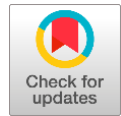


Increasing car washing competency in adolescents with autism and intellectual disabilities: Researching visual task evaluation



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Abstract This study looked at how well visual task evaluation helped teenagers with autism and intellectual disabilities become more competent at car washing. For disabled people to promote their independence and employment chances, car washing skills are crucial. The goal of this study was to ascertain whether training techniques that include visual task evaluation can improve car washing proficiency in teenagers with autism and intellectual disabilities. 30 participants, ranging in age from 12 to 18, participated in a pre-test/post-test design. Randomly chosen groups of participants were put into the evaluation group for the visual task or the control group. According to the findings, the visual task evaluation group outperformed the control group in terms of car washing ability. Adolescents with autism and intellectual disabilities can learn skills more quickly and become more independent by including visual task evaluation into their teaching strategies. These results demonstrate the potential for such treatments to enhance their quality of life and employment chances.

Keywords: handling conflicts, tactical decisions, emotional Intelligence, decision-making, leadership

1. Introduction

The quality of one's life as an adult greatly depends on one's employment. Employment benefits include better psychological wellness, family fulfilment, life satisfaction, perceived health, general quality of life, cognitive performance, and well-being. For people with disabilities, integrated employment is crucial to their full inclusion and engagement in communal life. It is essential to increase these people's access to top-notch research and career development suited to their unique requirements, preferences, and talents, as well as the labour market, to foster a more inclusive society for them (Cox et al 2017). Individuals with intellectual disability (ID) and autism spectrum disorder (ASD) currently have few employment options. Less than one out of five (20%) adults with autism or mental impairment disorder were employed in combined settings for employment between 2019 and 2020, according to current U.S. data; after graduation, 24% of Teenage grownups with intellectual disabilities and 33.9% of teens and adults with ASD are unemployed in the paid sector (Bishop et al 2018). According to studies, 30% of people with ASD are employed in the United States. However, only 50% of the 170 teens with ASD who participated in the study had paid employment, and 36% received social assistance. Developing and established nations acknowledge the importance of increasing work possibilities for people with disabilities beyond the United States (Whitesburg et al 2020). The Japanese government has dramatically increased accessibility to elementary learning and job prospects. For the approximately 38 million individuals of working age with disabilities, employment chances remain incredibly scarce despite significant government efforts to establish and safeguard labour opportunities.

The scarcity of resources for disabled persons to obtain adequate studies, work, or occupational skill learning is one of the main factors contributing to their unemployment, aside from ineffective law enforcement (Bergmann et al 2021). According to a recent study, over thirty percent (35.69%) of school-age Japanese kids with autism spectrum disorder either left early or never went there.

Additionally, transition programs are scarce or perhaps non-existent for the few teenagers and youths with disabilities who finish secondary school. Even if they are protected by the law, individuals with disabilities lack the necessary skills to work in environments that are competitive for employment because of their comparatively weak educational backgrounds (Root et al 2018). Video modelling and visual assistance are examples of evidence-based practices for instructing occupational abilities for children and adolescents people with autism spectrum disorder. Adolescents and young people with autism spectrum disorder have been taught several employment-related skills using video modelling in hypothetical or real-



world settings, such as mascot jobs. As well as fundamental abilities in environments like the workplace, bowling alleys, or supermarkets, such as aqua plants, supplying mail, and replacing paper towels. Some researchers used video modelling, which involved playing a clip of to-do chores on a portable device. This led to a rise in separate reactions and a decline in prompts in professional contexts. They coupled visual and audio prompting with video modelling, significantly boosting the accomplishment of a job on our own (Esposito et al 2017). The education findings above confirm the value of multimedia-based training for the learning and autonomous mastery of sophisticated technical abilities. In any workplace, it's crucial to complete independent jobs and engage in vocational activities continuously without taking frequent breaks. But in none of these research was, individual job participation quantified (Milligan et al 2017). Researchers were motivated to create these programs and assess their efficacy by the urgent need for job based on evidence abilities coaching courses for participants with ID/ASD in Japan. Since there are many car washes in the neighbourhood and Services for car washes are in high demand in Japanese suburbs, the job objective for this research was identified as knowing car washes. They provided competitive and integrated employment opportunities for people with disabilities through community-based training. The occupational skills training also consider the unique requirements of individuals with impairments, such as preferences, availability, and willingness. Both visual job analysis and Based on evidence approaches like video-based education help students learn new skills and complete jobs independently.

Questionnaire 1: How well did training help with accuracy when performing the car wash jobs?

Questionnaire 2: How much did training affect how engaged students were with their jobs?

Questionnaire 3: How well was the learned car wash techniques kept up?

The remainder of the paper is divided into subsequent parts. Part 3 contains the proposed method explained. Part 4 contains the results and analysis, while Part 5 discusses the conclusions.

