

Increasing Self-Evaluation Use Through Video Feedback to Improve Academic Engagement Among Students with Intellectual Disabilities

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Abstract

Self-evaluation is a skill that can help individuals to increase their own performance on completing tasks in engagements. The literature provides several examples of using self-evaluation with different participant groups with psychological and behavioral problems. There are a limited number of examples of using self-evaluation with individuals with intellectual disabilities (IDs), which demonstrated effective use of self-evaluation combined with other techniques such as video feedback. The present study focused on examining the effectiveness of using video feedback to increase the use of self-evaluation of students with IDs who are trying to improve their academic engagement. The study applied a multiple probe design to track changes in the behaviors with three students with IDs. The study provided evidence that the students were able to improve their academic engagement in regard to increase on-task behaviors, raising hands, and compliance while increasing self-evaluation.

Keywords: Self-evaluation, video feedback, intellectual disability, behavioral change, classroom behaviors

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INTRODUCTION

Use of Video Feedback to Increase Self-Evaluation and On-task behavior, Raising Hands, and Compliance with Intellectual Disabilities in Classroom

Students with IDs require diverse and effective services in a high-quality special education program in order to meet academic standards while simultaneously developing their language, social, and adaptive skills. Studies have provided evidence that the academic performance of students with IDs can be affected by behavioral problems (Appleton, Christenson, & Furlong, 2008; Rotgans & Schmidt, 2011). Regarding the connection between academic learning and behavioral problems in classrooms, Pennington and Courtade (2015) emphasized that students with moderate to severe IDs engage with only a small portion of the academic instruction. Similarly, Shelton and others (1988) indicated that students with IDs sometimes exhibit problem behaviors that may hinder their academic achievement. Arguably, changing the students' classroom behaviors could help them perform well in academic activities; the literature includes an extensive number of studies focused on solving the behavioral problems of students with IDs. However, the literature provides limited use of self-management strategies along with technology in regard to education of children with IDs. This study focused on improving self-evaluation of children with IDs by applying video-feedback technology.

Regarding the effects of problem behaviors in children and youth with IDs, the literature shows that behavioral problems interfere with their quality of life (Emerson, 2003; Murphy et al., 2005). These behaviors can also represent significant challenges to professionals responsible for providing rehabilitative and other educational services. Several meta-analyses have documented that there are a considerable number of studies focused on intervening to address the problem behaviors of individuals with IDs. As an example, Heyvaert, Van den Noortgate, and Onghena (2012) conducted a meta-analysis involving studies focused on reducing the problem behaviors of students with IDs. Two hundred and eighty-five studies reporting on 598 individuals were examined. Heyvaert et al. categorized interventions as falling into the groups of biological intervention, psychological intervention including teaching alternative skills, use of reward and praise, punishment, use of restraints, manipulation of antecedent factors, extinction, gaining insight into perceptions of challenging behavior, and social-contextual intervention methods. Harvey, Boer, Meyer, and Evans (2009) conducted a meta-analysis involving 142 articles reporting studies with a total of 316 individuals. Harvey et al. categorized the interventions as modification of antecedents, teaching and promoting alternative replacement skills, contingency management and system change. From a different perspective, Sturmey (2014) examined meta-analyses concerning behavioral interventions that were focused on the challenging behaviors of individuals with IDs. One conclusion that might be drawn from the meta-analyses is that interventions to deal with behavioral problems have focused on certain types of intervention models.

Even though the intervention studies mostly focused on certain models, the use of self-management procedures, which include goal-setting, self-monitoring, self-reinforcement, and self-evaluation, has been found to be effective in changing behaviors. Several studies used self-management intervention packages effectively in several populations and for a variety of behaviors (Harchik, Sherman, & Sheldon, 1992). Self-management procedures have been used together with video feedback to address the social behaviors of adolescents with intellectual disabilities (Embregts, 2000, 2002); however, the literature lacks evidence specifically related to testing the self-evaluations of individuals with IDs.

Self-evaluation may help individuals to make judgments about the adequacy and effectiveness of their own performance for the purpose of self-improvement (Airasian & Gullickson, 1997). Individuals socially negotiate their own self-concept by comparing their own performance to other models, which can lead to behavioral changes (Agran, 1997). Self-evaluation requires individuals to make a comparison between themselves and other individuals or certain criteria (Agran, 1997) that may be considered a common concern for individuals with IDs.

