Journal of Modern Education Review, ISSN 2155-7993, USA
October 2016, Volume 6, No. 10, pp. 693-703
Doi: 10.15341/jmer(2155-7993)/10.06.2016/001

http://www.academicstar.us

Ethnographic Study of a Co-enrollment Program for Deaf and Hard-of-Hearing Pupils in the USA: Focusing on Classroom Activities

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Abstract: The number of deaf and hard-of-hearing (DHH) children who enroll in mainstream schools has increased in recent years. In the present paper, we discuss with the co-enrollment program for inclusive DHH pupils in the United States. Through observation of classroom activities, I attempt to ethnographically clarify what happens in co-enrollment classrooms. In particular, I focus on DHH pupil's participation in classroom's activities, describing the interaction between hearing and DHH pupils, the collaboration between regular teachers and teachers for DHH, and the relationships between signed and spoken languages. Two types of information flow were found in classroom discourses: (i) formal, single-track flow, such as the teacher talking to the whole class, and the teacher asking questions and the pupils responding to it; (ii) informal, multiple-track flow, such as the pupils murmuring spontaneously and simultaneously, and talking with each other locally. While the sign language interpreters mainly supported the first type of flow of discourse, the direct interactions between DHH and hearing pupils were found to necessary for the second type of information flow. Finally, I discuss how the learning would be constructed for DHH pupils in inclusive classrooms from a socio-cultural point of view.

Key words: education for deaf and hard-of-hearing, co-enrollment, inclusive education, signed language, classroom observation

1. Introduction

The number of deaf and hard-of-hearing (DHH) children who enroll in mainstream schools has increased in recent years (Antia, Kreimeyer & Reed, 2010; Cerney, 2007). However, DHH pupils in inclusive settings are reported to experience sometimes various challenges academically, socially, and psychologically (Stinson & Antia, 1999; Hyde & Ohna, 2004; Cerney, 2007). Even if they have a need for signed language and the signed language interpreter is employed to be in the classroom, they are usually the only deaf child in the whole school and are easily isolated (Ramsey, 1997; Oliva & Lytle, 2014). Moreover, in an inclusive situation, DHH pupils generally have no contact with Deaf and/or hard-of-hearing adults, and having difficulty in developing their future self-images in adulthood.

1.1 Why the Co-Enrollment Program?

The co-enrollment program is regarded as a promising development, in terms of sign bilingualism and inclusive learning for DHH pupils (Kirchner, 1994; Stinson & Kluwin, 2003; Cerney, 2007). "Co-enrollment" was

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defined in this paper as (i) where DHH (not one, but as a group) and hearing pupils together in a classroom; (ii) where the general and the special education teachers (or Deaf teacher, sign language teacher or interpreter) teach and/or support children collaboratively, and (iii) where signed and spoken languages are both used as educational languages (Antia & Metz, 2014).

Outcomes have been reported, although sporadically, with the co-enrollment program, such as DHH pupils' participation and integration in the class had improved (Wauters & Knoors, 2008); DHH pupils having better academic performance compared with other DHH programs (Kreimeyer et al., 2000); hearing pupils showing some positive effects (Bowen, 2008). However, we still had no detailed information concerning what really happened in co-enrollment classrooms: how multiple teachers and staffs (including Deaf teachers, interpreters) co-taught and/or collaborated with each other; how DHH and hearing pupils interacted with each other and constructed the learning socially; and what was the relationship in the classrooms between spoken and signed languages. Through this information, we can know more about and deepen the inclusion for DHH pupils.

Thus, in this paper, I observe and describe ethnographically classroom activities in a co-enrollment program in the USA, in an attempt to clarify what happens socially, academically, and linguistically.

2. Methods

2.1 Site and Participants

I visited and observed the co-enrollment program of an urban primary school situated in the southwestern United States (Kreimeyer et al., 2000; Metz, 2013). This program was established in 1994. The school comprised of grades K-5 in multi-age classes. The co-enrollment program consisted of three multi-age classes: a kindergarten/first/second grade combination (K/1/2); a first/second/third grade combination (1/2/3); and a third/fourth/fifth grade combination (3/4/5). The total number of pupils in each class was around 30, including about 10 DHH pupils. Each class was co-taught by a general education teacher and a teacher of DHH. Two sign language interpreters were assigned to each class. The teachers of DHH were fluent in sign language, while the general education teachers had levels of sign language proficiency that ranged from beginner to advanced. All teachers were hearing, except for one teacher of DHH in the 1/2/3 class, who was Deaf herself.