2. Literature Review

Hart, 2021 stated special education services are provided to numerous people with Autism and other developing disorders to address weaknesses in cognitive and adaptive functioning. These deficiencies affect the student's capacity for independent participation in daily activities. To address these deficiencies across multiple special education classes, there are, however, few generalizable programs available. In research including 14 people, ages 13 to 18, who were diagnosed with autism spectrum disorders, intellectual impairments, studying disabilities, and multiple disabilities, two modules from the Healthy Relationships Curriculum were evaluated for effectiveness. Pfeiffer et al (2020) explained serious transportation issues frequently prevent individuals with intellectual and developmental disabilities (IDD), especially Autism Spectrum Disorders (ASD), from accessing healthcare, participating in their communities, and finding work. People with IDD may be able to get over transportation obstacles with the use of travel training, which uses one-on-one coaching. This study sought to determine how a thorough travel training program affected the travel abilities of people with IDD. Rosello et al (2020) aimed one of the essential ideas in the study of social thinking, particularly in the context of autism spectrum disorders (ASD), is the theory of mind (ToM). There is a large and convincing body of literature demonstrating deficiencies in ToM in people with ASD. The diverse profile of ToM skills in kids with ASD and the relationship between various ToM development levels and social, sensible, and adaptive behaviours in daily life are two linked concerns that need further study. Babb et al (2019) described, Executive function (EF) problems are frequently linked to autism spectrum disorder (ASD), which significantly affects how difficult it is for people with ASD to live independently, especially when it comes to social skills. Technologies present promising chances to design EF intervention programs for autistic youngsters. Most therapies discovered improved EFs and lessened symptoms in kids and teenagers with ASD. On its generalization to untrained talents (i.e., social abilities), as well as their long-term impacts, there is a lack of research. Shkedy et al (2021) stated from 2011 to 2017; there were 7.0 million children with disabilities enrolled in public schools that were covered by the Participants with Disorders Education Act (IDEA), a federal legislation. The current curricula provided to students with special needs are diverse and incoherent because they differ amongst students, classes, districts, and the entire country. Øzerk et al (2021) expressed one of the most critical areas of human growth is social development. A lack of social skills can have a detrimental effect on several vital areas, such as academic performance, interpersonal interactions, behaviour, psychological wellness, and adult life outcomes. Those who have autism typically lack basic social skills. Children with autism frequently fail to develop social competence. They may encounter difficulties in the family, school, and community contexts without the support and efficient therapies to improve social skills. Ketelaars et al (2017) suggested women with autism spectrum disorders (ASD) may exhibit a distinct, less obvious clinical expression. The study of potential underlying mechanisms that could be responsible for the female phenotype is, however, still in its early stages. Stiller and Mößle (2018) explained children and teenagers with autism spectrum disorder (ASD), and those without it now live almost exclusively on screens. This systematic review offers a current summary of screen media's importance in the lives of kids and teenagers with ASD. They found 50 research examining media consumption among kids and teenagers with ASD from 2007 to 2021. According to this research, screen media is a child or adolescent with ASD's favourite form of recreation, with varied results compared to those without ASD.

3. Methodology

3.1. Participants

WeChat, a popular social media on mobile devices platform in Japan, was used for enlisting volunteers for this study from a nearby parent support group (Table 1).

Table 1 Inclusion and Exclusion criteria.

Inclusion Criteria	Exclusion Criterion
Age: 14 to 20 years old	already received instruction in car cleaning
Dual diagnosis of Intellectual Disability (ID)	Concurrent vehicle washing training was intended to be obtained.
Autism Spectrum Disorder (ASD)	the investigation
Able to watch what others do and copy it collected with the consent of the participant's parents	

His IQ was 45 on the Wechsler IQ Grade for Kids IV in Japanese. He had an ASD diagnosis that was considered severe (score: 37) using the Japanese version of the Children's Autism Measure and the ASD standards in the Diagnostic and Statistical Manual of Psychological Illnesses. The parents claim that from the age of six to thirteen, at a private institution, Kao received in-depth instruction in speech, academics, and motor abilities. Also, when he was 13 years old, he spent a month in a rehab facility, where he had received some basic training in restaurant duties, including dishwashing, arranging tables, placing orders, and cleaning up. He created phrases with two words for communication, enquired about favourites, tagged over 50 everyday sections, and addressed social concerns. He was reading at a level equivalent to about first grade. He could dress, maintain his appearance, and tidy up his place. But he needs supervision and adults giving him instructions to finish his job.

