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Promoting Inclusive Science Education Practices using Cogenerative Dialogues

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《 Abstract 》

Promoting self-determination has become an increasingly important goal for programs serving students with Special Education Needs (SEN). Research examining self-determination in relation to transition education has emerged as an important topic in the field of Special Education. While studies have shown self-determination training provides considerable benefits related to post-secondary outcomes, students continue to be excluded from participating in a decision-making capacity during planning sessions for Individualized Education Programs (IEP) or Individualized Transition Programs (ITP). In this paper, we draw from a body of research in the field of science education to argue for "cogenerative dialogue" as a beneficial instructional strategy special educators and content area teachers could use to expand self-determination practices of SEN students. We provide examples of how this structured discourse method has been implemented by teachers and researchers to engage students in participatory dialogue about how to improve science teaching and learning. We conclude by raising questions about the efficacy of utilizing this method in different cultural contexts and we offer directions for future research on using cogenerative dialogue to expand self-determination practices of SEN students in Korea.

Key Words : self-determination, transition education, cogenerative dialogue, inclusive science education

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Ⅰ. INTRODUCTION

During the last 20 years, fostering self-determination among students with special education needs (SEN) has become a principal focus of policy in the United States and in many other countries. Self-determination is a concept long associated with efforts to afford maximum opportunities for individuals with disabilities to exert greater control over their own lives (Nirje, 1969). Self-determination entails having knowledge about one's own strengths, needs and interests, and being able to effectively communicate choices. In practice, self-determination entails choice making, setting realistic and attainable goals, identifying and solving problems, engaging in self-evaluation of personal behaviors, and reflecting on actions in order to realistically re-assess one's goals as needed, being self-aware, and being an advocate for your own rights. To achieve these goals, students must be explicitly taught self-determination behaviors and be provided opportunities to enact these practices and reflect on the results of their actions over time.

In many countries, self-determination strategies (like goal setting, self-advocating, and problem solving) are taught to SEN students as part of their transition education services. These services include supporting SEN students and their caregivers to develop and implement Individual Education Programs (IEP) and Transition Education Programs (TEP) that meet the needs and goals of each student. Supporting SEN students to take an active role in planning their future and being directly engaged in the transition education process by participating in IEP and TEP meetings are important goals of self-determination (Carter et al., 2010). However, the majority of studies examining self-determination in the context of transition education make clear that "student voice" is generally missing or extremely limited in decision-making processes related to education, post-secondary transitions, and every day life (Martin, et al., 2006; Lee, 2009). The term student voice refers not only to vocal participation, but also to having authentic opportunities to participate in decision-making processes (Taylor & Robinson, 2009).

In this paper, we argue the need for special educators to utilize more democratic and participatory pedagogies in an effort to empower SEN students to voice their personal goals for their education. Specifically, we

advocate the use of a structured discourse method called "cogenerative dialogue" that special education and general content teachers (e.g., science teachers) can use to promote self-determination practices in SEN students as part of the transition education process and in everyday teaching and learning contexts. Drawing from research that was initially conducted in the field of science education, we introduce cogenerative dialogue as a pedagogical tool useful for promoting inclusive education practices that can expand opportunities for SEN students to improve not only their self-determination practices, but also their academic achievement and conceptual understanding in content area courses.

In the sections that follow, we offer context for our focus on cogenerative dialogues by first providing a brief overview of research on self-determination and transition education. In an effort to highlight a wide range of problems associated with laws and policies mandating individuals with disabilities receive transition education services to promote self-determination, we focus our attention on research conducted mainly in the United States. Building from this discussion, we describe what cogenerative dialogue is and how they have been used to engage students in participatory dialogue. Next we introduce a model for implementing cogenerative dialogue between teachers, students, and parents that could expand opportunities for SEN students to participate more equitably in IEP and TEP meetings. We also discuss the potential for cogenerative dialogue to help strengthen coteaching relationships between special education teachers and general content area teachers (e.g., math or science). Finally, we share findings from recent research conducted in Korean special education context to demonstrate how cogenerative dialogues have been utilized to increase SEN students' achievement and content understanding, and to improve the quality of SEN students' social interactions with their teachers and peers. We conclude the paper by raising questions about the efficacy of utilizing cogenerative dialogue to expand self-determination practices of SEN students in different cultural contexts and by suggesting directions for future research in Korea.

Ⅱ. SELF-DETERMINATION AND THE TRANSITION EDUCATION PROCESS

Self-determination is broadly defined as having the skills, attitudes, and supports needed to direct one's life in the ways that are personally valued (Field, et al., 1998). While there is no one agreed-upon definition, Michael Weymeher's (1992) description of a self-determined individual as someone who acts "as the primary causal agent in one's life, free to make choices and decisions about one's quality of life, free from undue influence and interference" (p. 302), is widely cited in the literature. Self-determination is associated with individualistic values, such as autonomy, intrinsic motivation, and self-efficacy. The fundamental goal of self-determination instruction is to position individuals with disabilities to have increased control of their lives and futures. While this concept may not seem revolutionary today, people with disabilities have not always been provided the basic human right and legal authority to make decisions for themselves. In an effort to draw attention to some of the challenges facing educators and SEN students with regards to teaching and learning self-determination strategies, in the sections that follow, we discuss the extent to which SEN students are marginalized in the transition education process and we discuss some of the reasons why educators and parents fail to actively engage students in this process.

1. The benefits of teaching self-determination as part of transition education services

Several studies examining the impact of self-determined behavior on outcomes for individuals with disabilities revealed significant differences between those who were self-determined and those who were less autonomous (Wehmeyer & Palmer, 2003; Kim et al., 2001). Individuals who were identified as being self-determined exhibited more positive post- school outcomes (Cho, et al., 2012), especially with regards to financial independence and employment (Lachapelle et al., 2005). Self-determination has also been associated with improved academic performance, lower incidence of school

absenteeism, more active class participation (Martin & Williams-Diehm, 2013), increased rates of graduation (Gilberts, et al., 2001), improved employment opportunities (Wehmeyer & Schwartz, 1997), expanded opportunities for independent living arrangements (Gargiulo, 2012), and more positive perceptions about general quality of life (McDougall, et al., 2010 Wehmeyer & Schwartz, 1997).

Students who have been afforded opportunities to develop their abilities to self-regulate their learning, through self-evaluation and self-monitoring, show enhanced motivation to learn (Thoma, et al., 2008). Solberg and colleagues (2012) found that SEN students develop greater confidence in their abilities to successfully engage in career-oriented activities (like career planning, conducting interviews, and networking) when they have access to a compelling and comprehensive educational program where they are involved in career preparation, work-based learning experiences, youth development and leadership experiences, and activities connecting youth to their families and community. When students engage in goal setting, they tend to view school as more meaningful and enjoyable (Lee, et al., 2009) and tend to seek out learning opportunities to increase the likelihood of successfully reaching their goals. As a result, students tend to be more motivated to attend school and are more likely to engage in self-regulating behaviors, such as focusing on lessons, completing assignments, and seeking accommodation supports (Solberg, et al., 2012), all of which contribute to improved academic achievement.

2. The current state of student participation in transition education in the US

While many studies report positive outcomes associated with transition education, research in transition education overwhelmingly shows that students are not provided opportunities to develop these skills. For example, several studies have reported that SEN students are not informed about the purpose of the IEP and TEP processes, that they are not being invited to attend planning meetings, they are generally unaware of the stated goals in their own IEP and TEP plans, and they are not being provided with specific

transition services in accordance with federal laws (Martin & Hughes, 2008; Martin, et al., 2006; Martin, et al., 2004; Kohler & Field, 2003). Other studies show that even when SEN students are asked to attend IEP and TEP meetings, objectives for increasing self-determination skills are generally absent from their plans(Grigal, et al., 2003), parental involvement in the process is generally lacking (Martin, et al., 2004), and linkages with adult service agencies necessary for transition planning are not made (Wandry et al., 2008).

