Educational Sciences: Theory & Practice • 14(3) • 1082-1087
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www.edam.com.tr/estp
DOI: 10.12738/estp.2014.3.1984

Teaching Chained Tasks to Students with Intellectual Disabilities by Using Video Prompting in Small Group Instruction*

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Abstract

Teaching students with intellectual disabilities in groups presents several difficulties. Use of technology can reduce some of these difficulties. The literature cites several examples of skill acquisition. The purpose of this study is to teach skills to students with intellectual disabilities by using video prompting. A multiple-probe design of single-subject design methods has been applied to this study. Three students with intellectual disabilities participated as subjects in the study. The findings provided evidence for the effectiveness of video prompting in improving teaching skills. The subjects were able to apply and perform these skills away from the teaching environment, and were able to maintain their improved skills for the following 6 months.

Key Words

Acquisition of Skills, Intellectual Disabilities, Teaching Skills, Video Prompting.

Skills formed by sequential single-staged behaviors comprising complicated end behaviors are called chained tasks (Tekin-İftar & Kırcaali-İftar, 2004). Chained tasks are of different types, for example, self-care skills such as eating, toileting, and dressing; gross motor skills such as walking, running, and jumping rope; fine motor skills such as plucking, tearing, cutting, and painting; and daily living skills such as phoning and shopping. These skills, acquired from early childhood on, positively affect both children's school years and future life as an independent individual (Mechling, Pridgen, & Cronin, 2005; Snell & Brown, 1993; Varol, 2005).

* This study was presented in the 22nd National Special Education Congress (October 11–12, 2012) in Karadeniz Technical University.

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Modeling is a teaching technique used frequently in teaching new behaviors to individuals with intellectual disabilities; its effectiveness has been supported by numerous studies (Rehfeldt, Dahman, Young, Cherry, & Davis, 2003). Six types of video technology issues have been discussed in the literature: *a*) video feedback, *b*) video modeling, *c*) video self-modeling, *d*) subjective point of view video modeling, *e*) video prompting, and *f*) computer-based video instruction (Mechling, 2005; Murray & Noland, 2013; Öncül & Özkan, 2010).

Video prompting requires the respondent to watch a segment of a video recording and actively respond to the prompt in the video. In contrast to other video teaching methods, video prompting does not require the respondent to watch a video from beginning to the end before performing the behavior. Instead, the respondent is expected to watch a segment of the video and give an immediate active response to the video prompt. Depending on the subjects' response, the video recording is continued or repeated by the researcher the respondent (Mechling, 2005; Norman, Collins, & Schuster, 2001).

Chained tasks are more complicated skills consisting of more than one sequential, single-step behaviors. Performance of these tasks takes time. Video prompting appears to be an effective way to enable students with intellectual disabilities to acquire target behaviors (Horn et al., 2008). Thus, the video prompting technique has been used in this study. The literature, though limited, contains studies with experimental designs and a single subject, carried out by using video prompting to allow students to acquire chained tasks. Previous studies have used the video prompting technique to help intellectually disabled or developmentally delayed students acquire daily living skills and self-care skills such as setting a table (Norman et al., 2001), organizing food bought from a green-grocer (Cannella-Malone et al., 2006), cooking (Graves, Collins, Schuster, & Kleinert, 2005), washing clothes (Horn et al., 2008), and washing dishes (Sigafoos et al., 2007). At the end of these studies, the target chained tasks were acquired by these students.

Planning the training environment is at least as important as planning the training syllabus for helping students with disabilities acquire new behaviors. In general, one-to-one training for moderately and severely disabled students is effective; however, group instruction is another effective alternative with several advantages over one-to-one teaching: *a*) teachers can train more than one student, *b*) group training requires fewer personnel and less teaching time, *c*) students can earn more functional skills in a less-restrictive environment, *d*) they can develop appropriate skills for communicating with their peers, and *e*) they can acquire extra knowledge by observing other students in the group (Collins, Gast, Ault, & Wolery, 1991; Ledford, Gast, Luscre, & Ayres, 2008).

It is a unanimous reality that individuals, whether normally developed or with disabilities, need to acquire some skills to live independently in society. With recent technological developments, video recordings for allowing students with intellectual disabilities to acquire new behaviors have frequently been used. Additionally, because of the advantages and economic benefits of group instruction over one-to-one teaching, it is a familiar method in Turkey, where this study was conducted.

Hence, the aim of this study is to determine *a*) whether video prompting is effective for enabling students with intellectual disabilities to acquire chained tasks during small group teaching, *b*) at which level these acquired skills are maintained, and *c*) whether these acquired skills can be applied to use outside the teaching environment.

Method

Participants

The participants of the study were three students with intellectual disabilities enrolled in the Educational Practice School and Vocational School in Ankara during the 2011–2012 school year. They were between 11–13 years of age with moderate intellectual disability.