Male, age 16, with moderate ID and ASD, Ray. His Vehicles rating in the extreme categories was 38, and his WISC-IV rating was 40. From primary to middle school, Ray attended public schools, and his mother accompanied him to class every day. After finishing middle school, he stayed home with his parents, where his mother showed him how to conduct household jobs and brought him grocery shopping. Ray could use simple communication techniques, such as asking for select products, tagging above 52 commonplace objects, and responding to social cues. His writing and reading abilities were roughly on par with second-graders. He was also capable of performing simple self-care jobs, including grooming, taking a shower, doing the dishes, and doing the laundry. However, he needed many prompts and supervision to finish them. Before the study, he had never had any training in vocational skills.

Lon, a 20-year-old male, was identified as having moderate ASD and mild ID. Lon can write and read at the third-grade stage and has rudimentary communication abilities. He could take care of himself and maintain a daily schedule, including getting dressed, grooming, doing laundry, and cleaning his room when provided a list of things he could purchase in a grocery store alone. He could wash his dishes after meals and tidy up his room. From primary to high school, he was enrolled full-time in a unique education program. After graduation from high school, he had undergone three days of daily, two-hour instruction in vocational skills in a rehabilitation facility. Basic computer knowledge, the use of search engines, and mail delivery were all part of his professional development program.

3.2. Arrangements and Resources

The study was carried out in a Japanese interior city suburb. The university-affiliated autism study centre's conference room was the location of Part 1 of the training, which included a movie and instruction. Part 2 of the training included washing an automobile, which was done in a business with manual vehicle washes. The vehicle wash served as another location for the probe periods. After part 1 was finished, the teacher, parent or guardian, and child either got a ride, if there was one or walked for around 22 minutes (1.3 km) to the vehicle wash. Part 1 coaching was carried out elsewhere because there wasn't enough room in the car wash.

A female special education graduate student served as the instructor. During Part 1 training, the conference room was empty except for the trainer and the student. A pc, a chalkboard, a projection display up forward of it, a desk, and two stools could be found in this 6m x 5 m x 4 m room. To capture the meetings, a video cam was mounted on a tripod. One automobile could be washed in the 5 m by 5 m by 3.5 m car wash. Near the entryway on the front left side, an aqua pipe was positioned. At the far left side, adjacent to a tap, was where the sponge and bucket were located. In the forward right corner, near the entry, there was a holder with towels and liquid soap. Right next to the wash station was the workplace and the waiting room. Occasionally, the car wash's owner(s) and the participant's parent might stop by the office or waiting room to see a training session. Customers of the car wash did not have to stand by their because delivery and pickup services were available. The periods were recorded with a video camera mounted on a tripod.



In the Part 1 learning periods, there were four video clips used, one for each objective job. The teacher acted as the model, outlining and showing each step of a particular assignment. Every video clip lasted between 4 and 6 minutes. In addition to Oral comments provided by the modeller and illustrations of each action in a target assignment, the specifics of each phase (for example, wholly zoomed in for larger pictures, sprinkles aqua on every inch of the car's bodywork. The PC in the room was used to display the videos. The twenty laminated picture cards that comprised the visual job analysis were total. Each image card (13.9 centimetres 16 centimetres in size) had an image of one stage in a specific job and written explanations of that the following image (for example, taking out a aqua pipe). The learner could see these images on the wall since they were there. The jobs and steps are listed in Table 2 for convenience. Cars were used for the videos and graphic assignment evaluations, while vans, SUVs, small vehicles, and sedans that customers voluntarily contributed were used for the hands-on training. Due to the worker's training as a student with a disability and the fact that there wouldn't be numerous workers washing the car at once, the customers were advised that it would take between 30 and an hour.

Table 2 Techniques in Every Vehicle Cleaning Service.

jobs	Steps
A: sprinkle aqua	A1: removing and reattaching the aqua pipe A2: Spraying the car's outside (including the front, back, top, left, and right sides, as well as the wheels) A3: activating the aqua pipe A4: taking the aqua pipe out
B: Wash the vehicle with foam aqua.	B1: Restoring the bucket and scrubber B2: cleaning the scrubber and add aqua B3: Vehicle cleaning (front, the top, backward, left, both sides of windshields) B4: Fill the container with aqua, then wet the scrubber. B5: putting the soap pipe back after turning off B6: The front, back, top, wheels on the left and right sides are all sprayed with the soap pump. B7: Activating the soap pipe A8: taking the aqua pipe out
C: Wash the vehicle with aqua.	C1 to C4: similar to A1 to A4
D: With a towel, Wipe off the car.	D1: placing the used clothing in the hamper for laundry D2: drying both the right and left faces D3: wiping the vehicle (including the front, back, top, and windshields) D4: obtaining a fresh towel

3.3. Laboratory Design

To assess how well training affected assignment evaluations and the acquiring of car-washing skills, this research used a repeated probe over 4 behaviours sketch. The four targeted duties (i.e., Job A: sprayed aqua, Job B: washing the car with foamy liquid, Job C: washing the car with aqua, and Job D: wiping the car with a towel) was created after job analysis of the target car washing abilities, and each job had numerous steps. The training includes visual job analysis, video modelling, and a present hierarchy of prompts. When a stable baseline had been established, Job (A) training was started and continued until the criteria results of 100% for two continuous periods, at which point Job (B) training began. The following jobs were trained similarly. After each activity met the required standard, persueprobing periods were held 7 days later, 14 days later, and 183 days.