A study published this year (Landmark & Zhang, 2013) examined transition components of student IEPs and found that no schools in the study were fully compliant with the law. For example, the inclusion of annual statements regarding students' post-secondary goals aimed at continuing education/training, employment, or independent living were lacking in many of the IEPs (Landmark & Zhang, 2013). Studies showing that SEN students are not engaged in decision-making activities, including active participation in their own IEP and ITP meetings, are worrisome because this exclusion results in SEN students missing opportunities necessary for developing the capacity to make decisions (Getzel & Thoma, 2006; Grigal, et al., 2003), which may lead to dismal post-school outcomes (Morningstar & Benitz, 2004). In the following section, we highlight some commonly identified reasons for the marginalization of students during the transition education process.

3. Challenges preventing SEN students from participating in transition education

Presently, US legislation mandates students with disabilities have equal access to highly qualified teachers, to the general education curriculum, and the right to actively participate in the decision-making process concerning their futures (Garguilo, 2012). Many studies indicate advances have been made regarding SEN students' access to highly qualified teachers and the general curriculum, but considerable research shows the policies governing student participation in transition education services continues to be largely ineffective. Commonly cited barriers include lack of time, inadequate staffing, and limited fiscal supports (Wandry, et al., 2008), which are all issues that

need to be addressed by administrators and policy makers at district and school levels. Other research points to more systemic issues, including insufficient teacher training and lack of information about the availability of curricula designed to promote self-determination skills in young people (Martin, et al., 2006; Carter, et al., 2010).

Currently, preparation programs for special education teachers and general education teachers in the US do not uniformly include coursework or opportunities to practice the implementation of self-determination strategies in real educational contexts (Thoma, et al., 2002). Limited knowledge about and experiences with SEN students may help explain why on a recent survey, teachers (and parents) ranked self-determination as the least important quality of life indicator for people with disabilities (Schalock, et al., 2005). Interestingly, the same study showed that when people with disabilities were asked to rate the importance of self-determination, they ranked it much higher than their family members, teachers, or other service professionals (Schalock, et al., 2005). Several studies (Agran, et al., 1999; Wehmeyer, et al., 2000) have indicated that even when teachers professed to value self-determination, this belief did not translate into classroom practice. This finding is consistent with other research showing that merely having knowledge about the benefit of instructional strategies is not sufficient for making changes in classroom practice (Darling-Hammond, 1994).

Such findings suggest teachers may fail to teach self-determination strategies because they do not truly understand the goal of self-determination for students. Studies examining teacher perceptions about self-determination revealed that teachers commonly believe that self-determination is about students having "absolute control" or about students "just having choices" (Thoma, et al., 2008). When teachers define self-determination as simply "choice making" they limit student opportunities to lead a self-determined life (Wehmeyer, 1998). Because becoming self-determined is a developmental task (Pierson, et al., 2008), improving educational and post-secondary outcomes for youth with disabilities is dependent upon both the capacity of the individual and the opportunities provided to develop behaviors and practices associated with being self-determined. For students with disabilities to develop their capacity for self-determination, they must be involved in learning environments that are designed to provide them with the experiences

necessary for promoting these skills (Carter, et al., 2008). Thus, in order for SEN students to really develop their capacity for self-determination, students must be able to make choices and to have the opportunity to understand the consequences which result from the choices they made – even when the outcome is not what the student intended.

Some of the issues (such as, lack of time or resources) preventing teachers from fully engaging SEN students in the transition education process may be addressed through structural changes at administrative levels in school districts and schools. However, teachers' negatively held perceptions about the relative value and benefit of student autonomy and their skepticism about SEN students' capacity to become self-determined (Chambers, et al., 2007) are more challenging issues to address (Oh, 2002). A recent study (Thoma, et al., 2008) confirmed teachers' misconceptions about the purpose of self-determination are often used as a rationale for why self-determination is not an appropriate goal for students with disabilities. Due to misconceptions held about the purpose of self-determination and about the capacity of SEN students to become self-determined, teachers and caregivers may reject self-determination as an attainable or responsible goal for SEN students. If teachers and caregivers fail to recognize that the true value of self-determination comes not from making choices, but from having the opportunity to understand how choices shape our lives – then SEN students will continue to be limited in their opportunities to engage in problem solving and reflection with others, which will effectively limit them from developing the capacity to live a self-determined life.

However, changing a teacher's beliefs requires that he/she experiences an epistemological shift regarding what it means to be self-determined and whether it is possible, or even advisable, to help SEN students to cultivate these skills. Research on cogenerative dialogue demonstrates an important outcome of teacher participation in conversations with students is teacher's improved understandings of student abilities and goals related to school and education. In the section that follows, we introduce cogenerative dialogue and discuss how they have been employed as both a methodological tool for examining how people learn to teach science and as a pedagogical tool for improving student achievement and participation in science. First we discuss the methodological framework that structures this discourse method

and then we offer examples of its use as a pedagogical tool.

III. USING COGENERATIVE DIALOGUE TO TRANSFORM TEACHING AND LEARNING

Grounded in the phenomenological concept of *being in/with* others, cogenerative dialogues were originally developed as part of a methodological approach used to generate local theory about how people learn to teach science while coteaching (Roth & Tobin, 2002a). In this approach to learning how to teach, pre- and in-service teachers explicitly co-planned and co-implemented science lessons with a goal of reflecting on what was learned from their shared experiences *being in* (the same classroom teaching situation) *with others* (pre- and in-service teachers). The practice of cogenerative dialogue emerged from "debriefing sessions" that took place after a science lesson was cotaught (Roth & Tobin, 2005; Martin, 2009). The debriefing sessions focused on having teachers and researchers make explicit connections between classroom practices and theories about how people teach and learn science (Roth, Tobin & Zimmerman, 2002) and to negotiate roles and responsibilities for teaching (Roth & Tobin, 2005).

Initially these debriefing sessions did not include students, but over time, researchers and teachers extended the concept of *being in/with others* to include students who had also participated in the co-taught lesson. Once students became involved (Elmesky & Tobin, 2005), researchers began to explore the potential of cogenerative dialogues as not only methodology for exploring how people learn to teach, but they also began to recognize its value as a pedagogical tool. In an attempt to ensure equitable and ethical participation between teachers and students, researchers introduced Guba and Lincoln's (1989) authenticity criteria to structure participation in cogenerative dialogue. These four criteria necessitate that participants engage in conversations that are *Ontological, Educative, Catalytic*, and *Tactical* in nature.

Ontology refers to the importance of having each person share their individual perspectives about what is happening during the lesson, how they

experience teaching and learning, and how they make sense of the activities in which they participate. By adhering to this criterion, participants are asked to acknowledge that each person brings a unique perspective to the dialogue and that it is important to explicitly acknowledge the power differentials that exist between participants (e.g., pre- and in-service teachers; teachers and students; experts and novices) with the intent of minimizing those differences to promote equitable dialogue between all participants. The second criterion states that dialogue should be *Educative,* meaning that participation in the conversation requires that each person commits to listening to other participants and being willing to learn from (or be educated by) their perspectives. It is important to make clear that while participants are asked to listen to others and to accept that a change in ontology (change of belief or perspective) may occur as a result of being educated about differing perspectives, there is no requirement for participants to accept the same beliefs – only to value the differences between people. The third criterion is cogenerative dialogue should be *Catalytic,* meaning positive changes should occur as a result of engaging in dialogue. Changes may be ontological (e.g., a possible change in beliefs as a result of being educated about someone's perspective or experiences) or concrete (e.g., designing and implementing a new classroom teaching or learning strategy). After implementing the planned action, the participants meet again to reflect on the outcomes and to reflexively consider the roles individuals must play to maintain the desired outcome or, if necessary, to cogenerate a new or modified plan. To adhere to the fourth criteria, participants are asked to engage in dialogue that is *Tactical.* This refers to the need for participants to share responsibility to not only identify the need for change, but to also actively support transformation as a result of what was learned in the dialogue. In this way, cogenerative dialogues are cyclical, meaning that individuals engage in conversations over a period of time to identify problems and cogenerate solutions, and then collectively reflect on the changes made to determine if new or different action is needed.

1. How have cogenerative dialogues been used by researchers and teachers?

Employed as a methodological tool, cogenerative dialogue has been used to research coteaching interactions between pre- and in-service science teachers (Roth & Tobin, 2001a; Roth & Tobin, 2002b; Tobin, et al., 2003; Siry, 2011), as a model for developing positive coteaching relationships between two or more classroom science teachers (Roth, 2001; Roth, Lawless, & Tobin, 2000), and as an assessment and evaluation method as part of a science teacher education program (Roth & Tobin, 2001b; Tobin & Roth, 2002; Martin & Scantlebury, 2009). The focus of discussion when used methodologically is on learning from *being in* a particular situation *with other teachers and students* and reflecting on that experience to generate theory about teaching and learning. When used as a pedagogical tool, the focus of cogenerative dialogue is on transforming the teaching and learning of science.