A typical day in the co-enrollment classroom was as follows. In the morning meeting, one of the teachers took the main teacher's role, and the other took a supporting role. If the main teacher was hearing, the sign language interpreter stood by the side of the main teacher and interpreted the main teacher's talking into the signed language. If the main teacher was Deaf, the signed language interpreter stood at the other side of the classroom and interpreted the main teacher's signing into the spoken language. The morning meeting consisted of the calendar's work, checking the day's schedule, sharing talks from the pupils (what happened during the previous day), and several small lessons of English, Spanish, American Sign Language, and mathematics (mainly calculation). The lessons such as English, Mathematics, Social Science, and Natural Science were usually given in groups. Most of the lessons were done in a child-centered way, emphasizing group discussion, interaction among the pupils and independent learning. The teachers walked around the groups and supported the pupils when needed. Individual independent learning was implemented and one-to-one teaching was used where necessary. After lunch, they had one or two lessons. Sometimes the DHH pupils were pulled out to the resource room for a special English lesson given by the speech-language-pathologist.

2.2 Procedures

I visited this school for 5 days in 2011 and for 20 days in 2013. I stayed in one of the co-enrollment classrooms for the whole day, observing the classroom activities and describing what happened in the classrooms in detail. The focus of the observation and analysis was the relationship among the teachers, staff, and hearing and DHH pupils, and between signed and spoken languages. During his observation, I used short memos in my field notes, and after it I reconstructed what happened in the classroom in as detailed a way as possible. The interviews with the teachers and staff were conducted during the recess and/or lunch time for a short time, when possible.

2.3 Analysis

The analysis method used was qualitative and hypothesis-productive (Delamont, 1992; Mills & Morton, 2013). Through observation I selected episodes concerning the focus of analysis (described above). I read these episodes many times, trying to understand them deeply; and I developed open-codes which corresponded to parts of the episodes. Then, I reread them many times to elaborate and developed more general categories from the open-codes, which described what really happened in the co-enrollment classrooms.

3. Results

3.1 Data and Categories

I extracted 203 episodes from the observation of the classrooms activities and interviews, and developed 14 categories, which could be grouped further into three upper-level categories: language use, support and instruction, and interpretation.

3.2 The Language Use

For language use I developed seven categories: free language selection; local development of signed language space; signed language learning by hearing pupils; simultaneous use of signing and speaking; the functions of voice; mutual help for communication among children; and overhearing.

3.2.1 Free Language Selection

In the co-enrollment classrooms, the members were found to choose languages freely. We describe two classroom situations here in detail: single-track and multiple-track communications.

Single-track communication occurred in more structural situations. For example, the teacher talked to the whole class, and/or asked the pupils something, some of them raised their hands, the teacher called out one of the names, and the pupil replied to it. The teacher and the pupils communicated through signed language or spoken English. Sometimes signing and speech was used simultaneously. In these single-track communicative situations, the contents of the communications which were interpreted were easily shared among all the members of the classroom. The classrooms were really bilingual, and the members could fully and freely access the content directly in signed or spoken languages or through interpretation. Moreover, in these situations the simultaneous use of signing and speech was limited, such as the hearing teachers who were fluent in signed language used only speech when they talked to the whole class. We can say that the signed and spoken languages were clearly separated, not mixed.

Regarding the issue of language separation, in one episode, before the pupils presented the outcomes of their group activities to the whole class, the teacher asked them which language they would use for presentation. When they chose the spoken language, the interpreter moved beside them, and interpreted their speech into the signed

language. When they chose the signed language, the interpreter moved to the back of the classroom and interpreted into speech. Another example showed that in the morning meeting, the pupils had a small learning, such as counting and adding. The teacher asked the pupils to recite first in voice, and second in signing.