3.4. Procedure

Periods for probing various situations: To assess each pupil's development of skills progress over time and as a test of proficiency for every assignment within the training environment, probe periods were done consistently throughout the starting point, training, and persueconditions. Before Part 2 of the day's training within the coaching circumstance, a probing session was held. The teacher provided the equipment and delivered straightforward verbal instructions with specific phrases for each job throughout probe periods (for example. "Scrub car with soapy aqua"). The teacher then gave the pupil 10 seconds to reply. After each activity, the instructor complimented the student for doing an excellent job on each step that was completed correctly. The teacher made a neutral comment while ignoring incorrect answers (such as "Thank you for your work" or "Let's do something else") if the student failed to follow the instructions precisely or failed to react within 10 seconds. The linked replies over conditions were examined for all four jobs. If the learner lacked the necessary abilities to complete the assignments, the initial probe session lasted between 6 and 13 minutes. A second probing session, lasting between 23 and 30 minutes, took more time. In the practice circumstance, Job A was probed; afterward, Job A was acquired,

and Jobs A and B were examined as chained replies after Job B was obtained. Because Job C was the same as Job A and the students mastered Job C without training, probe periods for Jobs A, B, and C was skipped. Following this timetable, persueprobing periods were held: 7 days, 14 days, and 183 days after each job had been mastered during the program.

Periods of instruction: Each session of education had two sections. The conference room served as the location for Part 1 and the car washes for Part 2 of the training. The first training session included a video demonstration and guidance. The first table is titled "Car Washing Steps in Each Job." Activity Step A: sprinkle aqua A1: Extending the aqua pipe A2: Activating the aqua pipe A3: A car's outside being sprayed A4: Detaching and reattaching the aqua pipe. B: Wash the vehicle with soap and aqua. B1: Removing the soap pipe B2: Activating the soap pipe B3: Using the soap pipe to squirt the front windscreen, top windscreen, rear windscreen, left part and wheels. B4: Disconnecting the detergent pipe and reattaching it B5: Bucket loading with aqua and soaking the sponge B6: Detailing the vehicle's exterior .B8: Restoring the towel and the bucket after B7: Cleaning the sponge C: Wash the vehicle with aqua. Identical to A1-A4 for C1-C4. D1: Obtain a clean towel D2: Dry the vehicle (including the front windscreen, top windscreen, and back windscreen). D3: draining the left and right positions D4: Placing the discarded material in the laundering basket. A target job video was delivered by the instructor in Lee et al. Second, the instructor showed the relevant image while pausing the video after each step. Third, the teacher instructed each pupil to explain the procedure by analysing the text located at the base of each image. Fourth, the teacher gave positive feedback for appropriate reaction or used echoic suggestions to elicit appropriate responses. Fifth, the teacher went through the remaining stages in the same order until they were all demonstrated and explained. The learner was then requested to arrange the photographs in chronological sequence and define the steps when the instructor had finished. When a job was completed using the method outlined above, Part 1 came to a close. Each training session for Part 1 lasted roughly 15 minutes.

Practical training in the vehicle wash made up Part 2 of the program. First, the teacher arranged all of the images on the wall in chronological sequence. Second, the teacher instructed the pupil to go through the photos by outlining each step. The resources required for the activity were also presented by the instructor. Fourth, the pupil started completing the job's steps. When the student completed each stage successfully, the teacher offered encouragement. The teacher provided a gestural prompt (such as indicating the picture) combined with a voice explanation (such as "Pull out the pipe") for the learners to answer if they learners skipped a process. If this happened, the response was noted as being incorrect. After giving verbal and gesture instructions, if the pupil still didn't answer correctly, the physical direction was given.

In this research, we only used Ray's physical input to start Job a training periods. When every step in each activity was finished, Part 2 of the instruction ended. The training process for Job B was completed once the student met the criteria for Job A. Once the student met the requirement for Job D, the coaching process was repeated. The duration of each Part 2 workshop contends from 15 to 20 minutes. The student began each visit by receiving Part 1 teaching for the assigned job, was driven to the car clean, had one period of probing the skill(s) they had mastered, and then received Part 2 instruction for the target job. The entire coaching circumstance took between four and six weeks to complete, and every student received three to four visits per week.

3.5. Defining Responses

The percentage of accurate answers for every assignment and the proportion of probing session job involvement across circumstances were the dependent variables. A proper response was one that the student independently completed and matched the description of the step-in question. Each of the four stages in Job A, which involved spraying aqua, was included as a response. For step 3 to count as a correct reaction, the learners had to wet every part of the vehicles outside. The accuracy rate for Job A in that probing session was 25% if the learner had a correct answer out of all four phases.

