

Effects of Task Analysis and Symbolic Modeling on Self-Help Skill Acquisition among Learners with Moderate Intellectual Disability in Ghana

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HOW TO CITE:

Florence Akua Mensah (Ph.D.)
(2026). Effects of Task Analysis
and Symbolic Modeling on Self-
Help Skill Acquisition among
Learners with Moderate
Intellectual Disability in Ghana.
International Journal of Special
Education, 41(16s), 272-276

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ABSTRACT:

Learners with moderate intellectual disability often experience difficulties acquiring self-help skills needed for independent living. This study examined the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability in Ghana. A quasi-experimental pretest-posttest control group design was used. Thirty learners from Dzorwulu Special School and Twin City Special School participated in the study and were assigned to Task Analysis, Symbolic Modeling, and Conventional Teaching groups. Data were collected using the Self-Help Skills Performance Test and analysed using Analysis of Covariance (ANCOVA). The results showed significant treatment effects on eating [$F(2, 17) = 4.685, p < .05$, partial $\eta^2 = .420$], bed-making [$F(2, 17) = 11.300, p = .001$, partial $\eta^2 = .571$], and tooth-brushing skills [$F(2, 17) = 9.867, p < .05$, partial $\eta^2 = .537$]. Learners who received task analysis and symbolic modeling performed significantly better than those who received conventional instruction. Although symbolic modeling produced slightly higher gains, both interventions were effective in improving self-help skills. The study concludes that task analysis and symbolic modeling are effective instructional strategies for promoting independence among learners with moderate intellectual disability. The findings support the use of evidence-based instructional practices in special education programmes.

Keywords: task analysis, symbolic modeling, self-help skills, moderate intellectual disability, independent living

1. Introduction

Self-help skills are important daily living skills that enable individuals to function independently. These skills include activities such as eating, personal hygiene, dressing, and other routine tasks necessary for independent living. For learners with moderate intellectual disability, self-help skills are essential because they promote independence, reduce dependence on caregivers, and improve participation in school, family, and community life (American Association on

Intellectual and Developmental Disabilities [AAIDD], 2021).

Learners with moderate intellectual disability often experience difficulties acquiring self-help skills because of limitations in intellectual functioning and adaptive behaviour. As a result, many require structured instruction to learn and maintain daily living skills. Intellectual disability affects approximately 1–3% of the global population, with higher prevalence rates in low- and middle-income countries (World Health

Organization [WHO], 2020). In Ghana, special schools play an important role in helping learners develop self-help skills; however, many learners still experience challenges in performing everyday activities such as eating independently, brushing their teeth, and making their beds (WHO, 2020).

Research has shown that structured instructional strategies are effective in developing self-help and functional skills among learners with intellectual disability. Two commonly used strategies are task analysis and symbolic modeling. Task analysis involves breaking a task into smaller, manageable steps and teaching each step systematically (McConomy et al., 2022), while symbolic modeling uses pictures, illustrations, or other visual representations to demonstrate desired behaviours (Steinbrenner et al., 2020). Studies have found that these strategies improve self-help and daily living skills among learners with intellectual disability (Cihak et al., 2018; Hoogerheide et al., 2016; Kalyani et al., 2018). Similarly, Browder et al. (2021) reported that systematic instruction promotes skill acquisition and greater independence among learners with disabilities.

This study was guided by Bandura's Social Learning Theory (Bandura, 1977), which explains that learning occurs through observation, imitation, and reinforcement. The theory supports the use of task analysis and symbolic modeling because both strategies provide opportunities for learners to observe, practise, and master new skills.

Although previous studies have reported positive effects of task analysis and symbolic modeling on self-help skill acquisition (Cihak et al., 2018; Isawumi, 2023), limited research has examined their effectiveness in Ghanaian special schools. Most Ghanaian studies have focused on general teaching practices rather than evidence-based interventions for self-help skill development (Osei, 2020; Thompson, 2020). Therefore, this study investigated the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability in Ghana. It was hypothesised that there would be a statistically significant effect of

treatment (task analysis and symbolic modeling) on self-help skill acquisition among learners with moderate intellectual disability.

2. Methodology

Design

This study employed a quasi-experimental pretest-posttest control group design to examine the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability. The design allowed the researcher to compare the effectiveness of task analysis, symbolic modeling, and conventional teaching. It is commonly used in educational research when random assignment of participants is not possible (Fraenkel et al., 2019).

Participants/Sample

The study was conducted at Dzorwulu Special School in Accra and Twin City Special School in Sekondi-Takoradi, Ghana. Thirty learners with moderate intellectual disability were purposively selected to participate in the study. Selection was based on diagnosis of moderate intellectual disability, difficulties in performing the targeted self-help skills, and parental consent.

The participants were assigned to three groups of ten learners each: Task Analysis, Symbolic Modeling, and Conventional Teaching. These learners were selected because they met the requirements of the study and were available throughout the intervention period.

Instruments

Two instruments were used in this study. The Slosson Intelligence Test was adapted from the version developed by Oyefeso (2018) for use with pupils with intellectual disability in Nigeria and it was used to confirm participants' intellectual functioning and eligibility for the study. The Self-Help Skills Performance Test was used to assess learners' performance in eating, tooth-brushing, and bed-making skills. The test consisted of performance checklists, with higher scores indicating greater mastery of the self-help skills.

The instruments were reviewed by experts in special education assessment and head teachers

of selected special school for learners with intellectual disabilities to ensure content validity. Pilot testing was also conducted, and the instruments demonstrated acceptable reliability for use in the study.

