

# **CLASSROOM PARTICIPATION OF DEAF AND HARD OF HEARING STUDENTS IN A SIGN BILINGUALISM AND CO-ENROLLMENT (SLCO) EDUCATION SETTING**

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## **ABSTRACT**

Inclusive deaf education has become a global trend. One of the crucial questions regarding educating deaf and hard-of-hearing (DHH) students in a mainstream setting is whether students can have positive academic engagement and participation in a regular classroom. The aim of this study is to investigate if the DHH students in a sign bilingualism and co-enrollment (SLCO) educational environment possess a positive perception of their classroom participation comparable to their hearing peers. The 28-item Classroom Participation Questionnaire was translated into Chinese and administered to 17 DHH and 62 hearing students studying from Primary 4-6 in a SLCO education setting. Correlational analyses were conducted to investigate the relationships between CPQ scores and their performance in literacy, oral and signed language assessments. Results showed that both DHH and hearing students possessed a positive perception in their classroom communication with the teachers and peers. No major differences between the CPQ scores of DHH and hearing students were found. Oral and signed language skills, in general, do not possess strong association with DHH students' classroom participation. Rather, literacy skills in the setting seem to play a specific role that supports their classroom communication.

## **INTRODUCTION**

According to Stinson & Antia (1999), quality education for DHH students in inclusive settings need to provide means for these students to achieve social and academic integration. Academic integration includes academic performance and classroom participation, in which the former refers to DHH students' academic achievement compared to their classmates (classroom academic status) and to the norms based on standardized assessments (normative academic status); the latter refers to their ability to participate in classroom activities and discussion. Academic performance concerns more about the learning outcomes, while classroom participation focuses on the learning process, especially how their communication and engagement in classroom activities bring them academic success.

Academic attainment of DHH students, in disregard to the educational settings, has been consistently below hearing students, and the gap between the academic performance of DHH and hearing students is still relatively large for the past three decades (Qi & Mitchell, 2011). The unfavorable academic status of DHH is always attributed to communication factors such as hearing ability, and receptive and expressive communication skills (Antia et al., 2009). It is especially difficult for DHH students to participate in a mainstream classroom when there are barriers like rapid rate of discussion, rapid turn-taking and topic-change, multiple speakers at a

time, noisy environment, and difficulties interpreting during class discussion (see Stinson & Antia, 1999). In Borders, Barnett, & Bauer (2010), even students with mild to moderate hearing loss were found to have difficulties following verbal prompts like their hearing peers, and they required more high level prompts to support their participation in class.

Co-enrollment programming is considered a promising and valuable option that may effectively lower the communication barriers possessed in a regular classroom (McCain & Antia, 2005). According to Kirchner (2014), co-enrollment programming promotes: a) direct communication between the DHH and hearing students as well as teachers (i.e. “no interpreters” is preferred); b) equal access to a regular curriculum through team teaching between a regular teacher and a teacher for the deaf using signed and spoken language; c) equal opportunities for engaging DHH students in academically challenging tasks; and d) socio-emotional support by creating a bimodal bilingual peer group in school that shares common linguistic resources. The purpose of this study is to investigate the effectiveness on communication participation of DHH (and also hearing) students in a sign bilingualism and co-enrollment (SLCO) classroom.

## **CLASSROOM PARTICIPATION OF DHH STUDENTS**

Classroom communication, defined as students’ ability to receive and send information with their peers and teachers, along with their perceptions on the subject is considered a significantly important variable related to academic outcomes. In Long, Stinson and Braeges’s (1991) study of 95 high school students in a special school for the deaf, students’ perceived communication participation in class positively associated with their normative academic achievements in mathematics, language/writing and reading comprehension. This association between classroom participation and normative academic status could also be found in Antia, et al.’s (2009) study of 197 DHH students studying in the mainstream settings. Hintermair (2010) further explored the impact of classroom (communication) participation, and found that it predicts DHH students’ quality of life, including their social contact with peers and their mental health.