Agran (1997) described self-evaluation as comparing a measure of certain behaviors or events with a goal or standard for the behaviors or events. From this perspective, the use of self-evaluation has become crucial. Since self-evaluation may play a part in a variety of aspects of life, especially in the social aspect, it must be improved by everyone. Schunk (1990) stated that self-evaluation comprises a) self-judgement of the present performance through comparisons with one's goal and b) self-reactions to those judgements by deeming the performance noteworthy, unacceptable, and so forth. Schunk also (1990) stated that students with increased self-efficacy and high performance can evaluate their own capabilities and progress in skill acquisition. Schunk (2003) mentioned that teachers may need to help students to assess their own performance, since it is a critical skill for becoming self-directed learners. Therefore, teachers may need to give students who are not proficient in making self-evaluation prompts for assessing their performance (Schunk, 2003). Hypothetically, students with IDs would be one of those group of individuals who are in need of receiving self-evaluation prompts.

The literature indicates that the effectiveness of self-evaluation in reducing behavioral problems has been tested in several studies in regard to students with special needs (Ardoin, & Martens, 2004; Sutherland & Wehby, 2001), which rather focused on children with ADHD and emotional behavioral disorders (EBDs). Evidence for the effectiveness of self-evaluation in changing the behaviors of individuals with IDs or regarding the use and development of self-evaluation in individuals with IDs is limited.

Observational learning and interactions between individuals are critical for the acquisition of new skills, but individuals with IDs may also need instruction and reinforcement in learning new skills. Monitoring one's behaviors and differentiating between appropriate and inappropriate behaviors may help individuals with IDs learn new skills. Modeling via videos might serve as another method to provide visual examples of behaviors and also can be used practically in different settings. Possibly, because of its practicality, it has been used to a considerable extent in studies (Alberto, Cihak, & Gama, 2005; Cihak, Kessler, & Alberto, 2007; Mechling & Gast, 2003; Mechling, Gast, & Barthold, 2003; Taber-Doughty, Patton, & Brennan, 2008). Video feedback is a method that provides the opportunity for individuals to receive training in monitoring and evaluating their own behavior. Video feedback has also been used in training individuals with disabilities in social skills, social language, and to address behavioral problems (Chung et al., 2007; Kern-Dunlap, Dunlap, Clarke, White, & Stewart, 1992; Embregts, 2000; Kern-Dunlap, Dunlap, Maione & Mirenda, 2006; O'Reilly et al., 2005; Thiemann & Goldstein, 2001).

Several self-evaluation studies involved the use of video recordings as video feedback helps individuals to evaluate their own performance (Burgio, Glass, & Merluzzi, 1981; Griffiths & Gillingham, 1978; Harvey, Clark, Ehlers, & Rapee, 2000; Parr & Cartwright-Hatton, 2009; Rapee & Hayman, 1996). The findings indicated that the use of video recordings helped to improve the individuals' self-evaluation. Fukkink, Trienekens, and Kramer (2001) stated that video feedback provided an opportunity for instruction, practice, and feedback, which are intrinsically linked in this format. The instruction involves the operational definition of a skill; participants see an accurate presentation of what the target behavior is, in a concrete, practical circumstance. The comprehensive and explicit feedback on the target behavior subsequently helps participants to evaluate their performance in a structured manner. Individuals with IDs may exhibit difficulties in comparing their own behaviors to a set of standards (Glenn & Cunningham, 2001) and the structured format of video feedback presents an opportunity for students with IDs to improve their self-evaluation skills. Therefore, the present study aimed to determine the video feedback use in improving the self-evaluation procedures when teaching classroom behaviors to students with IDs.

METHOD

Participants

Criteria for inclusion in the study were as follows: (a) diagnosed disability or eligibility for special education services, (b) received the educational services in a self-contained setting, (c) consistently give joint attention with an adult to a screen, speak in turns, complete the tasks an adult stated using 2- to 3-word sentences, and answer questions in regard to what they watched for at least 10 min, (e) between 12 and 15 years old, (f) reported as having in-class behaviors which hinder learning in the classroom, (g) parents provided informed consent for their child to participate in the study. Recruitment was conducted in a segregated school for students with IDs. Participants meeting inclusion criteria were determined through school record review, observation by the author, and teacher recommendation. All children exhibited problem behaviors such as getting up from their desk during activities that did not interest them, improperly talking over the teachers and others, and not answering the questions that were directed to them.

