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The Effect of Direct Instruction Model on Teaching Musical Play (Round) Skills to Children with Intellectual Disabilities

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Abstract

Play is a very effective tool in the development of the child's personality, cognitive skills, social-emotional structure, communication and interaction skills. In this study, it was aimed to determine the effect of teaching with the Direct Instruction Model on the teaching of musical play (round) skills in students with moderate intellectual disability. The study was designed with the multiple probe model with probe phase between subjects five girls and four boys with intellectually disabled, aged between 9-11, participated in this study. The research findings show that the Direct Instruction Model, which was used to a limited extent in teaching play skills to children with intellectual disabilities, was effective in teaching butterfly round play skills to students with moderate intellectual disabilities. It is undestood that the participants continued their butterfly round play skills 7, 14, and 21 days after the end of the instruction. It also showed that all of the participants were able to generalize their round play skills to different environments, times and people. In addition, the teachers of the students included in the study also expressed positive opinions about the teaching model used in the research and the changes on their students.

Keywords: Intellectual disabilities, Musical play, Direct instruction model.

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Introduction

Children begin to take an active part in life by entering the process of interaction with their environment by their birth. These interactions of young children constitute the beginning of the process of adapting to the world. In this process, as children begin to interact with their environment, they also begin to recognize and understand the world they live in. One of the most important tools in children's attempts to recognize and understand the world they live in is plays. While play is seen as an important exercise that prepares the child for the culture he lives in (Jordan, 2003), Piaget (1962) defines play as a bridge between concrete experience and abstract thought (Ustundag, 2017). Froebel (1887), on the other hand, defined play as the occupation that determines the whole life of the child and provides the purest and most spiritual satisfaction in the pre-school period (Ilhan Ildiz et al., 2017; Ozmen, 2019). The play is a tool that can be played with or without a certain purpose, with or without rules, and which contributes to the physical, cognitive, language-speech and social-emotional development of the child willingly under any circumstances (Ozturk, 2018), also it is a tool where they discover their environment and learn while having fun (Barton & Wolery, 2008).

Plays are a universal and motivating activity in which children have fun, relax and their development is supported in many ways. Play is very effective in the development of the child's personality, dreams, social-emotional structure, communication and interaction skills (Sevinc, 2004). With this aspect, the play not only supports all development areas of the child as a whole, but also increases the adaptation to the cultural environment in which he lives. Considering the relationship between play and developmental skills, three aspects of play can be mentioned: (a) diagnostic, (b) experiential and (c) developmental. Plays are also a diagnostic tool that enables us to obtain information about the developmental levels of children (Kuguoglu & Kurktuncu-Tanir, 2006). Plays, while giving clues about the behavior and developmental characteristics of the child with the observations made in the play, can also reflect the emotional states of the child. In this respect, plays also show the feature of being a diagnostic tool in which the developmental differences of young children are seen and determined. Plays create contexts to make it easier for children to get to know their environment and adapt to it. Children get the opportunity to get to know their bodies and try their acquired skills through play. Moreover, through plays, children discover in which activities they can be successful and in which situations they have limitations (Oncu & Ozbay, 2007). At this point, it can be said that plays create very important experience opportunities for children. The most important contribution of plays is that they play an active role in the development of children. In this context, plays develop and support children spiritually, socially, physically and mentally (Goksen, 2014).

Children reflect their emotional reactions to the plays by enacting the events they feel, see or experience (Kiye & Yalcin, 2021). Thus, children learn to observe emotional changes in their own

lives and to control their emotional reactions. Children's independent movement and achievements in plays not only improve their self-confidence and increase their motivation, but also improve their ability to play, take responsibility and fulfill, especially with other children (Durualp & Aral, 2010). The fact that children act collectively with their friends in plays teaches them to solve problems, obey the rules and respect their friends, while also providing them with rules that support social relations such as trusting themselves and others, making decisions, sharing and cooperating (Durualp & Aral, 2010; Oncu & Ozbay, 2007).

Plays also greatly support children's cognitive skills. Children learn various concepts and information through their interactions with their peers and by observing others (Kurt & Tortamis-Ozkaya, 2015). Plays also support children's cognitive learning of new concepts, strategies and skills, and the development of memory, attention, speed, problem solving and imagination skills. In addition, plays support children's matching, grouping, sequencing, similarity and discrimination skills, and in this context, they also improve their senses (Coban & Nacar, 2006; Kiye & Yalcin, 2021). Moreover, the plays support both receptive and expressive language skills. Thus, children learn new words in plays and express themselves verbally or behaviorally (Goksen, 2014). The fact that plays develop and support children's development in all aspects is a clear proof that plays are a social structure (Frasca, 2007). In this respect, it can be thought that plays provide a social life model for children. In conclusion, it should be noted that plays are an important need for the healthy physical and social development of children.