In the starting point, learning, and persueprobe periods, where all of the jobs were completed by the students as chained replies, job participation was evaluated utilizing 30-s momentary time sampling. When a student spent more than three seconds on a job during each time sample interval without taking a break or engaging in disruptive behaviour, it was considered an instance of job engagement. Disruptive behaviours involve speaking out of turn, averting your gaze, making pointless, repetitive gestures, or moving about.

3.6. Social Acceptance

We created questionnaires and asked each child's parents, the two car wash shop owners, the motorists who wipe cars the students washed at continuation probe events, and the children who took part in the study for their opinions to determine the social validity of the study. The questionnaire for parents has 15 sections (Sections 1–6 regarding the acceptability of the learning, Item 6 regarding the perceived value of the teaching, Item 8-11 pertaining to viability, and Sections 12–15 regarding satisfaction). The course's content, the vehicle wash procedure, the individual learning format, and the practice chances were the first through fifth sections, and they were all considered acceptable. Section 6 questioned the parents if the training had improved their child's career abilities. Sections 7 through 10 dealt with the program's viability regarding the length of periods each week, the size of each one, the cost, and the amount of time needed to complete the

training. Sections 12 to 15 dealt with how pleased parents were with the instructor, the job involvement, the development of their child's vocational skills, and the acquisition of car wash skills. Every item was scored using a Likert-type scale with a maximum of five points. The final query was an open-ended one that asked parents to share what they learned from the intervention, their feedback on the interference, and suggestions for program enhancement.

Researchers spoke with each student individually during a brief interview to gauge their level of satisfaction with the course overall. The four inquiries were, "Do you enjoy car washing? If so, which feature is the best? Why not, then?" "How do you like the teacher?" "How do you feel regarding the cars you just cleaned?" And "Are you interested in working in a car wash in the future? For or against?" Open-ended interview questions were used with the two auto cleanse owners. Questions like "Are you happy with the outcomes of this training?" were among them. Is there something you could recommend to make this training better?

During the persueprobe periods, we only asked individuals to wipe cars our participants thoroughly washed to respond to the questionnaire we designed for the clients who gave their vehicles for the training. (A) Is the length of time that customers must wait for a vehicle wash sufficient? (a) Is the price reasonable? (c) Do you think the service was satisfactory? Any ideas for improvement if not? (d) Are you concerned about having people with impairments wash your car? (e) Are you prepared to have your automobile cleaned at a facility run by people with disabilities? And (f) any further remarks or training-related recommendations?

3.7. Procedure Adherence and Interobserver Consensus

One supervising professor from the institution evaluated 30% of all the instruction events for all learners and 30% of the probing events for each individual and in each condition, evaluating procedural fidelity on-site or through video recordings. The sections with implementing steps were listed on a checklist. The objective job had to be introduced, the video clip's action had to be shown, the picture/question had to be delivered, and the consequences had to be given. These were all elements on the checklist for Part 1 of the training—each step of the job involved repeating sections (b) through (d). A verbal direction and materials presentation, a visual representation of the objective job, and a discussion of the consequences were all part of the Part 2 training. A reminder in the tree structure for an inaccurate reaction or no reaction was the consequence in Parts 1 and 2 of the movement. Every one of the 20 steps for every job was specified on the checklist for probing periods. Each phase involved (a) giving verbal instructions and waiting for 10 seconds before giving supplies and (b) praising a good response while disregarding a bad one. By multiplying the number of particular sections by the total variety of sections on the list and dividing the result by 100, the degree of operational fidelity was determined. For all periods evaluated, there was 100 percent functional fidelity for probe periods. The procedural faithfulness for the learning periods varied from 93.9% to 99.6%, with a mean of 96% for all observed periods.

A graduate candidate who had been instructed to capture student replies from the visual recordings conducted interobserver agreement (IOA) assessments for every learner from each condition for 30% of the probe periods. IOA was computed by multiplying the variety of deals by the sum of the agreements and disagreements. The average IOA for vehicle wash jobs was 96% (ranging from = 93%-99%), and for all periods examined, it was 93% (content = 90%-100%).

