

Development of Cell phone Straps Beading Vocational Training Program for Children with Intellectual Disabilities

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ABSTRACT

Training provided to children with special needs is increasingly developing along with the advancement of human resource thinking. These training are assisted by the presence of technology that provides easiness for individuals to obtain information easily and quickly, as well as to foster innovation, including in the creation of handicrafts. An example of the handicraft innovation is stringing cell phone straps. This research used a field study method to collect data directly and evaluate real situations. The research objectives are developing educational programs for children with intellectual disabilities, validating theories with field evidence, and gaining practical insights into the studied problems. The implementation was carried out to three students. All students were able to follow well and showed significant progress when working on the stages of making cell phone straps from the beginning to the packaging stage. Vocational programs that focus on making cell phone straps for children with intellectual disabilities provide valuable opportunities for them to develop practical skills and creativity. Through this activity, children can learn to use various simple materials and tools to create other products that have economic advantages.

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INTRODUCTION

Training for children with special needs has continued to develop in line with technological progress and improvements in human resources. According to Rahman (2014) and Yasyfina (2024), traditional intervention patterns have gradually shifted toward more modern approaches, resulting in better educational services for children with special needs (Fakhiratunnisa et al., 2022). These changes not only teaching methods but also the involvement of various stakeholders in the special education services. Accordingly, service approaches that previously emphasized a child-centered approach have shifted toward a community-based approach (Putri et al., 2024). The community-based approach highlights the role of society in improving the quality of services for children with special needs (Supriati et al., 2022). Through community involvement, children with special needs are expected to adapt and participate better in social life (Nettles, 1991; Del Cura & Martínez-Pérez, 2021). This development has encouraged various innovations, including vocational activities in handicrafts. One example is the production of cell phone straps through beading activities (Mutiah, 2021). Beading activities provide both aesthetic and educational value, particularly in developing fine motor skills, accuracy, perseverance, and patience (Tassé & Grover, 2021).

Beading cell phone straps involves stringing small objects using thread or cord to form specific patterns. This activity can be used as a medium to stimulate fine motor development and vocational learning (Amelia & Azizah, 2023). The materials and level of difficulty should be adjusted to the abilities and needs of the children. In special education, beading is categorized as a vocational skill (Heyn et al., 2021). Vocational

skills are essential life skills that support independence among children with special needs (Zahroh, 2022), especially children with intellectual disabilities (Ookeditse, 2025). Children with intellectual disabilities experience limitations in intellectual and mental development that affect academic, social, and communication abilities (Rochyadi, 2012). Based on the level of functioning, they are classified into mild, moderate, and severe categories (Almalky & Alwadei, 2024).

Therefore, educational services for children with intellectual disabilities emphasize self-care and vocational skills to support independent living and social participation (Garrote, 2017) (Sibagariang & Thamrin, 2025a). Based on these conditions, innovative vocational training programs that match children's interests and market needs are required. This study proposes a vocational training program in the form of beads beading to produce cell phone straps (Pina Oktaviana, 2023). This activity was selected because the product is popular, has economic value, and uses affordable and easily obtained materials (Chithrangathan, 2022). In addition, the process is suitable for children with intellectual disabilities, particularly in improving fine motor skills and concentration (Fauzi et al., 2021).

This study aimed to develop and implement a vocational training program in form of beading activities to produce cell phone straps to improve the vocational skills and independence of children with intellectual disabilities (Fadillah et al., 2024). The novelty of this study lies in integrating vocational skills with current product trends in the form of cell phone straps as a learning innovation in special schools (Brown et al., 2006). This program not only develops vocational skills but also introduces simple entrepreneurial concepts to support independence and economic sustainability (Sibagariang & Thamrin, 2025b). Therefore, beading cell phone strap training is expected to be a relevant and practical vocational alternative for children with intellectual disabilities (Qohar, 2023).

METHOD

This study employed a qualitative approach using field study design (Sari et al., 2022). The field study was conducted to obtain in-depth data by directly observing the learning process and the implementation of vocational training programs for children with intellectual disabilities in a special school. This method was selected to support the research objective of developing and evaluating a vocational training program that is relevant to the abilities and needs of the participants. The vocational training program applied the principle of task analysis, in which each stage of beading cell phone strap production was broken down into small and sequential steps to facilitate student understanding (Putra et al., 2024). The learning process utilized visual and hands-on approaches, allowing students to directly observe and manipulate the materials during the activity. Visual learning media, including pictures, videos, and direct demonstrations, were used to support each stage of instruction and to enhance students' comprehension of the learning process (Abdussamad & Sik, 2021). In addition, individual guidance was provided by instructors to ensure that each student was able to follow the learning activities according to their abilities.