Plays are a very important tool for typically developing children as well as for children affected by developmental disabilities. Play is an important tool in recognizing and determining the developmental delays of children affected by developmental disabilities (Lifter et al., 2011). In addition to this, play is one of the important arguments in the lives of children affected by disability in interacting with other children and learning many concepts and skills in an informal way. For this reason, children's play skills, initiatives and experiences related to this should be supported from an early age.

One of the types of plays in which the development of children is supported is round which are musical plays. The dictionary meaning of round is game played as a ring. Round is defined as a group of entertaining rhythmic movements accompanied by music (Unutkan, 2006). While playing round, rhythm, sound and movement are displayed as a harmonious whole, making the play more fun for the child. Moving according to music is as natural as breathing in children. Before children learn to speak or sing, they learn to react to music with their whole body and then to move to the rhythm. Such studies give children the habit of listening to music. In addition, children develop their muscles and learn to control their bodies. Musical plays also allow children to spend their energies in a healthy way and make it easier for them to express themselves in this way (Ozturk, 2018; Unutkan, 2006).

It is known that children affected by intellectual disability have difficulty in playing plays containing movement. The negative effects of inadequacy on development, cognitive limitations of mental children negatively affect the quality of movements in plays. Significant limitations are observed in the display of play skills, symbolic play skills and manipulative plays of children affected by intellectual disability (Hellendron, 1994; Jennings, 2017; Sevinc, 2004; Tufekcioglu, 2013). Through play, children's symbolic play, language-speech and cognitive skills and their ability to understand the emotions of others develop (Barnett, 1990). For this reason, although it is important to develop play skills in terms of cognitive, physical, language-speech, symbolic play and social-emotional development of children with intellectual disability, these skills should be systematically acquired with scientifically proven teaching methods. One of the scientifically based applications that can be effective in gaining play skills is the Direct Instruction Model (Ciftci & Sucuoglu, 2004). The Direct Instruction Model includes the analysis of the skills to be taught, the systematic withdrawal of the clues and the corrective feedback from the teachers (Dagseven-Emecen, 2011). The Direct Instruction Model consists of three stages: (a) being a model, (b) guided practices, and (c) independent practices. In this model, it is aimed to gradually withdraw the hint of being a model offered to the child affected by disability, and to reach the child's independence in the skill aimed at teaching (Dagseven-Emecen, 2022).

Studies examining the effect of the Direct Instruction Model in the teaching of play skills mostly focus on teaching different concepts, independent play, communication and different play skills to children affected by autism (Arntzen et al., 2003; Boutot et al., 2005; Odluyurt, 2013). The number of studies in which the Direct Instruction Model is used to develop the play skills of children with intellectual disabilities is quite limited in the national literature. For this reason, more experimental research is needed to improve the play skills of children with intellectual disability. This research aims to determine the effect of direct instruction model on the acquisition of round skills in students with moderate intellectual disability. In this study, it was aimed to determine whether the Direct Instruction Model is effective in teaching "Butterfly Round Play" skills to individuals with moderate intellectual disability. Within the framework of this purpose, answers to the following questions were sought:

1. Is teaching with the Direct Instruction Model effective in teaching butterfly round skills to individuals with moderate intellectual disability?

2. Do the participants continue their playing skills 7, 14 and 21 days after the butterfly round play skill teaching is over?

3. Can the participants generalize their butterfly round play skills to another environment, to their friends, and to other teachers?

4. What are the teachers' views (social validity) on the acquisition of butterfly round play skills through the Direct Instruction Model teaching process?

Method

Research Model

In this study, the effectiveness of teaching with the Direct Instruction Model in teaching the butterfly round play to children with moderate intellectual disability was investigated. The independent variable of the research is the effect of the teaching applied through the Direct Instruction Model. The dependent variable of the study is the level of the subject groups in playing the butterfly round play. In the study, multiple probe model with probe phase between subjects, one of the single-subject experimental research models, was used. The multiple probe model with probe phase between subjects is a model that is carried out with at least three participants and examines the effect of the independent variable on the dependent variable (Tekin-İftar, 2012). This model can be organized with at least three participants or groups. In this research, the experimental study was carried out with three groups of nine children.

In the multiple probe model with probe phase between participants, the fact that the participant includes many repetitions within himself and among the participants increases the internal validity of this model. The fact that the participant characteristics are independent from each other and the number of repetitions is high also increases the external validity (Tekin-İftar, 2012). Experimental control is established according to the principle of diachrony in multiple probe models (Tekin & Kırcaali-İftar, 2001). In other words, experimental control is a change in the level or trend of baseline and practice data for the subject or behavior to be administered, it is established by the fact that there is no change in the level or tendencies of the data of the subjects or the baseline level of the behaviors that have not yet been implemented (Tekin-İftar, 2012).

