



Evaluation of the Facilitated Communication Pilot

Office of Shared Accountability

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Executive Summary

The Office of Special Education and Student Services asked the Office of Shared Accountability to evaluate the Facilitated Communication Pilot. In facilitated communication (FC), people with communication impairments express themselves by typing with the aid of a communication partner, called a facilitator, who provides physical (and other types of) support. Montgomery County Public Schools (MCPS) committed to the FC pilot in late spring 2013 and initiated it only two months later for the 2013–2014 school year with four Grade 5 students. Each one had a paraeducator facilitator and was included in general education classes for the first time by the end of school year 2013–2014. The pilot’s goal was for students to demonstrate their learning of the general education curriculum, initially through FC and longer term, through independent communication without facilitation.

Previously reported concerns with FC have been that the facilitator influences the user’s messages. For example, based on its review of the research, the American Speech-Language-Hearing Association (1995) found no conclusive evidence that messages produced through FC can be reliably attributed to the FC user. To lessen the potential for facilitator influence and reduce questions about the validity of authorship, it is important for facilitators to develop expertise in supporting the user and to follow the best practices that support FC, and further for FC users to master FC skills in order to decrease the possibility of influence from the facilitator (Ashby, 2013; Institute on Communication and Inclusion at Syracuse University, 2012).

The goals for this study were to help assess authorship of messages (i.e., whether students’ typed messages about schoolwork can be attributed to the student rather than to the facilitator), to study an approach that MCPS had not previously used, and to determine the efficacy of the pilot. To assess authorship, this study examined three questions: 1) to what extent did facilitators implement FC supports to students as intended; 2) to what extent did students demonstrate acquisition of FC skills?; and 3) to what extent were MCPS and pilot schools implementing best practices to support FC? Questions to address the other goals for this study were: 4) to what extent did pilot students demonstrate academic proficiency; 5) to what extent did pilot students use FC in the classroom to interact with peers or participate in activities; and 6) what were school-based staff’s experiences with the pilot? Key data collection activities were 24 classroom observations and interviews of 12 school-based staff. Documentation from the Institute on Communication and Inclusion at Syracuse University was used to identify FC supports, FC skills, and best practices.

Summary of Findings

Question 1: Implementation of FC Supports

Facilitators were expected to provide three types of supports: *physical* to help the user’s pointing become easier, more automatic, and more accurate; *communication* to help the user stay focused on the message, its content, and its clarity; and *emotional* to provide encouragement and convey high expectations. Data on implementation of FC supports came from 12 classroom observations of facilitators. Facilitators provided four types of physical support at the desired level in at least one half of the observations, but provided five types of physical support at the desired level in fewer than one half of observations. The mixed extent of evidence indicates a moderate level of implementation for physical supports. Facilitators regularly provided five of the six types of communication support in only one third or fewer of the observations, indicating a low level of implementation. Facilitators regularly provided two types of emotional support during more than one half of the observations, but provided two other types of emotional support

less frequently or not at all, during the majority of observations. The mixed extent of evidence indicated a moderate level of implementation for emotional supports.

Question 2: Implementation of FC Skills

Students were expected to demonstrate four required FC skills: *physical* (e.g., accurate pointing, finger isolation, looking directly and consistently at keyboard), *message production* (e.g., message formulation, correction strategies), *independence* (e.g., initiation of desire for facilitation, independent pointing without physical support), and *authorship* (i.e., message passing, which is conveying information unknown to the facilitator in a variety of contexts).

Data on implementation of FC skills came from 12 classroom observations of students. Students regularly exhibited all physical skills during at least one half of the observations; this level of evidence indicated a high level of implementation of physical skills. Students displayed both independence skills occasionally or never in the majority of observations, which indicated a low level of implementation. Out of five message production skills, students displayed the desired level for one skill during the majority of observations and occasionally or never exhibited two skills in about one half of the observations. There was no evidence during the majority of observations for two additional skills. Thus, there was a low level of implementation overall of message production skills. Although no observational evidence was available for authorship skills, school staff interviewees were relatively confident that the messages produced through FC, especially work produced at school, could be attributed to the student users.

Question 3: Implementation of Best Practices to Support FC

There was a low or moderate level of implementation for each school-based best practice. Implementation for the best practice of having an established protocol for students typing sensitive information was moderate; one half of key school-based staff members knew there was a protocol in place; one half did not. Likewise, there was a moderate level of implementation for the best practice of having a plan to fade physical support. One half of key school-based staff members indicated that there was a plan; one half were not aware of a plan. There was a low level of implementation for two school-based best practices; students should have multiple facilitators, but there was very limited provision of multiple facilitators. Also, school staff should analyze a student's portfolio of typed messages, but there was no evidence of such portfolios.

Implementation was high for three district-based best practices. Regular visits by a consultant to facilitators indicated a high level of implementation for the best practice of providing ongoing support for facilitators. There were three meetings with parents, over the course of the school year, which indicated a high level of implementation for the best practice of intentional collaboration with parents. Two thirds of key, school-based staff members named the staff member who serves as the point person for FC; this level of agreement indicated a high level of implementation for the best practice of identifying a point person for FC. The implementation level was low for one district-based best practice: initial training for facilitators. MCPS provided initial training, but the late start to the pilot resulted in only one half of the facilitators attending it, and staff members (including facilitators) reported inadequate preparation for the pilot.

Questions 4 and 5: Students' Academic Proficiency and Use of FC in the Classroom

Although the students previously had very limited exposure to the on-grade-level curriculum, the students' report card grades across three marking periods indicated grade-level proficiency on nearly one half of all content areas. Students participated in state accountability tests, but

without FC; the results indicated very limited academic proficiency, based on Grade 5 standards. Students regularly used FC to participate in classroom activities (e.g., warm-ups, worksheets, writing) but rarely used it to communicate directly with peers.

Question 6: Experiences of School-Based Staff with the FC Pilot

School-based staff rated the success of the FC pilot with respect to its goal for students to demonstrate their learning of the general education curriculum. Their responses indicated limited or partial success. Interviewees identified the paraeducator facilitators, the Grade 5 teachers, and the pilot students as factors that contributed most to the success of the FC pilot. Interviewees provided suggestions to address challenges encountered in the pilot; their suggestions, along with the other study findings, led to the following recommendations.

