



THE EFFECTIVENESS OF DIFFERENTIAL REINFORCEMENT OF INCOMPATIBLE BEHAVIOUR (DRI) TO OVERCOME DISRUPTIVE BEHAVIOUR OF INTELLECTUAL DISABILITY STUDENTS

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Abstract:

This research aims to determine the effectiveness of Differential Reinforcement of Incompatible Behaviour (DRI) to overcome the disruptive behaviour of intellectual disability students in the classroom during lesson. The type of disruptive behaviour, which becomes the target behaviour in this research, is physical aggression against classmates. This research used quantitative approach with experimental research design. The approach for this experimental research is Single Subject Research (SSR) with A-B-A (Baseline-1-Intervention-Baseline-2) design. The subject of the research is three students with intellectual disability in grade II C of SLBN Surakarta, Central Java, Indonesia. The instruments for collecting the data in this research consist of interview, observation, and anecdotal report. The data was analysed by using descriptive statistic and presented in the form of tables and graph. Furthermore, the components were analyzed by an analysis of the condition. The result showed that the frequency of disruptive behaviour of the three students was decrease. There is an alteration occurred in frequency of disruptive behaviour. Based on the fact, it can be concluded that DRI is effective to overcome disruptive behaviour of intellectual disability students.

Keywords: intellectual disability, Differential Reinforcement of Incompatible Behaviour (DRI), disruptive behaviour, physical aggression, behaviour modification, single subject research

1. Introduction

Intellectual disability (intellectual developmental disorder) is a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains (APA, 2013). Gargiulo (2012) said that in the social development, student with intellectual disability are typically lacking in social competence; rejection by peer and classmates (poor interpersonal skills); frequently exhibit socially inappropriate or immature behaviour; and diminished self-esteem coupled with low self-concept. Gardner (2010) stated that in general, intellectual disability have social behaviour deficits, affective behaviour deficit, deficits in self-direction and self-control behaviours, excessive social reactions, and excessive affective reactions. These characteristics then become a problem in social as well as the causes of behavioural problem.

Based research, Totsika, et al (2012) stated that intellectual disability children have high risk for emotional and behaviour problem. In 2007, Prakash, Sudarsanan & Prabhu found that 66% of intellectual disability children had behaviour problem, and 70% of them tend to be impulsive. Koshali (2013) said that 20, 86 % intellectual disability children had misbehaviour with other and 29, 56% for violent and destructive behaviour. Those behavioural problems then become disruptive behaviour on the classroom during the lesson.

Disruptive behaviour can be defined as behaviour that substantially or repeatedly interferes with the instructor's ability to conduct class or other students' ability to learn (Baker, 2013), it is attributable to disciplinary problems in schools that affect the fundamental rights of the learner to feel safe and be treated with respect in the learning environment (Mabeba & Prinsloo, 2000). So that, disruptive behaviour can defined as a pattern of repetitive behaviour and breaking the rules that occur in a structured environment, such as on the school or classroom. The disruptive behaviour significantly interfere with teacher manage classroom and disturb other student during the lesson.

Levin and Nolan (1996) said that whether intended or not, is bound to disrupt (e.g. wandering about, visiting other learners, passing notes, sitting on the desk, and throwing objects around the classroom). Marais & Meier (2010) noted that fighting in the classroom and on the playgrounds, apart from verbal aggression, mostly manifests as pushing, slapping, kicking, and aggressive play-fight, all of which are part of everyday school events. One kind of the disruptive behaviour is physical assault/physical aggression against classmates (Yuan & Che, 2012; Baker, 2013). So that,

physical aggression against classmates is the form of disruptive behaviour, such as throwing objects around the classroom or hitting classmates.