The multiple-track communicative situations concerned whole-class teaching situations, where the several pupils communicated simultaneously and spontaneously to the teacher; or small-groups learning situations, where the pupils learned collaboratively by talking to each other, and sometimes the teacher came to the group for advising the pupils. In these situations, the information flowed multiply and simultaneously among the members, and the interpretations sometimes did not work, because there was too much information to be interpreted. In the small group discussions, the teachers always encouraged the pupils, hearing and deaf, to talk directly to each other. Hearing pupils tried to use the signed language or signing with speech when communicating with deaf pupils. Several episodes showed that at one time the hearing pupils who were fluent at signing helped less-fluent signer as an interpreter, and that at the other times a hearing pupil first communicated just with speech and then signed the same contents for deaf classmates. We often observed that when a hearing pupil did not know a signed word, he or she asked the teacher or the interpreter how to sign it, and then directly signed to the deaf pupil. When the teacher came to a group for monitoring the pupils' activities, it was observed that she sometimes talked with simultaneous communication to all group members; or she signed or spoke individually to a single member, deaf or hearing, correspondingly. Another episode showed hearing and hard-of-hearing pupils talking with each other in speech only; and when a deaf pupil joined this group, they smoothly switched from speech only to speech with signing.

In those multiple-track communicative situations, direct interaction among the members was encouraged by the teachers. The selection of signed and spoken languages and the transfer between them were observed frequently and smoothly depending on the situation. In addition, there was a simultaneous use of signing and speech. However, the interpretation of these languages was limited.

3.2.2 Local Development of Signed Language Space

In the morning, before the meeting, there was always a space where only the signed language was used. The deaf teacher and deaf pupils, and sometimes hearing teacher, the interpreter, and hearing pupils who were fluent signers, freely conversed with each other. Although the signed language was the minority language in this classroom, this signing-only space was often observed locally and sporadically, especially during less structured times in the day. In those situations, the classroom seemed to be divided into two separate language spaces. While the interpreters tried to interpret spoken talk among hearing members for deaf members, they would not interpret signed talk to hearing members. Therefore, signed talk was not shared by most of the hearing members, if they were not good at signing.

3.2.3 Signed Language Learning by Hearing Pupils

Although the teachers encouraged hearing pupils to use the signed language when communicating with deaf pupils, they were not taught the signed language as a subject. The teachers told us that the hearing pupils learned the signed language through every day interaction with deaf members in the classroom. Therefore, there was a big difference in their proficiency of the signed language: some were born into deaf families, and the signed language was their first language, and some were not so good at signing.

We observed plenty of opportunities in which hearing pupils could learn the signed language in every day classroom activities. First of all, the classrooms were bilingual, and the hearing pupils observed signing by deaf pupils, teachers, and interpreters. This could be an input of learning the signed language. Some of the pupils were really enthusiastic about learning the signed language and were often observed spontaneously imitating signing

when they watched deaf members' signing; for example, when the deaf teacher communicated during the morning meeting.

In the morning meeting, the pupils always had a small session of signed language learning, such as dates, numbers, and schedules. Those lessons, however, were limited to learning words, not sentences.

As described above, hearing pupils were always encouraged to express themselves in the signed language, and when needed, they were supported by other members who were more fluent. We also observed an episode in which a hearing pupil moving her hands (signing) when reading a book during the independent reading lesson.

3.2.4 Simultaneous Use of Signing and Speaking

Not only were signed and spoken languages used in the classroom, simultaneous signing and speech were also used. We found five functions of this simultaneous use:

(1) Routine use. In the morning meeting, the teacher asked the pupils to recite something in unison, such as counting numbers and verifying the day's schedule. They all used speech and signing simultaneously. In the 3/4/5 grade class, teachers and pupils recited the pledge of allegiance to the American flag with signing and speaking in the every-day morning meeting.

(2) The hearing teachers saying something to both hearing and deaf pupils in the group learning situations, in which the signed language interpreters were usually not available.

(3) The less-fluent signers tended to use this mode rather than just signing. The typical way was that they spoke with voice while simultaneously using corresponding signed words sporadically.

(4) When the hearing pupils said something to the whole class, they tended to use this mode, not just signing. For example, the hearing pupil who was responsible for book lending at the library spoke to the whole class about the books while signing simultaneously.