The materials consisted of paracord strings, buckles, hooks, and various supporting accessories (Parsons et al., 2025). These materials were selected because they are safe, affordable, and suitable for developing fine motor skills and concentration among children with intellectual disabilities (Wibawa, 2022). The data were collected through direct observation, interviews, and documentation. Observations were conducted to examine student participation and responses during the vocational training activities. Interviews were carried out with the homeroom teachers, as well as the vice principal of curriculum affairs in a special junior dan senior high special school in West Java. Documentations in the form of photographs, videos, and field notes were used to support and strengthen the research data.

The collected data were analyzed descriptively to identify the student engagement and the suitability of cell phone strap beading activities as a vocational training program for children with intellectual disabilities (Ediyanto et al., 2021). The research flow begins with a field study to identify real-world needs and problems, which serves as the foundation for developing an appropriate assessment instrument. This is followed by assessment instrument development, its presentation, and subsequent validation to ensure its reliability and validity. Afterward, the validated instrument is used in the assessment implementation phase, and the results are analyzed, presented, and further validated to confirm their accuracy. Based on these validated findings, the study proceeds to program development, including its presentation, validation, and implementation in practice. The implementation results are then presented and validated again to ensure effectiveness. Finally, the process concludes with a comprehensive evaluation of program implementation, culminating in the preparation of the final report, guidebook, and scholarly article as the main outputs of the research.

RESULTS AND DISCUSSION

Result

Based on the cell phone straps beading implementation to the three students consisting of two junior secondary special school students and one senior secondary special school student on November 28, 2024, and December 5 and 9, 2024, only two students attended all three sessions. The remaining student participated in two sessions and was absent in the first session (Yasmin & Iswari, 2021). Nevertheless, this student was able to follow the learning activities well and demonstrated significant progress (Tibo et al., 2022). During the practical activity, the student was able to complete the cell phone strap and packaging process and became the first to finish among all participants. The learning activities were conducted from 09:00 to 10:00 a.m. local time (WIB). The progress of the program implementation assessment results is presented in the graph below:

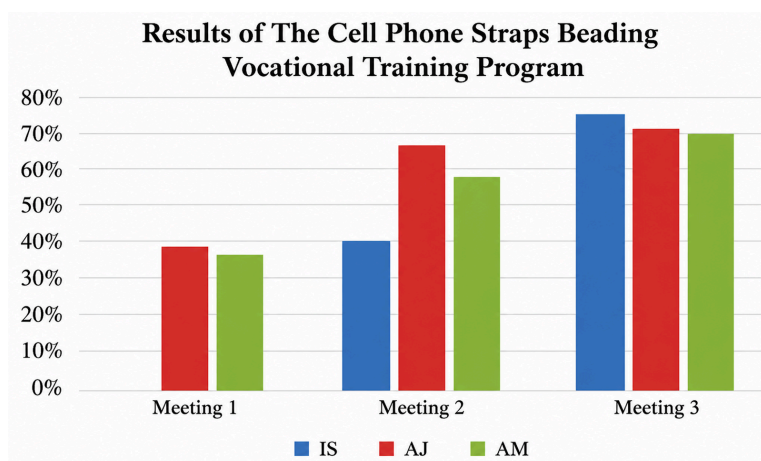


Figure 1. Results of The Cell phone Straps Beading Vocational Training Program

Results of program implementation on subject with initials AJ

The results of the cell phone straps beading implementation in the first session showed that AJ obtained a score of 8 out of 28 (28.58%) on the steps of making the cell phone strap and 6 out of 8 (75%) on the product packaging steps. AJ still required assistance in several activities related to measuring, cutting, knotting, and opening the packaging. Therefore, in the first session, AJ's ability in the cell phone strap-making steps was categorized at the frustration level, while the packaging steps were at the independent level. Overall, AJ achieved a total score of 14 out of 36 (38.89%), indicating that AJ was at the frustration level (Jannah & Damri, 2023).

In the second session, AJ obtained a score of 17 out of 28 (60.71%) on the steps of making the cell phone strap and 7 out of 8 (87.5%) on the product packaging steps. Thus, AJ's performance was categorized at the instructional level for the cell phone strap-making steps and at the independent level for the packaging steps. The overall score in this session was 24 out of 36 (66.67%), indicating that AJ was at the instructional level. In the third session, AJ achieved a score of 19 out of 28 (67.86%) on the steps of making the cell phone strap and 7 out of 8 (87.5%) on the product packaging steps. Accordingly, AJ's ability remained at the instructional level for the cell phone strap-making steps and at the independent level for the packaging steps. The overall score increased to 26 out of 36 (72.22%), which also placed AJ in the instructional level category.