Participant 1 was a 13-year old female student with the diagnosis of mild/moderate intellectual disability. Her IQ was determined to be 46. The participant was not literate, but she was able to use a board marker to put a mark in a small square on a record sheet. She was able to follow verbal directions and use pictorial cues to complete daily skills. She was able to sit at a table to watch a screen for at least 5 minutes. As far as her communication skills, she was able to take turns in conversations by using 3- to 4-word sentences, and to answer what, why and how questions with regard to everyday life events. She was able to tell short cause-and-effect stories with regard to her daily life.

Participant 2 was a 12-year-old male student with the diagnosis of mild/moderate intellectual disability. His IQ was determined to be 54. He was not literate, but he was able to use a board marker to put a mark in a small square on a record sheet. He was able to follow verbal directions. He was able to sit at a table to watch a screen for at least 5 minutes. As far as his communication skills, he was able to take turns in conversations by using 2- to 3-word sentences, and to answer what, why and how questions in regard to everyday life events.

Participant 3 was a 13-year-old female student with the diagnosis of mild/moderate intellectual disability. Her IQ was determined to be 54. She was not literate, but she was able to use a board marker to put a mark in a small square on a record sheet. She was able to follow verbal directions. She was able to sit at a table to watch a screen for at least 5 minutes. As far as her communication skills, she was able to take turns in conversations by using 3- to 4-word sentences and to answer what, why and how questions in regard to everyday life events. She was able to tell short cause-and-effect stories in regard to her daily life.

Setting

The baseline and instructional sessions were conducted in the participants' classroom. All three participants were assigned to the same classroom, which included a total of 8 students with IDs. The classroom held 4 desks arranged in a U-shape across from a whiteboard, and a teacher's desk. The camera to record the sessions was located in the front end of the classroom on a tripod.

The classroom was adjoined by an additional smaller separate room, and the video watching sessions were conducted in that room, with a table and two chairs placed next to each other so that the researcher and the participants could sit together to watch the video clips. Another camera to record these sessions was placed in the corner on a tripod. This setting was designed to meet the need for one-on-one sessions.

Recording Videotapes

Participant behavior during classroom instruction was videotaped using a portable camcorder stationed on a tripod in the corner of the classroom. In an attempt to reduce reactivity to the presence of the camera, videotaping began in the target setting two weeks prior to collecting data. All the recordings completed in those weeks were discarded. New recordings were completed to be used as baseline data. The recordings each lasted 15 minutes and were recorded on a daily basis for the participant currently receiving the intervention.

Response Definitions

The classroom teacher and the researcher selected the target behaviors. First, the researcher interviewed the teacher about the most inappropriate behavior(s) or the behaviors most disruptive to each participant's classroom participation. The researcher also collected observational data. Then, each participant's target behavior was identified by comparing the researcher's data and the teacher's statements.

The classroom had 8 registered students with ID. The teacher posted classroom rules on the wall, based on her account, she also identified and conducted learning sessions on behaviors that conflicted with the classroom rules. Examples included leaving their chairs, speaking inappropriately to the teacher or other students, and not responding to the teacher when they were asked a question. For the study, three classroom behaviors were identified as target behaviors: remaining seated during activities, raising their hands to speak, and responding to questions asked by the teacher and others. In addition to the selected 3 target behaviors (Table 1), the number of independent correct markings made by the participants on the record sheets was counted as attempts at self-evaluation.

Table 1 . Operational definitions of target behaviors

Remain seating during the activities	During the activities, remain sitting in their chair with feet on the floor and with head and body oriented toward teacher
Raising hand to speak	Request teacher attention by raising hand at the appropriate time
Responding to the questions	Verbalize in response to another student or teacher when a question is directed at him/her

Participantsto selected 3 target behaviors performance on following classroom rules. nstructional practices continued with no mo

Experimental design

A single-case multiple-probe across participants (Horner and Baer, 1978) was used to assess the effects of video feedback on self-evaluation and improving classroom behaviors. In a multiple probe across participants design, visual analysis is used to determine a functional relation through systematic and sequential manipulation of the independent variable. The participants were introduced to independent variables sequentially and continued to ensure change in the dependent variables.