Participants

The participants of the study consist of 9 students diagnosed with moderate intellectual disabilities in 3 different groups of 3 people, aged 9-11 years, attending the Special Education and Rehabilitation Center in a central district of Istanbul. Participating students were asked to have the following conditions: (a) having been diagnosed with moderate intellectual disability, (b) fulfilling instructions of at least 2-3 words, (c) imitating movements, (d) not having behavioral problems, (e) landing movement ability to perform bending, falling, coming and hand movements, (f) not having any additional commorbite. Teachers and parents of children with moderate intellectual disability who had suitable prerequisites were informed about the study by interviewing the rehabilitation center where they received support education services to determine the participants. Among the children whose prerequisites were suitable and whose informed consent form was filled out by their parents,

the children who would be included in the study by impartial assignment were determined. Afterwards, a child information form was filled in for the teachers of the children who will participate in the research. The characteristics of the children included in the study are shown in Table 1.

Table 1. General Characteristics of the Children Included in the Study

Participant	Gender	Age	Year of Special Education	School Level
Group 1				
P1	Girl	9	4	Special Education Classroom
P2	Boy	9	5	Special Education Classroom
P3	Girl	10	5	Separate Education Environment
Group 2				
P4	Boy	11	8	Special Education Classroom
P5	Boy	11	6	Separate Education Environment
P6	Girl	10	6	Separate Education Environment
Group 3				
P7	Girl	10	3	Special Education Classroom
P8	Girl	9	4	Special Education Classroom
P9	Boy	10	4	Special Education Classroom

Practitioner and Observer

The practitioner who carried out the research works as a faculty member at Canakkale Onsekiz Mart University, Faculty of Education, Department of Special Education. Practitioner has a previous history of providing systematic instruction for the Direct Instruction Model. In order to collect the application and inter observer reliability data of the research, two observers, one with a graduate degree and the other with a special education teacher, who had a previous systematic teaching background for the Direct Instruction Model, were assigned. Observers were given a one-hour training in which necessary information about the research was conveyed and how to code each item in the observation system was explained with examples. After the training, the observers were made to watch two video recordings from each session of the research until at least 80% agreement was achieved in their coding. Observers met the 80% criterion in two sessions. Inter observer reliability was calculated using the formula "Reliability= [Consensus/ (Agreement + Disagreement)]x100" (Erbas, 2012). During the trainings, the mean inter observer reliability (IOR) coefficient was calculated as 97% (range = 95-98) for baseline sessions and 89% (range = 86-94) for practice sessions.

Experimental Process

In the research, the skill analysis of the butterfly round to be taught was made according to the forward chain method and a measurement tool was prepared in this context. The experimental process of the research consists of baseline, full probe, daily probe, teaching, maintenance and generalization sessions. Probe session data were collected according to the single opportunity method by applying

the butterfly round skill measure tool. In order to teach the butterfly round skills to each group, a "Round Teaching Plan" was prepared for the three stages of the Direct Instruction Model: (a) being a model, (b) guided applications and (c) independent applications, and a preliminary practice was made. Before the experimental application of the research, the prerequisite skills (movements of the round) of the participants were evaluated and the movements (landing movement, happiness movement, bending movement, falling to the ground, sighing movement, coming movement, giving hand movement and rescue movement) which are included in the skill analysis of the butterfly round were taught. During these teachings, the movements were directly modeled and the hint was withdrawn, allowing the participants to reach independence in the movements. After all the participants achieved independence in the movements of the butterfly round, the experimental process (data collection process) of the research was started.

While applying the multiple probe model with probe phase between subjects, baseline data (at least five sessions) is collected simultaneously from all participants before the application. At the baseline level, after the data stabilizes, the planned intervention is performed in the first participant and no data is collected from the other participants. After the criterion is met in the first participant, the intervention is terminated for the first participant. After the intervention is terminated in the first participant, full probe data is collected simultaneously with the other participants and the second participant is intervened. The intervention is repeated similarly to the other participants (Dunlap, 2011; Tekin-İftar, 2018). Experimental control in this study was provided by the fact that there was a change in the level of butterfly round skills of the first subject group whose teaching was started, and there was no difference in the level of butterfly round skills of the other subject groups whose teaching was not started.

All sessions were held for 2 hours, 3 days a week, in the hall of the rehabilitation center where group activities were held. Food reinforcers such as pretzels and core reinforcers were used in the subjects' baseline, daily probe, practice, maintenance and generalization sessions. In all sessions of the research, a continuous reinforcement schedule was used in the practice sessions. Reinforcers that could be effective in the research process for the subjects were determined by obtaining the necessary information from the family and the teachers of the subjects.