Results of program implementation on subject with initials AM

The results of the cell phone straps beading implementation in the first session showed that AM obtained a score of 8 out of 28 (28.58%) on the cell phone strap-making steps and 5 out of 8 (62.5%) on the product packaging steps. AM still required assistance in several activities related to measuring, cutting, knotting, and opening the packaging. Therefore, in the first session, AM's ability in the cell phone strap-making steps was categorized at the frustration level, while the packaging steps were at the instructional level. The overall score achieved by AM was 13 out of 36 (36.11%), indicating that AM was at the frustration level. In the second session, AM obtained a score of 14 out of 28 (50%) on the cell phone strap-making steps and 7 out of 8 (87.5%) on the product packaging steps. Accordingly, AM's performance was categorized at the instructional level for the cell phone strap-making steps and at the independent level for the packaging steps. The overall score in this session was 21 out of 36 (58.33%), indicating that AM was at the instructional level. In the third session, AM achieved a score of 19 out of 28 (67.86%) on the cell

phone strap-making steps and 7 out of 8 (87.5%) on the product packaging steps. Thus, AM's ability remained at the instructional level for the cell phone strap-making steps and at the independent level for the packaging steps. The overall score increased to 26 out of 36 (72.22%), indicating that AM was in the instructional level category.

Results of program implementation on subject with initials IS

The results of the cell phone straps beading implementation in the first session showed that IS obtained a score of 10 out of 28 (35.71%) on the cell phone strap-making steps and 5 out of 8 (62.5%) on the product packaging steps. Accordingly, IS's performance was categorized at the frustration level for the cell phone strap-making steps and at the instructional level for the packaging steps. The overall score achieved by IS was 15 out of 36 (41.67%), indicating that IS was at the frustration level. In the following session, IS obtained a score of 20 out of 28 (71.43%) on the cell phone strap-making steps and 7 out of 8 (87.5%) on the product packaging steps. Thus, IS's performance was categorized at the instructional level for the cell phone strap-making steps and at the independent level for the packaging steps. The overall score increased to 27 out of 36 (75%), indicating that IS had reached the independent level.

Discussion

The results demonstrate that the program was successfully implemented and contributed to a measurable improvement in participants' vocational abilities. All students showed gradual progress, moving from the frustration level to the instructional level, and in some aspects reaching the independent level, especially in product packaging activities (Pamuladsih, 2020). The findings confirm that vocational training programs grounded in task analysis principles and supported by hands-on approaches is effective in enhancing fine motor skills and task comprehension among children with intellectual disabilities (Almarogi, 2019). Moreover, integrating vocational learning with contemporary and economically relevant products provides meaningful learning experiences and supports students' readiness for independent living (Rohana et al., 2022). This program also has potential further development through product diversification and integration with simple entrepreneurship activities in special schools (Supriati et al., 2022).

The findings demonstrate that the cell phone strap beading vocational training program significantly enhanced students' practical skills through structured, repetitive, and hands-on learning activities. All participants exhibited steady progression from the frustration level during the initial session to the instructional level, with one participant achieving the independent level by the final session. This improvement highlights the critical role of guided practice and task repetition in developing fine motor skills, task sequencing, and vocational competence among students with special needs (Kolb, 2015; Jannah & Damri, 2023). Both AJ and AM followed comparable learning trajectories, showing gradual performance improvements as instructional support reduced their dependency and facilitated partial independence, particularly in packaging tasks, which were less complex and more readily mastered.

IS showed the most significant progress, reaching the independent level in the final session, highlighting the role of individual differences in learning outcomes. Across all participants, packaging tasks consistently yielded higher scores than beadwork production, indicating that task complexity influences the rate of skill acquisition (Yasmin & Iswari, 2021). The results underscore that simpler, structured tasks can build initial confidence before transitioning to more complex activities requiring precision and coordination. Overall, the study confirms that scaffolded vocational training with incremental difficulty is effective in supporting skill development and independence in special education contexts, suggesting the need for adaptive instructional strategies and extended practice opportunities to optimize outcomes (Tibo et al., 2022).

CONCLUSION

In conclusion, this study demonstrates that the development and implementation of a vocational training program focused on cell phone strap beading is effective in improving the vocational skills of children with intellectual disabilities. The structured approach based on task analysis, combined with visual and hands-on learning methods, enabled students to gradually progress from the frustration level to the instructional level, and in some cases reach independence, particularly in packaging activities. The findings confirm that integrating practical, market-relevant skills into vocational education not only enhances fine motor abilities and task comprehension but also supports the development of independence and creativity among learners. Furthermore, the program shows strong potential for sustainability and further development through product diversification and the incorporation of simple entrepreneurial elements. Therefore, this vocational training model can serve as a practical and innovative alternative for special education settings in fostering life skills and economic readiness for children with intellectual disabilities.