Discussion and Key Recommendations

There was low or moderate implementation for facilitator supports, most of the students' FC skills, and the school-level best practices that address authorship. These areas of less than full implementation, although not unexpected for the initial year of a project, make it less certain that the students' typed messages about schoolwork demonstrated their own learning. With respect to the pilot's efficacy, there were successes, as indicated by report card grades, along with challenges, as indicated by results on state accountability tests.

To increase student success, as the pilot students move to middle school and to new teachers and new paraeducator facilitators, program staff should focus training, guidance, and other supports in the second year of the pilot as follows:

- Provide professional development to relevant middle school staff during the summer.
- Ensure that new paraeducator facilitators implement physical and emotional supports to students as intended, with more emphasis on communication support. Provide opportunities for students to begin facilitation with the new paraeducators in the summer, so that facilitators have more experience before classes start.
- Increase student message production and independence skills when using FC at school.
- Identify a case manager for the pilot students to do the following:
 - Provide facilitation to students when paraeducators are absent.
 - Ensure that each student has multiple facilitators.
 - Create and analyze portfolios of student typing.
 - Create and oversee formal plans for fading physical support.
 - Provide or oversee curriculum and lesson modifications to ensure that work is appropriate and to fill in gaps in students' knowledge, as needed.
 - Lessen the impact of students' frequent absences by identifying critical times for students to be in class, in consultation with their teachers.
- Encourage students to use an iPad tablet more frequently for typing at school to support creating a portfolio of their typed messages and to support monitoring of student FC skills and of facilitator supports. Teach staff how to save and print typing output.
- Provide supports to address students' behavioral and emotional needs.
- Improve preparation for all school staff involved with pilot students by providing more structure, support, and general information and by ensuring that paraeducator facilitators attend the initial professional development sessions.

Evaluation of the Facilitated Communication Pilot

Elizabeth Cooper-Martin, Ph.D.

Background

The Office of Special Education and Student Services (OSESS) asked the Office of Shared Accountability (OSA) to conduct an evaluation of a new initiative in the 2013–2014 school year, the Facilitated Communication Pilot. This evaluation focused on the scope and fidelity of implementation of facilitated communication within the pilot project.

Facilitated communication (FC) or supported typing is a form of alternative and augmentative communication in which people with disabilities and communication impairments express themselves by pointing (e.g., at pictures, letters, or objects) and, more commonly, by typing (e.g., on a keyboard) (Syracuse University, 2013). The method involves a communication partner who may provide emotional encouragement, communication supports (e.g., checks for typographical errors), and a variety of physical supports (e.g., slows and stabilizes the person's movement or spurs the person to initiate pointing). However, the partner should never move or lead the person.

The goal of FC is to reduce support from the communication partner and achieve more independent communication, either through independent typing, nearly independent typing (e.g., a hand on the shoulder or intermittent touch), or a combination of speaking with (supported or independent) typing (Syracuse University, 2013). The person who provides support for communication is called a facilitator or communication support person. A facilitator can be a teacher or other professional, a family member, or a friend. The person who receives the support is called the communication aid user or FC user. Communication with supported typing (i.e., FC) promotes access to social interactions and participation in inclusive schools and communities.

Montgomery County Public Schools (MCPS) initiated the FC pilot during school year 2013–2014. The students in the pilot have no ability or very limited ability to demonstrate their learning through verbal speech, sign language, or independent typing. However, the pilot students had used FC to communicate with family members and tutors (Bailey, 2013). Through the FC pilot, students had the opportunity to use FC as a way to communicate more effectively with others at school and to demonstrate their learning and knowledge of the MCPS curriculum.

FC is a controversial method due to the possibility that the communication partner influences the user's response, particularly when the partner provides physical support. For example, based on its review of the research, the American Speech-Language-Hearing Association (1995) found no conclusive evidence that messages produced through FC can be reliably attributed to the FC user. OSESS requested an evaluation of the FC pilot to help assess authorship of messages (i.e., whether students' typed messages about schoolwork can be attributed to the student rather than to the facilitator), to study an approach that MCPS had not previously used, and to determine the efficacy of the pilot. The pilot featured small groups of students in an inclusive school setting; professional development for staff; and provision of an iPad tablet for each student.

Program Description

Background and Goals

The target population for the FC pilot was a small group of MCPS students who were members of an informal FC club (Bailey, 2013). The students met weekly as a group with their parents present. The meetings grew out of a desire for friendship and a peer group as the students began to expand their lives through FC. The purpose of these meetings was primarily to allow the students to talk with each other and secondarily to allow the families to support each other in developing their students' communication skills. Each student began using FC to communicate with family members at least eight months prior to the start of school year 2013–2014. Most of the families had attended seminars on FC techniques at Syracuse University. A private special education consultant provided technical support and assistance with communication to this group, including individual instruction on FC skills with each student, as needed. Although the students in the FC club were using FC to communicate with family, friends, and tutors, they did not have the opportunity to use FC for communication at school.

Prior to school year 2013–2014, each of the pilot students attended MCPS's Elementary Autism Program (MCPS, 2013a). This program serves students with a diagnosis of Autism Spectrum Disorder; students receiving these services typically demonstrate significant impairments across all areas of development. Students receive individualized instruction based on the Fundamental Life Skills curriculum. Therefore, prior to school year 2013–2014, these students had limited exposure to on-grade-level curriculum at school.

MCPS committed to the FC pilot in late spring 2013. The pilot started two months later for the 2013–2014 school year with four Grade 5 students, in order to provide students with the opportunity to use FC to demonstrate their learning at school and to receive instruction in the general education curriculum.

The ultimate goal of the FC pilot was for the participating students to demonstrate the extent of their learning of the general education curriculum, initially through FC and longer term, through independent communication, without facilitation. An interim goal was to fade physical support for FC; for example, from support on the hand to support on the arm or support on the shoulder.

If the FC pilot was successful, the students should demonstrate evidence of their academic, creative problem solving, and social emotional skills; this outcome supports MCPS's mission that every student will have the skills needed to be successful in college and career (MCPS, 2013b). Further, the FC pilot reflected the following expectations for what MCPS staff members should do in order to support the district's mission (MCPS, 2013b):

- Evaluate what students know and are able to do through multiple and diverse measures.
- Engage students in active learning of relevant and challenging content.
- Create an environment that fosters student learning in a variety of ways and settings.
- Empower students to take ownership of learning.