Additionally, the experimenter and two observers for collecting reliability data participated in the study, as well.

All the subjects of the study had the ability to imitate, were able to focus on an activity for at least 5 minutes, and were able to follow instructions. Diagnostic information for the subjects was obtained from their teachers' individual report files. Although subjects' IQ scores were not noted in the reports, they were diagnosed as students with moderate intellectual disabilities.

Experimenter and Observer

The implementation stage of the study was carried out by the second author, who had studied special education teaching at graduate, post-graduate, and the Ph.D. levels, and has conducted the teaching practicum at the university for ten years. Reliability

data for the study in relation to the dependent and independent variables were gathered by two other researchers with postgraduate degrees in special education.

Teaching Environment

The study was implemented in the classrooms where the subjects studied. Experiments were conducted from 10:00–10:45 a.m. Students were seated in their desks arranged in a half-moon formation with wide rows. The classroom was about 20 m^2. In the classroom there was a board, a storage cabinet in which the educational equipment was kept, and a table on which laptops were placed. Sessions to promote outside use of these skills were held in the same room; however, follow-up sessions took place in other available rooms at the school.

Materials

In the study to learn how to peel an orange, each student was given a blunt fruit knife and an orange; to learn how to fold a paper puppy, each of them was given construction paper sheets of the same color, glue, and previously cut-out eyes and tongues made from construction paper. To learn stitching, they were given a 12x15 cm piece of plain white voile linen and a thick needle (thicker than that used for etamine) threaded with black thread. A 17-inch laptop and educational CDs containing the recorded video clips were used by the subjects to watch a model perform the skills. The CDs used for teaching were prepared by the researchers. Every step of the skill, along with verbal prompting, was recorded on the CD. In the study, a video camera and stand were used to record sessions.

Dependent and Independent Variables

Dependent variables of the study were the subjects' levels of performance of the chained tasks (peeling an orange, folding a paper puppy (origami), and stitching). Task analyses used in the study were performed by the researchers' performing the skills themselves. First, the task analyses were tested with normally developed children and those with intellectual disabilities, and then the items were corrected based on children's responses. The developed criteria-referenced test was also examined by two other experts in the field with postgraduate degrees. The independent variable of the study was the video prompt used during group training. Video clips were made for the skills targeted in the research. The experimenter performed all the steps for the skill following the ordering of steps outlined in the analyses, and verbal prompting was provided in parallel. Only the hands and arms of the experimenter were visible in the video.

Research Design

In the study, a multiple probe design with probe trials across behaviors was used. Experimental controlof the study was provided to find any increase in positive responses among the respondents when the target skill was being taught. However, no considerable change occurred in skill acquisition when they were not taught. This effect was diachronically occurred in each turn of the implementation (Tekin-İftar, 2012).

Experiment Stage

The research procedure covered full probe sessions, daily probe sessions, training sessions, observation, and generalization sessions. All sessions of the experimental process were recorded on video. The study was carried out five days in a week so as not to disturb the school schedule, and a training session was conducted every day. Each training session comprised three training processes. In the course of the experiment, no other training related to the target skills was given to the subjects, except that in the experiment.

Full Probe Sessions

To determine the performance skills of the subjects, full probe data were gathered through subsequent three probe sessions before training, and after meeting the criterion for each subject. Full probe data were gathered through a Single Opportunity Probe procedure. In the full probe sessions, the participants' task-completing behaviors were reinforced. Full probe sessions were completed individually. In the full probe sessions, participants' task-completing behaviors were only verbally reinforced.

Daily Probe Sessions

In the experiment, except the first training process, daily probe sessions were conducted at the beginning of each training session. Daily probe sessions were conducted similarly to full probe sessions.

Training Sessions

In the study, a single training session comprised three training processes. During the training

sessions, the experimenter placed the computer at eye level in the participants' seating area. The experimenter then explained the aim of the study, its rules, and its rewards. The subjects were allowed to watch the full video sequence of all the skills of the tasks being performed as motivational stimuli. Later, the experimenter addressing the subjects said: "Now it's your turn to do task. Are you ready?" By asking this question, she caught their attention. After receiving their consent verbally or through gestures, she started to play the video. Immediately after giving the basic instruction, the experimenter let the subjects watch the video, including the verbal prompt for the first step of the task and performance of the skill. After they had watched the segment, the participants were promptly asked to perform the initial step of the task. Correct responses were rewarded with positive reinforcement, while incorrect responses resulted in error correction with experimenter's physical prompts during instructional sessions. This procedure continued for each step of the skill training. In the training sessions, all students' positive responses were rewarded with positive and social incentives. At the end of the training sessions, incentives such as listening to music, reading stories, and drinking beverages in a group atmosphere were provided. When the target task completion reached at least 85%, the training sessions ended.

