mapping, through individual practice, to social collaboration—

participants are more likely to achieve optimal development in both communication skills and social autonomy.

Path analysis provides a more detailed understanding of the magnitude of each variable's influence. The initial assessment demonstrates an influence of 49%. This indicates that the process of evaluating participants' abilities from the outset is crucial for mapping their needs. By understanding their baseline capabilities, trainers can determine appropriate approaches, enabling participants to develop more optimally. This finding reveals that assessment is not merely a formality, but genuinely provides tangible contribution in guiding the training process, building participants' self-awareness, and ensuring the implemented strategies align with their actual needs.

Meanwhile, gradual mentoring in the form of scaffolding demonstrates a substantial influence of 57%. Its two components show the following impacts: individual practice (X1) contributes 27%, functioning to provide space for participants to build self-confidence. By practicing independently, participants learn to overcome nervousness, train consistency, and develop the belief that they are capable of speaking in front of others. Individual practice can be regarded as an internalization stage, where participants hone basic skills before encountering more complex and challenging situations, such as speaking before a group or larger audience.

The second component, collaborative practice (X2), exerts an influence of 30%. This result indicates that cooperation and interaction with others play a major role in enhancing communication skills. When participants practice in groups, they learn not only from their own experiences but also from the experiences of others. Group discussions, simulations, and collaborative activities provide opportunities for participants to give each other feedback, correct mistakes, and build self-confidence through social support and genuine interaction with peers and instructors.

All inter-variable relationships prove statistically significant, with T-values above 1.96 and P-values below 0.05. This indicates that all hypotheses in this study are accepted. These findings confirm that initial assessment, individual practice, and collaborative practice each play a tangible role in enhancing participants' social autonomy.

According to Vygotsky's Zone of Proximal Development (ZPD) theory, social interaction through collaborative practice emerges as the most dominant factor in improving social autonomy. This is supported by several studies affirming that collaboration-based learning provides space for peer scaffolding that accelerates the development of social skills (Morcom, 2014);(Zhang, 2023). In the context of communication, Infante and Poehner assert that dynamic assessment accompanied by instructor mediation and social support is more effective in developing skills that cannot be achieved independently (Infante & Poehner, 2019). Similar findings are revealed by Bamford, indicating that interaction, prompting, and feedback constitute key elements in dynamic assessment for supporting communication development (Bamford et al., 2022). Thus,

within the public speaking context, the theory also assumes that the courage to perform before others develops more readily through social simulation than through relying solely on individual practice or instructor evaluation.

The results of this study indicate that the largest contribution comes from scaffolding, namely collaborative practice (30%) and individual practice (27%), with a total influence of 57%. Meanwhile, the initial assessment maintains an important role with a 49% contribution as the foundation for mapping participants' abilities. This finding confirms that in the context of inclusive public speaking training for individuals with disabilities, the process of gradual mentoring through scaffolding is more dominant in enhancing social autonomy than the initial assessment alone. This can be explained by the fact that individual practice helps build self-confidence, while collaborative practice provides social support that encourages participants to transcend their initial limitations.