Participating Schools

The FC pilot included two elementary schools. At the beginning of the school year, the students at Burning Tree Elementary School were in a Grade 5 Learning Center class, a self-contained class with opportunities to be included with nondisabled peers in the general education environment, and the students at Carderock Springs Elementary School were in their own Grade 5 self-contained class. By the end of the school year, all students attended general education classes for all academic subjects.

Supports Provided

A series of professional development trainings about FC began in summer 2013 for classroom teachers, paraeducators, and other school staff at the pilot schools and for central services staff including autism experts, speech language pathologists, assistive technology experts, and psychologists. A second set of sessions occurred in November 2013, and the final sessions were offered in May 2014. The Director of the Institute on Communication and Inclusion at Syracuse University (formerly known as The Facilitated Communication Institute) led these professional development sessions. Further, a special education consultant with expertise in FC was hired to provide bimonthly, in-school consultations during school year 2013–2014 for the classroom teachers and the paraeducators that served as the facilitators in the pilot.

In addition to resources from MPCS, the Montgomery County Office of Innovation provided financial support for professional development of staff and to provide an iPad tablet with educational software for each student.

Methods of Intervention

The pilot's intervention was FC. The users were the students, each of whom had a paraeducator as a dedicated facilitator or communication partner for all or most of the school year.

The facilitator is expected to provide support in three areas: physical, communication, and emotional (Institute on Communication and Inclusion, 2012). The intention of physical support is to make the user's pointing easier, more automatic, and more accurate. The facilitator monitors the user's body position, eye contact with the keyboard, and device position, as well as the user's pace and rhythm. Moreover, the facilitator is expected to provide backwards resistance (i.e., pressure away from the keyboard), pullback to the neutral position at the center of the keyboard, and physical support as far back as possible (e.g., on the forearm rather than on the wrist).

When providing communication support, the facilitator helps the FC user stay focused on communicating the message, provides feedback to the FC user on message content, and assists the FC user in clarifying unclear messages. When providing communication support, the facilitator acts like a coach.

Emotional support involves providing encouragement, but not direction, as the user points or types to communicate. The facilitator should acknowledge to the user that this type of communication can be difficult, but also express confidence in the user's success. As with communication support, the facilitator, when providing emotional support, functions as a coach.

Several best practices can support FC users and facilitators (Ashby, 2013; Institute on Communication and Inclusion, 2012), such as initial training and ongoing assistance for facilitators and provision of multiple facilitators to each user. The latter increases opportunities for the user to communicate and supports independence in communication. Portfolio analysis is the best practice of analyzing a user's typed messages for consistency over time and under different conditions. To lessen the potential for facilitator influence and reduce questions about the validity of authorship, it is important for facilitators to develop expertise in providing the three types of supports and to follow the best practices described above (Ashby, 2013).

Expected Student Outcomes

Users of FC, including the pilot students, are expected to develop skills in the following four areas: physical, message production, independence, and authorship (Ashby, 2013). Mastery of these skills decreases the user's dependence on the facilitator and the possibility of influence from the facilitator and supports the goal of independent communication (Institute on Communication and Inclusion, 2012).

Physical. FC users are expected to develop and master the following physical skills:

- Accurate pointing
- Finger isolation (i.e., keeping index finger isolated for and during pointing)
- Body control (i.e., good posture and facing the communication aid or device)
- Hand control
- Looking strategy (i.e., looking directly and consistently at the communication aid or device)

Message production. FC users are expected to develop and master the following skills related to producing messages:

- Message formulation—using FC for various language functions
- Correction strategies—recognizing and correcting mistakes
- Clarification strategies—clarifying communications that are unclear to the reader
- Monitoring—keeping track of one's own messages

Independence. To support independence in communication, FC users are expected to develop and master two skills: independent pointing, which is using a communication device without physical support; and initiation, which is indicating to others the need and desire for facilitation without prompting

Authorship. To demonstrate authorship, FC users are expected to develop and master the skill of message passing, which is conveying information unknown to the facilitator in a variety of contexts. When an FC user conveys information that is unknown to the facilitator, it is more convincing that messages produced through FC can be reliably attributed to the FC user.

Literature Review

MCPS Implementation Evaluations

One of the focuses of this evaluation was implementation of a new program (i.e., FC). Therefore, recent evaluations of MCPS programs (e.g., Addison-Scott, 2010; Cooper-Martin & Wade, 2012; Hickson, 2008; Wade, Maina, & McGaughey, 2012; Wang & Cooper-Martin, 2010) were reviewed. Data collection strategies in these studies included classroom observations, school staff interviews or surveys, and student surveys.

Facilitated Communication

Early Research and Criticisms of Facilitated Communication

Researchers who advocate for FC contend that numerous studies have demonstrated that individuals with disabilities passed messages through a facilitator. In several studies of message passing, researchers argued that when the study included a series of sessions, individuals demonstrated authorship over multiple sessions, and that multiple sessions helped reduce participants' anxiety over the course of the study (Cardinal, Hanson, & Wakeham, 1996; Sheehan & Matuozzi, 1996; Weiss, Wagner, & Bauman, 1996).

In an extensive review of literature from the mid to late 1990s, Mostert (2001) found three studies that supported FC claims and had control procedures (i.e., attempts to control for internal validity and attempts to eliminate the most obvious rival explanations for FC, the influence of the facilitator). However, in a closer examination of two of these studies (Cardinal, Hanson, & Wakeham, 1996; Weiss, Wagner, & Bauman, 1996), Mostert (2001) questioned the findings given methodological weaknesses. He noted that Cardinal et al. did not adequately control for data collector bias, did not use a pretest, and could not rule out the possibility that other educational attempts were responsible for the findings. In the Weiss et al. study, individuals were unable to answer questions with a naïve facilitator (i.e., someone unknown to the FC user).