The multiple probe design requires administering intermittent probes during the baseline rather than continuous measurement of the dependent variable (Gast and Ledford, 2014). In this study, using a multiple probe design minimized the amount of time the children spent in the classroom without any intervention.

Procedure

Baseline

During the baseline, participants were observed in the classroom during course hours. No feedback was provided to the participants regarding their behaviors. In the second step, each student was provided a table with two columns on it. The researcher collected screen shots of inappropriate

classroom behaviors exhibited by the target students from the videos recorded during the baseline and put them in the left column. In the right column, the researcher created an imaginary student and put appropriate classroom behavior examples of him. The table was introduced as a tool that the students could use to compare their own behavior to an example. Each student was reminded of his/her performance during the baseline period, and asked where s/he wanted to set his/her goal. The experimenter suggested a goal if the student established a goal that seemed too difficult to attain. All selected goals were higher than the mean baseline level.

Self-evaluation training

The researcher worked with the participants on a daily basis, before their classroom instruction. All of the intervention sessions were conducted one-on-one, with instruction provided by the researcher. Instruction took place in a designated area and consisted of four parts: 1) rationale, 2) goal-setting, 3) video feedback session and 4) self-evaluation. After the first training session, subsequent sessions consisted of reviewing the first two components and instruction on the remaining components.

First, each student was asked why s/he felt it was important to follow classroom rules in the classroom. The experimenter supplemented the student's response with additional reasons as needed. Each student was told it was important to follow the classroom rules in the classroom, and that following the rules would help him/her to learn more, play with his/her friends properly, and increase his/her parents' and teacher's satisfaction.

Second, each student was shown a simple line graph which illustrated his current behaviors in terms of following the three targeted classroom rules (from baseline data) in comparison to an imaginary child with better behaviors. The students were helped to examine their own performance on the graphs placed on the left column of the page, and better performance of the imaginary friend on the right. Next, each student established a goal to increase his/her positive behaviors by comparing the graphs provided in the previous step. Each student was reminded of his/her performance during the baseline period, and asked where s/he wanted to set his/her goal. The experimenter suggested a goal if the student established a goal that seemed too difficult to attain. All selected goals were higher than the mean baseline level.

Once goal-setting was completed, instruction on the video-feedback strategy began. Since the use of video recordings on a computer is an essential piece of the intervention, all students were taught how to use the video player on the computer, so in following days they would be using the player independently, without the immediate presence of the researcher. Through verbal direction, modelling, rehearsal, corrective feedback and social praise, participants were taught, a) how to operate the video player, b) when to start and stop the video player, c) how to record their performance on a record sheet. The record sheet also included proper illustrations of the behaviors present within the context of the classroom rules as an example for the participants. For each step the students were given a verbal direction for the behavioral task, and a modelling by the researcher for the behavioral task followed the verbal direction. Next the student was urged to rehearse the behavior with the researcher, based on the student's performance the researcher provided a corrective feedback and provided a social praise based on the student's performance.

Finally, the participants were taught to compare their own performance against their goal, or the exemplary performance of the imaginary student and to adjust their performance accordingly. The researcher was involved in describing the stimulus and consequences of the target behavior in the early examples. A shaded area on each record sheet represented the target level. Participants were taught to verbalize to the experimenter whether or not they had met the criterion. For example, a student would say "Good, I am following the rules" or "I'm not following the rules, I need to be more careful" (please note that in the native language of the students, the first sentence is only two words, and the second sentence is formed of only two/three words depending on how it is said at that moment).

Once each student met his/her goal for 3 consecutive days, a new goal was established, with the experimenter using the same procedures as before, but based on the participants' self-recorded performance data. Each student selected a goal based on the imaginary child's performance until the proper criterion was reached by the students.

Maintenance

This phase was initiated when the intervention phase had been completed for the first participant. During maintenance, the participants independently marked their performance on the record sheet without any prompting by watching their own performance on the video recordings.

Treatment Integrity

During self-evaluation training sessions, both the experimenter and a second observer independently recorded on a checklist, for 25% of the all sessions whether or not each component of the video-feedback training was implemented as described. The second observer was a Ph.D. student in a special education department of a teacher education college. An agreement was scored when both observers recorded each step within the components of the video-feedback procedure were implemented as described. Percent agreement was calculated by the number of agreements and disagreement and multiplying by 100. Video feedback training was implemented with 100 % accuracy for all trainees.