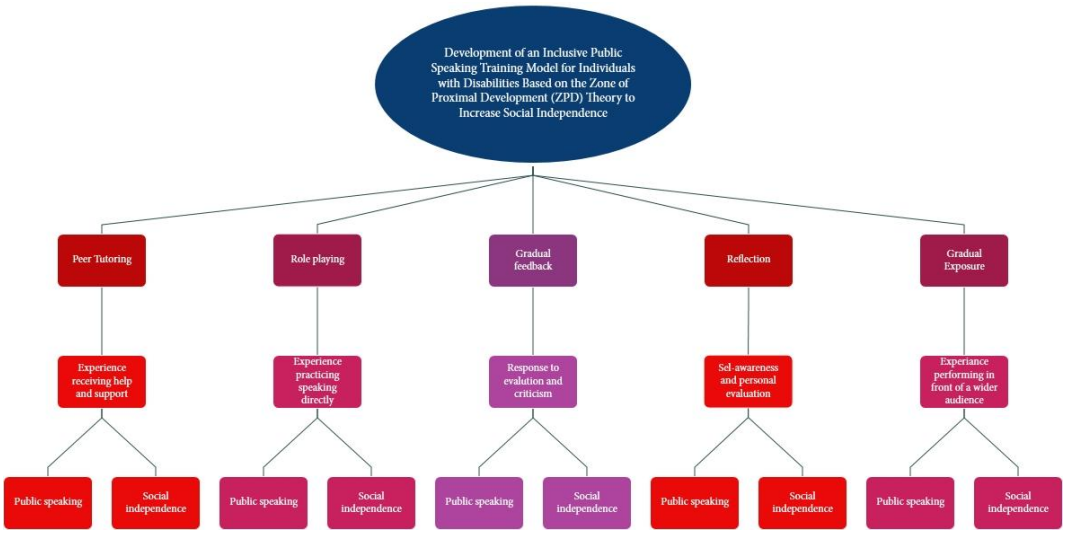

Figure 1. Coding Tree of Qualitative Analysis (NVivo)

In addition to quantitative results, this study also reinforces the findings through qualitative analysis using NVivo. The analysis confirms that the five designed training stages—peer mentoring, role-playing, gradual feedback, reflection, and gradual exposure—demonstrate how the scaffolding strategies that are statistically significant also prove effective in practice.

To clarify the qualitative analysis results, Figure 1 presents a coding tree illustrating the five stages of the ZPD-based public speaking training: peer mentoring, role-playing, gradual feedback, reflection, and gradual exposure. This coding tree demonstrates how each training stage is systematically categorized through the coding process in NVivo. The structure reveals that each stage contains sub-aspects contributing to the formation of social autonomy; for instance, peer mentoring relates to emotional support, role-playing connects to self-efficacy enhancement, and exposure associates with strengthening courage to perform in public spaces. Thus, this coding tree provides a visual representation of how the

training stages designed in the ZPD model are authentically enacted and experienced by participants.

Based on the coding tree structure generated from the qualitative analysis, it is evident that each training stage plays a unique role in the process of developing participants' social autonomy. Each training phase does not stand alone but interconnects to form a continuous learning experience sequence. To provide a more comprehensive overview, the following explains participant experiences in each training stage developed within the ZPD-based model.

1. Peer tutoring serves as the initial stage that cultivates a sense of community and social support among participants. Peer interaction creates an emotionally safe learning environment and encourages the development of basic self-confidence. This finding aligns with quantitative results showing collaborative practice has the strongest influence on enhancing social autonomy. Social support formed through collaboration proves to be a key factor in building courage and active participation.
2. Role-playing provides a space for participants to gain authentic experience speaking before small audiences. This stage serves as practical exercise where participants learn to improvise, manage self-expression, and control nervousness. This outcome aligns with the significant contribution of individual practice identified in the quantitative model. Through the internalization of direct experience, participants develop self-efficacy and readiness to perform in more complex situations.
3. Gradual feedback serves as a crucial process in developing self-regulation. In this stage, participants learn to accept criticism openly, filter relevant input, and utilize it for self-improvement. This dynamic demonstrates how individual practice contributes to building adaptation capacity and self-reflection, which subsequently strengthens their social autonomy.
4. Reflection functions as a contemplative phase where participants review their completed learning process. During this stage, they evaluate personal strengths and weaknesses while developing strategies for further improvement. Reflection helps participants understand that social autonomy is formed not only through external interactions but also through internal awareness and the ability to recognize self-potential.
5. Gradual exposure represents the culminating stage marking participants' readiness to perform before larger audiences. This stage serves as an arena for implementing training outcomes in real contexts, where participants test both their speaking abilities and psychological resilience. This process demonstrates the tangible transition from statistical results to actual behavior—revealing how the quantitative contributions of scaffolding variables genuinely reflect enhanced self-confidence and participants' social autonomy.