Daniel (2001) stated that some disruptive behaviour may be a result of the student's disability. Prayitno and Amti (2013) argued that disruptive behaviour such as fighting with playmates can be happened because of several things, for example the lack of self-control, selfishness, hyperactive, the unstable condition at home or the contrary incident, permissive for instance. Moreover, Slavin (2009: 78) investigated that disruptive behaviour during the class may be the result due to the urge to get more attention from the teachers and classmates. In addition, it is also performed as the purpose to release the uncomfortable feeling. Based on the characteristics that previously discussed about intellectual disability children, it can be concluded the major cause of disruptive behaviour is from internal factor. Intellectual disability has social, emotion problem and the behaviour that leads to the disruptive behaviour.

The problem of disruptive that practiced by intellectual disability children happens at the school which is being observed, SLB Negeri Surakarta, at the class of II C. It is found the children with the characteristic of intellectual disability who have disruptive behaviour during the class. The behaviour is performed by attacking the classmates/physical aggression. The example of disruptive behaviours that found are hitting each other, kicking and tweaking, throwing the slippers, stationery, and other stuffs around to the classmates. The disruptive behaviour leads to the rejection of the classmates, the disruption of teaching and learning process, the decrease of class productivity and the reduction of learning process time. So, the control effort is needed in order to resolve behaviour problem with the behaviour modification.

Alberto and Troutman as cited in Santrock (2013) recommended the first step of solution that can be conducted by the teacher to reduce unexpected behaviour is using differential reinforcement. Supported by Allday (2011) that in order to increase the expected behaviour and decrease the unexpected ones, such as disruptive behaviour, praising and appreciating good behaviour may help to reduce the unexpected behaviour. That statement can be assumed following the action of increasing positive behaviour responses that is opposite. As the result, the negative behaviour that may probably be practiced will decrease because the subject habitually conducts the positive action. The theory is in line with the principle of DRI.

DRI (Differential Reinforcement of Incompatible behaviour) is one kind of Differential Reinforcement (Sundel & Sundel, 2005; Vismara, Bogin, & Sullivan, 2010). Differential reinforcement is past and present rewards or punishments for the behaviour and the rewards and punishment attached to alternative behaviour (Reid, 2000: 156). If we decided to lower the target's response to detain the brace (with the

assumption that we the source and obstacle) and to strengthen the incompatible responses, the schedule is called Differential Reinforcement of Incompatible behaviour, abbreviated DRI (Martin & Pear, 2015, p.316)

Alberto & Troutman (1990, p.257) said that DRI is a procedure that involves reinforcing a topographically incompatible behaviour with the behaviour targeted for reduction. Then, the focus is on replacing negative behaviours with positive behaviour (The IRIS Center for Training Enhancements, 2005, p. 8).

Vismara, Bogin & Sullivan (2010: 3) argued the basic idea of the DRI is the replacement behaviour target that cannot be done simultaneously or performed at the same time with the behaviour problem. Supported by Sundel & Sundel (2005, P. 68) the DRI requires the behaviour which is specifically incompatible. Incompatible, defined as behaviour that cannot be performed at one time with the revealed target behaviour. So we can say, DRI is a program to provide reinforcement to the incompatible behaviour (cannot be done at same time with the omitted behaviour). Furthermore, the behaviour problem will be eliminated or decreased.

Martin & Pear (2015: 317) gave the example through biting fingernails as the behaviour that will decrease and keep the hands to stay below the shoulder as the incompatible behaviour to be improved. Another example by Ormrod (2008) in the usage of contrast reinforcement (DRI) with give reinforcement to hyperactive children when they are in quiet sitting, when sitting quietly cannot be at the same time with leaving the seat or walking around.

Sundel & Sundel (2005) also exemplifies the use of DRI through a case study. A mother named Juanita used DRI to reduce screaming/shouting at her child, Carla. Juanita will provide positive reinforcement for each behaviour as opposed to shouting, such as reading, playing quietly, asking politely for help, or bringing a toy with no noisy.