Observer reliability

Inter-observer agreement was assessed on an interval-by-interval basis. Reliability checks were conducted for 25% of the video recording sessions to observe the behaviors during the video recordings in regular class hours, and intervention periods and were approximately equally distributed for all participants and intervention phases. Agreement between observers was calculated as the percentage of matching ratings out of the total number of ratings (the number of matching ratings divided by the total number of ratings, times 100).

Social Validity

One doctoral student was provided with interview questions written by the researcher to collect social validity data. At the conclusion of the study, the results were shared with the classroom teacher and the interview was conducted. The questions were as follows:

1. Do you think that the participants' behaviors changed positively?
2. Do you think that the combined treatment package could be used for other students in the classroom?

RESULTS

Reliability

Reliability of the Recording. The videos showing the target students' behaviors had also been watched by another coder in order to collect reliability data regarding problem behaviors. The mean inter-observer reliability for the ratings of the occurrence of the target behaviors was 96%.

Procedural reliability. The training provided by the trainer as far as stopping the videotape, asking the participant to record behaviors, and describing the stimulus and consequences of the target behavior, was correct in 100%, 90%, and 100% of the sessions, respectively. The participants used self-evaluation and recorded their own behaviors correctly in 94%, 94%, and 96% of the training sessions, respectively.

Student Performance

Data for the behavior of staying in their chairs are presented in Figure 1. All participants showed an increase in listening to teacher instructions. All baselines presented considerably stable scores. All three participants were able to increase the amount of time for staying in the chair. Data for the behavior of raising their hands are presented in Figure 2. Similarly, all participants showed a rapid increase in raising their hands when they wished to get the teacher's attention. Data for the behavior of responding to questions are presented in Figure 3. In contrast to the other two target behaviors, participants differed slightly with regard to responding to questions. Overall, the data proved that the students were able to improve their appropriate behaviors as a result of intervention.