Follow-up and Application Sessions

Sessions for applying the new skills were conducted immediately after completion of the training by another experimenter. However, follow-up sessions were held six months after the completion of training. Follow-up and application sessions were conducted identically to full probe sessions, and subjects were rewarded at the end of the session.

Social Validity Form

A social validity form consisting of eleven questions to be completed by the class teacher was developed. Its purpose was twofold: to evaluate the importance and functionality of the target skills enabling the students to acquire new skills and to evaluate the effectiveness of the video clip used in this study. The Social Validity Form was administered through one-to-one discussion with the students' teacher following the experimental stage of the research. The form showed that the teacher's feedback was positive.

Reliability

In at least 20% of the sessions conducted in the study, reliability data among the observers, and reliability data on implementation were gathered. The reliability between the observers was found to be 100%; on the other hand, the reliability of the implementation was 95%. In the study, the "agreement/disagreement x 100" formula was used for analysis of the reliability data between the observers; the "observed behavior of the experimenter/planned behavior of the experimenter x 100" (Tekin-İftar & Kırcaali-İftar, 2004) formula was used for the analyses of reliability data of the implementation.

Results

The subjects acquired the skills for stitching and folding a paper puppy at the end of six training sessions; however, they acquired the skills for peeling an orange after only three training sessions. Additionally, the subjects gave 100% correct responses for the performance of skills of stitching, folding a paper puppy, and peeling an orange during the full probe sessions. These findings suggest that video prompting is an effective teaching method for small group training that allows students with intellectual disabilities to acquire chained tasks.

In the application sessions held immediately after completion of the video training, the subjects were found able to demonstrate 100% full performance of the acquired skills before another experimenter. In the follow-up sessions six months after completion of the video training for chained tasks, the average level of correct responses from subjects was 85%. These results indicated that acquired skills were maintained by the subjects for six months at a level meeting the desired criteria.

Discussion

The aim of this study is to determine whether the video prompting method for acquisition of chained tasks is effective for small group instruction of intellectually handicapped students; at which level these acquired skills are maintained; and whether these students are able to generalize targeted skills across individuals. The findings of the study prove that the video prompting method for acquisition of chained tasks is effective for subjects in small group training. The results of this study are consistent with those of other studies in which video prompts

were used and skills acquired (Cannella-Malone et al., 2006; Graves et al., 2005; Horn et al., 2001; Norman et al., 2001; Sigafoos et al., 2007).

Once prepared, the video prompting method does not increase researchers' workload. It can be executed multiple times because it is easily implementable and replicable (Mechling, 2005). Group training, if the students are appropriate for the group, is more advantageous and economical than one-to-one teaching. Hence, group training is an effective teaching strategy (Collins et al., 1991). The results of this research can serve as a contribution to the field literature and to researchers working in this field.

In the literature, classroom management is identified as a problem that disrupts teaching in classes for intellectually disabled students (Mastropieri & Scruggs, 2000). Since the motivational level of intellectually disabled students is low, their teachers' efforts to teach them are often redirected to managing the class (Carter & Scruggs, 2001). Mechling (2005) emphasizes that the increased use of sound, light, and visuals in the teaching environment improves students' motivation. Furthermore, various examples in the literature show the positive effects of technology on students' motivation (Dowrick, 1991; Nikopoulos & Keenan, 2003; Schreibman, Whalen, & Stahmer, 2000). In this study, group teaching with video technology has motivated students to perform their tasks and has resulted in their receiving more social reinforcement. Thus, the teacher spent less energy managing the class and more time teaching. The researchers' personal views support this idea. Nevertheless, it is necessary to discuss a few remaining issues. The subjects in this study needed more time to meet the goal of performing tasks independently for the first two skills taught, stitching and folding (origami), than for the final skill, peeling an orange. This result can be interpreted to mean that after mastering the first and second tasks, the subjects were more aware of what to watch for when learning to perform a task.

Another point of discussion is the physical prompts used for error correction in the study. Physical prompts, requires the most strength from the individual's body among all prompt types (Snell & Brown, 1993; Tekin-İftar, 2004; Wolery, Ault, & Doyle, 1992). Nevertheless, the use of physical prompts minimizes errors. Participants in future studies can watch their own videos to correct their own mistakes.

In conclusion, the aim of this experiment is to determine whether the video prompting method for acquisition of chained tasks is effective for small group training of students with intellectual disabilities. For this reason, levels of subjects' task performance are given as the group mean (Mechling & Gustafson, 2009; Sigafoos, Kerr, Roberts, & Couzens, 1994).

For further research, this study can be replicated with students of different ages and levels, and for teaching different skills. A similar experiment can be designed with a different error correction technique for comparison. Moreover, some other video-modeling and prompting studies that presented their data similarly can be compared to this study. Additionally, an evaluation study of teachers' views of classroom management can be planned.

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