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Using Busy Book Learning Media to Improve Fine Motor Skills of Students with Intellectual Disabilities

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ABSTRACT

This classroom action research examined the use of a busy book to improve fine motor skills of two Grade VII C1 students with intellectual disabilities at SLB Negeri Purbalingga. The Kemmis–McTaggart cycle of planning, action, observation, and reflection was implemented in two cycles. Performance tests and structured observations assessed grasping, holding, pinching, folding, stringing, twisting, dressing-related manipulation, and other fine-motor actions. Baseline scores were 31.94 for AL and 27.77 for FH. After Cycle I, scores increased to 41.66 and 38.88. By Cycle II, both students had reached the study success criterion; the manuscript reports total gains of 44.44 percentage points for AL and 43.06 for FH. The findings indicate that repeated, concrete manipulation of buttons, zippers, laces, and other tactile components within the busy book was accompanied by meaningful within-student improvement. Because the study involved only two participants and no comparison condition, the findings should be interpreted as classroom-based evidence rather than causal proof.

Keywords: busy book; fine motor skills; intellectual disability; classroom action research; special education

INTRODUCTION

Fine motor competence enables students to coordinate small-muscle movements for grasping, pinching, folding, manipulating fasteners, and performing everyday self-care. For learners with intellectual disabilities, instructional priorities should include functional performance, meaningful practice, and opportunities for greater independence. The evidence-based special-education literature emphasizes selecting observable goals and monitoring the fidelity and outcomes of classroom supports (Cook & Odom, 2013; Spooner et al., 2012; Bouck, 2010).

A busy book is a portable, tactile collection of short activities involving fasteners, textures, laces, and manipulable objects. Unlike passive worksheets, these materials invite repeated object handling, visual guidance, and immediate feedback. Recent studies of busy books in early childhood report their suitability for fine motor practice, although these studies are not directly generalizable to adolescents with intellectual disabilities (Nazara & Tegeh, 2023; Handika & Rocmah, 2025; Purnamasari et al., 2026; Lestari et al., 2026).

Initial observations in Grade VII C1 at SLB Negeri Purbalingga identified difficulties in pencil holding, pinching small objects, and self-care actions. The school had not previously used the busy-book medium for the two participating learners. Accordingly, this study asked: How did students' fine motor performance change across two classroom action-research cycles using a busy book?

LITERATURE REVIEW

Fine motor practice and functional independence

Fine motor learning is task-specific: repeated opportunities to manipulate objects can support coordination, but improvements in a practiced task should not automatically be interpreted as generalization to all daily activities. Instruction for students with substantial support needs therefore benefits from explicit modeling, systematic prompting, and repeated functional opportunities (Browder et al., 2006; Browder et al., 2008; Hughes & Agran, 1993; Mechling, 2007; Ayres et al., 2013).

Engagement, feedback, and accessible instruction

A useful tactile resource must also sustain engagement. Motivation theory distinguishes externally controlled compliance from meaningful participation, and research on interest emphasizes the value of appropriately challenging tasks and supportive feedback (Deci & Ryan, 2000; Ryan & Deci, 2020; Hidi & Renninger, 2006; Reeve, 2009; Jang et al., 2010). Formative assessment and feedback can guide adjustment of prompts and task difficulty across repeated lessons (Black & Wiliam, 2009; Hattie & Timperley, 2007; Shute, 2008).

Instructional accessibility requires attention to learner differences rather than a single prescribed response mode. Inclusive pedagogy and evidence-based implementation support combining concrete materials with observation of each learner's participation (Florian & Black-Hawkins, 2011; Ainscow, 2020; Alquraini & Gut, 2012).

METHOD

Research design, participants, and setting

The study used classroom action research with two cycles, each comprising planning, action, observation, and reflection. Participants were two purposively selected Grade VII C1 students, identified as AL and FH, at SLB Negeri Purbalingga, Central Java. Both had low initial fine motor performance. The source manuscript reports data collection during January 2022 in the second semester of 2021/2022. Some weekday/date descriptions in the original are inconsistent; the revised article retains the dated schedule without inferring weekdays.

Intervention and procedures

Baseline performance was assessed before the intervention. Cycle I included two instructional meetings and one post-action assessment; learners practiced opening and fastening buttons, operating zippers, manipulating shoe laces, opening and closing purse fasteners, and using hook-and-loop sandal straps. The reflection noted increased interest but continuing difficulty with buttons, zippers, and shoelaces. In Cycle II, the teacher increased positive appreciation and attempted to reduce classroom interruptions while continuing busy-book activities. Each reported meeting lasted 2 × 35 minutes.