Fig.1 Remaining Appropriately Seated

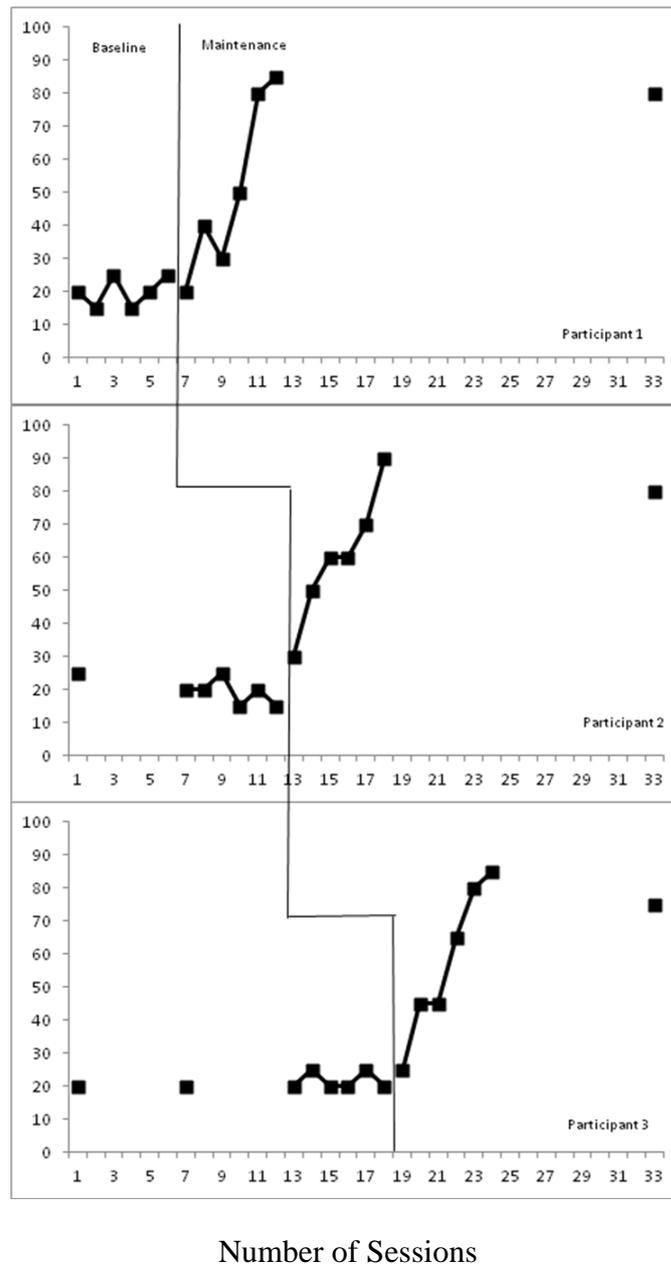


Fig. 2 Raising Hands for Asking Questions

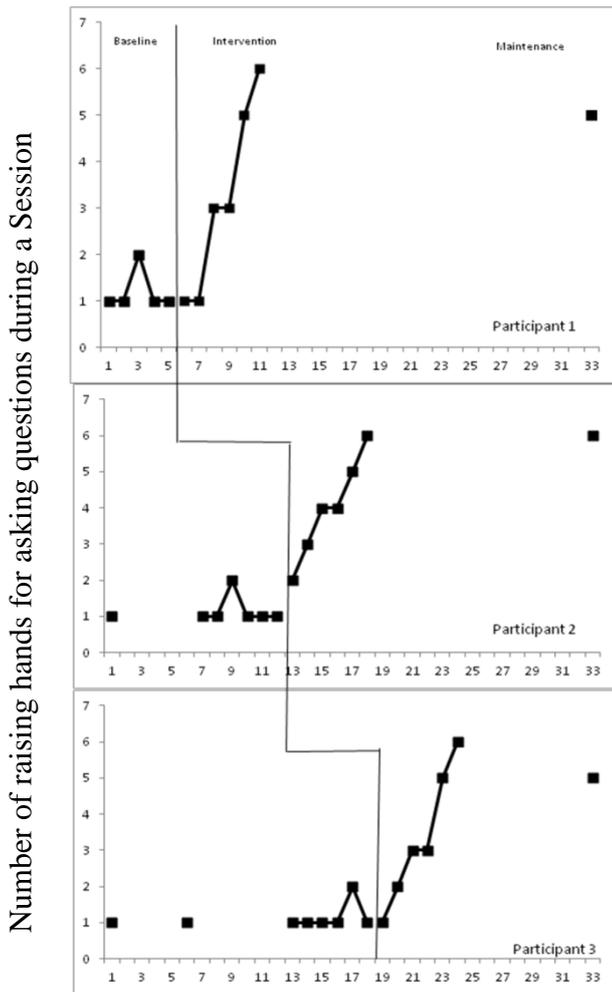
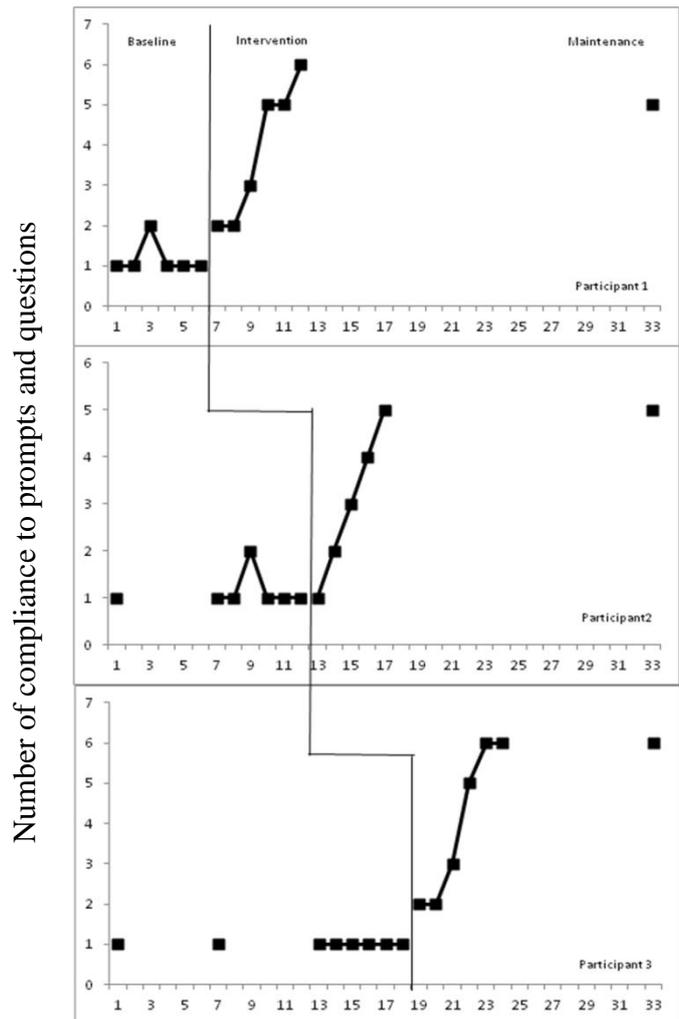