(5) Even fluent signers used this mode when the interpreter was not available. Sometimes the interpreter was absent from the classroom or the class was divided into more than three groups, some of which had no interpreter. Therefore, the simultaneous use of signing and speaking was on one hand just "a culture" and on the other was the last resort for DHH pupils' equal participation.

3.2.5 The Functions of Voice

In these classrooms, voice also constituted an important aspect of communication: (1) many deaf pupils who had cochlear implants and hard-of-hearing pupils used spoken language substantially; (2) while signing speech was also used simultaneously by hearing and DHH members.

For communicating adequately by voice, the teacher sometimes supported the pupils, deaf or hearing. On one occasion, when pupils were discussing something in groups, and the class became a little bit noisy, the teacher told them that a noisy sound environment did not allow DHH pupils to participate in the group talk and advised them to control their own voice level. On another occasion, when a group of pupils presented the results of their activities to the class and the presenter spoke very fast with a low voice, the teacher told this pupil to speak loudly and slowly. This support by the teachers would help them to make voice operate more functionally in the classroom, especially for DHH pupils.

3.2.6 Mutual Help for Communication among Children

The classroom activities and learning were mainly child-centered. The pupils sometimes needed to support each other. On one occasion the morning meeting was led by the pupils themselves. Two pupils stood at the front of the classroom, one took the role of the teacher and the other took the role of the interpreter. The "teacher" pupil talked about the day's schedule and the "interpreter" pupil interpreted it into the signed language. On this day, the

"interpreter" happened to not be so good at signing. A deaf pupil who was a fluent signer sat in front of the "interpreter" and supported her when she was struggling.

Another episode showed that when a pupil with cochlear implants talked about the conclusion of his group's discussion using signing and speech simultaneously, a hearing pupil standing next to him supported the presenter by whispering when he was stuck. One episode in a more informal situation showed that before the morning meeting, a deaf and a hearing pupil looked at the white board on which an English sentence was written by the teacher, the deaf pupil tried to read with signing, but could not understand some words, then the hearing pupil explained their meaning with signing and speech. The deaf pupil then could express the whole sentence with the signed language, and the hearing pupil imitated that signing expression, learning some signs.

The direct interaction between DHH and hearing pupils was encouraged by the teachers and this was done by the flexible use of languages and mutual support among the children.

3.2.7 Overhearing

In the formal situation, all communications that were signed or spoken were interpreted by the interpreter. For example, during the morning sessions when hearing teacher asked a question and a hearing pupil answered with speech, this speech was interpreted into the signed language, and the pupils could share this interaction directly through speech or by interpretation.

However, in less formal situations, for example, when the pupils learned individually and the teachers moved around in the classroom, supporting pupils individually when needed, it may become challenging to share the information equally with DHH pupils. When the hearing teacher said something to a hearing pupil only with voice, other hearing pupils also could overhear this talk and learn something incidentally from it. However, DHH pupils could not learn from this without interpretation. The interpreters usually would not interpret the individual teaching interaction, and even if they did, DHH pupils concentrated on their own work and would not watch the signing. Thus, the DHH pupils were at risk of absorbing less information than the hearing pupils. This situation also applied to hearing pupils, when DHH and hearing members who were good at signing made a signing space in a less formal situation, for example, before the morning meeting as described above. The pupils who were not as good at signing could not "overhear" the signed contents that happened to not be interpreted. However, the signed language was less dominant and this did not happen as often as compared with the reverse situation.

For fully sharing information among hearing and DHH pupils, the support by teachers and/or interpreters was indispensable.

3.3 Support and Instruction by Teachers

Two languages were used in this bilingual classroom, and all the pupils could access information through either of two languages. However, these two languages were not equal, that is, the signed language was a minority language. Therefore, to encourage the classroom to be more equally bilingual, the role of the teachers was very important. We classified the related episodes into two categories: teacher's control of information flows, and the collaboration of teachers.