Measures and analysis

The performance checklist contained 24 items scored 0 (unable), 1 (verbal and nonverbal assistance), 2 (verbal assistance), or 3 (independent), for a maximum total of 72. Assessed domains were grasping, holding, pinching, folding, threading, rolling/manipulating material, and self-care. Scores were expressed as percentages: observed score ÷ 72 × 100. Participation observations were scored out of 20. The classroom success criterion was a performance percentage of at least 70%. Given n = 2, analysis was descriptive and individual-level; no inferential tests were appropriate.

RESULTS

Individual progress across assessments

Participant	Baseline (raw; %)	Cycle I (raw; %)	Cycle II (raw; %)	Baseline → Cycle II (pp)
AL	23/72; 31.94	30/72; 41.67	55/72; 76.39	+44.44
FH	20/72; 27.78	28/72; 38.89	51/72; 70.83	+43.06

Note. Percentages are recalculated from the original raw scores to two decimal places. pp = percentage points. The source reports some truncated percentages (e.g., 27.77 and 76.38). The gains of 44.44 and 43.06 are percentage-point differences, not relative percentage growth.

Both students improved after Cycle I but remained below the 70% threshold. In Cycle II, AL scored 55 of 72 and FH scored 51 of 72, meeting the classroom criterion. Improvements were especially apparent in object grasping and holding, pinching, material manipulation, and selected self-care actions. Threading remained comparatively weak (one point for each student at Cycle II).

Participation and reflection

Participant	Cycle I participation	Cycle II participation	Change (pp)
AL	10/20 (50%)	15/20 (75%)	+25
FH	9/20 (45%)	14/20 (70%)	+25

The observation records describe greater enthusiasm and task participation with the busy book. The source also records two concurrent Cycle II modifications: more frequent teacher appreciation and

management of classroom interruptions. Consequently, improvement cannot be attributed uniquely to the tactile book itself.

Source-data reconciliation

A transcription inconsistency appears in the original Cycle II domain table: its printed total row repeats the Cycle I totals of 30 and 28, while its seven domain entries sum to 55 and 51, matching the subsequent Cycle II summary table. This revision uses the domain sums and the summary table (55 and 51) and explicitly discloses the discrepancy. The original also duplicates the label "holding" for two separate domains; based on the accompanying prose, these are rendered here as "grasping" and "holding."

DISCUSSION

The observed increases suggest that brief, repeatable manipulation tasks can be incorporated into functional skills instruction for learners requiring substantial support. The performance pattern is consistent with the logic of active participation, graduated prompting, and formative feedback, rather than providing proof that busy books outperform other media (Chi & Wylie, 2014; Prince, 2004; Freeman et al., 2014; Cihak et al., 2010).

The gains in both performance and participation may reflect several interacting mechanisms: increased practice opportunities, novelty and interest, more supportive feedback, and fewer interruptions. Research on learning engagement and instructional support suggests these processes should be assessed separately in future studies (Fredricks et al., 2004; Skinner et al., 2009; Martin & Dowson, 2009; Wentzel, 1998; Pintrich, 2003; Eccles & Wigfield, 2002; Schunk & DiBenedetto, 2020).

The instructional tasks were concrete and sequential, potentially reducing demands associated with processing unfamiliar instructions. Research on cognitive load and learner-tailored instruction underscores the importance of calibrating guidance and task complexity to the learner's prior knowledge (Sweller, 1988; Sweller et al., 2019; Paas et al., 2003; Kalyuga, 2007; Mayer, 2003; Mayer & Moreno, 2003; Moreno & Mayer, 2007). These are conceptual interpretations, not mechanisms directly tested in the present classroom study.

Individualized goals should extend beyond criterion scores to the degree of independence achieved in authentic routines. Further work could incorporate repeated baseline probes, maintenance checks, caregiver ratings, and generalization to clothing and household objects outside the busy book. The broader literature on instructional strategies, self-regulation, and learner engagement offers useful methodological perspectives for such extensions (Dunlosky et al., 2013; Zimmerman, 2002; Nicol & Macfarlane-Dick, 2006; Rosenshine, 2012; Bandura, 2001; Kyndt et al., 2011; Linnenbrink-Garcia et al., 2016).

LIMITATIONS

This report involves only two students from one classroom, without a comparison group, independent scoring, or follow-up measures. The intervention was accompanied by adjustments to teacher feedback and classroom management. The instrument's reliability and the degree of generalization to daily-life independence were not established. The study should therefore be interpreted as a descriptive classroom improvement project rather than a controlled effectiveness trial.

CONCLUSION

Following two cycles of busy-book-based fine motor instruction, AL increased from 31.94% to 76.39% and FH from 27.78% to 70.83%; both reached the prespecified 70% classroom criterion. Participation scores also increased. The findings support the practical feasibility of using a tactile busy book in this specific classroom, while stronger designs are needed to determine comparative effectiveness and sustained functional benefits.

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