The Effectiveness of the Constant Time Delay Procedure in Teaching Pre-school Academic Skills to Children with Developmental Disabilities in a Small Group Teaching Arrangement

Ozgul ALDEMIR[a]
Anadolu University

Oguz GURSEL[b]
Anadolu University

Abstract

Children with developmental disabilities are trained using different teaching arrangements. One of these arrangements is called small-group teaching. It has been ascertained that a small-group teaching arrangement is more effective than a one-to-one teaching arrangement. In that sense, teaching academic skills to pre-school children in small-group arrangements is crucial in order to make them ready for their future educational environment. Considering this, the present study investigated the effectiveness of the constant time delay procedure in teaching pre-school academic skills to children with developmental disabilities in a small group teaching arrangement. It was also examined to what extent learning through observation can be achieved using the small-group teaching arrangement with a constant time delay. The study was conducted using four children with developmental disabilities between the ages of four and six. The multiple probe design across behaviors was applied individually to the four subjects in the study. The findings indicated that the use of constant time delay teaching in small-group arrangements was effective for children with developmental disabilities in teaching different pre-school academic skills using different stimuli. Furthermore, it was observed that the children acquired the skills more precisely through observational learning.

Key Words
Constant Time Delay Procedure, Developmental Disability, Observational Learning, Pre-school Academic Skills, Small Group Teaching Arrangement.

Pre-school education has significant effects on children's learning abilities and their academic achievements, and thus they provide great contributions with their transition to educational environments (Diken, 2009; Gürkan, 2006; Güven & Efe-Azkeskin, 2010; Lerner, Lowenthal, & Egan, 2003). Preschool education contributes to a child's mental development. As is already known, cognitive development is defined as the development of mental activities which enable children to learn and understand their environment (Senemoğlu, 2001). Cognitive development is related to and cooperates

with all developmental areas. Moreover, cognitive development covers mental development as well (Yücesoy-Özkan, 2008). One of the cognitive skills included in the pre-school education program is functional academic skills. With the teaching of academic skills, one aim is to determine and teach the skills which are functional for the children (Batu, 2003).

Different teaching arrangements are used to teach the skills that children with developmental disabilities need. The common teaching arrangement for children with developmental disabilities is the one-to-one teaching arrangement (Collins, Gast, Ault, & Wolery, 1991). One-to-one teaching is a structured arrangement in which the child has the chance to react with the teacher and be reinforced when they respond correctly (Duker, Didden, & Sigafoos, 2004). It is widely accepted that children with developmental disabilities need early education and one-to-one teaching (Colozzi, Ward, & Crotty, 2008). However, the one-to-one teaching arrangement has some limitations. For instance, this arrangement has high costs in terms of personnel and time. Additionally, it does not offer opportunities for positive peer-model and observational learning. Thus, the one-to-one teaching arrangement can also cause some limitations in terms of instructional and social integration/interactivity. In this context, for the child who does not need one-to-one teaching urgently and whose education needs can be satisfied in a small group, a small-group teaching arrangement can be offered (Collins et al., 1991; Ledford, Gast, Luscre, & Ayres, 2008; Tekin-İftar, 2009).

Small-group teaching is an effective and efficient arrangement for children with developmental disabilities (Collins et al., 1991; Colozzi et al., 2008; Gürsel, Tekin-İftar, & Bozkurt, 2004, 2006; Ledford et al., 2008; Taubman et al., 2001; Tekin-İftar & Birkan, 2010; Parker & Schuster, 2002; Wolery, Ault, & Doyle, 1992). This arrangement can offer different learning opportunities such as the acquisition of instructive feedback and observational learning (Collins et al., 1991; Colozzi et al., 2008). Moreover, in a small group teaching arrangement, children have the chance to learn in a more natural classroom environment as well as to improve their social and behavioral skills in this environment (Schoen & Ogden, 1995; Taubman et al., 2001).