3.3.1 Teacher's Control of Information Flows

As described above, the pupils were found to choose a language freely in two classroom's situations: the formal single-track communication and the local multiple-track communication. As I described, the former situation was easier to follow for DHH pupils than the latter. However, even in the former, DHH pupils could sometimes not follow the communication and participate in the collaborative learning with hearing pupils. In the

whole-class instruction, when the teacher asked the pupils a question, several children started to respond at the same time without raising their hands. Moreover, sometimes the teacher picked up on some of these conversation threads and extended her discussion. In such situations, the interpreter would become overloaded, and DHH pupils, even though they may directly receive a part of the speech, may not be able to participate in those discussions. The teacher noticed that there was an overflow of information, and told the pupils that they should not speak simultaneously and spontaneously, but raise their hand and ask for the floor. Thus the teacher controlled the flow of information, leading to a single-track communication.

Another episode in the whole-class instruction setting showed that when one pupil said something or murmured to oneself concerning what the teacher was saying, the teacher noticed that the pupil had made a good point. Hearing pupils may hear this speech; however, DHH pupils could not because of their hearing constraints. The teacher picked up on the pupil's murmur, retold with signing and speech simultanously, and extended it. Thus, DHH pupils also could participate. The reverse situation also occurred often when DHH pupils signed to the teacher, which some hearing pupils could not see, so the teacher picked up the signing, resigned with their voice, and extended it. This method of the teacher picking up, retelling and extending would help with sharing information among the pupils.

3.3.2 Collaboration of Teachers

Although one of the two teachers in the class was a teacher for the deaf, they were responsible for the whole class. For example, in the morning meeting of the 1/2/3 class, deaf and hearing teachers swapped their role each day, that is, the main and supporting teacher roles. The pupils could learn how to collaborate between deaf and hearing people when they observed their teachers' collaboration.

Moreover, information was always shared among the teachers. One day an incident occurred among the hearing pupils. The hearing teacher called these pupils to her place and discussed only through speech. After she solved the problem with the pupils, she shared it with the deaf teacher using an interpreter. In another episode, the parent of one DHH pupil came to the classroom and asked for advice concerning a hearing aid from the deaf teacher, using an interpreter. After this consultation, the deaf teacher summarized it and shared it with the hearing teacher.

3.4 The Interpretation

As the classrooms were bilingual, and the pupils used languages freely, the interpretation became very important for communication and interaction among the class members, while direct interaction and communication between DHH and hearing members was encouraged. Although each classroom had two interpreters, and they seemed to function well, various challenges were also observed. We classified these into five groups: the tutor's role; the use of visual materials; local and simultaneous talks; simultaneous works; and phonics training.

3.4.1 Tutor's Role

DHH and hearing pupils sometimes talked directly to the interpreters. For example, hearing pupils asked the interpreter about a sign they did not know when they tried to directly communicate with DHH members. Sometimes the interpreters spoke about or explained the content of the subjects. In particular, in individual learning situations the interpreters sometimes extended their role as a tutor. Sometimes, when the teacher's instruction seemed to be unclear or not enough, the DHH pupils asked the interpreter for more detailed instructions. As an interpreter, they should intervene between the teacher and DHH pupils, and verify whether the

teacher should give further instructions. However, this was not always possible, and the interpreter often gave the DHH pupils the additional information. In that situation, a closed space for DHH pupils and the interpreter would be established in the classroom and this would not be shared with other hearing members, being separated with each other. In this regard, collaboration between the teacher and the interpreter is necessary to overcome this challenge.

3.4.2 Use of Visual Materials

The teachers usually implemented various visual materials, such as books, videos, real items, and projected pictures for the pupils to understand the contents easily. However, this way of teaching sometimes seemed to make it difficult for DHH pupils to follow the teacher's instruction because the signed language was also visual, and DHH pupils could not watch both at the same time. One episode was observed in a mathematics lesson, where the teacher stood next to the projector and the materials were projected on the screen, next to which the interpreter stood. The teacher talked to the pupils concerning the materials while often pointing at some parts of those materials and asked questions. The visual reference to the materials and the explanation by voice was done simultaneously, the signed language interpretation usually lagged a little behind the voice. DHH pupils sometimes could not switch their gaze adequately between the interpreter and the visual materials pointed to by the teacher.

Another episode showed that when the pupils checked the answers of the mathematics test together, the teacher projected the test paper on the screen, pointed to the questions one-by-one and simultaneously asked each pupil to read their own answer. In this situation, DHH pupils needed to pay attention to the screen, their own test, and the interpreter, all at the same time. Consequently, they sometimes lost track.