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REFERENCES

- Abdussamad, H. Z., & Sik, M. S. (2021). *Metode penelitian kualitatif*. CV. Syakir Media Press.
- Almalky, H. A., & Alwadei, A. M. (2024). Vocational rehabilitation services and career readiness for individuals with intellectual disability in Saudi Arabia. *Children and Youth Services Review*, *166*, 108003. <https://doi.org/10.1016/j.childyouth.2024.108003>
- Almarogi, A. M. (2019). Implementasi Program Pendidikan Vokasional Sebagai Investasi Bagi Anak Tunagrahita dalam Setting Pendidikan Khusus. *INCLUSIVE: Journal of Special Education*, *5*(1).
- Amelia, E., & Azizah, N. (2023). Implementasi pembelajaran keterampilan vokasional untuk anak berkebutuhan khusus: Sebuah tinjauan sistematis. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *7*(5), 6127–6140.
- Brown, L., Shiraga, B., & Kessler, K. (2006). The quest for ordinary lives: The integrated post-school vocational functioning of 50 workers with significant disabilities. *Research and Practice for Persons with Severe Disabilities*, *31*. doi.org/10.1177/154079690603100202
- Chithrangathan, C. (2022). Vocational training for livelihood and rehabilitation of persons with intellectual disabilities. *Tizard Learning Disability Review*, *27*(34), 129–138. <https://doi.org/https://doi.org/10.1108/TLDR-11-2021-0030>
- Del Cura, M., & Martínez-Pérez, J. (2021). Childhood, disability and vocational training in Franco's Spain during the 1950s and early 1960s. *History of Education Review*, *50*(2), 241–257. <https://doi.org/https://doi.org/10.1108/HER-07-2020-0041>
- Ediyanto, E., Hastuti, W. D., & Rizqianti, N. A. (2021). Identifikasi dan asesmen anak berkebutuhan khusus: Program peningkatan kompetensi guru sekolah inklusi. *Yayasan Pusat Pendidikan Angstrom*, *1*(1), 1–63.
- Fadillah, M., Usman, U., & Sulasminah, D. (2024). Improving keychain making skills using the drill method for sixth grade mentally disabled children in special schools. *Pinisi Journal of Education*, *4*(6), 9–20.
- Fakhiratunnisa, S. A., Pitaloka, A. A. P., & Ningrum, T. K. (2022). Konsep dasar anak berkebutuhan khusus. *Masaliq*, *2*(1), 26–42.
- Fauzi, E., Aprilia, I. D., & Homdijah, O. S. (2021). Keterampilan vokasional analisis kebutuhan magang bagi anak tunagrahita. *Jurnal Pendidikan Indonesia*, *2*(11), 1866–1876.
- Garrote, A. (2017). The relationship between social participation and social skills of pupils with an intellectual disability: A study in inclusive classrooms. *Frontline Learning Research*, *5*(1), 1–15. <https://doi.org/10.14786/flr.v5i1.266>
- Heyn, P. C., Goldberg, A., McGrew, G., & Bodine, C. (2021). The effects of a mobile-based vocational skill building coaching technology intervention for people with cognitive disabilities: A pilot feasibility study. *Journal of Rehabilitation and Assistive Technologies Engineering*, *8*. <https://doi.org/10.1177/20556683211009731>
- Jannah, R., & Damri, D. (2023). Meningkatkan keterampilan vokasional membuat kentang mustofa balado melalui metode analisis tugas bagi anak tunagrahita ringan. *EDUKATIF: JURNAL ILMU PENDIDIKAN*, *5*(2), 1754–1761.
- Mutiah, K. N. (2021). Manajemen pendidikan ketrampilan vokasional anak tunagrahita. *Exponential (Education For Exceptional Children) Jurnal Pendidikan Luar Biasa*, *2*(1), 191–198.
- Nettles, S. M. (1991). *Community Involvement and Disadvantaged Students : A Review*. *61*(3), 379–406.
- Ookeditse, G. B. (2025). Vocational transition challenges for students with disabilities in Botswana: vocational teachers' perspectives. *SAGE Open*, *15*(2). <https://doi.org/10.1177/21582440251344370>
- Pamuladsih, K. D. (2020). *Pengaruh model pembelajaran langsung (direct instruction) melalui media benda konkret untuk meningkatkan keterampilan vokasional siswa tunagrahita di slb negeri karanganyar tahun pelajaran 2019/2020*.
- Parsons, C. C., Gibson, M., Thum, M., Cleary, D. S., & Persch, A. C. (2025). Inclusion of young adults with intellectual disabilities in their transition to employment: Designing the Vocational Fit Assessment – Self Report. *Archives of Physical Medicine and Rehabilitation*. <https://doi.org/https://doi.org/10.1016/j.apmr.2025.10.028>
- Pina Oktaviana, I. (2023). Efektivitas alat punch needle dalam meningkatkan keterampilan vokasional menyulam pada anak tunagrahita ringan. *Jurnal Pendidikan Tambusai*, *7*(1).
- Putra, A. A., Samudra, T. G., Priyatama, L., Adriaman, M., Fauzi, V. F., Pratama, A., Fadhlansyah, H., Putri, D. R. A., & Fadhlurrahman, A. (2024). *Metode penulisan artikel hukum*. Yayasan Tri Edukasi Ilmiah.