The constant time delay procedure is one of the near-errorless teaching strategies used to teach discrete tasks and chained skills to children with different ages and disabilities (Kırcaali-İftar, Ergenekon, & Uysal, 2008; Roark, Collins, Hemmeter, & Kleinert,

2002; Rogers, Hemmeter, & Wolery, 2010; Yıldırım & Tekin-İftar, 2004). In literature, there are some findings which indicate how effective the constant time delay procedure can be when used with different teaching arrangements such as one-to-one teaching (Bozkurt & Gürsel, 2005; Kırcaali-İftar et al., 2008; Koscinski & Gast, 1993) and small-group teaching (Campbell & Mechling, 2009; Ross & Stevens, 2003; Wall & Gast, 1999).

Additionally, there are some studies on teaching discrete and chained skills using the constant time delay procedure within small observational learning groups. In those studies, teaching skills such as pronouncing letters, telling the time, recognizing art and geography terms, reading functional words, writing the spelling of dictated words, gift packaging, preparing drinks, cleaning, folding clothes, and preparing envelopes was examined. These studies confirmed that teaching both discrete tasks and chained skills within a small-group arrangement is effectively taught using the constant time delay procedure (Campbell & Mechling, 2009; Falkenstine, Collins, Schuster, & Kleinert, 2009; Ledford et al., 2008; Ross & Stevens, 2003; Schoen & Ogden, 1995; Stonecipher, Schuster, Collins & Grisham-Brown, 1999; Wall & Gast, 1999; Wolery, Ault, Gast, Doyle, & Griffen, 1991). In the studies conducted for small group teaching arrangements, all groups can be taught either the same skills or different skills as well (Collins et al., 1991; Fickel, Schuster, & Collins, 1998).

The studies in which both small-group teaching arrangements and constant time delay procedures were applied simultaneously generally include elementary school children. Only two studies were conducted with pre-school children (Campbell & Mechling, 2009; Schoen & Ogden, 1995). It has been widely ascertained that teaching academic skills to children with developmental disabilities during the pre-school period is critical in preparing them for their future educational environments (Odluyurt & Batu, 2010). On the other hand, there is an urgent need for studies to examine the effectiveness of the constant time delay procedure for teaching discrete tasks and chained academic skills (Dogoe & Banda, 2009; Odluyurt & Batu, 2010).

For this purpose, the following research questions were addressed:

1. Is the constant time delay procedure, when applied in a small-group teaching arrangement, effective for teaching children with developmental disabilities different pre-school academic skills using different stimuli?

2. Will children maintain the acquired behaviors over time (1, 3, and 4 weeks after training)?

3. Will children generalize the acquired behaviors across different settings, materials and people?

4. Will children acquire the target behaviors of their partners through observational learning?

5. Will the performance of a developmentally disabled child's target pre-school academic skills in the study approach the performance level of normally developed children in that same age group?

Method

Participants

Four children with developmental disabilities, three boys and one girl between the ages of four and six, participated in the study. Three of the participants were diagnosed with Down syndrome, and one of them was diagnosed with pervasive developmental disorder. The social validity in this study was evaluated by comparing the performance levels of the children's target skills and their peers' performance levels. For each child with a developmental disability in the study, three normally developed peers attending general education schools were also included.

Setting and materials

As the materials for this study, flashcards and photos prepared for each participant were used. The study was conducted at Anadolu University Research Institute for the Handicapped, Unit for Children with Developmental Disabilities.

Experimental Design

To investigate the effectiveness of the constant time delay procedure when applied to a small group teaching arrangement for teaching preschool academic skills, one of the single subject research designs, the multiple probe design across behaviors, was used and replicated with each of the four subjects (Tekin-İftar, 2012).

Dependent and Independent Variables

The dependent variables of the study were the children's correct response levels regarding pre-school academic skills taught in the study. The independent variable was the constant time delay

procedure applied to a small group arrangement for teaching pre-school academic skills. The target skills for each participant are presented in Table 1.