4. Result and Analysis

4.1. Accuracy of Work

Figures 1, 2, and 3 depict the rate of reaction for Jobs A, B, C, and D. Except job C (ranging from = 30.6%-100%), Kao's job accuracy was rather steady during baseline for every job (Job A: M = 38.1%, ranging = 31.6%-42.9%; Job B: M = 45.1%, content = 33.9%-49.2%; Job D: M = 38.1%, content = 34.6%-36.8%). Before meeting the mastery requirement for Job A, Job C's performance was on par with the other assignments in the baseline. Kao's accuracy under the coaching condition soon rose to an excellent level. He met the criteria for Job A in five periods (with a content of 88.8%–100%), Job B in seven periods (with a content of 77.9%–100%), and Job D in six periods (with a content of 79.9%–100%). Between the baseline and training conditions, there was no data overlap. One week after completing Job A, Kao continued to perform with 100% accuracy throughout persueperiods. He also performed flawlessly when learning jobs (such as AB and ABCD) were chained together. He continued to complete all jobs with 100% accuracy one week, two weeks, and six months after the instruction was over. Similar to this, Ray's accuracy was low and consistent at the start for Job A (M = 29.9%, content = 29.6%-29.7%), Job B (M = 15.1%, content = 8.7%-16.9%), and Job D (M = 19.6%, content = 11.5%-22.1%), but increased after mastering Job A to learn Job C (content = 30.6%-100%). His accuracy on each job grew right away to an extreme level, and under the learning circumstance, he reached criterion performance. He completed Jobs A, B, and D in a total of 5, 7, and 6 events, respectively (M = 85.7%, content = 72.3%-100%; Job A: M = 89.5%; Job B: M = 55.6%; Job D: M = 77.5 %). Between initial and training conditions, there were no data overlaps. During persueprobe periods conducted a week, two weeks, and six months later, he kept up acquired duties and completed them in a linked order with 100% accuracy. Job A: content = 43.5%-77.5%; Job B: content = 48.3%-66.4%; Job C: content = 44.2%-100%; Job D: content = 23.1%-44.1%). Lon had a relatively high job performance during baseline compared to Kao and Ray. He also completed Job C after meeting the requirements for Job A.

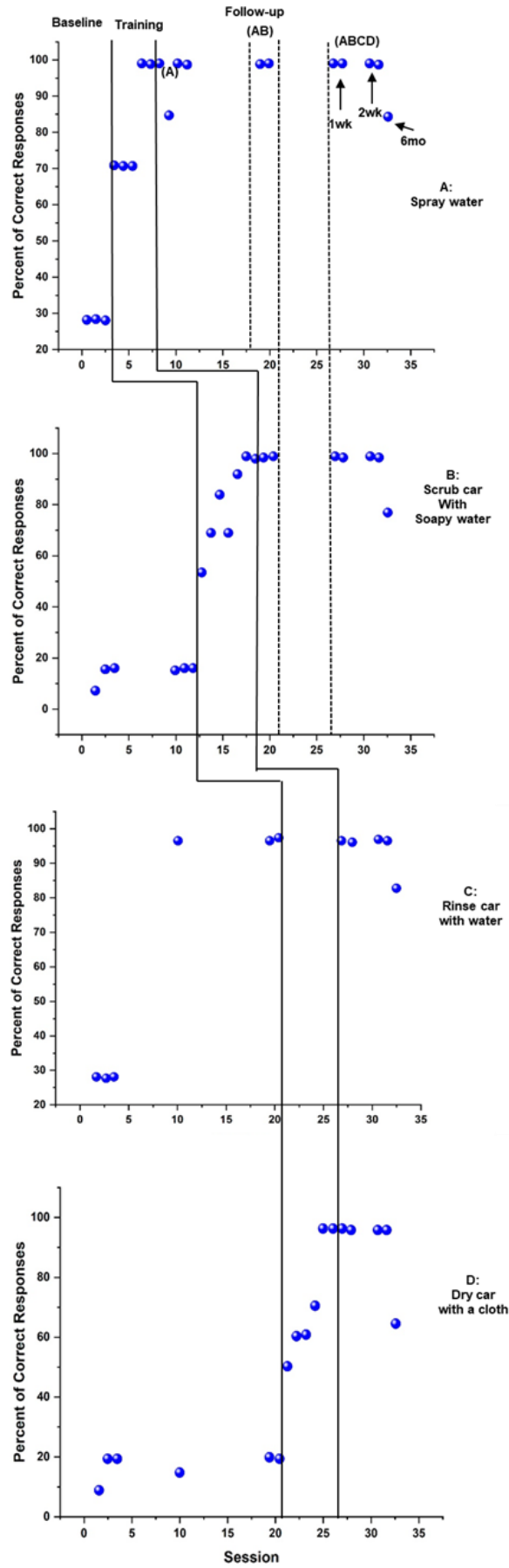


Figure 2 percentage of accurate answers for Ray's job A through D under all situations.