It is generally agreed among research that co-enrollment programming support social integration among DHH and hearing students in a mainstream classroom (Marschark, Tang, & Knorr, 2014). The positive peer acceptance among DHH and hearing individuals, along with the positive attitudes of hearing students toward their DHH peers in co-enrollment programs create a sense of true membership for DHH students in class (Yiu & Tang, 2014). This language-rich environment facilitates deaf-hearing interactions as well as on-task engagement in both whole-class teaching and small group activities. McCain and Antia’s (2005) study of 28 DHH and 18 hearing students in a multigrade co-enrollment classroom showed no significant difference between DHH and hearing students in their communication participation, suggested that DHH students can have comparable classroom participation to their hearing peers. In this study, the classroom participation of DHH and hearing students in the SLCO program was compared. In addition, classroom participation’s relationships with students’ sign language, oral and signed language abilities were also examined.

## **METHOD**

17 DHH and 62 hearing Primary 4-6 students in the SLCO classrooms participated in the study. DHH students have been studying in the SLCO classes for 4-6 years. 14 (82%) of them have severe (N=4) or profound (N=8) hearing loss in their better ears (based on the average thresholds at 500Hz, 1KHz and 2kHz). For the remaining three hard-of-hearing subjects, one has unilateral loss, one has mild loss and another has moderately-severe loss. 8 (47%) DHH students were using hearing aids. The same number of students was using cochlear implants. The student with unilateral loss used no hearing instrument.

The 28-item Classroom Participation Questionnaire (CPQ) (Antia, Sabers, & Stinson, 2007) that is originated from Garrison, Long, & Stinson's (1994) Perceived Communication Ease Questionnaire was used in this study. The CPQ was translated into Chinese and administered to both DHH and hearing subjects. The English version of CPQ was validated by Antia, Sabers, & Stinson (2007) and was found to be a valid and reliable checklist to assess DHH students' perceived classroom communication participation. All students participated in this study were asked to rate the items in a four-point scale (1=almost never; 2=seldom; 3=often; 4=almost always). The results collected from CPQ were categorized into four subscales: i) Understanding Teachers (UT), such as "I understand my teachers"; ii) Understanding Students (US) such as "Other students understand me"; iii) Positive Affect (PA) such as "I feel relaxed in group discussions"; and iv) Negative Affect (NA) such as "I feel nervous when I talk to my teachers". In the questionnaire, students were asked to indicate their preferred mode of communication and the expected mode their peers adopt when interacting with each other and teachers, including: interpreter, sign (i.e. Hong Kong Sign Language or HKSL), speech (i.e. Cantonese), speech and sign (mixing together or using two modes separately), and writing notes in Chinese.

In order to examine the relationships between DHH students' classroom participation and their language abilities, the Cantonese Grammar Subscale of the Hong Kong Cantonese Oral Language Assessment Scale (HKCOLAS-CG) (T'sou, Lee, Tung, Chan, Man, & To, 2006), the Hong Kong Sign Language Elicitation Tool (HKSL-ET) as well as the Assessment of Chinese Grammatical Knowledge (ACGK) (see descriptions of the two assessments in Tang, Lam, and Yiu, 2014) were used to assess students' morphosyntactic knowledge in oral Cantonese, HKSL, and written Chinese respectively.

## **RESULTS**

The preferred mode of receptive communication (RC) and expressive communication (EC) with their peers and teachers of the DHH and hearing students' were mostly "speech and/or sign" (a mixed code) in the SLCO classrooms. In sum, over 70% of the DHH students' preferred using a mixed code to communicate with their hearing peers and their teachers, no matter deaf or hearing. Understandably, besides speech and/or signed communication (47% for RC & 35% for EC), some DHH students preferred the use of sign-only communication (53% in RC; 65% in EC) among deaf-deaf interactions. A few of them preferred using speech only with their hearing peers,

but none opted for sign interpretation.

For hearing students, 71% of them preferred using both sign and/or speech in their expressive communication, but a similar number of students showed preference to use speech-only (26%), sign-only (32%) and the mixed code (34%) in their receptive communication with DHH peers. Different students had different expectations to their DHH peers. In communicating with their Deaf teachers, they preferred using sign language only (around 50%), while 30% of them preferred a mixed mode. Only a few of them preferred using a sign interpreter or written Chinese when communicating with their DHH peers or Deaf teachers.

The CPQ (Chinese version) was found to have good internal reliability. The reliability coefficient of CPQ based on 17 DHH and 62 hearing subjects was 0.85, in which the subscales for that ranged from 0.78 to 0.86. Similar to Antia, Sabers, and Stinson (2007), the inter-correlations between the subscales indicated that correlations between the UT, US and PA subscales were substantially higher (from 0.62 to 0.80,  $p < 0.001$ ) than that involving NA (from .15 to .44, correlation exists between NA and PA (0.44,  $p < 0.001$ ) only). Therefore, statistical analysis was made according to a combined score of UT/US/PA (Cronbach's alpha .93) and NA alone, instead of the overall CPQ scores.