Table 1.
Target Skills Taught to Each Child

Children	Target Skills
Defne *(Peer: Bulut)*	Pointing at the different ones among the geometrical shapes Pointing at the fewest/least one Pointing at the last one
Bulut *(Peer: Defne)*	Pointing at the fat one Pointing at the thick one Pointing at the old one
Toprak *(Peer: Kayra)*	Pointing at the full one Pointing at the half one Pointing at the one outside
Kayra *(Peer: Toprak)*	Pointing at the musical instruments (Maracas, Tambourine , Flute) Pointing at the symbols of "+", "-", "=" Pointing at the numbers of 2 - 3 -4

General Procedures

The general procedures of the study consisted of baseline, training, full probe, observation and generalization sessions. Teaching sessions were conducted in a small-group teaching arrangement while the rest of the sessions were carried out via one-to-one teaching. The criterion was to have 100% correct responses before prompting for the three consecutive sessions. After this criterion was fulfilled for each skill, maintenance data was collected after one, three and four weeks. Furthermore, to collect generalization data for the study, pre-tests were conducted on the children soon after the baseline sessions were completed, then post-tests were given after the third full probe sessions. During the procedures, each child was taught three pre-school academic skills.

Baseline Sessions

The baseline data was collected until stable data was recorded for at least three consecutive sessions. Then, teaching the first skill to all of the children started. During the baseline sessions, no prompt for a correct response was given to the children. Four seconds was the waiting time for a child's response to skill instruction. Three seconds were allocated between the trials. Children's correct responses were reinforced verbally while their wrong reactions were ignored. At the end of the session, children's cooperative behaviors were reinforced verbally and with food rewards.

Training Sessions

After the children's baseline performances were determined, constant time delay procedures were started. The controlling prompts for all children were model and verbal prompts. During the small-group teaching arrangements, teachers used individual criterion to evaluate whether children acquired the skills. In one session, training for four children's skills was presented. Only the first session of all skills was conducted with 0 second trials. The delay interval for the prompts during the constant time delay procedures was determined to be 4 seconds. Teachers at the training sessions presented the attention-grabbing prompts to the participating child and his peer.

Full Probe Sessions

The full probe sessions are designed to test all target skills simultaneously. The full probe sessions were conducted for children who fulfilled the criteria successfully during the three sessions, and these full probe sessions covered all the skills of the child. During these sessions, the same process as the baseline sessions was followed.

Observational Learning

The study also investigated to what extent observational learning occurred. Therefore, data from each child and peer was collected regarding the target behaviors. To determine a child's performance in observational learning, data was collected from both the baseline session and one session from the student's peer's skills. This was conducted soon after the full probe sessions. Again, the same process as the baseline sessions was followed.

Investigation Sessions

During the research process, one child from each pair learned faster than the other child. In other words, one child from the pair learned all skills while the training of the other child just continued. In this case, since teaching the last skill to the slower child had not yet started, they could not do any observing in the last full probe session for the faster child, so their correct response to observational learning was found to be 0%. To avoid this situation, after the slower child fulfilled all criteria for all skills, one more session for all skills of the pair was conducted for the faster child. In these investigation sessions, the process of the baseline session was again followed.

Generalization and Maintenance Sessions

The maintenance sessions were conducted one, three and four weeks after the end of the training sessions in order to determine to what extent the children acquired their skills. The generalization sessions were carried out in the different group teaching classroom of the Research Institute for the Handicapped, Unit for Children with Developmental Disabilities, with different materials and with a different teacher through a one-to-one teaching arrangement. The same process was followed during the generalization and follow-up sessions.

Social Comparison Probe Sessions

Social validity is usually evaluated in terms of subjective evaluation and social comparison. Social comparison is comparing the performances of the individuals under investigation with their peers (Kurt, 2012; Vuran & Sönmez; 2008; Wolf, 1978). In this study, social validity was determined by comparing the children's performances of the target skills with their peers' performances. In order to investigate the social validity in the study, social probe sessions were conducted for the normally developed peers after the research was over. The extent to which the performances of the children with developmental disabilities approached the performances of normally developed children was examined. The process of the social comparison probe sessions was the same as process of the baseline sessions with developmental disabilities.

Data Collection and Analysis

In the study, inter-observer reliability and treatment integrity data were collected from thirty percent of the sessions. Randomization was applied to determine from which session reliability data was collected. Then, a point by point method with a formula {(number of agreements/(number of agreements + disagreements)) *100} was used to calculate inter-observer reliability (Erbaş, 2012). In this study, the inter-observer reliability of the baseline, training, full probe, generalization and observational learning sessions for all children was calculated at 100%. Procedural reliability was calculated by dividing the number of observed teacher behaviors by the number of planned teacher behaviors, and multiplied by 100 (Erbaş, 2012). In the same vein, the treatment integrity obtained from the baseline, training, full probe, generalization and observational

learning sessions for all children was calculated at approximately 100% (range: 99%-100%). Moreover, the inter-observer reliability and treatment integrity of the social comparison probe sessions, which were arranged to collect the social validity data through social comparison of children with developmental disabilities to normally developed children, were also calculated at 100%.