3.4.3 Local and Simultaneous Talks

In the learning situations, several pupils often talked simultaneously, and/or murmured to themselves, or discussed privately while thinking, and the teacher picked up on sometimes one of them, saying as it was relevant, trying to share it among the pupils. In such situations, multiple flows of information were observed as described above, and the interpreters found it difficult to interpret all the simultaneous talking, murmurs, and private discussions. The interpreter had to choose which speech should be interpreted or not. While hearing pupils could ignore seemingly unimportant talk, but DHH pupils must be interpreted when they decided which were relevant or irrelevant. Moreover, DHH pupils often could not follow who talked to whom, although the discussions were interpreted.

Simultaneous talk was often observed when the teacher read a picture book to the pupils. When the teacher asked a question concerning the content, pupils often answered voluntarily without raising their hand and simultaneously burst into conversation. Their murmurs were also observed very often, some were relevant and some were not. In such situations, the interpretation also became challenging, as they showed DHH pupils both the picture book and the signing, and the latter needed to include who talked to whom.

3.4.4 Simultaneous Works

In the learning situations, the pupils sometimes were required to work on several things at the same time. One day, in the format of a timed race, the teacher told the pupils to make a problem based on a formula, such as "23×_=276", as fast as they could and to come to the front of the classroom to report their answer to the class. When the pupils completed their assigned activities, they reported their problems and the teacher checked the time taken. Hearing pupils seemed to listen to the other pupils' reporting while they simultaneously thought about their own problems; however, DHH pupils were always interrupted in their ongoing work while others' reports were interpreted. As a result, some of the DHH pupils decided not to look at the interpreter but continued to concentrate

on their own work.

Therefore, the interpreter always thought about and judged which information should be interpreted to DHH pupils and which should not. However, this did not work when there were several DHH pupils in the classroom and when the interpreter did not know well the situation of each DHH pupils learning abilities. The collaboration between the teacher and the interpreter is indispensable to overcome this challenge.

3.4.5 Phonics Training

In this school, phonetics training was given not only to DHH pupils but also to the hearing pupils, as this would be helpful for attaining literacy (phonics). Each day the teachers taught the phonetic rules of the relationship between pronunciation and spelling. While the interpreters used finger spelling for spelling, they had difficulty in interpreting the English pronunciation. Depending on the situations, the interpreter translated it into corresponding signed word, or just showed mouthing of the English word, like an oral interpretation. The teachers often checked the knowledge and skills of phonics through a dictation test. For example, the teacher presented some phonetic parts of English words, and the pupils wrote the spelling. In this situation, the interpreter would not interpret and just made the DHH pupils pay attention to the teacher's pronunciation.

4. Discussion

In this paper, I observed and described ethnographically the classroom activities in a co-enrollment program, in an attempt to clarify "what happens" in the co-enrollment classroom, socially, academically, and linguistically.

From observation of co-enrollment classrooms I can summarize the findings as follows. First, the co-enrollment classes were really bilingual, and DHH pupils could access fully the signed and/or spoken languages, through hearing (general and special) teachers, Deaf teacher, and/or signed language interpreters. Second, the flexibility in language choice was shown, sometimes using speech with signs (or simultaneous communication), depending on the participants' signed language skills and situations. Third, the teachers were really collaborative, with both being responsible for the whole class. Fourth, the learning was socially constructed among hearing and DHH pupils through their direct interaction and communication and/or interpretation. Fifth, through the interpretation, a high level in both languages would be secured as the two languages were separated.

Hyde and Ohna (2004) classified the bilingual classrooms for DHH children into two types: modality-separate and modality-mixed models. In the former classrooms, the two languages, signed and spoken, were separated, and simultaneous communication was not so used. In the latter, direct communication between deaf and hearing was encouraged, and simultaneous communication was often used. In our observation, the language choice was really flexible, especially in a small group setting or in a child-centered way. Hence, we can say that it would be modality mixed situations, rather than modality separate that would function in the structural teaching situations. However, the quality of bilingualism would also be important, depending on the level of signed language. We need to know more about the role of modality mixed situations or simultaneous communication in the sign bilingualism of the co-enrollment programs.