In all sessions of the research, before the session, the participants were asked whether they needed wc and water, and it was tried to prevent negative situations that may arise during the study. Afterwards, the practitioner reminded the subjects of the rules of the study (eg, during this study, there are some rules that I want you to follow: he will look when I say look, he will do when I say do, he will watch when I say watch) and then "now we will play the butterfly play with you, I see you ready to play this game" He drew the attention of the participants to the study.

Baseline Sessions

Before the baseline sessions, the researcher had a short conversation with the participants and motivated the participants to study. Afterwards, the researcher explained the rules by saying, "Today we are going to play a game with you, there are some rules that I want you to follow during this study": for example, you will look when I say look, you will play when I say play, and then the reward (e.g., pretzel) that your participants will receive if the rules are followed) has been explained. After the researcher said "I see you ready to work", he turned on the music of the butterfly round and presented the target stimulus (eg, play the butterfly play). 5 seconds after the target stimulus is given. Participants were expected to start playing the butterfly round, and if the children's play skills were correct, the researcher coded the relevant box in the data form as (+). If the children did not respond or gave an incorrect response after the target stimulus (instruction) was given, the researcher coded the relevant steps in the data form as (-). At the end of the baseline session, the researcher reinforced the participants' working behaviors by describing them (eg, well done, you looked when I said look, you played when I said play) and the participants were given the reward that was said before the study.

Full Probe and Daily Probe Sessions

Data in full probe sessions were collected in a similar way to baseline sessions. The collective probe session was organized for all participants after the practice session was completed with the first group of participants. The third and last full probe session was held for all participant groups after the teaching of the last participant group was completed. Full probe sessions were held simultaneously with each participant group.

After the first practice session, daily probe sessions were held before each practice session. Daily probe sessions were conducted as in the baseline level sessions (a study was said to be done, the rules were told, the materials were introduced, the reward was explained). In the daily probe sessions, after the correct responses of the participants were marked as (+) and the incorrect responses and unresponsive steps were marked as (-), the daily probe sessions were ended by giving a reward to the participants. Daily probe sessions continued until 100% correct response was received in three consecutive sessions regarding the target play. Correct response percentages in the sessions were calculated by dividing the number of correct steps by the total number of steps and multiplying by 100 (Tekin-İftar & Kırcaali-İftar, 2012). In the daily probe sessions, all correct responses of the participants were reinforced with a continuous reinforcement schedule, and wrong responses were ignored. Daily probe sessions were conducted separately at all stages of the direct instruction model.

Practice Sessions

The practice sessions of the research were carried out at the stages of being a model, guided practices and independent practices, which are the stages of the Direct Instruction Model. After obtaining stable data at the baseline level, the practice sessions were started with the first participant group. In the practice sessions, the practitioner tried to prevent the negative situations that would arise during the teaching by asking whether the participants needed wc and water before starting the sessions, as at the baseline level. Then, before starting the teaching, the researcher briefly chatted with the participants (eg, hello, how are you today) and drew the participants' attention to the play. Afterwards, the participants were reminded of the rules, the prize was told, and then we will play the butterfly play with you, now I see you ready to play, and the participants' attention was drawn to the study. Then, the main instruction of the play in the form of play the butterfly play was presented by the practitioner. The practitioner waited for the participants to do the steps that they could do independently, the play and music were stopped for the children who could not do the steps, the children's positions were returned to the previous position and the model was modeled for the movement that could not be done. For example, the teacher is accompanied by music, children look at me and watch me carefully, well done, you are watching very well. I open my arms to the sides, now you open your arms to the sides, well done, you opened it very well. Now I move my arms up and down, now you move your arms up and down like me. Well done, you moved very well. I now put my hands on the daisy and bow my head, now you, like me, put your hands on the daisy and bow your head. It is a model for children who cannot do the movements by saying, "Well done, you landed on the daisy very well." In the guided practices step, in the movements that the participants could not do, the researcher provided reminders for the movement without a model and made the participants do the movement. While the correct responses of the participants were recorded, in the wrong responses, the participants were remodeled by returning the previous position of the play. In the guided practices phase, after enough teaching attempts were made, the independent implementation phase was started. At this stage, the main instruction of the skill is presented (eg, play the butterfly round), then reinforced by describing the correct responses of the participants. In case of incorrect responses, a reminder tip is presented to the participants by returning to the guided practices phase. The practice sessions lasted until the participants met the 100% criterion for at least three consecutive sessions in their daily probe sessions. The correct responses of the participants were reinforced by describing them with a continuous reinforcement schedule, and their incorrect responses were ignored. Probe (evaluation) data was taken before starting each new practice session. Practice sessions were applied similarly in the guided and independent practices stages of the Direct Instruction Model.

Maintenance and Generalization Sessions

It was carried out 7, 14 and 21 days after the end of the last probe sessions, which were held after the end of the practice sessions, to examine the level of protection of the butterfly round play skills of the participants. No tips were given to the participants in any of the maintenance and generalization sessions. The correct responses of the participants were coded as (+) and incorrect responses (-), and at the end of the session, the correct responses and working behaviors of the participants were described and reinforced.