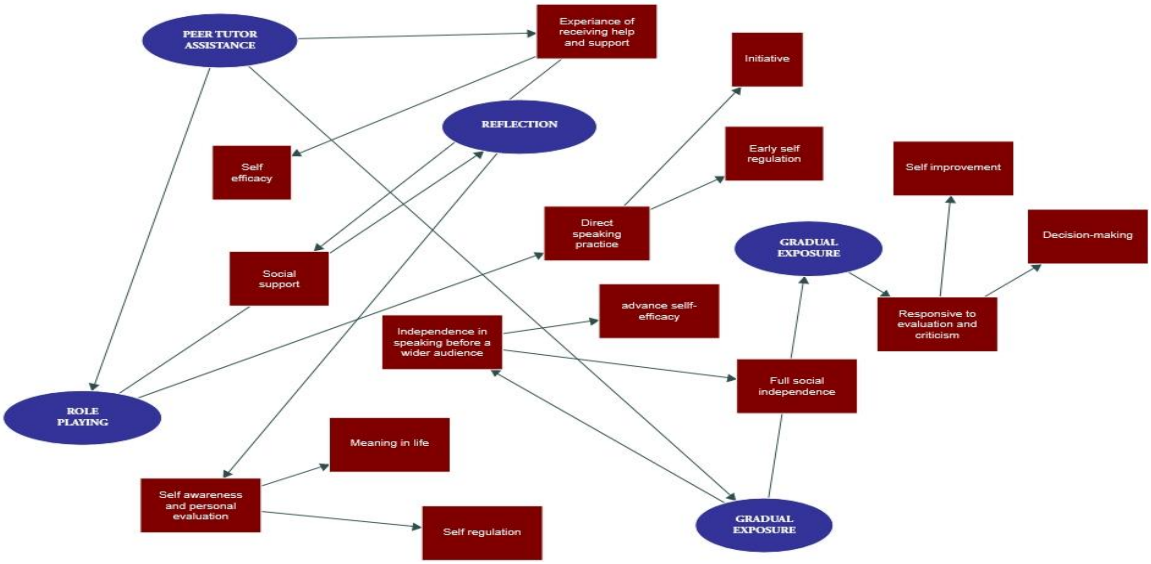

Figure 2. Concept map of Qualitative Analysis (NVivo)

Figure 2 presents a concept map illustrating the interconnections between stages in the public speaking training model based on the Zone of Proximal Development (ZPD) theory, and how interactions between these stages form a continuous learning cycle toward enhanced social autonomy. Unlike the coding tree which emphasizes hierarchical relationships between categories, the concept map is more dynamic as it displays patterns of functional relationships that mutually influence training components. This map helps explain that the learning process in the ZPD model is not merely linear, but rather cyclical and reflective.

In the concept map, peer tutoring serves as the starting point that functions as both social and emotional foundation for participants. In this stage, participants gain emotional support and social scaffolding that enables them to build the confidence to begin the training process. Subsequently, role-playing functions as the direct application stage, where participants practice speaking before small groups and test their speaking abilities in semi-formal situations. Through these practical experiences, participants demonstrate increased self-efficacy and confidence in facing larger audiences.

The subsequent stage, gradual feedback, serves as a bridge between practice and reflection. This process enables participants to identify areas needing improvement and utilize input from facilitators or peers as a means of adaptive learning. Next, reflection becomes an introspective moment where participants review previous experiences, recognize progress and obstacles, and build self-awareness regarding their learning process. The final stage, gradual exposure, marks the peak phase in this training model. Participants begin to perform in broader public spaces and express their abilities independently, demonstrating a tangible transformation from guided assistance to full autonomy.

Beyond illustrating the learning stages, this concept map also depicts the circular nature of the ZPD-based process. The outcome of each stage serves as the foundation for the subsequent stage. For example, participants' success in role-playing reinforces self-confidence

that supports their readiness to receive feedback, while profound reflection outcomes enhance performance in subsequent exposure sessions. Thus, the learning process evolves through continuous cycles rather than concluding after a single training round.

Conceptually, this concept map serves as a visual representation integrating qualitative findings with quantitative results from the SEM-PLS analysis. While quantitative data indicate that collaborative scaffolding provides the largest contribution to social autonomy (57%), the qualitative results explain the psychosocial mechanisms underlying this finding. Social support, collaborative learning, self-reflection, and graduated exposure experiences emerge as key factors driving the enhancement of participants' social autonomy. In other words, this concept map clarifies that the ZPD-based training model operates through mutually reinforcing cycles of social, emotional, and cognitive aspects experienced by participants.

Thus, the qualitative analysis provides deeper understanding of the mechanisms behind the statistical figures obtained from SEM-PLS analysis. While quantitative findings show the initial assessment serves as the main foundation with a 49% contribution, and scaffolding plays a larger role with a total contribution of 57%, the NVivo analysis explains how these processes occur in actual practice. Peer support proves to strengthen participants' social participation, role-playing helps build self-efficacy through direct experience, gradual feedback trains self-regulation skills, reflection deepens personal awareness, and gradual exposure tests participants' readiness to perform in public spaces.