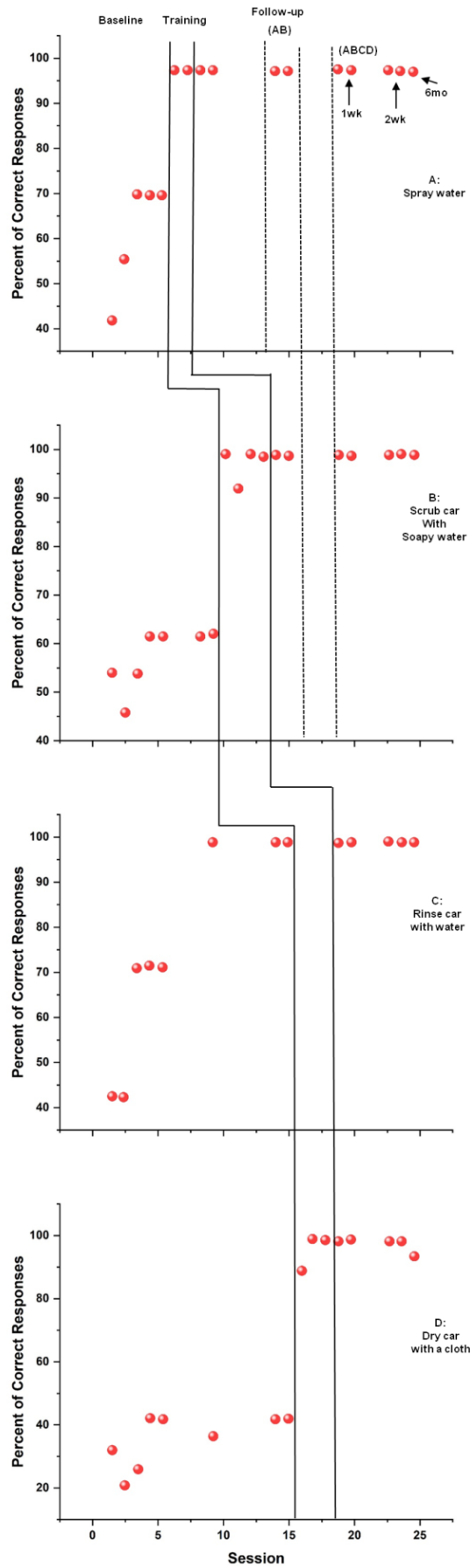


Figure 3 Percentage of accurate answers for Tasks A through D for Lon across conditions.

4.2. Job Participation

The rate of learner job engagement for the beginning, learning, and persuecircumstances is shown in Figure 4. Kao's job engagement was somewhat higher during the training scenario (M = 90.7%, content = 88.3%-93%) than at the beginning of the study (M = 87.8%, content = 86.2%-89%). It has remained there during the following periods (M = 94.6%, content = 95.8%-96.4%). Between the baseline and training conditions, there was one data point overlap, while there was none between the initial and persueperiods. Ray and Kao similarly engaged in jobs. His job engagement remained stable at an elevated level when follow-ups (M = 95.7%, content = 92%-97.8%), after increasing with an upward trend to an extreme level beneath the learning circumstance (M = 85.7%, content = 77%-94.4%). His job involvement was stable at a comparatively minimal level during the starting point (M = 70.5%, content = 61%-76%). There was just one point of data overlap between the baseline and the training session, and there were none between the baseline and the persueperiods. Throughout the initial training and persueconditions, Lon's job involvement remained constant and high at 100%. The data trend did not change.