A research conducted by Sigafos, et al (2009) using DRI to reduce repetitive behaviours of autistic children by scheduling leisure time (entertainment activities) through reading a picture book or playing a puzzle if the subject can sit quietly and not arranging stuffs (books, food, or toys) on his desk. Research by Wheatley, et al (2009) also used DRI to reduce inappropriate behaviour during lunch at the elementary school, such as litter left, leaving the seat, and running around. Praise note will be given to students who maintain the cleanliness of the lunch room, sat quietly during meals, and walk quietly in the lunch room. Another investigation by Zaghlawan, Ostrosky, and Al Khateeb (2007) combined the DRI and response cost in order to increase attention toward the teachers on the subject of ADHD. The uses of DRI implemented through giving "a smile" of if give attention to the teachers. Iqbal (2002) in a study of autism

with low mental ability and obsessive compulsive, applied the DRI to design a program to minimize the isolation behaviour and ritualistic with the additional activities and leisure time. Those relevant studies applied the DRI by giving the reinforcement over positive behaviour that is incompatible the behaviour problem, have been practiced. So, it can be concluded to minimize disruptive behaviour with the use of DRI strategy can determine through conducting improved appropriate activities.

Martin & Pear (2011: 95) explained there are 5 steps of DRI application. These points should be done in a coherent, following:

1. Choose an appropriate behaviour to strengthen that is incompatible with the behaviour to be eliminated
2. Take baseline data of the appropriate behaviour over several sessions or more to determine how frequently the appropriate behaviour should be reinforced to raise it to a level at which it will replace the inappropriate behaviour
3. Select a suitable schedule of reinforcement for increasing the appropriate behaviour
4. While strengthening the incompatible behaviour, apply the guidelines for the extinction of the problem behaviour
5. Gradually increase the schedule requirement for the appropriate behaviour in such a manner that it continues to replace the inappropriate behaviour as the reinforcement frequency decreases

The relevant theories and researches related to the DRI emphasized that DRI is able to resolve problematic behaviour. But, it has not applied in dealing with disruptive behaviour, especially in the subject of intellectual disability. The disruptive behaviour of intellectual disability students in the class of II C in Surakarta SLBN should be given treatment. Thus, this study aims to investigate the effectiveness of Differential Reinforcement of Incompatible Behaviour (DRI) in overcoming the disruptive behaviour of intellectual disability students.

2. Material and Methods

2.1 Subject and settings

The subject of this research is 3 intellectual students in the class of II C, SLBN Surakarta. The initials subject is MFA, FUS, and GAAP, whom show disruptive behaviour in the classroom in form of physical aggression against classmates during lesson based on initial observations. The research was conducted in the classroom when the teaching and learning session is going on with 60 minutes for each session

2.2 Collecting data and instrument

A. Observation

During the research, the primary data was collected through observation. Naturalistic observation used in Baseline-1 and Baseline-2 phase, and participant observation in intervention phase. The instruments conducted in observation were the instrument of A-B-C (Antecedent-Behaviour-Consequence), which is used to determine the antecedent stimuli, specific responses, and consequent stimuli (Alberto & Troutman, 2008). Moreover, the additional technique to conduct this research is called the instrument of recording frequency behaviour which helps to count the total of a behaviour being performed or the total of different feelings within a specific period (Engel & Schutt, 2008). The instrument was validated by two ortopedagoog and the teachers. As the impact, it was used in each phase of observation

B. Interview

Interview was conducted before the baseline-1 observation with the sources from the teacher of class II C SLB N Surakarta. The classroom teacher was selected as the speaker because she knew deeply the behavioural problems of the subjects in this research. It was also expected to help giving the input for the successful of DRI implementation as an intervention.

C. Anecdotal report

The anecdotal report/note focuses on the disruptive behaviour of a subject such as physical aggression against classmates during the lesson at baseline-1, interventions, and baseline-2. The anecdotal report contains the narration that is written briefly that happen in the research, which can be additional information besides the observation instruments.