The integration of these two approaches reveals that the ZPD theory-based public speaking training model operates through mutually reinforcing synergistic cycles. The initial assessment functions to map participants' baseline abilities, while individual practice facilitates the internalization of self-confidence. Conversely, collaborative practice provides a space for social interaction that fosters courage and a sense of belonging, whereas the reflection and gradual exposure stages solidify participants' readiness to perform independently before broader audiences. Through this continuous progression, the training model proves robust not only statistically but also demonstrates tangible effectiveness in participant experiences, thereby providing a comprehensive empirical foundation for developing inclusive training programs.

Conceptually, these findings reinforce the relevance of ZPD theory, which positions social interaction at the core of the learning process. Scaffolding emerges as a key element accelerating progress toward social autonomy, as through structured and collaborative support, participants transition from dependence to independent capability. Meanwhile, the initial assessment maintains a strategic role as the starting point determining intervention direction, though long-term success is predominantly determined by the effectiveness of scaffolding in guiding participants toward their optimal potential. Thus, this study not only confirms the strength of inter-variable relationships but also clarifies the

social and psychological dynamics underlying the development of social autonomy within inclusive communication training contexts.

These research findings strengthen the theoretical foundation of Vygotsky's Zone of Proximal Development (ZPD) concept, wherein optimal learning occurs through targeted scaffolding and social interaction (van de Pol et al., 2010). The training model developed in this study not only represents a concrete application of ZPD principles but also demonstrates alignment with the Universal Design for Learning (UDL) framework. UDL emphasizes the importance of providing multiple means of engagement, representation, and action and expression in learning (CAST, 2018). The synergy between these two approaches enhances the relevance of the ZPD-based training model for application across various inclusive education contexts, both locally and internationally (Rao et al., 2014).

From a ZPD theoretical perspective, these results reinforce that learning is a social process dependent on the interaction between participants and their environment. Scaffolding serves as a bridge connecting participants' actual abilities with developmental potential achievable through guidance. Within the public speaking training context, the initial assessment functions to identify participants' zones of proximal development, while individual and collaborative practice act as forms of gradual support that help them transcend their current capabilities. Thus, the training model resulting from this study directly reflects the operational principle of ZPD, where each stage—from initial evaluation to role-playing and collaborative practice—functions as a scaffolding mechanism guiding participants toward higher social autonomy.

From a practical perspective, this research yields several important implications. For educators, these results affirm the necessity of establishing initial assessment as a fundamental component in every training program, as this process determines the starting point for intervention and enables learning strategies to be tailored to each participant's needs. For training practitioners, the research findings demonstrate that collaborative-based activities exert the strongest impact on enhancing self-confidence and social participation. Therefore, training should prioritize group-based activities such as simulations, role-playing, or interactive discussions.

Meanwhile, for policymakers, these findings provide empirical evidence that the ZPD-based training approach can serve as a primary reference for developing inclusive education policies. This model proves relevant not only for improving the communication skills of persons with disabilities but also holds potential for strengthening their broader social participation. By adopting scaffolding principles in educational and training programs, educational institutions and communities can create learning environments that are more adaptive, participatory, and empowering for all individuals.

Beyond enriching theoretical understanding, this research also provides tangible contributions to strengthening inclusive educational

practices. Individuals with disabilities frequently face various communication barriers that impact their social engagement. Through the implementation of the Zone of Proximal Development (ZPD)-based public speaking training model, these barriers can be minimized. This model provides space for participants to learn according to their actual ability levels while receiving gradual support through adaptive scaffolding strategies. This process enables participants to develop progressively until achieving higher autonomy. Consequently, they not only become more skilled in public speaking but also demonstrate enhanced self-confidence, social autonomy, and readiness for active participation in community life.

Conceptually, these research results not only reinforce the validity of ZPD theory but also demonstrate how its principles can be effectively implemented in real-world communication training contexts. The developed inclusive public speaking training model proves capable of serving as a strategic approach for enhancing the social autonomy of individuals with disabilities. Through the synergy between initial assessment, individual practice, collaboration, reflection, and gradual exposure, this model confirms that learning based on social interaction and progressive support can produce significant behavioral changes.