Studies using cogenerative dialogue have been conducted at the primary grades (Stith & Roth, 2006; Siry & Lang, 2010), and at the secondary level with low achievers (LaVan & Beers, 2005; Emdin, 2007; Grimes, 2010) and with high achievers (Olitsky, et al., 2010; Martin, 2006). In addition, researchers and instructors have used them at the university level in science content courses (Martin & Scantlebury, 2009) and in science teacher education programs (Martin, Milne, & Scantlebury, 2006; Siry & Martin, 2010). There have been numerous studies conducted in various educational contexts with diverse participants. In each study, the method for implementing cogenerative has been a little different (e.g., when the conversations took place, how often, how long, with how many participants) – but in each case, the methodology has been consistent – meaning that the authenticity criteria served as a framework to structure equitable participation in the dialogue.

2. What do cogenerative dialogues look like?

Participants in cogenerative dialogues can include various stakeholders, including teachers, students, researchers, school administrators, counselors and even parents. Cogenerative dialogues can take many different forms, including one-on-one, small group, or whole class – but generally cogenerative dialogues take place between one teacher and 2-3 students (LaVan &

Beers, 2005). The dialogues vary in length from 20-45 minutes and because it is a practice implemented in school contexts, they usually occur during lunch or before or after school. Teachers and students generally sit in a circle so they can all see one another. Often the teachers provide a snack and they may choose to show a short video clip from the classroom using a laptop or projector.

3. How do teachers get started using cogenerative dialogues in their own classrooms?

Teachers usually begin by telling students they have been invited to participate in a cogenerative dialogue with the teacher because the teacher is interested in working with students to introduce a positive change in the teaching and learning environment. To start, the teacher shares with students the basic premise of cogenerative dialogue by describing the authenticity criteria. The teacher then introduces a set of guidelines to help structure the talk (LaVan, 2004). Specifically, teachers remind students that 1) no one voice is privileged; 2) that while every person has the right to speak; 3) speaking is optional, and finally 4) what is discussed in the meeting is considered confidential and should not be shared outside of the group unless all participants agree (Martin, 2006).

In general, these "rules" provide participants a concrete method for structuring turns at talk, while the authenticity criteria help guide the quality of the talk. Generally the rules are introduced by teachers at the beginning of the first meeting in an effort to structure interactions between individuals during the discussion. During subsequent cogenerative dialogues, teachers and students routinely re-iterate the rules (either orally or by referring to a printed set of the rules). If all members are aware of the rules, there is no specific requirement to review the rules at the beginning of each meeting, but doing so can be helpful. These rules support participants to adhere to the spirit of the authenticity criteria by explicitly acknowledging inherent hierarchies that exist in social life (for example, between adults and children, teachers and students, experts and novices) with the intention of "flattening" these hierarchies so that teachers and students can engage

in a two-way dialogue about the needs of each individual within the group.

Researchers have found that cogenerative dialogues are most productive when specific events are recalled from the class and when all participants are asked to reflect on the events and share their perceptions. For example, watching a video of an event (recorded from a previous lesson and shared as a short video vignette about 1-2 minutes in length) or examining an artifact (like an exam or section of a textbook) has been shown to promote discussions that are more focused in nature. Teachers and students may engage in open dialogue when they have no specific questions or events to discuss. During this type of cogenerative dialogue, participants may choose to review video from a previously recorded class -stopping the video when someone notices an interaction they want to examine more closely Finally, participants may also choose to engage in conversations around a general question, such as: What do you like the most about our class? What do you like the least about our class? What do you enjoy most about science class? What activities help you learn the most during class?

Regardless of who is involved in the dialogue or how long the conversation takes place, participants engage in conversation with the intention of identifying conditions that could improve teaching and learning, and then allocating individual and collective responsibility for enacting the changes necessary to co-generate the optimal learning environment (Bayne & Scantlebury, 2013).

IV. COGENERATIVE DIALOGUE AND INCLUSIVE SCIENCE EDUCATION

Cogenerative dialogue is a tool for expanding participation in education. That the tool has been so widely utilized in the context of science education research is no accident. A major national science education goal is to promote "science for all Americans" (AAAS, 1993, NRC, 1996). The notion that all students can learn science if provided the proper tools and supports (NRC, 1996) has strongly influenced national policies, science

teacher education programs, and school science curriculum – which all seek to expand student participation in science at all levels and in all schools. The origin of research for cogenerative dialogue is urban science classrooms where the reality of the "science for all" doctrine has historically been impeded by what urban researchers have identified as inequalities in the US education system which places urban youth at a disadvantage due to a lack of available of resources, limited access to the community of science, and a lack of culturally relevant teaching. Urban science educators who are concerned with addressing these inequities in science education have found cogenerative dialogue to be a critical tool for not only examining the challenges that exist in urban schools, but to actively seek to transform science teaching to be more inclusive. Researchers and teachers who embrace the need to engage students in participatory dialogue challenge the notion that there should be a one-size fits all approach to learning science. This standpoint is critical for special education teachers who have the goal of making science learning both meaningful and accessible for SEN students.

Limited data for SEN students on international assessments make it challenging for us to have a clear understanding of SEN students' science proficiencies, but results from national standardized science exams in the US indicate SEN students have significantly lower achievement than their peers (Steele, 2004). SEN students may perform poorly due to difficulties with academic skills, behavior problems, or limited prior experiences with scientific phenomena. In addition, science teachers' limited knowledge and lack of experience creating appropriate modifications to support SEN students' science may also contribute to decreased science achievement (Villanueva, et al., 2012). Instructional strategies that alienate and disadvantage many students in urban science classrooms may also limit SEN students' learning. For example, science instruction traditionally relies heavily on lecture and textbook (Scruggs & Mastropieri, 2007). For students who have difficulty with reading or processing auditory information, lecture and being forced to learn from reading the textbook can greatly reduce opportunities for SEN students to be successful. In addition, because science textbooks utilize linguistically dense text and a writing style that is not familiar to many students, SEN students may not have access to appropriate instructional materials in science class.

Currently, there is limited research in the field of science education regarding SEN learners (Villanueva, et al., 2012), but the research on cogenerative dialogues suggests that engaging teachers and SEN learners (and their peers) in dialogues to identify problems and collectively suggest new practices can provide teachers and students an effective, classroom-based strategy to make science more accessible to and inclusive of SEN learners. In order for SEN students to have equitable opportunities to engage in science, teachers need to engage students in setting learning goals that are appropriate, supported by necessary material resources, and taught using instructional strategies and assessment methods that are responsive to the needs of the student. Being able to successfully engage in group-work, conduct laboratory activities, and generate explanations about phenomena is a challenge for all students. However, utilizing inquiry-based instruction and hands-on activities can provide SEN learners with opportunities to experience scientific phenomena from which they can build improved conceptual and academic understanding (Scruggs, et al., 2008).

No matter if SEN students are being taught in exclusive "special education" classrooms or mainstreamed into "general" science classrooms, educators who want to expand learning opportunities for those students need to improve the quality of social interactions that occur in the classroom (e.g., between SEN students and their peers and between teacher and SEN students). Teachers and students who engage in cogenerative dialogue develop new understandings about one another's perspectives concerning teaching and learning, which expands their opportunities to learn how to effectively communicate their goals and challenges. By engaging in cycles of participatory dialogue over time, teachers and SEN students can gain an improved awareness of themselves and the roles they each play in classrooms. Conversations addressing the purpose of science education and how to accommodate SEN students so they can effectively meet their learning goals could positively transform science teaching in special education contexts. For these reasons, we believe cogenerative dialogue could provide special educators and general education teachers an effective method to improve inclusive education practices – especially when used to engage students in dialogue about their goals for learning through the transition education process and when used as part of the normal classroom

practice to cogenerate ways to improve classroom teaching and learning.

