MOBILE TECHNOLOGY AS MIND TOOLS TO DEVELOP METACOGNITIVE SKILLS FOR SPASTIC CEREBRAL PALSY

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ABSTRACT

Spastic cerebral palsy (CP) means stiffness or tightness of muscles. Patients with spastic CP are usually accompanied with learning disabilities. Spastic CP in learning is facilitated by the use of mobile technology. Mobile technology can be used as mind tools, because its application is support high-level thinking. Learning for special needs aimed at the development of metacognitive skills. The method used in this study is a single subject research, type multiple baseline design. Data analysis using graphic analysis that aims to know the baseline and intervention development. Data from the graph are calculated trend estimate and effect size. The results showed that the use of mobile technology as mind tools provide great impact for students with spastic CP. The use of mobile technology as mind tools for students spastic CP should have the support of the environment. Mobile technology in learning is a partner in thinking, not the tool.

Keywords: Mindtools, Spastic, Metacognitive skill

INTRODUCTION

Cerebral palsy (CP) describes a group of disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behavior, and/or by a seizure disorder" (Rosenbaum et al. 2007). Spastic CP refer to increased muscular tone. In cases of spastic CP are learning disabilities.

Learning special needs required for the provision of equipment and technology to ensure free education and compatibility (Male, 2003; Ulman, 2005, in Santrock, 2008: 283). Learning disabilities on spastic CP can be facilitated by using mobile technology. Applications in mobile technology can be used as mind tools, Mind tools is a computer application when used by learners to represent what they know, to involve them in critical thinking about content learn it (Jonassen et al, 1998 in Hwang, 2011).

Now, Smartphone (Android or iOS) has had an application such as in computer, Smartphone support mind tools. The use of mobile technology, Smartphone, as mind tools expected to support the ability to think for children with spastic CP. Learning for children with disabilities is to use metacognitive strategies to understand the reading and to build the skills of 'self-determination' as the ability to independently (Slavin; 2006).

Metacognitive be a clue how to think before learning that the way to think about a problem in the study or the possibility of considering a strategy, setting beginning in locating and framing the issues, and contribute continuously before solving (Hannafin et al, 1999; 131). Metacognitive skills, learners can control how they learn, how they organize their work, and how they reflect on it, which will encourage them to take responsibility for learning and show that it is an active process. Metacognitive skills related to repertoire derived from procedural

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knowledge for monitoring, guiding and controlling the behavior of a person's learning and problem solving (Veenman, 2011; 197).

METHOD

The method used in this study is a single subject research with multiple baseline (MB) design type. Data were analyzed using the techniques of visual analysis chart (visual analysis of the chart data), that is by plotting the data into charts, then the data is analyzed based on the components in each condition (A and B) and described qualitatively. Graph data were analyzed by using the effect size for any changes occur. Subjects in this study were 3 people who have spastic CP without disruption to cognitive.

This study was conducted over 12 weeks, in which each participant was given a matter of problem solving essay form as many as 10 items each week. Each week will be measured metacognitive skills. The experimental procedure is (1) Participant I: 3-week baseline, and 9-week intervention, (2) Participants II: 5-week baseline, and 7 week intervention, and (3) Participants III: 7-week baseline, and 5-week intervention. Metacognitive instrument in this study adapted from Hoffman and Spatariu (2008), which consists of 10 items of questions. Analysis to determine changes in metacognitive skills using three methods, the slope, effect size with R^2 and descriptive analysis