Results

The findings of the study indicated that all participants performed well to fulfill the criteria for the target skills. Although children's performances on observational learning differed, it was ascertained that children had observational learning rates of approximately 95%, and observational learning was effective in the small-group teaching arrangement (range: 88%-100%). When the data from the maintenance sessions was examined, it was seen that all children had 100% correct responses towards all skills. On the other hand, the data from the generalization sessions indicated that the children averaged 99% correct responses towards all skills (range: 96%-100%).

When the study was over, the social comparison probe sessions involving children with developmental disabilities against normally developed children were arranged to determine the performance levels regarding the same pre-school academic skills. In this context, the social comparison probe sessions showed that peers with typical development performed at the 100% accuracy level. At the end of the study, the children with developmental disabilities also showed good performance in all skills with a 100% accuracy level. In other words, it can be stated that the children with developmental disabilities achieved the same performance levels as their normally developing peers of the same age range for the target pre-school academic skills in the present study.

Discussion

The findings of the study had similarities with other studies investigating the effectiveness of the constant time delay procedure applied to the small-group teaching arrangement (Campbell & Mechling, 2009; Falkenstine et al., 2009; Ledford et al., 2008; Ross & Stevens, 2003; Schoen & Ogden, 1995; Stonecipher et al., 1999; Wall & Gast, 1999; Wolery et al., 1991).

In the present study, which investigated the effectiveness of the constant time delay procedure applied to the small-group teaching arrangement, a single criterion was used. The individual criterion requires the training to continue until each child reaches the criteria for their own behavior. Additionally, this criterion enables each child to continue at their own pace and the teacher to provide more time to the children who learn faster in the group (Collins et al., 1991). Since the individual criterion was used in this study, in the pair of Defne and Bulut, Bulut learned faster, and in the pair of Toprak and Kaya, Toprak learned his target skills faster. However, when other studies investigating the effectiveness of the constant time delay procedure when applied to a small-group teaching arrangement were examined, it could be seen that group criteria were adapted in most of the studies (Campbell & Mechling, 2009; Ledford et al., 2008; Ross & Stevens, 2003; Schoen & Ogden, 1995; Stonecipher et al., 1999; Wall & Gast, 1999; Wolery et al., 1991). The reason why the group criterion was used can be explained by the fact that the process becomes less complicated for the teacher when all of the children in the group study on the same skills as a result of group criterion (Collins et al., 1991).

In the study, the children with developmental disabilities were taught the different pre-school academic skills in pairs. Considering other studies on the effectiveness of the constant time delay procedure applied to the small-group teaching arrangement, only three studies formed pairs during the research (Ledford et al., 2008; Wall & Gast, 1999; Wolery et al., 1991). In the studies applying the small-group teaching arrangements, it is possible to teach the whole group either the same skills or different skills (Collins et al., 1991; Fickel et al., 1998). In the present study, the children had the opportunity to learn the different skills by observing their partners. Furthermore, out of the eight studies on the effectiveness of the constant time delay procedure applied to a small-group teaching arrangement, only one study taught different academic skills using different stimuli (Falkenstine et al., 2009). In the same vein, the findings of the present study about teaching the different discrete tasks with different stimuli showed consistency with the findings of the other study. Thus, it can be claimed that the results of the present study also support the findings of the other similar study.

When the findings regarding retention were examined, it was observed that children retained the acquired skills after teaching was over. In the

literature, only three studies conducted with the constant time delay procedure applied to the small-group teaching arrangement included the maintenance sessions (Falkenstine et al., 2009; Ross & Stevens, 2003; Wall & Gast, 1999). The findings regarding the retention levels in the present study had parallel findings with the other studies.