Irrespective of the many good practices that were shown above, several challenges were also observed. As for the interpretation, because of the characteristics in teaching and learning situations, such as simultaneous tasks, the multiple flows of information, the use of visual materials, and the emphasis on the voice, the interpretation work might be extended and overloaded. Moreover, hearing members might tend to depend on interpreters, and might become less collaborative, leading to the emergence of two separate (non-collaborative) worlds in a

classroom. Although research on educational interpretation in the inclusive situation for DHH has been accumulated thus far (Ramsey, 1997; Cerney, 2007), the typical situation was one deaf child in a whole classroom or school. Thus, we need to know more about the signed language interpretation in the co-enrollment program.

We felt that we need to tackle those issues for innovating co-enrollment practices. I dealt with two things among others: the multiple flows of information in the classroom and the overheard and incidental learning by children.

4.1 Multiple Flows of Information

In the classrooms, when the learning is socially and/or dynamically constructed, such as creative discussion in a small group, the pupils become initiative and active, and they talk spontaneously and, sometimes, simultaneously. In that situation, information flows become multiple, as compared with the single flow of information in the structural teaching. Such as in a morning meeting, when many hearing children communicated simultaneously to a hearing teacher and the teacher responds to some of them, DHH pupils sometimes cannot follow those discussions, even with the interpreter. Moreover, interpreted discussions would be time-delayed and DHH pupils may lose the opportunity to take a timely turn in the whole-class talk. In such situations, the information flow in the classroom is multiple and, sometimes, unanticipated; therefore, sharing discussions among DHH and hearing pupils would become difficult, even when the interpreter is present.

Although active and spontaneous talk is indispensable for dynamic and creative learning, some teachers tried to make the information flows one-way, and used strategies such as stopping children to talk spontaneously and asking them to raise their hands before speaking when the discussion became heated. Implementing that kind of "culture" in the co-enrollment class is important for full-participation by DHH pupils. In other situations, when spontaneous talk from children occurred in the whole-class situation, and sharing among children seemed to be difficult, some teachers took a strategy of repeating the child's talk with signs and speech, which would be also helpful for sharing. We need to know more about good practice and innovations for making the learning socially-constructive in the co-enrollment classrooms.

4.2 Overhearing and Incidental Learning

While in small group learning and/or individual learning situations, teachers move around in the classroom, and talk to individuals or to a group locally. Those individual or local talks (not a whole-class discussion) were usually not interpreted to DHH pupils if they were not directed to them. In those situations, however, hearing children may overhear those discussions and learn something from them. Children generally learn a lot from overhearing others talk. Overhearing would give an opportunity for incidental learning, and DHH pupils often miss this opportunity. Moreover, input of language to DHH pupils might lessen, compared with hearing children. However, if all local talks would be interpreted to DHH pupils instantaneously, this might interrupt DHH pupils' ongoing learning or activities. Interpreters would sometimes need to summarize later what happened in the hearing/spoken world, if DHH pupils seemed to miss it.

However, another episode was observed as below. DHH pupils always loved to talk individually to Deaf teacher or special teachers who knew the signed language very well. Those signed (individual, and/or local) talks were not interpreted into speech and not shared with hearing members, just being closed in a signed world. The hearing pupils who are less skilled signers could not "overhear" those signed talks. To put the two worlds together, the interpretation would play an indispensable role in the co-enrollment classroom. We need to clarify more what, when, and how to interpret in the co-enrollment classrooms.

4.3 Further Research

Torigoe (2014) described the variation of co-enrollment programs for DHH and classified them into two types: interpretation-prominent and co-teaching-prominent programs. This program seemed to include in the former type. This research was descriptive in nature, and moreover dealt with just one co-enrollment program in USA. Educational practices are embedded in cultures and histories of schools and societies in general. We need to know other type programs for understanding more deeply what happens in co-enrollment classrooms.

Acknowledgements

I, first of all, would like to give gratitude to pupils and teachers of this school for giving me an opportunity of observing their nice classroom activities. I also thanks to Shirin Antia, and Katherine Kreimeyer, The University of Arizona, for various support and advices for this research. This research was financially supported by Japan Society for the Promotion of Science (No. 25301054).

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