V. USING COGENERATIVE DIALOGUE IN THE CONTEXT OF SPECIAL EDUCATION

In this section, we argue that the need for cogenerative dialogues to be ontological, educative, catalytic and tactical in the context of transition education and in special education classrooms. We demonstrate how the frameworks structuring interactions in cogenerative dialogues can be used to expand possibilities for SEN students, special education teachers, and other stakeholders to enact new practices that can transform transition education and the teaching and learning of students with special needs. Specifically, we describe how special education teachers can use cogenerative dialogue as a tool to facilitate the development of SEN students' self-determination skills in transition education and to support special education teachers to distribute responsibility for teaching SEN students by developing more effective collaborative relationships with content area teachers (e.g., math or science teachers).

1. Facilitating self-determination skills of SEN students through cogenerative dialogue

An important goal for student self-determination is to have a student take a more active role in directing his/her own IEP and TEP meetings. Unfortunately, research examining student participation in IEP meetings (Martin, et al., 2006) found that teachers spoke the majority of the time during IEP meetings (more than 60%), that adults rarely pose questions directly to students (Agran & Hughes, 2008), and that when students were invited to speak, they did so for less than 3% of the entire conversation (Martin, et al., 2006). These statistics demonstrate a clear lack of student voice in transition education meetings. But research has shown that student

voice is not the only one lacking in IEP and TEP meetings as studies have also found that parents also feel disconnected from the process.

Parents reported that they feel disempowered with regards to the teachers and the school, which left them with considerable discomfort and pessimism concerning their child's future (Whitney-Thomas & Hanley-Maxwell, 1996; Trainor, et al., 2008; Chambers, et al., 2007). Citing an overreliance on the use of "jargon" during meetings, many parents reported they were unsure of the true nature of their own child's disability (Fish, 2006). Alternatively, teachers have reported family members to be an obstacle during transition education efforts (Pierson, et al., 2008; Carter, et al., 2008), especially if those families are not well educated or are economically disadvantaged. In these instances, teachers report frustration that parents believe the school should take greater responsibility for teaching students the self-determination skills that can help their child to become more independent (Agran & Hughes, 2008). In these studies, teachers felt parents were neglecting their own responsibility to support the development of their child. This misalignment in teacher and parent beliefs regarding responsibility for the student's education can be a major source of friction and frustration in IEP conversations.

To expand opportunities for SEN student's to participate in the transition education process and to help teachers and parents more effectively negotiate their roles and responsibilities, we recommend that special education teachers use cogenerative dialogues to conduct IEP/TEP meetings. To do so, special education teachers would first need to invite all stakeholders (teachers, SEN students, caregivers, counselors, etc) to engage in dialogue that is ontological and educative – meaning they would each be asked to share their understanding about the role and responsibility of each person in the transition education process. Next all stakeholders would be asked to articulate realistic and attainable goals for each person (especially the student) and to work to collectively identify challenges associated with meeting these goals. Next, all members would be asked to help cogenerate a plan (clearly negotiating the roles of each individual) for meeting these goals (i.e., catalyzing change) and agreeing to take responsibility to ensure the plan is successful. At the end of the meeting, and in subsequent follow-up meetings, all stakeholders would be asked to evaluate the effectiveness of

the plan – working to problem solve challenges and even re–negotiating the action plan if necessary (i.e., considering tactical authenticity).

To structure IEP/TEP meetings using cogenerative dialogues, teachers would also need to remind participants about the rules for engaging in equitable dialogue. To promote ontological and educative dialogue, teachers would encourage caregivers and other stakeholders to express their beliefs and to provide feedback for the student, but care should be taken to ensure that adult voices (and the voices of "abled" people) are not privileged over the voice of the SEN student. Thus, teachers must be prepared to stop participants from dominating the dialogue. This is because no one voice should be privileged. Making sure no voice is privileged is not necessarily about allocating equal time to speak (which is important), but it is also about making sure that no one person is allowed to assert authority over another by exalting their views above others.

One way to address this issue is by reminding participants to make space in the dialogue by ceding time for others to speak – and even by creating long pauses in the dialogue so that others can join. These strategies are useful for increasing opportunities for everyone to share their perspective, but they may not be sufficient for inviting SEN students (and some caregivers) to join the conversation. This is because different power dynamics exist between adults and adolescents, teachers and parents, and abled and disabled people. Teachers, parents, and adults are in positions of authority in the life of SEN students. In addition, abled people are generally in positions of power as those who "are able" do things that disabled students are not. These dynamics have to be considered when engaging in cogenerative dialogues because being told each person has the same rights to speak and be heard is not the same as having the tools needed to articulate one's beliefs, goals, and concerns.

Conducting IEP/TEP meetings using cogenerative dialogue (once or many times) will not necessarily ensure equitable participation, shared understanding and responsibility for action, or the self–determination of a student. This is because the likelihood that any tool will be effective is related to how the tool is used. Cogenerative dialogue is not a panacea – meaning that in order for transformation to occur, teachers must do more than structure turns at talk. To catalyze change, teachers, parents and even SEN students must be

willing to closely examine their own ontological beliefs about what it means to be disabled and what constitutes reasonable or desirable goals for students to pursue. This will require all participants are willing to not only educate others about their own views, but to also listen to and learn from others. Negative held beliefs about SEN students and their ability to meaningfully contribute to the transition education process is the first hurdle participants must overcome if they are to transform transition education. Research from the field of science education suggests that if special education teachers employ cogenerative dialogues (supported by the rules of dialogue and aligned to the authenticity criteria), they can provide parents, SEN students, and other stakeholders the social space necessary to engage in a dialogue that may support everyone to cultivate new/different beliefs and practices over time.

Research has shown that when teachers use cogenerative dialogues to expand participation of students, parents, and stakeholders in decision-making, they can also begin to share responsibility for teaching and learning with others. Sharing responsibility for supporting SEN students to become self-determined positions special education teachers to ensure students can successfully transition into post-secondary life because they will have greater access to people and resources. In the next section, we describe how teachers can use one-on-one and small group cogenerative dialogues to model for SEN students how to participate more effectively during their own IEP/TEP meetings. By preparing SEN students to be able to advocate for themselves during these meetings, teachers can help distribute some of the responsibility for decision making to the student.

2. Using cogenerative dialogue to share responsibility with SEN students

If teachers intend to employ cogenerative dialogue as a tool for expanding SEN student participation during IEP or TEP meetings, they may first need to provide students with opportunities to develop skills to identify and solve problems, engage in self-evaluation of personal behaviors, and gain knowledge about how to advocate for their own rights. Currently,

several methods, strategies, and lesson packages exist to teach students to become actively involved in the transition education process. Some examples include *Whose Future Is It Anyway?* (Wehmeyer, et al., 2011), the *Self-Determined Learning Model of Instruction* (SDLMI) (Wehmeyer, et al., 2000), the *Student-Led IEPs: A guide for student involvement* (McGahee, et al., 2001), the *Student-Directed Transition Planning curriculum* (Woods, et al., 2010), and the *Self-Directed IEP* (Martin, et al., 1997). Each of these methods seeks to develop students' abilities to be better able to actively engage in the transition education process.

From the perspective of cogenerative dialogue, it does not matter which of the methods a teacher chooses to use, the most important thing would be for the teacher and student to engage in dialogue focused on individually and collectively identifying short-term and long-term goals for both academic and social needs. This is because transition planning necessitates attention is paid to the long-term goals students have for post-secondary education and employment. To be able to meet these goals, students need support to develop short-term goals designed to address academic needs (e.g., which courses should be taken and what accommodations will necessary) and social and vocational needs (e.g., which extra curricula activities or employment activities would provide students the best opportunities to meet their long-term goals). The focus of these one-on-one cogenerative dialogues would be on setting realistic goals and on cogenerating an understanding between the student and teacher about the responsibility required of each person to be successful in the short- and long-term.