Considering the findings about generalization, it was observed that the children could generalize the acquired skills to different settings, materials and people with high accuracy. Likewise, in the similar studies, most of which collected generalized findings, the participating children could generalize at different levels (Falkenstine et al., 2009; Ledford et al., 2008; Ross & Stevens, 2003; Schoen & Ogden, 1995; Stonecipher et al., 1999; Wall & Gast, 1999). In this sense, it can be stated that the findings of the present study have consistency with the results of similar studies on this topic.

Regarding the findings about observational learning in this study, it was realized that children with developmental disabilities could learn the target skills, which were not directly taught, by observing their peers' teaching sessions. According to the findings, although the children's observational learning levels differed, they could learn by observation at a rate of 95%, thus the observational learning in the small-group teaching arrangement was found to be effective (range: 88%-100%). Regarding the differences among children's observational learning levels, the individual differences in learning can be taken into account.

In the literature, there are some studies in which children observed their peers and the whole group observed the target skills. The studies in which the whole group observed the target skills reported that the participating children could learn by observing at different levels but averaged between 56%-77% (Campbell & Mechling, 2009; Falkenstine et al., 2009; Ross & Stevens, 2003; Schoen & Ogden, 1995). On the other hand, there are two studies in which the pair's target skills were observed and those children achieved an average of 92% and 86% accuracy (Ledford et al., 2008; Wolery et al., 1991). Considering these studies, it can be stated that the findings of the present study are consistent with those studies.

It is crucial for the present study to collect social validity data through social comparison in order to determine to what extent the target behaviors taught to the children with developmental disabilities can reach its goal effectively (Kurt, 2012; Vuran & Sönmez, 2008). Thus, social validity was determined by social comparison. The results of the social comparison probe sessions indicated that normally developing peers performed at a 100% level of accuracy. Hence, it could be considered that the pre-school academic skills taught to the children with developmental disabilities in the study were appropriate for their ages and academic levels. In the literature, only two studies on the effectiveness of the constant time delay procedure applied to a small-group arrangement collected social validity data through subjective evaluation (Ledford et al., 2008; Stonecipher et al., 1999). Therefore, it can be taught that the findings of the present study regarding the social validity contribute to the literature as regarding the social comparison evaluation.

The study has some limitations to be considered. First of all, there was no generalization data about the target skills in their natural setting. Secondly, regarding the social validity findings obtained through social compression, the data was collected from only three peers with typical development for each child with developmental disabilities. The data could not be collected from a larger group representing the peers with typical development. Thirdly, the social validity data was limited in collecting the social validity data from social comparison probe sessions arranged only at the end of the research.

On the basis of the findings and experiences at the interventions/sessions, some suggestions for future studies can be offered. Some studies on the effectiveness and efficiency of the constant time delay procedure for small groups involving children of different ages and characteristics for teaching different discrete tasks and chained skills is one suggestion. The number of participants in the social comparison probe sessions can be increased to have better representativeness of the peers with typical development. Moreover, the effectiveness and efficiency of video modeling, activity-based intervention and peer tutoring, which have been used commonly and are defined as recent effective interventions, can be investigated when applied to small-group teaching arrangements for teaching discrete tasks and chained skills.

Author's Note

References/Kaynakça

Batu, S. (2003). İşlevsel akademik becerilerin öğretimi. G. Kırcaali-İftar (Ed.), *Davranış ve öğrenme sorunu olan çocukların eğitimi* içinde (s. 93-108). Eskişehir: T.C. Anadolu Üniversitesi Açıköğretim Yayınları.

Bozkurt, F., & Gürsel, O. (2005). Effectiveness of constant time delay on teaching snack and drink preparation skills to children with mental retardation. *Education and Training in Developmental Disabilities*, *40*(4), 390-400.

Campbell, M. L., & Mechling, L. C. (2009). Small group computer-assisted instruction with smart board technology: An investigation of observational and incidental learning of nontarget information. *Remedial and Special Education*, *30*(1), 47-57.

Collins, B. C., Gast, D. L., Ault, M. J., & Wolery, M. (1991). Small group instruction: Guidelines for teachers of students with moderate to severe handicaps. *Education and Training in Mental Retardation*, *21*, 18-32.