Indeed, in a number of studies, FC users seemed unable to produce the correct responses when the facilitator was not aware of the experimental stimulus or when the stimulus differed for the user and the facilitator (Hall, 2009; Simpson & Myles, 1995; Vázquez, 1995; Wheeler, Jacobson, Paglieri, & Schwartz, 1993). Mostert (2001) reviewed 72 studies that used multiple controls to enhance internal validity and eliminate alternative explanations for the results; in more than 80% of them, FC was not found to be an effective intervention.

Based on a review of the literature, the American Speech-Language-Hearing Association (1995) concluded that the scientific validity and reliability of FC has not been demonstrated. The Association noted that in evaluations that control the information available to facilitators and utilize objective methods, peer-reviewed studies and clinical assessments found no conclusive evidence that messages produced through FC could be reliably attributed to the FC user. Instead, the evidence indicated that most messages originated with the facilitator. Moreover, as stated by the American Psychological Association (1994), it has not been scientifically demonstrated that the facilitators are aware that they direct or determine the communications.

Research and Critiques Since 2000

In response to the controversy surrounding FC, recent studies have specifically sought to establish authorship (i.e., is the user or the facilitator the author of the typed messages). Some studies provide evidence that the FC user, not the person providing the support, authored the message. For example, Grayson, Emerson, Howard-Jones, and O'Neil (2011) studied an FC user with an autism spectrum disorder who had no independent means of expression, and was believed to have no literacy skills. The researchers used eye-tracking techniques to follow the FC user's gaze as he produced texts by pointing (with physical support) to letters on a board. Next, the researchers compared the pattern of eye movements of the FC user to data from a random model. The authors found evidence that the FC user looked for a longer period at to-be-typed letters before typing them, and looked ahead to subsequent letters of words before the next letter of the word is typed. The findings support the value of FC; the conclusion that the user's gaze predicted which letters were typed is consistent with the proposition that this FC user authored the typed texts, rather than the facilitator who provided physical support to the FC user.

In another study, Bara, Bucciarelli, and Colle (2001) matched autistic children to a group of non-autistic children along the dimensions of gender, age, nonverbal reasoning capacity, and written language comprehension. Their results indicated that autistic children performed as well as the control group of non-autistic children in pragmatic and theory of mind tasks; they argued that FC overcomes the attention deficits of autistic children.

Jacobson, Foxx, and Mulick (2005, p. 363) referred to FC as “the ultimate fad treatment” and critiqued numerous studies for poor research design. However, among the studies cited and published since the year 2000, several appear to have been inaccurately cited, making it difficult to assess the validity of their critiques.

Some FC proponents also appear to have inaccurately cited articles and overstated claims regarding the efficacy of FC based on new research. For example, Niemi and Kärnä-Lin (2002) analyzed the correspondence of the developmental course of facilitated messages for one individual to the developmental course of acquisition typically of his native language, but “failed to note correspondence of a number of these elements to typical, almost stereotypic features of automatic writing” (Jacobson et al., 2005, p. 367). Additionally, after re-analyzing Niemi and Kärnä-Lin's data, Saloviita and Sariola (2003) concluded that the disabled individual was not the author of the texts. Broderick and Kasa-Hendrickson (2001) presented evidence of speech before and during typing; Jacobson et al. (2005) critiqued this study for not using causal methodology to ascertain the authenticity of communications or verify that observed changes were attributable to FC.

Mostert (2010) reviewed literature on the efficacy of FC that was published in peer-reviewed journals since his 2001 review and found three primary studies. He concluded that the Niemi and Kärnä-Lin (2002) study, along with Emerson, Grayson, and Griffiths (2001), did not support the claim that the FC user was the author of his messages, because the researchers failed to rule out alternative explanations for their findings. A third study (Wegner, Fuller, & Sparrow, 2003) presented evidence that facilitators subconsciously influenced messages and that the messages were attributable to the facilitator, not the user.

Scope of the Evaluation

OESS requested an evaluation of the FC pilot to help assess authorship of messages (i.e., whether students' typed messages about schoolwork can be attributed to the student rather than to the facilitator), to study an approach that MCPS had not previously used, and to determine the efficacy of the pilot. To lessen the potential for facilitator influence and reduce questions about the validity of authorship, it is important for facilitators to develop expertise in skills that support the user and to follow the best practices that support FC, and further for FC users to master certain skills to decrease the possibility of influence from the facilitator (Ashby, 2013; Institute on Communication and Inclusion at Syracuse University, 2012). Therefore, this evaluation examined the fidelity and extent of implementation of FC within the pilot program, with a focus on the acquisition of FC skills by both facilitators and student users and implementation of best practices that support FC. Additional evaluation questions addressed students and staff experiences with an approach that MCPS had not previously used and efficacy of the pilot.

Evaluation Questions

1. To what extent did the facilitators implement the following FC supports to students as intended and following best practice guidelines?
 - a. Physical
 - b. Communication
 - c. Emotional
2. To what extent did the pilot students demonstrate acquisition of the following skills, when using FC at school?
 - a. Physical
 - b. Message production
 - c. Independence
 - d. Authorship
3. To what extent were MCPS and pilot schools implementing best practices to support FC?
4. To what extent and in what ways did pilot students use FC in the classroom to interact with peers or participate in activities?
5. To what extent did pilot students demonstrate academic proficiency during their participation in the Facilitated Communication Pilot?
6. What were the experiences of school-based staff with the FC pilot?

Methodology

Study Population

This evaluation included all four students who used facilitated communication in the pilot. (One student, who was considered part of the pilot but used a different form of communication that requires different supports, was excluded from the evaluation.)

Data Collection Activities

Classroom Observations

Based on FC training materials (Ashby, 2013; Institute on Communication and Inclusion, 2012) and advice from FC experts, the evaluator developed two observation protocols: one for facilitators and one for students. Based on pilot observations in fall 2013, the evaluator revised both protocols for data collection in May 2014. The facilitator protocol included multiple indicators for each of three types of support: physical, communication, and emotional (Figure 1).