Using one-on-one cogenerative dialogues, special education teachers could engage in dialogue with SEN students to set academic goals and to understand how progress in their academics links to their career aspiration. So that students can better understand the roles that teachers and support professionals play in helping the student meet their goals as outlined in their IEP (Hart & Brehm, 2013), teachers can engage students in one-on-one cogenerative dialogues to explicitly discuss the IEP process and the concept of accommodation services. Additionally, cogenerative dialogues could provide a structured space for teachers to model accommodations so the student can understand how the accommodation is designed to help and what the accommodation will look like when applied in a real classroom

situation. During these conversations, teachers could ask students to provide feedback about the effectiveness of accommodations, which could improve teacher instructional practices that leads to increases in student achievement. Teachers could also use these dialogues to engage students in conversations about when their accommodations can be used, how to ask for accommodations when needed, and what actions the student should take if a student is denied their right to access an accommodation (Hart & Brehm, 2013). Because cogenerative dialogues are cyclical, they can be used to engage students in focused conversations to track changes in student progress over time and to refine student goals based on feedback. Teachers could also engage multiple students in a small group cogenerative dialogue as a way to role-play the group IEP/TEP process. During the role-play, teachers could walk SEN students through the structure of the meeting, providing students opportunities to learn how to ask questions, to deal with difference of opinion, to express their own limits, and to advocate for needed supports.

However, in order for students to effectively participate in these one-on-one and small group cogenerative dialogues and to adhere to tactical authenticity, it would be critical for students to have knowledge about their disability. This is because it is not tactical to suggest that a student should simply "work harder" or "achieve" something that is not within their ability to actually do. Currently, US law does not require that teachers and parents engage SEN students in conversation about their plans for transitioning into post-secondary life until they are 16 years old (Garguilo, 2012). Not understanding the characteristics of one's own disability may prevent a student from being able to set reasonable and attainable goals and research shows that students benefit from gaining knowledge about their disabilities, their IEPs, the IEP process, and why they receive services (Jones, 2007). However, many children report being unsure about why they receive special education services, why they have IEPs/TEPs, or how their disability may shape their academic and social potential as they continue to grow older (Abernathy & Taylor, 2009).

An important component of self-advocacy is self-knowledge regarding how a student's disability affects his or her academic and social life. If a student reaches the age of 16 without being knowledgeable about their

disability, then their ability to participate in the decision-making process regarding their own future has already been limited. Teachers who employ cogenerative dialogues to design educative experiences for SEN students are positioning students to be able to share responsibility for their own teaching and learning. In the next section, we discuss the need for special education teachers to position students to be successful academically by sharing responsibility for improving teaching for SEN students by using cogenerative dialogue to effectively collaborate and coteach with content area teachers.

3. Using cogenerative dialogue to catalyze change in teaching and learning of SEN students

Legislation over the last 10 years has radically altered the way SEN students are instructed in public schools, but teacher education programs have not necessarily managed to change pace as quickly. For example, preparation programs for special education teachers and general education teachers do not uniformly include coursework or opportunities to practice the implementation of self-determination strategies in real educational contexts (Thoma, et al., 2002). However, NCLB and IDEIA 2004 require SEN students to learn content (science, math, reading, social studies) from "highly qualified" teachers. To meet this goal, instruction for SEN students has shifted towards an inclusion education model. This means that SEN students who once attended "special education classes" taught by teachers with special education certifications are now being "mainstreamed" into general education classrooms where they can be instructed by certified content teachers. According to the National Center for Education Statistics, in 2009 less than 5 percent of all students with disabilities aged 6-21 were attending special schools for students with disabilities (NCES, 2012). Of the 95% of SEN students attending public schools in the US, at least 60% spend the majority of the school day being instructed in the same classroom with their general education peers (NCES, 2012).

This means that the vast majority of SEN students in the US are being educated using an inclusion model of education in which a content area

teacher may be solely responsible for supporting SEN student learning. In some schools, the content area teacher may also be required to collaborate with a special education teacher who "pushes in" to the class to engage in a form of coteaching with the content area teacher or to provide one-on-one support for the SEN learner.

These developments are very disconcerting because it means that both content specialists and special education teachers are forced to "teach out of field" to instruct SEN students for which they are not properly trained. Because content area teachers are now responsible for teaching SEN learners, they are also required by law to participate in student IEP/TEP meetings with a goal of aligning content instruction with transitional planning goals to support students to be successful after high school.

One study engaging special education and content area teachers in collaborative coteaching using cogenerative dialogues (Lehner, 2007) offers findings that could help support coteachers to improve content instruction for SEN learners. In this study, researchers found that the theoretical and methodological frameworks underpinning cogenerative dialogue provided teachers a structure for engaging in goal setting (identifying content learning objectives) and identifying problems (lack of content understanding by special education teacher and limited knowledge about how to modify activities to support SEN student learners by science teacher). By reviewing video captured from cotaught science lessons, the two teachers identified some challenges they each faced when coteaching – including knowing when to "pass the baton" to the other teacher so they could explain a concept or suggest an accommodation. Using cogenerative dialogue, the teachers shared their understandings about how they wanted to restructure the lessons and they cogenerated a new plan for implementing a cotaught lesson that would better support SEN students during the lesson. The teachers engaged in a cycle of cogenerative dialogues, to coplan, implement a lesson, and reflect on the outcome of the lesson. In doing so, they each developed an improved understanding of the roles and responsibilities of each teacher and they found more effective ways to support SEN student learning (Lehner, 2007).

Currently, teacher education programs for content area teachers require limited coursework about the needs of students with disabilities, instructional strategies that support their learning, or the administrative processes related

to transition education. As such, content specialist, like math or science teachers are somewhat limited in their abilities to effectively support SEN learners in the classroom or to help facilitate effective dialogue about appropriate goals for SEN learners during the IEP/TEP meetings. Another complication revealed in a recent study (Carter, et al., 2008) suggests that because content area teachers are held accountable for SEN student performance on content exams, there may be even fewer opportunities (or reason) for these teachers to engage SEN students in self-determination building activities during class time or IEP/TEP meetings because improving performance on exams would likely take precedence.

To help counter these trends, special education and content area teachers could utilize cogenerative dialogues to meet a variety of needs. In the case of co-teaching between a special education teacher and a content area teacher, the participants may choose to focus attention on how to more effectively engage in co-planning, setting goals for content learning that effectively utilize accommodation strategies for each SEN student, or how to practically coordinate movement and interactions with one another and with students while co-teaching in the same classroom. Doing so would afford these teachers the opportunity to develop new ways of enacting practices in the classroom that bring about concrete changes in their teaching, which could expand learning opportunities for SEN students. Engaging content area teachers in one-on-one and small group cogenerative dialogues with SEN students and special education teachers could provide a social space for the content area teacher to learn about the needs of their students and to develop social relationships that can help students feel more connected to the teacher. These conversations could also provide teachers and students a chance to set content specific learning goals and to model and "try out" accommodations to support the student's learning. Finally, participating in these small group cogenerative dialogues can help the content area teachers be more knowledgeable about their role and responsibility with regards to IEP/TEP meetings. In each scenario, special education teachers would be provided a means for sharing more responsibility with other educators and the students. As we noted earlier, we think that special education and science content teachers could especially benefit from using cogenerative dialogues as part of their coplanning, coteaching, collaborations

during IEP/TEP meetings, and as a pedagogical tool used with SEN students to directly address classroom practice.

In the following section, we provide an example of cogenerative dialogue utilized in a special education science classroom in which a special education teacher and a science teacher invited seven SEN students to engage in dialogue about how to improve science class. This research is unique because it is the first to examine the co-teaching relationship between a science and special education teacher and because the study takes place in a Korean public middle school.

4. Cogenerative dialogue in Korean Contexts

Research on cogenerative dialogue is relatively new in Korea, but (Kim, 2013) a recently conducted study utilized both coteaching and cogenerative dialogue as tools to create an inclusive model of science education practice called Model of Inclusive Research About CLass of sciencE (MIRACLE). The MIRACLE model focused participants' attention on analyzing teacher and student interactions during a co-taught science lesson in a special education classroom in an urban middle school. Using this model, teachers, SEN students, and researchers examined phenomenological vignettes captured from class activities, which they discussed during cogenerative dialogue with a goal of understanding and changing teaching and learning practices. A specific aim of this research was to support the two teachers to collaboratively enact teaching practices that served to expand SEN student opportunities to participate in laboratory activities and to engage in discourse about science learning. The research revealed structural limitations that impeded the science learning of SEN students, including teachers' low expectations about the learning ability of the students and teachers' lack of knowledge and understanding about how to effectively modify science practices and assessments to meet the needs of these particular students. As teachers and students engaged in MIRACLE, the teachers began to transform classroom activities to align to student interests. Over time, the teachers learned how to enact more appropriate strategies for the individual learners in the classroom, which helped expand student science learning opportunities,

increased student achievement, and increased students' science fluency.