Table 1 presents the CPQ scores of the DHH and hearing students. All the mean scores, no matter from the DHH or hearing students, were larger than 3 and that reflected a positive perceived classroom communication participation of students with their teachers and their peers.

Table 1. Comparing the perceived CPQ scores between DHH and hearing students

CPQ Subscales	Hearing Students (N=62)		DHH Students (N=17)		t
	Mean	SD	Mean	SD	
UT	3.35	0.45	3.13	0.42	1.97
US	3.33	0.47	3.01	0.36	2.54*
PA	3.15	0.56	3.18	0.41	-0.23
NA <sup>@</sup>	3.52	0.45	3.86	0.14	-3.13**
UT/US/PA	3.28	0.44	3.11	0.38	1.58

<sup>@</sup> Reverse scoring; \* $p < .01$ ; \*\* $p < .001$

No significant difference was found between the combined scores of UT/US/PA rated by the two groups of students. When comparing the scores of the subscales, the hearing students showed to have significantly higher scores than their DHH peers in the US (Understanding Students) Subscale. Checking with the scores of the individual items of US, on average, the DHH students had the two items "I join in classroom discussion" (mean = 2.88) and "I understand other students when they answer my teachers' questions" (mean = 2.94) rated below 3, indicating that they had more difficulties in joining group discussions and understanding other students' responses to teachers. There was also a significant difference between the DHH and hearing students in NA (Negative Affect), despite that no differences could be found in PA

(Positive Affect) between the two groups. The more positive ratings from DHH students represents that DHH students had less negative feelings about their classroom learning.

CPQ of DHH students was associated with their level of hearing loss in UT/US/PA ( $r=-0.613$ ,  $p<0.01$ ) and the two cognitive subscales: UT ( $r=-0.634$ ,  $p<0.001$ ) and US ( $r=-0.678$ ,  $p<0.001$ ), but no relationships could be found with the two affective subscales: PA and NA. There was no correlation found between CPQ, including the combined scores of UT/US/PA and all individual subscale scores, and the DHH students' morphosyntactic knowledge in HKSL (based on HKSL-ET) and Cantonese (based on KCOLAS-CG). Significant associations were found between DHH students' grammatical knowledge in written Chinese (i.e. ACGK) and CPQ in UT/US/PA ( $r=0.523$ ,  $p<0.01$ ) and the subscales UT ( $r=0.520$ ,  $p<0.01$ ) and US ( $r=0.506$ ,  $p<0.01$ ). No relations could be found between NA and any of the language scores.

## **DISCUSSION AND CONCLUSION**

Communication barrier is always a problem facing DHH students in mainstream settings. Co-enrollment programming represents a promising possibility to alleviate the difficulties facing DHH students during classroom learning and communication with their peers and teachers. While DHH students are supported to acquire oral language and signed language, hearing students are also encouraged to acquire signed language as an additional language. As suggested by this study, by creating a language-rich environment that nurtures a community of bimodal bilingual users within a regular school environment, both DHH and hearing students make good use of the languages they possess to engage themselves in classroom learning and classroom interactions. Both DHH and hearing students as well as teachers in the SLCO classrooms have adopted the "no interpreters" approach. Instead, they have direct communication among each other with a flexible use of code choice according to the hearing status and language preference of the interlocutors. DHH students do not perform differently in their participation in classroom communication with their peers and teachers. Barring that DHH students may have greater difficulties in joining group discussions and following other students' responses to teachers, they have good understanding and positive feelings about classroom communication in the SLCO classrooms.

Despite that students with higher level of hearing loss are facing greater barriers in classroom communication with their peers and teachers, DHH students in a SLCO classroom do not seem to have more negative feelings about their participation in class. By enrolling DHH and hearing students in a sign bilingual education setting, supporting them with bimodal bilingual development, DHH students, in general, have a positive perception to their own participation and communication in class independent of their oral language or signed language skills alone. Literacy skills in the setting seem to play a specific role that supports their classroom communication, especially when visual learning strategies and text reading are highly promoted in the SLCO classrooms.

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