<p>Physical Support to make pointing easier, more automatic, and more accurate</p> <ul style="list-style-type: none"> • Arranges proper sitting/standing positioning for user. • Places the aid/device in an accessible position. • Waits for the person to initiate the movement. • Provides physical support as far back as possible. • Creates opportunities for pointing with less physical support. • Pulls hand back from device to a neutral position (not necessary with less physical support). • Monitors user's body position. • Monitors whether user is looking at the device. • Monitors for steady pace and rhythm, for example: <ul style="list-style-type: none"> ○ Adjusts support to slow down movement, if pointing too rapidly. ○ Pulls user's hand back & pauses to interrupt hitting same selection over & over. ○ Provides skill reminders about movement (e.g., slow down, reach more for the letters).
<p>Communication Support to focus on communicating message, give feedback on message content, or assist in clarifying unclear messages</p> <ul style="list-style-type: none"> • Provides prompts and cues to help user get started or to initiate conversation. • Prompts and cues user to maintain focus or continue interaction (e.g., what's the next letter). • Provides feedback on what pictures, words, letters user has pointed to. • Provides feedback on full content of message/Checks for accuracy. • Asks clarifying questions (does not speculate), when message is unclear (e.g., extra letters). • Helps communication breakdown (e.g., providing more structured questions).
<p>Emotional Support to provide encouragement, but not direction & convey high expectations in user's competence</p> <ul style="list-style-type: none"> • Conveys high expectations or belief in user's competence. • Offers encouragement and positive feedback; uses supportive language; expresses confidence. • Is patient with the person even when the process is difficult or progress is slow. • Respects user's right to privacy and confidentiality with his messages (e.g., "This is private" key on board; facilitator asks before sharing typed messages).

Figure 1. Indicators of physical, communication, and emotional support for FC facilitators.

The student protocol included multiple indicators for each of four FC skills: physical, message production, independence, and authorship (Figure 2). The protocol also included items on the student's use of FC in the classroom to interact with peers and to participate in activities.

Physical Skills
<ul style="list-style-type: none"> • Accurate pointing—selecting targets accurately and using consistent movement to the target • Finger isolation—keeping index finger isolated for and during pointing • Body control—good posture and facing the device • Hand control—using stable arm/hand posture with good tone
Message Production Skills
<ul style="list-style-type: none"> • Message formulation—using FC for various language functions • Message formulation—making content clear through the use of spaces, punctuation, grammar, word usage • Correction strategies—recognizing mistakes, using delete keys, using auditory and visual feedback to correct • Clarification strategies—clarifying communications that are unclear to the listener • Monitoring—keeping track of one’s messages (i.e., checking what’s on the computer screen)
Independence
<ul style="list-style-type: none"> • Independent pointing—using communication device without physical support • Initiation—indicating to others the need and desire for facilitation, without prompting • Have independent yes/no response
Authorship based on message passing (i.e., conveying information unknown to facilitator)
<ul style="list-style-type: none"> • Message passing beginning—pass meaningful information incidentally • Message passing intermediate—can convey accurate information in response to specific questions • Message passing advanced—can pass information in formal, controlled blind experimental condition

Figure 2. Indicators of FC skills for student users.

The evaluator conducted 3 observations for each of the four facilitators for a total of 12 facilitator observations. Additionally, the evaluator conducted 3 observations for each of the four students for a total of 12 student observations. All observations occurred during academic classes (i.e., mathematics, reading/language arts, science, or social studies). Each facilitator and each student was observed in more than one academic subject. The majority of observations lasted 30 minutes. The evaluator requested transcripts of the typing for each of the 24 observations; however, school staff provided transcripts for only 8 (33%) of them.

The purpose of the observations of facilitators was to collect data on their implementation of supports to the student user. Each observation included several typing sessions. Categories for extent of evidence were defined as follows:

- Regularly—facilitator provided support during two thirds or more of the typing sessions.
- Sometimes—facilitator provided support during less than two thirds but more than one third of the typing sessions.
- Occasionally—facilitator provided support during one third or fewer of the typing sessions.
- Never—facilitator did not provide the support during any typing sessions.
- No evidence—not observed during any typing session, however the facilitator may have provided it in a non-observable way.

The purpose of the observations of students was to collect data on their acquisition of FC skills. Each observation included several typing sessions. Categories for extent of evidence were defined as follows:

- Regularly—student exhibited skill during two thirds or more of the typing sessions.
- Sometimes—student exhibited skill during less than two thirds but more than one third of the typing sessions.
- Occasionally—student exhibited skill during one third or fewer of the typing sessions.
- Never—student did not exhibit this skill during any typing sessions.
- No evidence—not observed during any typing session, however the student may have performed the skill in a non-observable way.

Other Data Collection Activities

Other data collection activities included compiling measures of students' academic performance from MCPS databases (i.e., progress on IEP goals, report card grades, scores on standardized tests); document analysis of agendas, meeting minutes, and plans; and interviews. During May 2014, the evaluator conducted face-to-face interviews at schools with 12 school-based staff, as follows:

- One administrator at each pilot school
- The two paraeducators who served as a facilitator at each pilot school
- Three teachers (special or general education) at each pilot school

Analytical Procedures

Descriptive statistics were used to analyze the findings from all data collection activities. Some interview questions included a five-point scale. For these questions, the median was used as a measure of central tendency, instead of the mean, because there were only 12 interviewees. The median was the value at which half the responses were above it and half were below it.

Strengths and Limitations of Methodology

One strength of this study is including both schools involved in the FC pilot. Another strength is that the evaluator completed all desired interviews. Further, rather than relying on self-reports, the evaluator conducted observations to measure the extent of implementation of FC supports by facilitator paraeducators and also to measure the extent to which students exhibited FC skills.

The observations did have some limitations, however; the observer could not capture certain FC supports, such as “provides backwards resistance only” or “does not move co-actively with user.” Observations incompletely captured other supports; for example, if a facilitator monitored a user's body position and requested a change the support was observable. If the facilitator monitored without requesting a change, it was more difficult to capture. The lack of transcripts for most observations was a limitation. Lastly, interviewees may provide socially desirable answers rather than report their actual experiences (Collins, Shattell, & Thomas, 2005). Some interviewees in this study needed explicit reassurance that their answers would be confidential. By promising confidentiality, the evaluator decreased the extent of measurement error.

Findings

Question 1: To what extent did facilitators provide supports to students as intended?

Data on facilitators' implementation of FC supports came from 12 classroom observations.