VI. CONCLUSION AND IMPLICATIONS

Today there are a variety of studies focused on identifying strategies that will more effectively include students in their own educational planning (Test, 2004) and prepare students to be able to advocate for their own needs and interests (Test, 2005), and engage them to direct their own learning (Lee, et al., 2009). These studies indicate a growing appreciation of the need for educators and researchers to prepare SEN students to play an active role in making decisions about post-secondary life. Most adolescents experience risks associated with self-determination and have the potential to make errors in judgment that can affect goal attainment. However, they are generally provided opportunities to develop this skill over time. Students with disabilities are largely excluded from transition education services and are rarely supported to develop the self-determination skills necessary to become advocates on their own behalf.

We believe that there are important implications for practice in teacher education, for there is a need to ensure adequate teacher training to promote the self-determination of students with disabilities (Lee and Wehmeyer, 2004). Specifically, we believe that pre-service and in-service teachers would greatly benefit from teacher education programs and professional development that encourages participatory dialogue with students using methods like cogenerative dialogue. Our findings suggest that teacher education programs that provide pre-service teachers (special education and general education) with opportunities to engage in dialogue with SEN learners using cogenerative dialogues could help to challenge these teachers' negative perceptions about SEN students' capacity for learning and to more critically consider the importance of self-determination as a goal for SEN students. Used as a pedagogical tool in the classroom, teachers and students could be positioned to change their perceptions about the purpose of school, science education, or even what it means to teach and to learn.

Finally, using cogenerative dialogue to help structure transition education meetings could benefit parents by supporting them to develop expectations, negotiate responsibilities, and understand the roles all members are expected to play as their child transitions to post-secondary life.

Today in special education research, there are many calls for qualitative research to better understand students and families so we can develop more effective models of transition education to ensure that students increase their capacity for self-determination. Science educators who are committed to the notion of "science for all" must also become invested in engaging in research to promote more inclusive science education practices. In this paper, we argue that cogenerative dialogue is a beneficial instructional strategy special educators and content area teachers could use to expand self-determination practices of SEN students, which could also lead to improved science teaching and learning. We provide examples of how this structured discourse method offers researchers, teachers, SEN students, and caregivers a social space from which to engage in participatory dialogue that is necessary for learning how best to support SEN students' to meet their learning goals. However, we believe that additional research is needed to understand how this tool can be used to improve learning opportunities for students with special needs, both in the context of transition education and in everyday classroom contexts and in different content areas.

In this paper, we drew heavily from research published in the United States. We want to raise some questions about the extent to which these findings, which are situated within dominant cultural values that promote individualism as a cultural norm, may or may not be well aligned with societal values of non-western countries. For example, Lee (2009) suggested a direction of future study related to the self-determination or transition education in consideration of the Korean cultural context. Western cultures often give priority to individualism over collectivism, which raises question about whether self-determination, which is most commonly understood and promoted from an individualistic perspective, is really relevant to or translatable for people from collectivistic cultures. For special education teachers in Western cultures, the family or society might be viewed as an obstacle to individual choice and self-determination and as a result, SEN students may be encouraged to develop goals that are more self-oriented

than group-oriented. For example, providing opportunities and supports to promote independent living (Fleischer & Zames, 2001) is often viewed as positive goal for SEN students to have as part of their TEP, but for many collectivistic cultures where multigenerational households is the norm, independent living may be viewed as a goal that should not be promoted (Geenen, Powers, Vasquez, & Bersani, 2003).

While one study has been conducted in Korea, we still have many questions about how students' cultural identities impact on their self-determination practices or beliefs or how teachers and parents contribute to or limit the self-determination of the student. Research may show that educators may need to adopt a more flexible view of self-determination in their efforts to support SEN learners and their families to strike a balance between interdependence and autonomy that fits the needs of the individual, the family, and society. Studies utilizing cogenerative dialogue may provide researchers a central vantage point from which to re-conceptualize self-determination based on cultural considerations. Understanding the role of culture in determining how educators, students, and families make sense of self-determination and the transition education process is an important area for future study.

REFERENCES

Abernathy, T. V., & Taylor, S. S. (2009). Teacher perceptions of students' understanding of their own disability. *Teacher Education and Special Education: The Journal for the Council of Exceptional Children, 32*(2), 121-136.

Agran, M., Snow, K., & Swaner, J. (1999). Teacher perceptions of self-determination: Benefits, characteristics, and strategies. *Education and Training in Mental Retardation and Development Disabilities, 34,* 293-301.

Agran, M., & Hughes, C. (2008). Asking student input: Students' opinions regarding their Individualized Education Program involvement. *Career Development for Exceptional Individuals, 31*(2), 69-76.

American Association for the Advancement of Science. (AAAS). (1993). Benchmarks for science literacy. New York, NY: Oxford University Press.

Bayne, G., & Scantlebury, K. (2013). Cogenerative dialogues as an instructional theory in science education. In B. J. Irby, G. Brown, R. Lara-Alecio & S. Jackson (Eds.)

and J. Koch (Sect. Ed.), *The handbook of educational theories* (pp. 237-247). Charlotte: Information Age Publishing Inc.

Carambo, C. (2009). Evolution of an urban research program: The Philadelphia project. In K. Tobin & W.-M. Roth [Eds.], *World of Science Education: North America* (pp. 473-489). The Netherlands: Sense Publishers.

Carter, E. W., Lane, K. L., Pierson, M. R., & Stang, K. K. (2008). Promoting self-determination for transition-age youth: Views of high school General and Special Educators. *Exceptional Children, 75*(1), 55-70.

Carter, E. W., Trainor, A., Owens, L., Sweden, B., & Sun, Yu. (2010). Self-Determination prospects of youth with high-incidence disabilities: Divergent perspectives and related factors. *Journal of Emotional and Behavioral Disorders, 18*(2), 67-81.

Chambers, C. R., Wehmeyer, M., Saito, Y., Lda, K. M., Lee, Y., & Singh, V. (2007). Self-determination: What do we know? Where do we go? *Exceptionality, 15*(1), I3-15.

Cho, H., Wehmeyer, M. L., & Kingston, N. M. (2012). The effect of social and classroom ecologilcalfactors on promoting self-determination in elementary school. *Preventing School Failure, 56*(1), 19-28.

Darling-Hammond, L. (1994). *Professional Development Schools: Schools for Developing a Profession.* New York: Teachers College Press.

Elmesky, R., & Tobin, T. (2005). Expanding our understandings of urban science education by expanding the roles of students as researchers. *Journal of Research in Science Teaching, 42*(7), 807-828.

Emdin, C. (2007). Exploring the contexts of urban science classrooms. Part 1: Investigating corporate and communal practices. *Cultural Studies of Science Education, 2*(2), 319-341.

Field, S. S., Martin, J. E., Miller, R. J., Ward, M., & Wehmeyer, M. L. (1998). Self-determination for persons with disabilities: A position statement on the division on career development and transition. *Career Development for Exceptional Individuals, 21,* 113-128.

Fish, W. (2006). Perceptions of parents of students with autism towards the IEP meeting: A case study of one family support group chapter. *Education, 127*(1), 56-68.

Fleischer, D. Z., & Zames, F. (2001). The disability rights movement: From charity to confrontation. Philadelphia, PA: Temple University Press.

Gargiulo, R. M. (2012). *Special education in contemporary society: an introduction to exceptionality*, (4th ed). Thousand Oaks, CA: SAGE Publications.

Geenen, S., Powers, L., Vasquez, A. L., & Bersani, H. (2003). Understanding and promoting the transition of minority adolescents. *Career Development for Exceptional Individuals, 26*(1), 27-46.

Getzel, E. E., & Thoma, C. A. (2006). Voice of experience: What college students with learning disabilities and attention deficit/hyperactivity disorders tell us

are important self-determination skills for success. *Learning Disabilities: A Multidisciplinary Journal, 14,* 33-39.

Gilberts, G. H., Agran, M., Hughes, C., & Wehmeyer, M. (2001). The effects of peer delivered self-monitoring strategies on the participation of students with severe disabilities in general education classrooms. *Journal of the Association for Persons with Severe Disabilities, 26*(1), 25-36.