2.3 Procedures

This research used quantitative approach with experimental research design. The approach for this experimental research is Single Subject Research (SSR) with A-B-A (Baseline-1-Intervention-Baseline-2) design.

A. Baseline-1 phase

The Baseline-1 is a naturalistic observation, the researchers were outside the classroom while making observations and investigating the disruptive behaviour (physical assault). The subjects studied in the classroom with the teacher without the intervention in order to collect natural behaviour data. Baseline-1 conducted over 5 sessions until the obtained data being stable

B. Intervention phase

Interventions conducted through 10 sessions or until the data became stable by applying the DRI. It was conducted by the researchers assisted with the class teacher. On the intervention phase, the researchers conducted participant observation to provide interventions and still use the instruments to collect data.

The DRI as the intervention was started by making a behavioural contract. The statement of the contracts is "A good student is the student that completes the task, sit quietly, and not be naughty like hitting friend or throwing pencil case while studying. If you can sit quietly during 30 minutes, you can get cute sticker 'I can sit quietly' on the end of learning time, and if you complete your task, you can get sticker 'Hurray, My task is done!' You cannot get this sticker if you misbehaviour with your classmates or you uncompleted your task." The stickers are shown below:

Picture 1: The stickers that used in the DRI treatment



Social reinforcement was given in the form of verbal and non-verbal to the subjects during the learning process that demonstrated the appropriate behaviour (sit quietly, doing the task). If the disruptive behaviour appeared, extinction would be do and given cueing or prompting to raise sit quietly or completing tasks. If the behaviour leads to fighting, the researcher will separate them and ask to return following study quietly. The researcher will repeat the contract as a reminder in the middle of the lesson session. At the end of the session do review the behaviour before the subjects were given a sticker "Hurray, my task is done!" when the subject completed the task and "I can sit quietly" if the subject can sit quietly at every 30 minutes interval. Given an explanation of why the subject got / did not get as understanding.

C. Baseline-2 phase

Baseline-2 is a repetition of the baseline-1. On this stage, researchers observed and recorded the student's behaviour during the process of learning with the teacher without any intervention by DRI.

2.4 Analysis data

In the SSR, data analysis using descriptive statistics, show by using tables and graphs. Visual analysis performed by observing the graph changes in disruptive behaviour. Analysis of data using analysis in conditions with component (1) length condition, (2) estimate the tendency direction, (3) the tendency of stability, (4) trace data, (5) the level of stability and range, and (6) the levels of change (Sunanto, et al, 2006). The analysis starts from collecting data obtained from interviews, observations, and anecdotal report. Then, data is organized into units. The frequency of disruptive behaviour that appears on the A1-A2-B will be compared. Hypothesis testing is done descriptively refer to the data obtained. The hypothesis could be accepted if the disruptive behaviour of students with intellectual disability shows a tendency toward decreased, so that it can be said disruptive behaviour can be overcome.

3. Results and Discussion

A. Baseline-1

Baseline-1 (A1) session consisted of 5 sessions which is each session was conducted within 60 minutes. A1 is data collection and disruptive behaviour to the subject without intervention. The Baseline-1 data is presented below:

Table 1: The frequency of disruptive behaviours on baseline-1

| Subject | The frequency of disruptive behaviours (times) | | | | |
|---------|--|-----------|-----------|-----------|-----------|
| | Session 1 | Session 2 | Session 3 | Session 4 | Session 5 |
| MFA | 7 | 7 | 9 | 9 | 9 |
| GAAP | 7 | 8 | 6 | 7 | 8 |
| FUS | 6 | 7 | 6 | 6 | 7 |

Based on the observations in phase A1 and interviews found that the subjects of MFA performed disruptive behaviour (physical aggression) to seek attention in the form of an angry reaction and as an activity utilizing free time when the work was completed and their friends were not yet. GAAP subject behaved in order to seek attention, especially to the FUS subject so that the disruptive behaviour of the FUS is a form of self-defence on disruptive behaviour of GAAP.