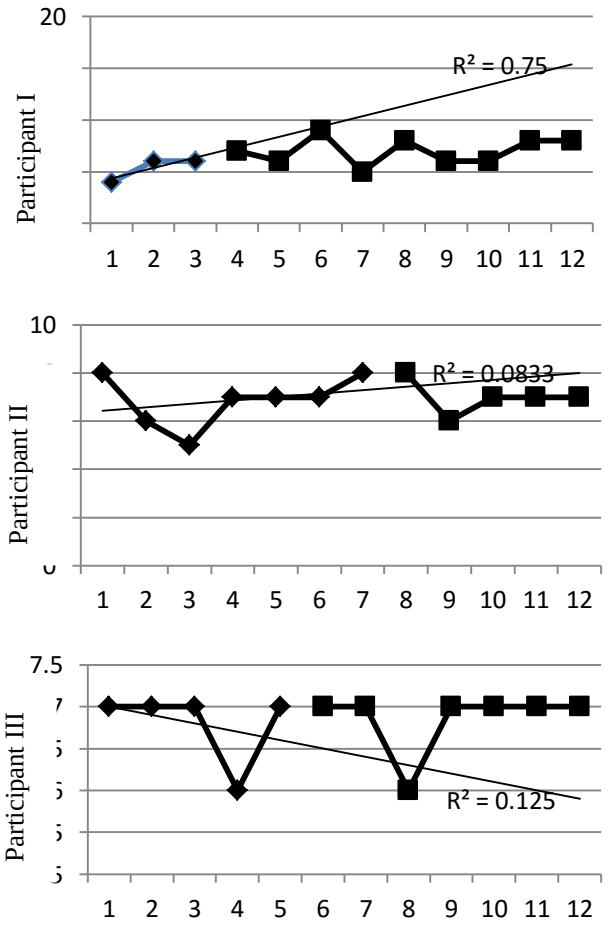

Figure 1. Multiple baselines across participant

RESULT

Data were analyzed for 12 weeks every participant level slope obtained from correct word per minute (WCPM). The results show the level of the slope to the Participant first stage is 1 WCPM baseline and slope at 0.083 WCPM intervention phase. Participants II, at baseline phase have a slope of -0.1 WCPM level and baseline phase has a slope of 0 WCPM. Participants III has a slope of 0.14 WCPM the intervention phase and tilt WCPM -0.1 at baseline phase. Trend estimates of the three participants showed a slope of 0.25 which showed no positive effect or increase in metacognitive skills.

In this study, there are three participants, to see the effect size of each participant, used analysis by R^2. In chart 1 shows the value of R^2 each participant. Data in chart 1 provides the score for Participant I R^2 is 0.75; Participants II is 0,125; and Participants III is 0.083; or the average was 0.32, including large based on the criteria of Cohen (1988). The results of analysis of trend estimation and R^2 showed a positive influence.

Descriptively explained that the participants have used the strategy in the troubleshooting process, the steps that are used can solve the problem, and they find a strategy that has been used quick use in solving problems

DISCUSSION

Learners with intellectual disabilities may be less aware of how their minds work, have little knowledge of learning strategies, and although they can learn strategies, they tend not independently implement and monitor them (Porter, 2002). Metacognitive strategies that can be used to monitor and assess progress are (1) to develop awareness of learning or problem solving including the importance of tracking; (2) helps learners to "stand back" of the problem and assess what to do next.

All three participants expressed confidence in the answer and the belief that the answer is correct. Confidence participants in the answer and the right strategy employed showed that metacognitive awareness in individuals include planning, sequence, and monitor in an effort to improve performance (Schraw and Dennison, 1994). And metacognitive skills leading to the development and contribute to the learning performance (Veenman, Wilhelm, and Beisuizen, 2004). The use of auxiliary computer can improve self-regulation in individuals with limitations (Moreno and Saldana, 2005). Self-regulation in this study looks at the determination of strategies and measures to be taken in the problem solving process. By using mobile technology, participants have more knowledge acquisition. The use of mobile technology enhance the knowledge before implementing learning (Pai et al, 2007). The use of multimedia exercises, making kids (CP) more autonomous persistent, happy, and can easily absorb the material as well as more willing to continue working (Reis, 2010).

Application of metacognitive skills for individuals who have difficulty learning depends on at least three factors, namely specific training in applying metacognitive skills beyond academic, motivation is needed in the application of metacognitive strategies, and facilitate the environment or support penggunaana metacognitive strategies (Wong, 1987). The process of looking for and studying with a Smartphone, spastic CP will try to control their learning and seeking knowledge that is not known or understood. The use of mobile technology support mind tools in achieving learning goals with terbantunya learners and learners in assessing the results of mathematical keterampila (Reece, 2003). Effective learner will track their learning process and attention to times when the use of strategies to succeed. Learners who are good will as they work to monitor and stop their progress when they see a problem with their understanding. Instead, learners with special needs tend to accurately assess their progress, or to fix problems as they arise. It can be linked back to inadequate understanding

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of the tasks. It also may result from a lack of awareness of their own knowledge or from failing to ask themselves in check for understanding.

CONCLUSION

Metacognitive impetus to improve the performance and efficiency of problem solving separately with reflection activity and cognitive strategies (Hoffman and Spatariu 2008). Metacognitive skills refers to the procedural knowledge required for the regulation and control over the behavior of one's learning (Veenman, 2013) in which the manifestation of skills includes orientation, goal setting, planning, monitoring, inspection, evaluation, and recapitulation (Veenman, 2011 in Veenman 2013). Metacognitive skills component refers to the cognitive process control individuals progress (Annevirta&Vauras, 2006). Metacognitive skills can be seen as a control voluntarily in cognitive processes (Brown, 1980 in Desoete and Roeyers, 2002), refers to the activities of the control, monitoring, and self-regulation that occur when learning and solving problems (Brown 1978 in Bannert and Mengelkamp, 2008). Metacognitive skills related to repertoire derived from procedural knowledge for monitoring, guiding and controlling the behavior of a person's learning and problem solving (Veenman, 2011; 197). The use of mobile technology, smartphone, with a variety of applications can be used as mind tools in developing metacognitive skills for spastic CP. Mobile technology in teaching special needs should serve as a partner, not as a tool. The use of mobile technology as a necessary mind tools environmental support.

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