Grigal, M., Neubert, D., Moon, M. S., & Graham, S. (2003). Self-determination for students with disabilities: Views of parents and teachers, *Exceptional Children, 70,* 97-112.

Grimes, N. (2010). Exploring multiple outcomes: Using cogenerative dialogues and coteaching in a middle school science classroom. In C. Murphy & K. Scantlebury (Eds.), The part I underlined here should should be in italics (pp. 303-326). New York, NY: Springer.

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation.* Newbury, CA: SAGE Publications.

Hart, J., & Brehm, J. (2013). Self-Determination: A model for training elementary students to self-advocate for IEP accommodations. *Teaching Exceptional Children, 45*(5), 40-48.

Jones, M. (2007). Teaching Self-Determination: Empowered Teachers, Empowered Students. *Teaching Exceptional Children, 39*(1), 12-17.

Kim, H. -J. (2013). *A Critical Ethnographic Study to Improve Scientific Fluency of Students with Special Education Needs(SEN).* Unpublished doctoral dissertations, Daegu University, Gyeongbuk, South Korea.

Kim, J. K., Cho. I. S., Moon, T. H., & Kim, H. K. (2001). The effect of demographic factors on self-determination ability of student with developmental disability. *Korean Journal of Special Education, 36,* 127-146.

Kohler, P. D., & Field, S. (2003). Transition-focused education: Foundation for the future. *The Journal of Special Education, 37*(3), 174-183.

Lachapelle, Y., Wehmeyer, M. L., Haelewyck, M. C., Courbois, Y., Keith, K. D., & Schalock, R. (2005). The relationship between quality of life and self-determination: An international study. *Journal of Intellectual Disability Research, 49,* 740-744.

Landmark, L. J., & Zhang, D. (2013). Compliance and practices in transition planning: A review of individualized education program documents. *Remedial and Special Education, 34*(2), 113-125.

LaVan, S. K. (2004). *Cogeneration fluency in urban science classrooms.* Unpublished doctoral dissertations, The University of Pennsylvania, Philadelphia, PA.

LaVan, S. K., & Beers, J. (2005). The Role of Cogenerative Dialogue in Learning to Teach and Transforming Learning Environments. In K. Tobin, R. Elmesky, and G. Seiler (Eds), *Improving Urban Science Education: New Roles for Teachers,*

Students, and Researchers (pp. 167-185). New York: Rowman & Littlefield Publishers, Inc.

Lehner, E. (2007). *Cogenerative dialogues and coteaching as fields for transforming urban teaching and learning.* Unpublished doctoral manuscript. The Graduate Center, CUNY, NY.

Lee, S. (2009). A review of understanding and practice of the self-determination in the Korean and foreign cultural context: Focused on domestic literatures related to perception and casual effects on the self-determination of students with disabilities. *Asian Journal of Education, 10,* 1-32.

Lee, S., & Wehmeyer, M. L. (2004). A review of the Korean Literature related to self-determination: Future directions and practices for promoting the self-determination of students with disabilities. *Korean Journal of Special Education, 38,* 369-390.

Lee, S., Palmer, S. B., & Wehmeyer, M. L. (2009). Goal setting and self-monitoring for students with disabilities. *Intervention in School and Clinic, 44,* 139-145.

McGahee, M., Mason, C., Wallace, T., & Jones, B. (2001). *Student-led IEPs: A guide for student involvement.* Arlington, VA: The Council for Exceptional Children.

Martin, J. E., Huber Marshall, L., Maxson, L., & Jerman, P. (1997). *Self-directed IEP.* Longmont, GO: Sopris West.

Martin, J. E., Marshall, L. H., & Sale, P. (2004). A 3-year study of middle, junior, and high school IEP meetings. *Exceptional Children, 70,* 285-297.

Martin, J. E., VanDycke, J. L., Christensen, W. R., Greene, B. A., Gardner, J. E., & Lovett, D. L. (2006). Increasing student participation in IEP meetings: Establishing the self-directed IEP as an evidence-based practice. *Exceptional Children, 72,* 299-316.

Martin, A., & Hughes, C. (2008). Students' opinions regarding their Individualized Education Program Involvement. *Career Development for Exceptional Individuals, 31*(2), 69-76.

Martin, J. E., & Williams-Diehm, K. (2013). Student engagement and leadership of the transition planning process. *Career Development and Transition for Exceptional Individuals, 36*(1), 43-50.

Martin, S. (2005). *The social and cultural dimensions of successful teaching and learning in an urban science classroom.* Doctoral dissertation, Science and Mathematics Education Centre, Curtin University, Perth, Australia.

Martin, S. (2006). Where practice and theory intersect in the chemistry classroom: Using cogenerative dialogue to identify the critical point in science education. *Cultural Studies of Science Education, 1*(4), 693-720.

Martin, S. (2009). Learning to teach science. In K. Tobin & W.-M. Roth [Eds.], The part I underlined here should should be in italics (pp. 567-586). The Netherlands:

Sense Publishers.

Martin, S., Milne, C., & Scantlebury, K. (2006). Eye rollers, risk-takers, and turn sharks: Target students in a professional science education program. *Journal of Research in Science Teaching, 43*(8), 819-851.

Martin, S., & Scantlebury, K. (2009). More than a conversation: Using cogenerative dialogues in the professional development of high school chemistry teachers. *Educational Assessment, Evaluation and Accountability, 21*(2), 119-1136.

Martin, S., & Siry, C. (2012). Using video in science teacher education: An analysis of theutilization of video-based media by teacher educators and researchers. In B. Fraser, K. Tobin, & Campbell [eds.] The part I underlined here should should be in italics (417-433). Netherlands: Springer.

McDougall, J., Evans, J., Baldwin, A. P., & Wehmeyer, M. L. (2010). The importance of self-determination to perceived quality of life for youth and young adults with chronic conditions and disabilities. *Remedial and Special Education, 31*(4), 252-260.

Morningstar, M. E., & Jerald, M. L. (2008). A preliminary investigation of how states are responding to the transition assessment requirement sunder IDEIA 2004. *Career Development for Exceptional Individuals, 31*(1), 48-55.

National Center for Education Statistics. (2012). Inclusion of students with disabilities: Fast facts. Accessed on August 7, 2013 at http://nces.ed.gov/ fastfacts/display .asp?id=59.

National Research Council. (NRC). (1996). The part I underlined here should should be in italics. Washington, DC: National Academies Press.

Nirje, B. (1969). The normalization principle and its human management implications. In R. Kugel, & W. Wolfensberger (Eds.), *Changing patterns in residential services for the mentally retarded* (pp. 179-195). Washington, D.C.: President's Committee on Mental Retardation.

Oh, J. (2002). *A survey study of special education teachers' perception on and implementation of a self-determination skill.* Unpublished master thesis, Ewha Womans University, Seoul, Korea.

Olitsky, S., Loman, L. F., Gardner, J., & Billups, M. (2010). Coherence, contradiction, and the development of school science identities. *Journal of Research in Science Teaching, 47*(10), 1209-1228.

Pierson, M. R., Carter, E. W., Lane, K. L., & Glaeser, B. C. (2008). Factors influencing the self-determination of transition-age youth with high-incidence disability. *Career Development for Exceptional Individuals, 31*(2), 115-125.

Roth, W. -M. (2001). Becoming-in-the-classroom: Learning to teach in/as praxis. In D. R. Lavoie & W. -M. Roth (Eds). *Models for science teacher preparation: Bridging the gap between research and practice,*(pp. 11-30). Dordrecht, Netherlands:

Kluwer Academic Publishers.

Roth, W. -M., Lawless, D. V., & Tobin, K. (2000). {Coteaching | Cogenerative Dialoguing} as Praxis of Dialectic Method [47 paragraphs]. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 1(3), Art. 37, http://nbn-resolving.de/urn:nbn:de:0114-fqs0003372.

Roth, W. -M., & Tobin, K. (2001a). Learning to teach science as praxis. *Teaching and Teacher Education, 17*(7), 741-762.

Roth, W. -M., & Tobin, K. (2001b). The implications of coteaching/cogenerative dialogue for teacher evaluation: Learning from multiple perspectives of everyday practice. *Journal of Personnel Evaluation in Education, 15*(1), 7-29.