B. Intervention

Interventions were conducted 10 sessions with 60 minutes per session. The result data of intervention frequency is presented in Table 2 below:

Table 2: Frequency of Disruptive Behaviour on Intervention Phase

| Subject | The frequency of disruptive behaviours (times) | | | | | | | | | |
|-------------|--|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|
| | session 6 | session 7 | session 8 | session 9 | session 10 | session 11 | session 12 | session 13 | session 14 | session 15 |
| MFA | 5 | 4 | 5 | 3 | 2 | 2 | 1 | 1 | 0 | 1 |
| GAAP | 3 | 4 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| FUS | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 |

Referring to Table.2 2 found that the frequency of disruptive behaviour of MFA, GAAP, and FUS subject gradually decreased. The decrease was due to the behaviour of the subject began to be able to manage themselves and try sitting quietly and complete the task during the learning. From baseline-1 knew that the FUS behaviour related with GAAP, so when frequency of disruptive behaviour GAAP decreases, FUS also decreased

C. Baseline-2

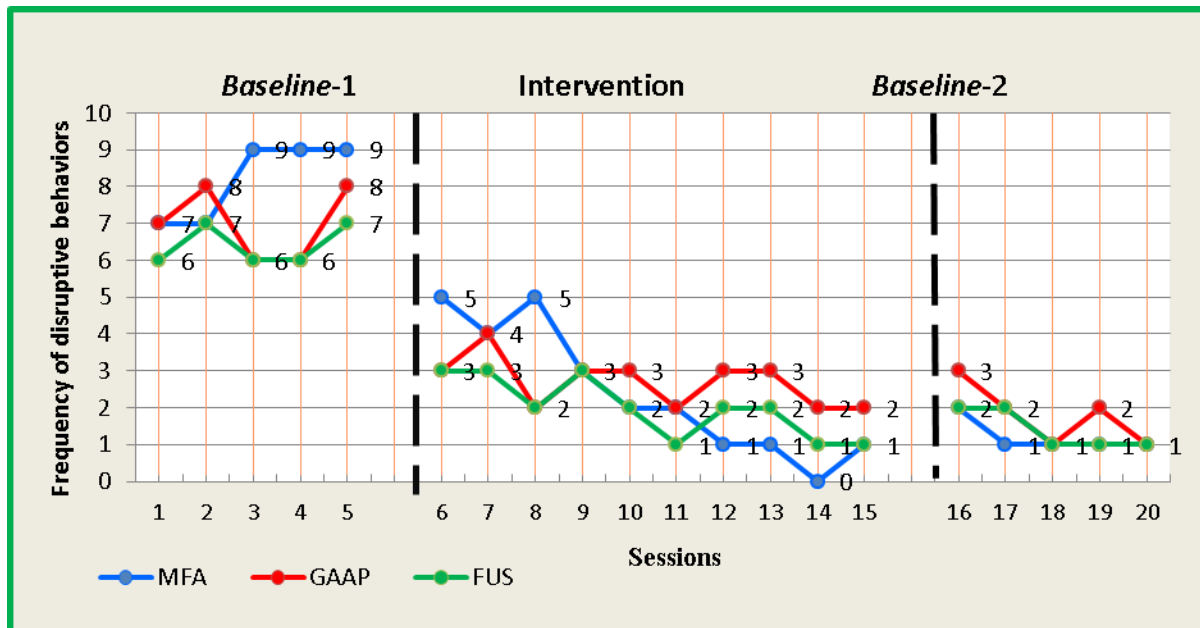
The Baseline-2 (A2) is repetition of Baseline-1 (A1) phase. Data was collected through 5 sessions. On A2 phase naturalistic observation was conducted again to examine the effectiveness of DRI. The frequency of disruptive behaviour on the Baseline-2 sessions, presented in Table 3.