Procedure

Ethical approval, institutional permission, and parental consent were obtained before data collection. Participants first completed a pretest using the Self-Help Skills Performance Test.

The intervention was conducted over six weeks and focused on eating, tooth-brushing, and bed-making skills. Learners in the Task Analysis group received step-by-step instruction, while those in the Symbolic Modeling group were taught using picture-based visual models. Participants in the Conventional Teaching group received the regular instructional methods used in their schools.

At the end of the intervention, all participants completed a posttest using the same Self-Help Skills Performance Test to determine the effects of the instructional strategies on self-help skill acquisition.

Data Analysis

Data were analysed using descriptive and inferential statistics. Means and standard deviations were used to describe participants' performance before and after the intervention. Analysis of Covariance (ANCOVA) was used to determine whether significant differences existed among the treatment groups after controlling for pretest scores. The hypothesis was tested at the .05 level of significance. Effect sizes (partial η^2) were also computed to determine the magnitude of the treatment effects.

3. Results

This study examined the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability. Analysis of Covariance (ANCOVA) was conducted to determine whether significant differences existed among the treatment groups after controlling for pretest scores.

Table 1 presents the ANCOVA results for the three self-help skill domains.

Table 1 Effects of Treatment on Self-Help Skill Acquisition

Skill Domain	F	p	Partial η^2
Eating	4.685	< .05	.420
Bed Making	11.300	.001	.571
Tooth Brushing	9.867	< .05	.537

The results indicate statistically significant treatment effects across all three self-help skill domains. For eating skills, treatment had a significant effect, $F(2, 17) = 4.685$, $p < .05$, partial $\eta^2 = .420$, indicating that 42.0% of the variance in posttest performance was attributable to instructional strategy.

Similarly, treatment had a significant effect on bed-making skills, $F(2, 17) = 11.300$, $p = .001$, partial $\eta^2 = .571$. This was the strongest treatment effect observed in the study, accounting for 57.1% of the variance in posttest performance.

For tooth-brushing skills, treatment also produced a significant effect, $F(2, 17) = 9.867$, $p < .05$, partial $\eta^2 = .537$, indicating that instructional strategy accounted for 53.7% of the variance in learners' performance.

Across the three skill areas, both task analysis and symbolic modeling resulted in significantly higher levels of self-help skill acquisition than conventional teaching. Although symbolic modeling consistently produced slightly higher adjusted mean scores than task analysis, the differences between the two intervention groups

were not statistically significant. The findings therefore indicate that both interventions were effective instructional approaches for improving self-help skills among learners with moderate intellectual disability.

4. Discussion

This study examined the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability. The findings showed that both instructional strategies significantly improved learners' eating, bed-making, and tooth-brushing skills compared with conventional teaching methods.

The findings support previous studies that identified structured instructional interventions as effective approaches for teaching functional skills to learners with intellectual disability (Cihak et al., 2018; Spooner & Browder, 2015). The results suggest that learners benefit from systematic instruction that provides clear guidance, repeated practice, and reinforcement. This finding is also consistent with Yakubova et al. (2022), who found that video- and model-based instructional approaches effectively enhanced functional and daily living skills among individuals with intellectual and developmental disabilities and with Cannella-Malone et al. (2011), who reported that modeling interventions improved daily living skill performance among learners with developmental disabilities. The findings also support Bandura's Social Learning Theory (Bandura, 1977), which explains that learning occurs through observation, imitation, and reinforcement. Learners in the symbolic modeling group observed visual representations of the target skills and were able to imitate and practise the behaviours. This may explain the significant improvement in their self-help skills. Although both interventions were effective, symbolic modeling produced slightly higher gains than task analysis. This may be because visual supports help learners with moderate intellectual disability understand and remember task steps more easily. Visual models provide clear and

consistent cues that support learning and performance (Hoogerheide et al., 2016; Steinbrenner et al., 2020).

Task analysis was also effective in improving self-help skills. By breaking complex tasks into smaller and manageable steps, learners were able to learn one step at a time and gradually master the entire skill. This finding is consistent with Kalyani et al. (2018) and McConomy et al. (2022), who reported that task analysis improves daily living skill acquisition among learners with intellectual disability.

Overall, the findings indicate that task analysis and symbolic modeling are more effective than conventional teaching methods for promoting self-help skill acquisition among learners with moderate intellectual disability. The study therefore supports the use of evidence-based instructional strategies in Ghanaian special schools to enhance learners' independence and adaptive functioning.

5. Conclusion

This study examined the effects of task analysis and symbolic modeling on self-help skill acquisition among learners with moderate intellectual disability in Ghanaian special schools. The findings showed that both strategies improved learners' eating, bed-making, and tooth-brushing skills more than conventional teaching methods. Although symbolic modeling produced slightly better results, both approaches were effective. The findings suggest that structured instructional strategies can help learners with moderate intellectual disability develop important self-help skills and become more independent. Therefore, special education teachers should incorporate task analysis and symbolic modeling into their classroom instruction. Teacher education institutions and educational authorities should also support the use of these evidence-based practices in schools.

Future studies should examine the long-term effects of these instructional strategies in different educational settings.

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7. Acknowledgements

The author expresses sincere appreciation to the management, teachers, learners, and caregivers of Dzorwulu Special School and Twin City Special School for their cooperation and support throughout the study. Appreciation is also extended to the Department of Special Education, University of Education, Winneba, for its academic support and guidance during the research process.

8. Author Declaration

The author declares that this manuscript is an original work and has not been published previously nor submitted for publication elsewhere. The author further declares that there are no conflicts of interest regarding the publication of this paper.