Furthermore, this study provides an important foundation for educators, practitioners, and policymakers to integrate ZPD principles into the design of inclusive training and education programs at various levels. This approach proves relevant not only in the realm of communication skills but can also be adapted to various learning domains that emphasize empowerment and social participation.

Additionally, this ZPD-based training model aligns with Universal Design for Learning (UDL) principles, which emphasize flexibility in engagement, representation, and expression. The compatibility between these two frameworks strengthens the model's relevance for developing inclusive education oriented toward diversity and accessibility. Consequently, this research not only delivers empirical and theoretical contributions but also opens new directions for more humanistic, participatory, and socially equitable training practices.

CONCLUSION

This study confirms that developing a public speaking training model based on the Zone of Proximal Development (ZPD) is an effective approach for enhancing the social autonomy of individuals with disabilities. This model combines initial assessment as a foundation for mapping abilities with the implementation of scaffolding strategies delivered through individual and collaborative practice. The synergy between these two strategies enables training that is gradual, adaptive, and oriented toward participants' actual needs.

The results indicate that the initial assessment serves as the primary foundation for determining the training direction. This stage helps instructors understand participants' baseline conditions, allowing learning strategies to be tailored to their actual capabilities.

Subsequently, the scaffolding process through individual and collaborative practice becomes the determining factor in building self-confidence, developing communication skills, and strengthening social interaction. Individual practice functions as a means for internalization and confidence building, while collaborative practice provides social support that enables participants to transcend their initial limitations.

The qualitative analysis conducted using NVivo enriches the findings of this study. The results show that the developed training stages—from peer mentoring and role-playing to gradual feedback, reflection, and exposure—are genuinely implemented and perceived as beneficial by participants. Scaffolding strategies prove effective not only statistically but are also tangibly experienced in the learning process. Peer support fosters self-confidence, role-playing strengthens self-efficacy, feedback helps participants develop self-regulation, reflection cultivates deeper self-awareness, while gradual exposure trains courage to perform in public spaces. Thus, this ZPD-based training model is not only empirically valid but also meaningful in participants' subjective experiences.

From a theoretical perspective, this study reinforces the core idea of Vygotsky's ZPD theory by providing empirical evidence that scaffolding can be practically implemented in communication training. ZPD is no longer understood merely as an abstract concept, but also as a practical approach that helps individuals with disabilities transcend their current capabilities. Through initial assessment as a starting point, individual practice as an internalization process, and collaborative practice as a means of social support, participants achieve comprehensive development in both communication skills and social autonomy. These findings simultaneously expand the application of ZPD theory within empowerment-oriented inclusive education contexts.

From a practical perspective, this study provides concrete guidance for educators, practitioners, and policymakers. For educators, initial assessment must be positioned as a crucial stage determining learning strategy direction. For practitioners, collaborative-based activities should be prioritized as they prove most effective in building confidence and strengthening communication skills. For policymakers, these research results offer empirical evidence that ZPD-based inclusive education deserves consideration in program formulation, curriculum development, and resource allocation that guarantees equal access for individuals with disabilities.

The core finding of this research confirms that inclusive public speaking learning becomes more effective when initiated with a robust initial assessment, followed by progressive scaffolding stages—from individual practice, collaborative practice, reflection, to public exposure. This gradual process demonstrates comprehensive enhancement of social autonomy, encompassing cognitive, affective, and social aspects, reflected in increased self-confidence, self-awareness, emotional regulation capacity, and courage to perform in public spaces.

Looking ahead, this ZPD-based model holds potential for broader development by integrating the Universal Design for Learning (UDL) framework, enabling inclusive learning practices to become relevant not only locally but also applicable globally. This integration is expected to yield a training model that is more adaptive, participatory, and universal.

Furthermore, this study opens avenues for further research. Subsequent investigations are expected to deepen qualitative analysis using NVivo to explore participants' direct experiences in greater detail. Testing the model across various disability types or different cultural contexts is also necessary to assess its flexibility and adaptability.

Overall, this study not only enriches scientific literature concerning the application of ZPD theory in education but also offers tangible solutions for empowering individuals with disabilities. The ZPD-based public speaking training model proves to be an effective strategy for building social autonomy, strengthening self-confidence, and creating opportunities for equal participation in society. Thus, this research affirms the importance of developing adaptive, inclusive communication training as a concrete step toward a more equitable, collaborative, and socially empowering education system.

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