The generalization sessions of the research were carried out after the last full probe session at the end of the teaching. Generalization data was made in the form of generalizing to the environment and the presence of other people. In the research, generalization sessions were carried out with a different teacher in a different educational environment. In the generalization sessions, the correct responses of the participants were described and reinforced. Incorrect responses were ignored, and the generalization sessions were terminated without saying anything. In the generalization sessions, the correct responses of the participants were recorded as (+), the wrong responses and non-reactions were recorded as (-).

Data Collection Tools

In this study, three different data were collected, namely effectiveness, reliability and social validity. Within the scope of the research, data form, social validity and reliability data forms were developed for each of the student demographic information form, baseline, practice, maintenance and generalization sessions. Within the scope of effectiveness data, a data collection form was developed for baseline, daily probe, full probe, practice, generalization and maintenance session. Within the scope of reliability data, inter observer and practice reliability data forms were developed.

Baseline, diary probe, full probe, generalization and maintenance session data collection tool used butterfly round skill analysis in order to observe the change in the participants' butterfly round skills. The data form for baseline, diary, full probe, generalization and observetion consists of sections in which the butterfly round skill steps presented as notifications, the criterion and the child's reactions will be recorded. In order to collect the social validity data of the social validity data collection tool, the opinions of two experts were taken for the social validity data form developed by the researcher for teachers. The social validity data form was finalized in the teacher social validity data form, consisting of 10 open-ended questions (eg., Do you think that the skills taught to your student will contribute positively to other games?; Would you consider teaching different games or skills in the classroom and school environment by learning the Direct Instruction Model?), in line with expert opinions. The social validity data were obtained in the rehabilitation center where the teachers worked, and each interview lasted an average of 16 minutes. Reliability data form, in this

study, two different reliability data forms were developed, namely application and inter observer reliability. The application reliability data form consists of a total of 19 items in four parts: preliminary preparation, preparation for teaching, teaching and end of teaching.

Analysis of Data

In the study, the data were analyzed under three different headings: effectiveness, reliability and social validity. In the study, effectiveness data were collected at (a) baseline level, (b) practice, (c) maintenance and (d) generalization sessions. The data in the sessions were analyzed using the (Number of Correct Responses/Total Number of Responses) x100 formula (Bilmez & Tekin-İftar, 2014). In single-subject studies, data were analyzed graphically and data paths were interpreted. In this context, the number of sessions on the horizontal axis and the percentages of correct responses regarding the skill levels of the butterfly round are on the vertical axis.

Reliability Data

In order to calculate the reliability coefficient between the practice and the observer in the research, 30% of the video recordings of all sessions were determined by impartial assignment and the video recordings were watched. While calculating the application reliability coefficient, the formula "observed practitioner behavior / planned practitioner behavior X 100" was used. The reliability coefficient for the application of the butterfly round was calculated as 100% for the baseline level, 97% for the daily probe sessions, 91% for the full probe sessions, 94% for the generalization session, and 90% for the maintenance session. Consensus/ (consensus + disagreement) x 100 formula was used to calculate the inter observer reliability coefficient. Accordingly, the inter observer reliability coefficient was calculated as 100% for the baseline level, 95% for the daily probe sessions, 90% for the full probe sessions, 92% for the generalization session and 90% for the maintenance session.

Effect Size Value

The effect size value of this study was calculated using the Tau-U method, which is one of the non-overlapping data-based methods. The Tau-U value is defined as the ratio of the number of overlapping data pairs obtained as a result of comparing the baseline data points with the data points at the practice stage, and the value obtained by subtracting the non-overlapping data pairs to the total number of data pairs compared (Parker et al., 2011; Rakap, 2015; Rakap et al., 2020). Briefly, Tau-U is a method used to measure non-overlapping data between baseline and practice phase (A and B). The formula [(Kendall correlation number (S) / Total number of pairs) x 100] is used to calculate the Tau-U value (Rakap, 2015). It is emphasized that the Ta-u value obtained as a result of the calculations should be between 0 and 1 (Rakap et al., 2020). Accordingly, if the Tau-U value is between 0 and 0.65, it indicates a low level of effect, between 0.66 and 0.92 a medium level of effect, and a value of 0.93 and above indicates a high level of effect (Parker et al., 2011; Rakap et al., 2020).

In this study, the effect size Tau-U value was calculated using the calculation engine at the http://singlecaseresearch.org/calculators/tau-uwebaddress As a result of the calculation, the effect size of this study was calculated as Tau-U value of "1". The Tau-U value shows that the effect of the Direct Instruction Model in the teaching of butterfly round skills is high compared to the initial level.