Fig. 3. Compliances To Prompts And Questions

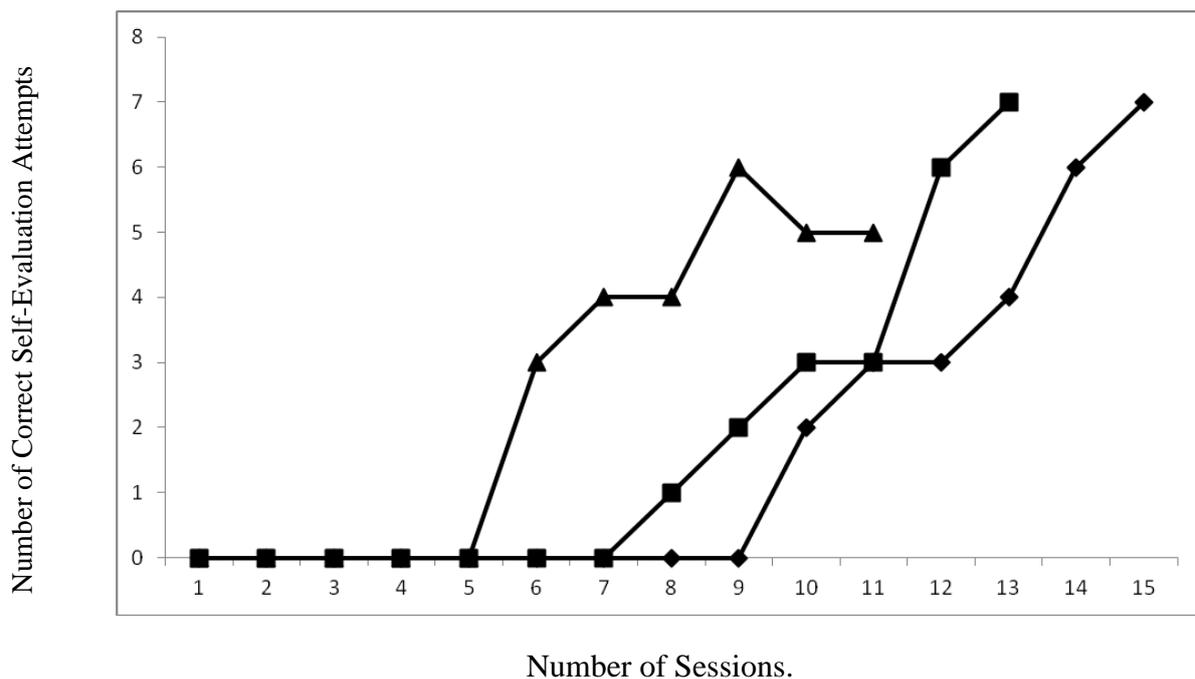


Number of Sessions

All three participants were observed for the target behaviors for three weeks after completing the treatment phase, and all participants were documented as able to maintain the target behaviors. The findings of the data collection was also alligned with social validy findings which is summarized below. All three students improved their performance in the classroom along with increasin the acceptance of them.

Also a fourth figure was provided to show the number of correct self-evaluation attempts. The participants were able to compare their performance on targeted behaviors.

Fig 4. Sessions, Triangle is Participant 1, Square is Participant 2, and Diamond is Participant 3



In order to extend the meaning of the results, effect-size calculation was completed. The researcher applied Non-overlapping data method. The calculation yielded 100% which is a sign of an effective result. This result is also aligned with the findings of single subject design study and social validity findings.