Roth, W. -M., & Tobin, K. (2002a). *At the elbow of another: Learning to teach by coteaching.* New York: Peter Lang.

Roth, W. -M., & Tobin, K. (2002b). Redesigning an "urban" teacher education program: An activity theory perspective. *Mind, Culture, and Activity, 9*(2), 108-131.

Roth, W. -M., & Tobin, K. (2005). *Teaching together, learning together.* New York: Peter Lang.

Roth, W. -M., Tobin, K., & Zimmerman, A. (2002). Coteaching: Learning environments research as aspect of classroom praxis. *Learning Environments Research, 5*(1), 1-28.

Schalock, R., Verdugo, M., Jenaro, C., Wang, M., Wehmeyer, M., & Xu, J. (2005). Cross-cultural study of core quality of life indicators. *American Journal on Mental Retardation, 110,* 298-311.

Scruggs, T. E., & Mastropieri, M. A. (2007). Science learning in special education: The case for constructed versus instructed learning. *Exceptionality: A Special Education Journal, 15*(2), 57-74.

Scruggs, T. E., Mastropieri, M. A., & Okolo, C. M. (2008). Science and social studies for students with disabilities. *Focus on Exceptional Children, 41*(2), 1-24.

Siry, C. (2011). Emphasizing collaborative practices in learning to teach: coteaching and cogenerative dialogues in a field-based methods course. *Teaching Education, 22,* 91-101.

Siry, C., & Lang, D. (2010). Creating participatory discourse for teaching and research in early childhood science. *Journal of Science Teacher Education, 21,* 149-160.

Siry, C., & Martin, S. (2010). Coteaching in science education courses: Transforming science teacher preparation through shared responsibility. In C. Murphy & K. Scantlebury [eds.] *Coteaching in international contexts: Research and practice* (pp. 57-78). The Netherlands: Springer.

Solberg, S. V., Howard, K., Gresham, S., & Carter, E. (2012). Quality learning experiences, self-determination, and academic success: A path analytics study among youth with disabilities. *Career Development and Transition for Exceptional Individuals,*

35(2), 85-96.

Steele, M. M. (2004). Teaching science to students with learning problems in the elementary classroom. *Preventing School Failure, 49*(1), 19-21.

Stith, I., & Roth, W. -M. (2008). *Students in action: Cogenerative dialogues from secondary to elementary schools.* Rotterdam, The Netherlands: Sense Publishers.

Taylor, C., & Robinson, C. (2009). Student voice: theorizing power and participation. *Pedagogy, Culture & Society, 17*(2), 61-175.

Test, D. W., Mason, C., Hughes, C., Konrad, M., Neale, M., & Wood, W. M. (2004). Student involvement in individualized education program meetings. *Exceptional Children, 70,* 391-412.

Test, D. W., Fowler, C. H., Brewer, D. M., & Wood, W. M. (2005). A content and methodological review of self-advocacy intervention studies. *Exceptional Children, 72,* 101-125.

Thoma, C. A., Baker, S. R., & Saddler, S. J. (2002). Self-determination in teacher education: A model to facilitate transition planning for students with disabilities. *Remedial and Special Education, 23,* 82-89.

Thoma, C. A., Pannazzo, G. M., Fritton, S. C., & Bartholomew, C. C. (2008). A qualitative study of preservice teachers' understanding of self-determination for students with disabilities. *Career Development for Exceptional Individuals, 31*(2), 94-105.

Tobin, K., & Roth, W. -M. (2002). Evaluation of science teaching through coteaching and cogenerative dialogue. In J. Altschuld & D. Kumar (Eds), *Evaluation in science education in the 21st century* (pp.187-217). Dordrecht, Netherlands: Kluwer Academic press.

Tobin, K., Zurbano, R., Ford, A., & Carambo, C. (2003). Learning to teach through coteaching and cogenerative dialogue. *Cybernetics & Human Knowing, 10*(2), 51-73.

Trainor, A. A. (2005). Self-Determination perceptions and behaviors of diverse students with LD during the transition planning process. *Journal of Learning Disabilities, 38*(3), 233-249.

Trainor, A. A., Lindstrom, L., Simon-Burroughs, M., Martin, J. E., & Sorrells, A. M. (2008). From marginalized to maximized opportunities for diverse youths with disabilities: A position paper on the Division on Career Development and Transition. *Career Development and Transition for Exceptional Individuals, 31,* 56-64.

Villanueva, M. G., Taylor, J., Therrien, W., & Hand, B. (2012). Science education for students with special needs. *Studies in Science Education, 48*(2), 187-215.

Wandry, D. L., Webb, K. W., Williams, J. M., Bassett, D. S., Asselin, S., & Hutchinson, S. (2008). Teacher candidates' perceptions of barriers to effective transition programming. *Career Development for Exceptional Individuals, 31*(1), 14-25.

Wehmeyer, M. L. (1992). Self-determination and the education of students with mental retardation. *Education and Training in Mental Retardation, 27,* 303-314.

Wehmeyer, M. L., & Schwartz, M. (1997). Self-determination and positive adult outcomes: A follow-up study of youth with mental retardation or learning disabilities. *Exceptional Children, 63*(2), 245-255.

Wehmeyer, M. L. (1998). Self-determination and individuals with significant disabilities: Examining meanings and misinterpretations. *Journal of the Association for Persons with Severe Handicaps, 23,* 5-16.

Wehmeyer, M. L., Agran, M., & Hughes, C. (2000). A national survey of teachers' promotion of self-determination and student directed learning. *Journal of Special Education, 34,* 58-68.

Wehmeyer, M. L., & Palmer, S. (2003). Adult outcomes for students with cognitive disabilities three years after high school: The impact of self-determination. *Education and Training in Developmental Disabilities, 38*(2), 131-144.

Wehmeyer, M. L., Palmer, S. B., Lee, Y., Williams-Diehm, K., & Shogren, K. (2011). A randomized-trial evaluation of the effect of whose future is it anyway? On self-determination. *Career Development for Exceptional Individuals, 34,* 45-56.

Whitney-Thomas, J., & Hanley-Maxwell, C. (1996). Packing the parachute: Parents' experiences as their children prepare to leave high school. *Exceptional Children, 63,* 75-87.

Woods, L. L., Sylvester, L., & Martin, J. E. (2010). Student-directed transition planning: Increasing student knowledge and self-efficacy in the transition planning process. *Career Development and Transition for Exceptional Individuals, 33,* 106-114.

공동생성적 대화를 활용한 통합 과학교육 실천의 증진

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<요 약>

특수교육을 필요로 하는 학생들의 자기결정성 증진은 특수교육에서 점차 중요한 목적이 되면서 이와 관련된 연구가 특수교육 분야에서 중요한 주제로 대두되고 있다. 그동안의 연구에 의하면 자기결정성 훈련이 중등교육 이후의 모든 성과에서 상당한 이점이 있는 것으로 보고되어 왔다. 그러나 개별화교육 프로그램(IEP)이나 개별화전환교육 프로그램(ITP)을 계획하는 일련의 과정에서 학생들은 의사결정 역량을 발휘할 기회를 갖지 못해 왔다. 본 연구에서는 과학교육 분야의 연구문헌에서 제안된 공동생성적 대화를 소개하면서 이것이 특수교육이 필요한 학생들에게도 적절한 교수 전략이 될 수 있음을 제안하고자 하였다. 이를 위해 공동생성적 대화가 특수교육 지도교사와 내용 분야 전문 교사들이 특수교육이 필요한 학생의 자기결정적 실행을 확장하는데 유용하게 사용될 수 있음을 주장하였고, 이러한 구조화된 담화 방법이 교사와 연구자들에 의해서 어떻게 실행되는지와 어떻게 교수-학습을 향상시키는지에 대한 사례를 제시하였다. 마지막으로 서구와 다른 문화적 맥락에서도 이 방법의 활용에 대한 유효성을 연구할 필요가 있음을 제기하면서, 특수교육이 필요한 한국 학생들에게 공동생성적 대화의 활용을 통한 자기결정성 실행의 확장과 관련된 미래의 연구 방향도 함께 제시하였다.

주제어 : 자기결정성, 전환교육, 공동생성적 대화, 통합과학교육

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