Physical Support

Facilitators should provide the least physical support possible; this was evaluated by recording the location of support. The desired levels, least or light support, occurred during one half of the observations, as follows:

- Least support—no touch or facilitator stands next to the person: one observation
- Light support—touch on shoulder, arm above elbow, or elbow: five observations
- Most support—touch on forearm, wrist, or hand: six observations

A second indicator, facilitator creates opportunities for pointing with less physical support (e.g., gave student a pencil to hold to aid in pointing), was observed less frequently. It was apparent sometimes in one observation, occasionally in one, and never in ten.

Findings on the frequency of seven more indicators of physical support are shown in Table 1. The following three indicators occurred at the desired level (i.e., regularly) in at least one half of the observations: places the device in an accessible position, pulls hand back to a neutral position, and monitors user looking at device. During slightly less than one half of the observations, facilitators regularly arranged proper sitting position. The extent of evidence was low (i.e., occasionally or not evident) for the following three other physical supports: waits for user to initiate movement, monitors for steady pace and rhythm, and monitors body position.

Table 1
Frequency of Physical Supports Provided by Facilitators ($N = 12$)

Indicator of physical support	Regularly		Sometimes		Occasionally or not evident	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Places the device in an accessible position	12	100	0	0	0	0
Pulls hand back from device to a neutral position ¹	6	100	0	0	0	0
Monitors whether user is looking at the device	6	50	1	8	5	42
Arranges proper sitting positioning for user ¹	4	44	2	22	3	33
Waits for the person to initiate the movement ²	3	27	2	18	6	55
Monitors for steady pace and rhythm ¹	1	14	2	29	4	57
Monitors user's body position ¹	0	0	2	18	9	82

¹ Excludes observations if the support was not needed.

² No data were collected for one observation.

Out of nine indicators of physical support, four occurred at the desired level in at least one half of the observations but five occurred at the desired level (i.e., regularly) in less than one half of observations. The mixed extent of evidence indicates a moderate level of implementation for physical supports.

Communication Support

Providing prompts to help the user start was evident regularly during two thirds of the 12 observations (Table 2). However, regular use of the following supports was evident in only one third or fewer of the observations: prompts user to maintain focus, helps communication breakdown, provides feedback letters/numerals, provides feedback on full content, asks clarifying questions when message is unclear. This low level of evidence for the majority of these six supports indicates a low level of implementation of communication support.

Table 2
Frequency of Communication Supports Provided by Facilitators ($N = 12$)

Indicator of communication support	Regularly		Sometimes		Occasionally or never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Provides prompts or cues to help user get started or to initiate communication	8	67	4	33	0	0
Prompts or cues user to maintain focus or continue interaction	4	33	6	50	2	17
Helps communication breakdown (e.g., provides more structured questions) ¹	2	29	0	0	5	71
Provides feedback on what letters, numerals user has pointed to	1	8	3	25	8	67
Provides feedback on full content of message/Checks for accuracy	1	8	3	25	8	67
Asks clarifying questions (does not speculate) when message is unclear	0	0	2	17	10	83

¹Excludes observations if the support was not needed.

Emotional Support

During more than one half of the 12 observations, facilitators regularly provided the following two types of emotional support: patience with the person and offers of encouragement, support, and confidence (Table 3). A third support—conveying high expectations or belief in user’s competence—was evident regularly in one third of the observations. For the fourth support—respects user’s right to privacy and confidentiality—there was no evidence, such as a key labeled “this is private” or a facilitator checking with the user prior to sharing messages. The mixed extent of evidence indicates a moderate level of implementation for emotional supports.

Table 3
Frequency of Emotional Supports Provided by Facilitators ($N = 12$)

Indicator of emotional support	Regularly		Sometimes		Occasionally or never		No evidence	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Is patient with the person even when the process is difficult or progress is slow	9	75	1	8	2	17	0	0
Offers encouragement and positive feedback/Uses supportive language/Expresses confidence	7	58	1	8	4	33	0	0
Conveys high expectations or belief in user’s competence	4	33	0	0	8	67	0	0
Respects user’s right to privacy with his messages	0	0	0	0	0	0	12	100

Question 2: To what extent did the pilot students demonstrate acquisition of FC skills?

Twelve classroom observations of students provided data on implementation of their FC skills.

Physical Skills

As seen in Table 4, students regularly exhibited all five physical skills—finger isolation, body control, hand control, looking strategy, and accurate pointing—during at least one half of the observations. This level of evidence indicates a high level of implementation of these skills.

Table 4
Frequency of Exhibition of Physical Skills by Students ($N = 12$)

Physical skill	Regularly		Sometimes		Occasionally or never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Finger isolation—keeping index finger isolated for and during pointing	11	92	0	0	1	8
Body control—having good posture and facing the device	9	75	2	17	1	8
Hand control—using stable arm/hand posture with good tone ¹	7	64	2	18	2	18
Looking strategy—looking directly and consistently at the device	6	50	6	50	0	0
Accurate pointing—selecting targets accurately, using consistent movement to the target	6	50	2	17	4	33

¹ No evidence was collected for one observation.

Independence Skills

There was little evidence of independence skills (Table 5). Students pointed independently occasionally or never during 8 of the 12 observations and initiated FC occasionally or never in all 12 observations.

Table 5
Frequency of Exhibition of Independence Skills by Students ($N = 12$)

Independence skill	Regularly		Sometimes		Occasionally or never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Independent pointing—using communication device without physical support	2	17	2	17	8	66
Initiation—indicating to others the need and desire for facilitation, without prompting	0	0	0	0	12	100

Message Production Skills

One message production skill is to use FC for a variety of language functions. Students' messages were categorized using the following functions: learn, get things, create a world of imagination, express personal feelings, create interaction with others, communicate information, or control behavior (Rhalmi, 2009). Out of 12 observations, students used FC for one function during 2 of them, for two functions during 8 observations, and for three functions during 2 observations. (Table A in the Appendix shows the functions of students' messages.) Thus, students used FC for more than one language function during the majority of observations, indicating a high level of implementation of this skill.