Colozzi, G. A., Ward, L. W., & Crotty, K. E. (2008). Comparison of simultaneous prompting procedure in 1:1 and small group instruction to teach play skills to preschool students with pervasive developmental disorders and developmental disabilities. *Education and Training in Developmental Disabilities*, *2*, 226-248.

Diken, İ. H. (2009). Erken tanılama ve erken eğitim. E. S. Batu (Ed*.), 0-6 Yaş arası down sendromlu çocuklar ve gelişimleri* içinde (s. 401-415). Ankara: Kök Yayıncılık.

Dogoe, M., & Banda, D. R. (2009). Review of recent using constant time delay to teach chained tasks to persons with developmental disabilities. *Education and Training in Developmental Disabilities*, *44*(2), 177-186.

Duker, P., Didden, R., & Sigafoos, J. (2004). *One-to-one training: Instructional procedures for learners with developmental disabilities.* Texas: PRO-ED, Inc.

Erbaş, D. (2012). Güvenirlik. E. Tekin-İftar (Ed.), *Eğitim ve davranış bilimlerinde tek-denekli araştırmalar* içinde (s. 109-129). Ankara: Türk Psikologlar Derneği Yayınları.

Falkenstine, K. J., Collins, B. C., Schuster, J. W., & Kleinert, H. (2009). Presenting chained and discrete tasks as non-targeted information when teaching discrete academic skills through small group instruction. *Educational and Training in Developmental Disabilities*, *44*(1), 127-142.

Fickel, K. M., Schuster, J. W., & Collins, B. C. (1998). Teaching different tasks using different stimuli in a heterogeneous small group. *Journal of Behavioral Education*, *8*(2), 219-244.

Gürkan, T. (2006). Okul öncesi eğitimin tanımı, kapsamı ve önemi. Ş. Yaşar (Ed.), *Okul öncesi eğitimin ilke ve yöntemleri* içinde (s. 2-9). Eskişehir: T.C. Anadolu Üniversitesi Açıköğretim Yayınları.

Gürsel, O., Tekin-İftar, E. ve Bozkurt, F. (2004). *Gelişimsel gerilik gösteren öğrencilere eşzamanlı ipucuyla öğretimin küçük grup düzenlemesiyle sunulmasının etkililiği.* (Anadolu Üniversitesi Bilimsel Araştırma Projesi, 2002-2204. Proje No: 020527)

Gürsel, O., Tekin-İftar, E., & Bozkurt, F. (2006). Effectiveness of simultaneous prompting in small group: The opportunity of acquiring non-target skills through observational learning and instructive feedback. *Education and Training in Developmental Disabilities*, *41*(3), 225-243.

Güven, G. ve Efe-Azkeskin, K. (2010). Erken çocukluk eğitimi ve okul öncesi eğitim. İ. H. Diken (Ed.), *Erken çocukluk eğitimi* içinde (s. 2-50). Ankara: Pegem Akademi.

Kırcaali-İftar, G., Ergenekon, Y. ve Uysal, A. (2008). Zihin özürlü bir öğrenciye sabit bekleme süreli öğretimle toplama ve çıkarma öğretimi. *Anadolu Üniversitesi Sosyal Bilimler Dergisi, 8*(1), 309-320.

Koscinski, S. T., & Gast, D. L. (1993). Use of constant time delay in teaching multiplication facts to students with learning disabilities. *Journal of Learning Disabilities*, *26*(8), 533-544.

Kurt, O. (2012). Sosyal geçerlik. E. Tekin-İftar (Ed.), *Eğitim ve davranış bilimlerinde tek-denekli araştırmalar* içinde (s. 375-392). Ankara: Türk Psikologlar Derneği Yayınları.

Ledford, J. R., Gast, D. L., Luscre, D., & Ayres, K. M. (2008). Observational and incidental learning by children with autism during small group instruction. *Journal of Autism and Developmental Disorders*, *38*, 86-103.

Lerner, J. W., Lowenthal, B., & Egan, R. W. (2003). *Preschool children with special needs: Children at risk and children with disabilities.* Boston: Pearson Education.

Odluyurt, S. ve Batu, E. S. (2010). Gelişimsel yetersizlik gösteren çocuklara kaynaştırmaya hazırlık becerilerinin öğretimi. *Eğitim Bilimleri Dergisi, 10*(3), 1533-1572.