Social Validity

Based on the interview data, the teacher saw a positive change in the behaviors of the participants. The class schedule began at 9:00 am and continued until 3:00 p.m., with an hour break for lunch. The teacher claimed that the lunch break was the most problematic time period for her, but she noticed that some of the participants' targeted behavioral problems decreased even during that period. She also believed that changing the participants' behaviors provided her with an opportunity to use typical classroom management techniques with greater confidence. The decrease in problem behaviors helped her to focus on more positive behaviors.

For the other question, the teacher raised her own concerns. She was directed a question of using the method in her classroom, she mentioned her concern about the one-to-one training part of the implementation. Since she was the only teacher in the classroom and the classroom was for participants with moderate to severe ID, she had concerns about leaving the classroom unattended and conducting one-to-one training sessions with her students; however, she emphasized that the package would be one of the first methods that she would use when she had someone assisting her in the classroom. She found it effective and since she was an observer of the implementation in her classroom she mentioned that she found it easy to use beside the practical concern of one-to-one implementation.

The study applied single subject design data collection procedure and also checked social validity and applied effect-size calculation to determine the effectiveness of the independent variable in a qualitative and quantitative ways. Overall, the data indicates to significant change in the students qualitatively and quantitatively.

DISCUSSION

The present study aimed to provide evidence about the effectiveness of using video feedback to improve self-evaluations when changing the problem behaviors of participants with ID in a self-contained setting. During the intervention, the participants were provided with one-on-one sessions to observe and monitor their own behaviors, in which they were prompted to evaluate their behaviors against a criterion and which reinforced appropriate behaviors. The results show that the intervention improved the participants' performance on the targeted behaviors along with their use of self-evaluations. Before the training the participants had no successful comparison of their own behaviors with exemplary behaviors and with the beginning of the training session, the number of the successful comparisons of their own behaviors with exemplary behaviors increased considerably.

Based on Agran's definition of self-evaluation (1997), a person should be able to compare his/her behavior to a goal or standard, which may be problematic when taking into account the characteristics of individuals with IDs. Glenn and Cunningham (2001) concluded that figuring out the evaluation of self by how young people with Down syndrome presented difficulties and they concluded that individuals with Down syndrome and a comparison group with normal development showed a standard developmental trend. In this study, the participants were able to improve the targeted behaviors, and number of successful self-evaluations of their own behaviors. These improvements can be attributed to the video feedback and self-evaluation training, in which they watched themselves and gave themselves feedback regarding the comparison of their actual behaviors to a set of expected classroom behaviors. To this extent, the results were similar to those from the Glenn and Cunningham study. Both studies provided evidence that individuals with IDs were capable of improving their self-evaluations.

The literature has also provided limited examples of intervention studies involving the use of self-evaluation by individuals with IDs that focused more on developing the individuals' work skills. Sainoto, Strain, Lefebvre, and Rapp (1990) applied the self-evaluation treatment package to teach independent work skills to preschool children with IDs. The results revealed that substantial improvements were possible. Grossi and Heward (1998) implemented a self-evaluation package to improve the work efficiency of adults with IDs. Their results demonstrated that the individuals with IDs were able to improve their work productivity. Another study examined the use of video feedback and self-management for participants with intellectual disability (Embregts, 2000). In contrast to the existing literature, this study focused on and provided evidence regarding improving appropriate classroom behaviors of individuals with IDs.

In this study, as observational output, the participants exhibited several behaviors while watching the videos of themselves. Anecdotal observation reveals that the participants were eager to work with the researcher during the study. They also enjoyed watching themselves, and expressed it by saying phrases such as "ooowww, what did I dooo" or "I did it again, I did it again!" The participants also began to warn one another in the classroom about their inappropriate behaviors by saying, "do not talk" or, "she is talking."

Further research could focus on testing the effects of the students' increased self-evaluation skills in the classroom and in relation to their academic success. The research could be extended to other self-management procedures as well. For example, self-reinforcement could possibly be used as a self-management procedure along with video feedback in order to increase appropriate behaviors.

Researchers could focus on a variety of topics to extend the current literature. Primarily, the literature has not provided any evidence on teaching the use of self-evaluation in small group instruction in an educational setting for participants with ID. Peers in a regular classroom could also be considered as comparison models for self-evaluation, as well as the use of peer mediation to teach self-evaluation.

Compliance with Ethical Standards

Conflict of interest: The authors declare that they have no conflict of interest.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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