- Putri, F. A., Utami, Y. T., & Pratama, T. Y. (2024). Efektivitas model direct instruction dalam meningkatkan keterampilan vokasional merangkai bunga artificial pada anak tunagrahita kelas X SMALB di SKH PGRI Rangkasbitung. *Jurnal UNIK: Pendidikan Luar Biasa*, 9(2), 75–80.
- Qohar, H. A. (2023). Pengembangan program pembelajaran keterampilan vokasional membuat buket bunga bagi anak tunagrahita ringan. *Jurnal on Education*, 5(04).
- Roehyadi, E. (2012). Karakteristik dan pendidikan anak tunagrahita. *Pengantar Pendidikan Luar Biasa*, 1–54.
- Rohana, R., Aprilia, I. D., & Khomdijah, O. S. (2022). Pembelajaran program vokasional di pusat kegiatan belajar masyarakat. *Jurnal Pendidikan Kebutuhan Khusus*, 6(1), 19–27.
- Sari, I. N., Lestari, L. P., Kusuma, D. W., Mafulah, S., Brata, D. P. N., Iffah, J. D. N., Widiatsih, A., Utomo, E. S., Maghfur, I., & Sofiyana, M. S. (2022). *Metode penelitian kualitatif*. Unisma Press.
- Sibagariang, D. R., & Thamrin, H. (2025a). Efektivitas program keterampilan vokasional bagi penyandang tunagrahita di Sekolah Luar Biasa Negeri Binjai. *Concept: Journal of Social Humanities and Education*, 4(3), 120–128.
- Sibagariang, D. R., & Thamrin, H. (2025b). Efektivitas program keterampilan vokasional bagi penyandang tunagrahita di Sekolah Luar Biasa Negeri Binjai. *Concept: Journal of Social Humanities and Education*, 4(3), 120–128.
- Supriati, A., Sidik, S. A., & Asmiati, N. (2022). Pembelajaran vokasional terhadap karir siswa berkebutuhan khusus. *Jurnal Educatio FKIP UNMA*, 8(4), 1567–1574.
- Tassé, M. J., & Grover, M. (2021). American association on intellectual and developmental disabilities (aaidd). In *Encyclopedia of autism spectrum disorders* (pp. 165–168). Springer.
- Tibo, P., Padang, M. E., & Sipayung, R. (2022). Peran guru dalam mewujudkan keterampilan vokasional memanfaatkan barang bekas secara kreatif bagi anak tunagrahita pada masa pandemi Covid-19 di Sekolah Luar Biasa C Karya Tulus. *Jurnal Penelitian Pendidikan Agama Katolik*, 2(1), 51–61.
- Wibawa, S. (2022). Peningkatan kemampuan berwudhu anak tunagrahita melalui praktik. *Al-Maziyah: Jurnal PAI Sekolah Luar Biasa*, 1(1), 16–20.
- Yasmin, N. S., & Iswari, M. (2021). Meningkatkan keterampilan vokasional membuat bunga mawar dari sabun melalui pendekatan keterampilan proses bagi anak tunagrahita ringan. *Ranah Research: Journal of Multidisciplinary Research and Development*, 3(3), 191–195.
- Yasyfina, F. (2024). *Pengaruh pembelajaran keterampilan vokasional terhadap kesiapan kerja anak tunarungu (kajian studi kasus di SLB Negeri Slawi)*.
- Zahroh, F. (2022). Keterampilan vokasional sebagai upaya peningkatan kemandirian anak berkebutuhan khusus di SMPLB-BCD YPAC JEMBER. *International Conference on Islamic Guidance and Counseling*, 2, 91–100.