Results

In this section, the findings regarding the effectiveness, generalization, continuity and social validity of the Direct Instruction Model in teaching butterfly round skills to children with moderate intellectual disability are included. In this context, the findings of the research are summarized under two main headings: effectiveness and social validity.

Findings Related to Efficiency Data

In this section, the data collected in the baseline, full probe, practice, generalization and maintenance sessions regarding the butterfly round skill levels of the three groups included in the study are shown in Figure 1. Sessions of the research are indicated on the horizontal axis in the graph, and the response percentages related to the butterfly round skill are indicated on the vertical axis in the graph. Daily probe sessions were held before the practice sessions in order to structure the research's withdrawals of being a model (guided practices and independent practices). In addition, the number of sessions regarding the experimental process of the research and how long the sessions lasted are shown in Table 2.

Table 2. Number of Sessions and Duration of Butterfly Round Skill

Participant	Baseline		Practice Session		Full Probe		Maintenance		Generalization	
	No.	*Time*	*No.*	*Time*	*No.*	*Time*	*No.*	*Time*	*No.*	*Time*
Group	5	8,05	6	84,25	12	48,08	3	9,08	2	7,17
Group	5	7, 47	8	70,27	12	49	3	9,56	2	6,15
Group	5	8,17	7	68,27	12	53,28	3	8,13	2	7,01
Total	15	24,09	21	223,2	36	150,4	9	27,49	6	20,33

Note. time is expressed in minutes. No.= represents the number of sessions.

The baseline level sessions of the butterfly round teaching process average 1.53 minutes for the first group. It took 1.49 minutes for the second group. It took 1.55 minutes for the third group. it took. Practice sessions average 14.04 minutes for the first group. It took 8.78 minutes for the second group. It took 9.69 minutes for the third group. it took. full probe sessions take an average of 4 minutes for the first group. It took 4.08 minutes for the second group. It took 4.44 minutes for the third group. it took. Generalization sessions average 3.38 minutes for the first group. It took 3.07 minutes for the second group. It took 3.30 minutes for the third group. it took. Maintenance sessions average 3.02 minutes for the first group. It took 3.18 minutes for the second group. It took 2.71

minutes for the third group. it took. The change in the butterfly round skill levels of the participants is shown in Figure 1.

Before starting the practice in the first group, five session baseline data were collected for the butterfly round play. In the first group, the starting level in the butterfly round play is 0% for all participants. With the determination of the baseline level, teaching started in the first group. In the practice sessions, the first participant among the group members was 50% in the first session, 75% in the second session, 90% in the third session; second participant in the first session 65% in the first session, 80% in the second session, 90% in the third session; the third participant received 70% in the first session, 85% in the second session, 90% in the third session; all participants met the 100% criterion in the last three sessions. In the first group, the practice sessions were completed in six sessions.

After the completion of the practice sessions in the first group, full probe data were collected in all three groups. In the second group, with the stability of the baseline data, the practice sessions were started. In the second group, the baseline data of all participants was measured as 0%. In the practice sessions, the first participant among the group members was 65% in the first session, 85% in the second session, 95% in the third session; 100% in the fourth session; 95% in the fifth session; second participant in the first session 75% in the first session, 90% in the second session, 90% in the third session; 95% in the fourth session; the third participant received 70% in the first session, 80% in the second session, and 95% in the third session; 90% in the fourth session; all participants met the 100% criterion in the last three sessions. Practice sessions for the second group were completed in eight sessions. In the practice sessions, the practitioner played the butterfly round play with the participants.

Following the completion of the practice sessions in the second group, full probe sessions were held for all participants. The baseline data of the participants in the third group is 0%. After the baseline data showed stability in the third group, practice sessions were held for the third group. In the practice sessions, the first participant among the group members was 65% in the first session, 75% in the second session, 85% in the third session; 100% in the fourth session; 70% of the second participant in the first session, 80% in the second session, 90% in the third session; 95% in the fourth session; third participant 75% in the first session, 85% in the second session, 95% in the third session; 90% in the fourth session; all participants met the 100% criterion in the last three sessions. Practice sessions for the third group were completed in seven sessions.