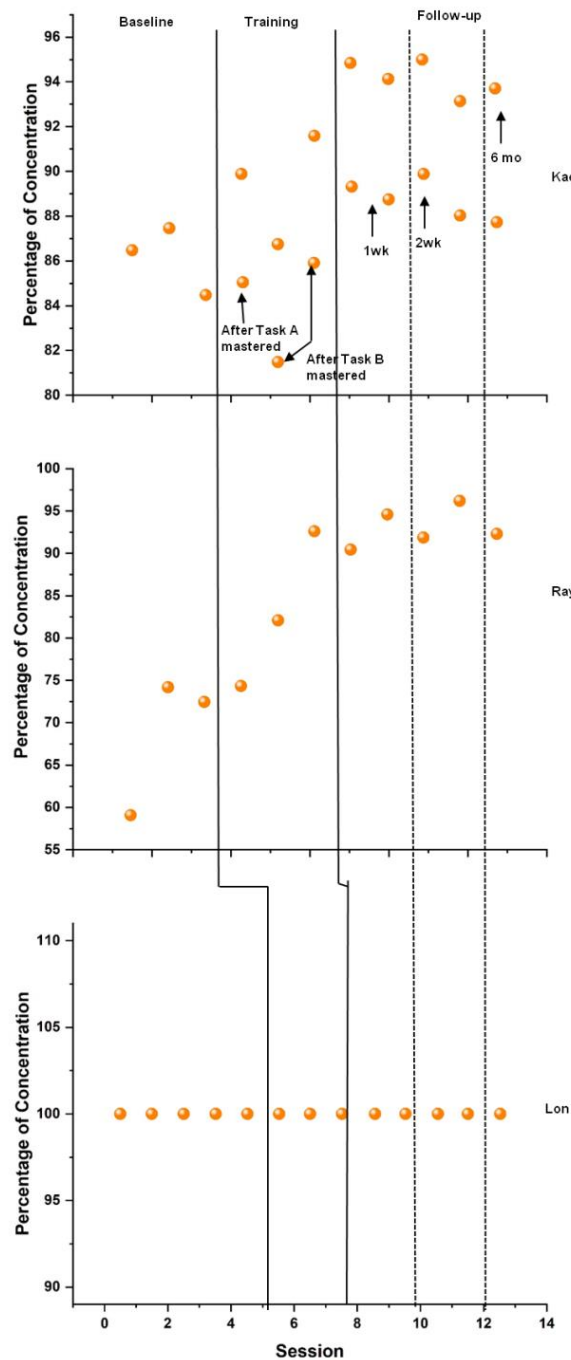


Figure 4 percentage of each student's participation in tasks ABCD under various conditions.



4.3. Social Acceptance

The three parents gave the training an average evaluation of 5.90 out of 6 (SD = 0.15) for acceptability, 5.60 out of 6 (SD = 0.45) for perceived usefulness, 6 out of 6 (SD = 0) for usefulness, and 5.58 out of 6 (SD = 0.33) for fulfilment. The learning was well-received by all three pupils, who replied. According to Kao, cleaning the car with foamy aqua was the most excellent part because the formation of foam made the car look clean. Ray was skilled at aqua spraying. Thus, he enjoyed doing it. Because it was the last process and made the automobile incredibly clean, Lon enjoyed drying the car. The three students were pleased with the vehicles they had cleaned and with the instructor. Kao and Ray expressed their happiness at being able to thoroughly wash the automobile by themselves. Lon claimed that by paying attention, he kept the cars clean. Ray and Kao stated they were interested in employing at a car wash since it would be lucrative. Car cleaning is exhausting, Lon stated. The teacher asked, "What if they reward you for doing it?" Lon then retorted, "Oh, I will do it then." The car cleanses station's proprietors said they were pleased with the coaching outcomes. One person noted that the trainer may have instructed the trainees to use lesser foam. Another said the time the clients had to wait could have been reduced. Both business customers expressed a desire to keep using their car cleans as a place where people with disabilities can get training for jobs. Additionally, they would take into account employing individuals with ID or ASD.

A questionnaire was given to 9 out of 35 clients' pipe automobiles our students washed. With the take and delivering services offered by the car cleanse, they said the wait time of 60 minutes was reasonable. Additionally, they thought the prices were fair compared to those at other vehicle washes. They were pleased with the calibre of the service as well. A supervisor being present, according to one customer, was a good thing. One of his car windows, for instance, wasn't entirely dry, but the issue was soon resolved once he spoke with the manager. Although every customer admitted to being concerned about the students unintentionally scratching their automobiles, the findings proved differently. One client observed that the learner who cleaned his car was exceedingly cautious and paid close attention to detail. All the clients said they have no issue with future vehicle washes being performed by people with disabilities.

5. Conclusion

Research priorities in Japan include creating and analysing evidence-based instructional strategies for teaching occupational skills to people with ID. One of the early studies to assess the impact of video modelling and video analysis of jobs on acquiring, maintaining, and involvement in vehicle cleansing for teenagers with ASD was the one reported in this article. The program was successful in passing on and preserving the abilities of all three participants, according to the results. After the training was over and during the subsequent probe periods, three of the participants' job engagements improved.

The study's limitations include the absence of a controlled experiment for Job C, the absence of a section assessment allowed in the research sketch, and the inability to generalize newly learned skills to other contexts. In our experiment, we used a multiple-probe approach to teach a chained behaviour using four distinct challenges. All students learned Job C without any more training after mastering Job A, which interfered with the experimental control that the design required because Jobs A and C had the same processes. Perhaps a variety of probes across individual plans would be more suitable. Determining if each component used in the learning periods was required was also challenging without component analysis. Each visit may also last an hour within the learning conditions. The effectiveness and viability of the movement are now a cause for worry. In the vehicle wash facility, it might be essential to show films, employ video prompting techniques, and brief video clips to teach one behaviour after another while also providing comprehensive job training. Future studies should assess if it is possible to generalize car wash knowledge to another car cleans or not.

The findings significantly impact creating of efficient occupational skill development programs for people with autism spectrum disorder in Japan. Practitioners may want to think about teaching sophisticated occupational skills to teenagers with autism spectrum disorder by using visual simulation for fundamental instruction and visual evaluation of jobs in a real-world work environment. Since the method is efficient and promotes independence in work completion, it can also be used in particular education institutions or job support facilities for people with ID/ASD. The course of study is practically viable for companies who might think about hiring people with ID/ASD to operate in their facilities, given that these people have access to supervision and video equipment.

Ethical considerations

Not applicable.

Declaration of interest

The authors declare no conflicts of interest.

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