Other message production skills were less frequent (Table 6). In about one half of the observations, students occasionally or never exhibited two skills: message formulation (e.g., use of spaces) and clarification strategies (i.e., for messages that are unclear to others). Further, in at least one half of the observations, there was no evidence of the following two skills: monitoring one's messages and correction strategies. It was difficult to collect evidence on message production skills because there were no transcripts for 7 of the 12 observations, and students used a device without a screen to display the message during 3 more observations. The available evidence indicates a low level of implementation of message production skills.

Table 6
Frequency of Exhibition of Message Production Skills by Students ($N = 12$)

Message production skill	Regularly		Sometimes		Occasionally or never		No evidence	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Message formulation—making content clear through the use of spaces, punctuation, grammar, word usage ¹	4	36	2	18	5	46	0	0
Clarification strategies—clarifying communications that are unclear to the facilitator ¹	1	9	1	9	6	55	3	27
Monitoring one's messages—keeping track of one's messages (i.e., checking what's on screen)	1	8	1	8	3	25	7	58
Correction strategies—recognizing mistakes, using delete keys, using auditory and visual feedback to correct	0	0	2	17	4	33	6	50

¹ No data were collected for one observation.

Authorship Skills

Each authorship skill is a type of message passing, which is conveying information unknown to the facilitator. For example, a user could describe activities that did not involve the facilitator. No evidence on message passing was collected; during the observations, there was not a situation when the evaluator and the student knew certain information, but the facilitator did not.

Interviews with school staff provided some evidence about authorship, as follows. Each facilitator replied to the following question: Can you give me an example of a time when you typed information that was unknown to you? Each of the four facilitators gave examples; these messages frequently were answers to mathematics problems.

School staff, other than facilitators, replied to the following question: How confident are you that the typed responses represent the student's academic skills, and not those of the facilitator? Staff answered using a scale of 1 to 5, where 1 was not at all confident, and 5 was very confident. Responses ranged from 1–5; the median response across eight interviewees was 4, indicating that they were relatively confident that students' typed messages about school work demonstrated the student's knowledge and learning, as opposed to the facilitator's. Most interviewees were more confident if they recognized the student's voice in the response; for example, one interviewee was most confident when the message was a “cloud of understanding with a kernel of syntax.” A couple of interviewees who were less confident referred to students typing without looking at the device. A couple of interviewees, who were more confident, explained their answers by describing times when students needed little or less physical support, gave inaccurate responses when the facilitator probably knew the answer, or literally pushed away a facilitator.

Question 3: To what extent were MCPS and pilot schools implementing best practices to support FC?

Data on the extent of implementation of best practices by the district and by schools in the FC pilot came from document analysis, interviews, and classroom observations.

District-based Practices

Initial training for facilitators. MCPS did not make a decision to implement the FC pilot until May 2013. MCPS offered training for facilitators in July 2013, before the start of the school year. However, only two of the four paraeducator facilitators attended, although all were new to facilitation. One facilitator had a conflict with the July 2013 training and the fourth facilitator was hired after the initial training.

During interviews in May 2014, school staff members responded to the following question: Overall, how adequate was your preparation for the FC pilot? They answered on a scale from 1 to 5, where 1 was not at all adequate and 5 was very adequate. Responses ranged from 1–3; the median response of 2 indicates that school staff members believed that they were less than adequately prepared.

Although MCPS did provide initial training, the late start to the pilot resulted in only one half of the facilitators attending it, and reports from staff members (including all the facilitators) of inadequate preparation indicate a low level of implementation for the best practice of providing initial training for facilitators.

Ongoing support for facilitators. MCPS used a special education consultant with expertise in FC to provide bimonthly, in-school consultations for the classroom teachers and the paraeducators who served as the facilitators in the pilot during school year 2013–2014. All these staff members had no previous experience with facilitation. Document analysis confirmed that, from September 2013 to May 2014, the consultant visited each school twice a month in six months and once a month during three months. These ongoing, regular visits to support facilitators indicate a high level of implementation for this best practice.

Intentional collaboration with parents. Because the pilot students' parents were their first facilitators, it was important to collaborate with them. Both the November 2013 and May 2014 professional development sessions with the director of the Institute on Communication and Inclusion at Syracuse University included collaborative sessions with parents. Further, in January 2014, MCPS held a meeting that included parents, along with students, paraeducators/facilitators, teachers, principals, and other school staff members. Document analysis of notes from this meeting confirmed that it provided opportunities for parents to work with school staff members on providing the best support to the students. This series of meetings indicates a high level of implementation for this best practice.

Identification of a point person within district. Among the 12 key staff members interviewed in May 2014, 8 (67%) accurately identified the staff member who serves as the point person for FC within MCPS. The remaining four interviewees replied with don't know or did not respond. This level of agreement among staff indicates a high level of implementation for the best practice of identifying a point person.

School-based Practices

Providing multiple facilitators for each student. It is important for FC users to type with different facilitators to reduce dependence on a particular facilitator, to increase independence in communication, and to produce a variety of messages. When an FC user produces certain messages with only one facilitator, it suggests that the facilitator, rather than the user is the author. Conversely, if a user creates similar messages across multiple facilitators, it supports the conclusion that the user, rather than the facilitator, is the author.

During all 24 observations, including 12 of facilitators and 12 of students, only one included a student typing with a facilitator who was not his usual facilitator. During interviews, the majority of facilitators reported working with another student at the school for brief periods of time (i.e., 10–30 minutes) on one to three days per week. The very limited provision of multiple facilitators for each student indicates a low level of implementation for this best practice.

Use of portfolio analysis. Portfolio analysis refers to collecting samples of the user’s typing to allow for examination of performance over time and under different conditions (e.g., facilitators, content areas, tasks). None of the 12 interviewed staff reported printing out typing sessions in order to create a portfolio of transcripts. This lack of portfolios indicates a low level of implementation for this best practice.

Further, the ability to print transcripts of typing was lacking for most students. MCPS provided an iPad tablet for each student. However out of the 24 observations of students and facilitators, students only used an iPad tablet during 9 (38%) of them (the 9 included all of 8 observations and part of 1). Students used a letterboard during 8 observations (33%) and other electronic devices during 8 observations (33%).

In response to the evaluator’s request for a transcript from observed sessions, school staff could not provide them for most students, either because the student used a nonelectronic device (i.e., letterboard) or because staff did not know how to generate transcripts from the student’s device.