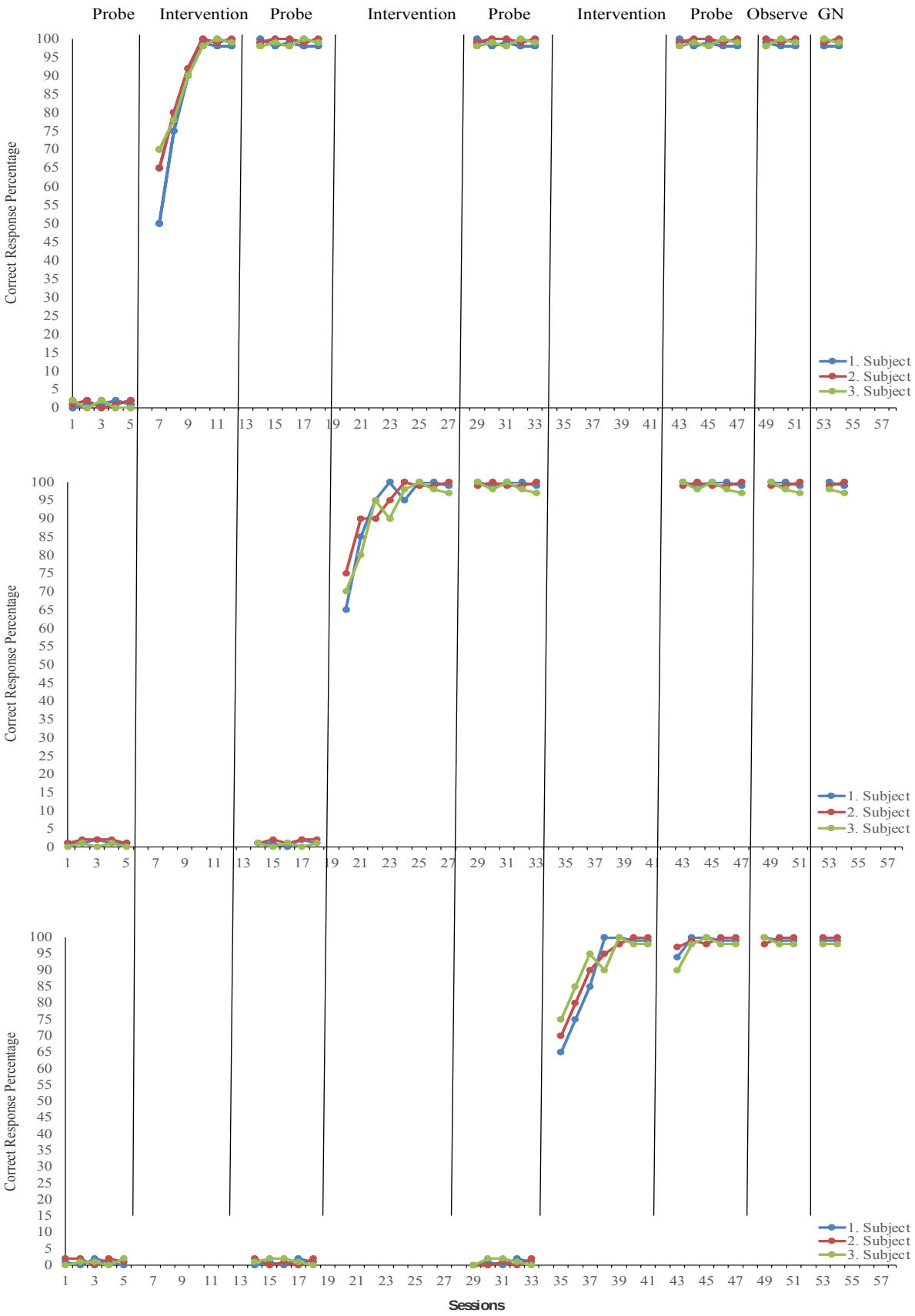

Figure 1. Correct response percentages for butterfly round skill collective probe, daily probe, monitoring, and generalization sessions

Maintenance and Generalization Data

In the study, maintenance (MA) and generalization (GN) data were collected from all participants. In the study, maintenance data were collected 7, 14, and 21 days after the last group probe sessions of the butterfly round. The correct response level of the participants in the maintenance sessions is 100% for all participants. In the research, generalization sessions were also held with different environments, different times and different people. While the performance of the participants in the generalization sessions was 0% for all participants in the pre-test collected before the instruction, it was 100% for all participants in the post-test session. These results of the study show that all participants in the study were able to generalize the butterfly rondel to different environments, times and people.

Social Validity

Social validity data were collected from the teachers of the participants included in the study. Social validity data showed that teachers' views on the Direct Instruction Model were positive. All of the teachers answered “yes” to the first six questions about the teaching model used in the research and expressed a positive opinion about the effects of the teaching model on the development of students. In addition, in their answers to open-ended questions, they stated that the effect of the study on the students was positive (eg., it increased their motivation, they participated in the activities more willingly).

Discussion, Conclusion and Recommendations

In this study, it was aimed to determine whether the Direct Instruction Model is effective in teaching butterfly round play skills to students with moderate intellectual disability, whether the skill is preserved 7, 14, and 21 days after the end of the instruction, and whether it can be generalized to different environments, times, and people. Within the framework of this purpose, the effects of the method used in the research on children and the opinions of teachers about the method (social validity) were determined. The research findings show that the Direct Instruction Model, which was used to a limited extent in teaching play skills to children with intellectual disabilities, was effective in teaching butterfly round play skills to students with moderate intellectual disability, and that the participants continued their butterfly round play skills 7, 14, and 21 days after the end of the instruction showed that all of the participants were able to generalize their round play skills to different environments, times and people. In addition, the teachers of the students included in the study also expressed positive opinions about the teaching model used in the research and the changes on their students.