Table 3: Frequency of disruptive behaviours on baseline-2 (A2)

| Subject | The frequency of disruptive behaviours (times) | | | | |
|-------------|--|------------|------------|------------|------------|
| | Session 16 | Session 17 | Session 18 | Session 19 | Session 20 |
| MFA | 2 | 1 | 1 | 1 | 1 |
| GAAP | 3 | 2 | 1 | 2 | 1 |
| FUS | 2 | 2 | 1 | 1 | 1 |

Table 3 shows the subject of the MFA, GAAP, and FUS have a tendency to have decreased disruptive behaviour. Then, the three subjects can manage their selves for not behaving disruptive after DRI being given. It is presented on graph of frequency of behavioural disorders on MFA subject, GAAP, and FUS in A1-B-A2 phase.

Graphic 1: The frequency of disruptive behaviour (physical aggression) during the lesson of MFA, GAAP and FUS in all session



The result of this study showed that *Differential Reinforcement of Incompatible Behaviour* (DRI) effective to overcome disruptive behaviour of the three subjects. DRI proven to decreased disruptive behaviour (physical aggression) of them. The effectiveness of DRI can seen from the frequency of disruptive behaviour of MFA, GAAP, and FUS that gradually decrease on the intervention phase and continue downhill towards the stabilized on baseline-2 (A2) phase. The mean of A1 phase was 8 times, decreased to 2 times on B phase, and 1 time on A2 phase. In GAAP, the mean of disruptive behaviour on A1 was 7 times, 3 times on phase B, and 2 times on phase A2. Moreover, FUS, the mean of A1-B-A2 phase was 6 times, dropped to 2 times and 1 time.

Based the interview with the teacher and the result of baseline 1, then complete the task and sit quietly chosen as incompatible behaviour, because the assumption that, both of the behaviours cannot do in one time with physical aggression. It can say that when we try to increase sit quietly and complete the task, we hoped the subjects could focus on the task, try to sit quietly, so that their disruptive behaviour can decrease.

The effectiveness of DRI caused by the following:

1. Provide reinforcement for the incompatible behaviour to decrease disruptive behaviour is the reason why DRI can overcome the disruptive behaviour in the classroom.
2. Behaviour contract before the learning, when teacher/researcher give the rules in the classroom are clear and simple, and done repeatedly.

3. The reinforcement is adjusted with fondness the subject obtained from the interview with the classroom teacher.
4. Immediately of social reinforcement when the expected behaviour is displayed.
5. Reinforcement activity in the form of colouring activity when the subject has completed a task give effect, because when student colouring their colouring pages, they enjoy colouring and forget to do disruptive behaviour.
6. Giving the sticker in the end of session. By giving a sticker at the end of the session, the subject trying to sit quietly and complete the task until the end of the study. So that the subjects tried hold disruptive behaviour during learning. Stickers with a cute picture also made the subject try to finish the task and sit quietly. The effect of giving a sticker just for the subject who sit quietly in intervals of 30 minutes and complete tasks, contributed to a decrease in disruptive behaviour.

The things that have been disclosed affirm what DRI procedures effective in overcome disruptive behaviour in the form of a physical aggression on three intellectual disability students in class II C SLBN Surakarta.

The results showed that DRI could overcome the disruptive behaviour. Then, DRI can become one of the solutions for teacher to overcome problem behaviour, either intellectual disability or other student in the school. When use DRI, we must concern to appropriate behaviour that incompatible with the problem behaviour. This research was limited to intellectual disability with physical aggression as behaviour target, and only measurements the frequency, so that further research needs to be done in developing the application of DRI to solve a variety of behavioural problem with different characteristics of the students.

4. Conclusion

The result showed that the frequency of disruptive behaviour of the three students was decrease. As a result of the research, it can be concluded that DRI is effective to overcome disruptive behaviour of intellectual disability students.

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