Parker, M. A., & Schuster, J. W. (2002). Effectiveness of simultaneous prompting on acquisition of observational and instructive feedback stimuli when teaching a heterogeneous group of high school students. *Education and Training in Mental Retardation and Developmental Disabilities*, *37*(1), 89-104.

Roark, T. J., Collins, B. C., Hemmeter, M. L., & Kleinert, H. (2002). Including manual signing as nontargeted information when using a constant time delay procedure to teach receptive identification of packaged food items. *Journal of Behavioral Education*, *11*(1), 19-38.

Rogers, L., Hemmeter, M. L., & Wolery, M. (2010). Using a constant time delay procedure to teach foundational swimming skills to children with autism. *Topics in Early Childhood Special Education*, *30*(2), 102-111.

Ross, A. H., & Stevens, K. B. (2003). Teaching spelling of social studies content vocabulary prior to using the vocabulary in inclusive learning environments: An examination of constant time delay, observational learning, and ınstructive feedback. *Journal of Behavioral Education*, *12*(4), 287-309.

Schoen, F. S., & Ogden, S. (1995). Impact of time delay, observational learning and attentional cuing upon word recognition during integrated small-group instruction. *Journal of Autism and Developmental Disorders*, *25*(5), 503-519.

Senemoğlu, N. (2001). *Gelişim, öğrenme ve öğretim*. Ankara: Gazi Kitabevi.

Stonecipher, E. L., Schuster, J. W., Collins, B. C., & Grisham-Brown, J. (1999). Teaching gift wrapping skills in a quadruple instructional arrangement using constant time delay. *Journal of Developmental and Physical Disabilities*, *11*(2), 139-158.

Taubman, M., Brierley, S., Wishner, J., Baker, D., McEachin, J., & Leaf, R. B. (2001). The effectiveness of group discrete trial instructional approach for preschoolers with developmental disabilities. *Research in Developmental Disabilities*, *22*, 205-219.

Tekin-İftar, E. (2009). Kaynaştırma uygulamalarında öğretimin planlanması. S. Eripek (Ed.), *İlköğretimde kaynaştırma* içinde (s. 67-83). Eskişehir: T.C. Anadolu Üniversitesi Açıköğretim Yayınları.

Tekin-İftar, E. (2012). Çoklu yoklama modelleri. E. Tekin-İftar (Ed.), *Eğitim ve davranış bilimlerinde tek-denekli araştırmalar* içinde (s. 217-251). Ankara: Türk Psikologlar Derneği Yayınları.

Tekin-İftar, E., & Birkan, B. (2010). Small group instruction for students with autism: General case training and observational learning. *The Journal of Special Education*, *44*(1), 50-63.

Vuran, S. ve Sönmez, M. (2008). Sosyal geçerlik kavramı ve Türkiye'de özel eğitim alanında yürütülen lisansüstü tezlerde sosyal geçerliğin değerlendirilmesi. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi*, *9*(1), 55-65.

Wall, M. E., & Gast, D. L. (1999). Acquisition of incidental information during instruction for a response-chain skill. *Research in Developmental Disabilities*, *20*(1), 31-50.

Wolery, M., Ault, M. J., & Doyle, P. M. (1992). *Teaching students with moderate to severe disabilities: Use of response prompting strategies.* White Plains, NY: Longman.

Wolery, M., Ault, M. J., Gast, D. L., Doyle, P. M., & Griffen, A. K. (1991). Teaching chained tasks in dyads: Acquisition of target and observational behaviors. *The Journal of Special Education*, *25*(2), 198-220.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*, 203-214.

Yıldırım, S. ve Tekin-İftar, E. (2004). Akranların sunduğu sabit bekleme süreli öğretim gelişimsel geriliği olan öğrencilere tanıtıcı levhaların öğretiminde etkili midir? *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi*, *3*(2), 67-84.

Yücesoy-Özkan, Ş. (2008). Bilişsel gelişim destekleme. S. Eripek (Ed.), *Özel eğitim* içinde (s. 201-219). Eskişehir: T.C. Anadolu Üniversitesi Açıköğretim Yayınları.