At the end of the instruction with the Direct Instruction Model, it is observed that there is an upward increase in the slope of the data obtained about the butterfly round play skills compared to the

baseline level. In other words, it shows that the instruction with the Direct Instruction Model is effective in reaching the 100% level for three participants in each group in the teaching of butterfly round play skills. The number and duration of sessions held in order to reach the targeted level of independence in teaching butterfly round play skills differ between groups. In this context, six practice sessions were held in the first group, eight in the second group, and seven in the third group. The same number of practice sessions took place for the participants in the same group. It can be said that the reason for this and the low number of practice sessions is that the clue presented to a child in the group is also instructive for other children, they model their play skills from each other during the play, and the practitioner plays together in the play. While the duration of the groups' initiation, full probe, maintenance and generalization sessions are similar, the duration of the practice sessions differs. Accordingly, the first group's practice sessions are 84.25 minutes, the second group's practice sessions are 70.27 minutes, and the practice sessions of the third group are 68.27 minutes. it took.

The findings show that while there is a gradual increase in the correct response levels of the participants in the first and second groups, there is a small decrease in the correct response level of the first and second participants from the third group after the first session, an increase in the maintenance sessions, and a gradual increase in the third participant. It can be said that the change in the skill levels of the participants is rapid. It can be said that the participants' previous special education background supports the acquisition of butterfly round play skills. The generalization data of the study showed that the butterfly round skill, which was taught, could be generalized to different environments, times and people in all participants. The results of the study show that the Direct Instruction Model is effective in teaching comprehensive play skills such as round to individuals with intellectual disabilities in different age groups, the skill is maintained after the end of the teaching and the play-based skills can be generalized to different environments, times and people (Elinc & Kaya, 2016; Guzmán et al., 2020; Matson, 2007; Odluyurt, 2013; Ramdana & Sari, 2020; Sagotsky, 1981; Smith, 2015) and other research findings in which different skill concepts are taught using the Direct Instruction Model (Dagseven Emecen, 2011; Ekergil, 2010; Kesci, 2014; Turer, 2010; Yenioglu, 2019; Yikmis & Varol Ozcakir, 2019; Yozgat et al., 2018; Zepeda et al., 2015).

The answers given by the teachers to the questions in the social validity data form in the research show that their views on the effectiveness of the teaching model used in the research and its effects on children's development are positive, the motivation of the children increases after the teaching, and they are willing to participate in other educational activities. This output in the social validity data of the study is also emphasized by some researchers (eg, Pratt, 1991) in the literature. Pratt (1991) states that providing musical skills to individuals with special needs increases the success and motivation of these children, their self-confidence and they participate willingly in other activities. Considering the social validity data of the research, it can be said that the social validity of the research is high. It can be thought that the determination of the reinforcers used in the research in

line with the opinions received from the children and teachers supports the participation of the participants in the study (Sewell et al., 1998). The results of this research and other studies in the literature show that (a) Direct Instruction Model is a scientifically based method that can be applied systematically and its effectiveness has been proven once again, (b) Direct Instruction Model, which was used at a limited level in teaching play skills to children with intellectual disabilities is effective, (c) teachers working with children with intellectual disabilities can easily use the Direct Instruction Model. In addition, it is thought that reinforcing the correct responses of the participants with a continuous reinforcement schedule until the criterion is met in the practice sessions of the research helps to prevent the emergence of inappropriate behaviors that may occur during teaching and increases the interaction between the participant and the practitioner. In addition, the fact that the research was conducted with nine participants affected by moderate intellectual disability provided a significant advantage in supporting the external validity, in other words, the generalizability of the research results. However, it is thought that testing the teaching model used in the research with children affected by different inadequacies in supporting comprehensive play skills such as round and other play skills will both strengthen the external validity and contribute to obtaining more evidence regarding the teaching model. For this reason, more research is needed to support the play skills of children with intellectual disability, and it is recommended to compare the Direct Instruction Model and another teaching method in terms of effectiveness and efficiency in teaching chained skills.

In studies using single-subject experimental designs, the number of group studies is limited. For this reason, it can be considered as an advantage to include group training in the research. In addition, it is stated that the organization of practice sessions in one-to-one teaching is a waste of time and creates a limitation in its implementation in general education environments (Yucesoy-Ozkan & Gursel, 2006). In this context, it can be said that the planning and execution of the research as a group study prevents the loss of time that may occur in practice sessions and supports the effective use of this teaching model in general education environments.

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