Established protocol for students typing sensitive information. All staff interviewees answered the following question: Sometimes students may type sensitive information, for example, “Someone’s hurting me.” Does your school have a policy or plan for how to respond if that happens? One half of the interviewees said yes and indicated that the policy or plan is the same as the MCPS one for responses to a student sharing reports of abuse or neglect. However, the other six school staff members (including three of the four paraeducator facilitators) answered “don’t know.” The mixed responses from school staff members indicate a moderate level of implementation for this best practice.

Plans for fading physical support. One half of respondents made comments that suggested there were plans (although not written) for fading physical support; they noted that physical support had decreased (i.e., faded) over the course of the school year or reported discussions about less support within the school’s team or with the outside FC consultant. The other six respondents were not aware of any plan to fade physical support. The mixed responses from school staff members indicate a moderate level of implementation for this best practice.

Summary of Implementation Findings for Questions 1–3

Table 7 summarizes the findings for evaluation questions 1, 2, and 3, which all concern implementation. The extent of implementation was low or moderate for facilitator supports, low or high for student skills, low or moderate for school-based best practices, and low or high for district best practices.

Table 7
Summary of Implementation

Category		Extent of implementation
Facilitator supports	Communication	Low
	Emotional	Moderate
	Physical	Moderate
Student skills	Physical	High
	Message production	Low
	Independence	Low
	Authorship	Not observable
School-based best practices	Established protocol for students typing sensitive information	Moderate
	Multiple facilitators for each student	Low
	Portfolio analysis of student typing	Low
	Plans for fading physical support	Moderate
District best practices	Ongoing support for facilitators	High
	Intentional collaboration with parents	High
	Identification of district point person	High
	Initial training for facilitators	Low

Question 4: To what extent and in what ways did pilot students use FC in the classroom to interact with peers or participate in activities?

Interaction With Peers at School

Pilot students infrequently used FC to interact with other students. Out of 12 student observations, students used FC to interact with other students during only 3 observations as follows:

1. Type out lines and advice for the performance, during a group project to write a play
2. Share answers to mathematics problems with another student
3. Read poem out loud (i.e., the student's device spoke the words)

Participation in Classroom Activities

Pilot students regularly used FC to participate in classroom activities. They did so for all activities during 11 of the 12 observations and for some activities (i.e., not all) during one observation. The activities included warm-up questions, observations of videos, researching a topic, worksheets, mathematics problems, creative writing, and responding to teacher questions.

Question 5: To what extent did pilot students demonstrate academic proficiency?

In reviewing the findings on academic proficiency, it is worth noting that the pilot students had limited exposure to on-grade-level curriculum at school prior to the pilot.

Report Card Grades

The report cards for the pilot students, like all Grade 5 students in MCPS, have standards-based scores for multiple content areas within each subject; for example, in marking period 1, students received scores in three content areas for reading and five content areas for writing. Due to the small number of pilot students, report card scores were summarized as follows. Each pilot student's score in each content area was categorized as proficient or not yet proficient, following MCPS definitions. The results for each marking period were combined across the four students for all content areas in the five academic subjects (i.e., mathematics, science, social studies, reading, and writing). For example, in marking period 1, there were 15 content areas across the five academic subjects; when combined across the four students, there were 60 scores in total. Proficiency results are summarized in Table 8, along with a score that reflects missing data. Results for marking period 3 are excluded from Table 8, because no grades were recorded for students at one school during this period.

Table 8
Proficiency Based on Report Card Grades for Academic Subjects, by Marking Period

Marking period	Total # content areas ¹	Proficient		Not yet proficient		Missing data, no grade recorded	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
1	60	18	30	12	20	30	50
2	56	37	66	11	20	8	14
3 ²	-	-	-	-	-	-	-
4	52	22	42	27	52	3	6
1, 2, & 4	168	77	46	50	30	41	24

¹Content areas combined across mathematics, science, social studies, reading, & writing for four students.

²No grades reported because no grades were recorded for two students.

In marking period 1, students demonstrated proficiency on 30% of the content areas; however, teachers assigned a grade of missing data for one half of the content areas. Findings from the interviews with school staff, presented below, explain why the pilot students sometimes did not complete enough assignments to receive a grade. In marking period 2, missing data was an issue for fewer content areas (14%), and students demonstrated proficiency in two thirds (66%) of all content areas. However, in marking period 4, students demonstrated proficiency in fewer content areas, less than one half (42%), and were not yet proficient in one half (52%) of the content areas. Across the three marking periods, the pilot students demonstrated academic proficiency at a Grade 5 level in nearly one half (46%) of all content areas.

Standardized Tests

Participation. Grade 5 students in the general education curriculum—including those in the pilot—are expected to participate in standardized tests, including Measures of Academic Progress–Mathematics (MAP-M) and MAP–Reading (MAP-R), which provide information about student progress. All students are expected to participate in the fall and spring administrations of the MAP tests; the majority also participated in the winter administration for

the 2013–2014 school year. Two of the four pilot students participated in both fall MAP tests, two attempted (but did not complete) the winter tests, and none participated in or attempted the spring MAP tests.

For accountability purposes, Grade 5 students must participate in Maryland School Assessments (MSA) in mathematics, reading, and science, which are administered in spring. All four students participated in the MSA tests in mathematics and reading, and three participated in the MSA science test. It was the pilot students' first experience with MSAs.

The Maryland State Department of Education (MSDE) did not approve FC as an accommodation for MSA tests, but did approve for two pilot students a unique accommodation that was shoulder support (i.e., placing one's hand on the shoulder or the arm that the student uses to point to the letters) prior to the test question being read. Once the test examiner began to read the test question, the "touch" accommodation could not be repeated.

Further, all pilot students were eligible for several other accommodations for MSA tests, including the following:

- Reader for verbatim reading of entire test
- Scribe
- Augmentative communication system and speech generating devices
- Electronic word processors
- Mathematics tools and calculation devices
- Visual organizers
- Extended time
- Multiple or frequent breaks
- Settings to reduce distractions to the student
- Settings to reduce distractions to other students

Proficiency. Due to the small number of students, results were summarized across all four pilot students for the three MSA tests that were administered in the spring for a total of 12 scores. Proficiency was based on grade-level benchmarks. Each MSA score was categorized as basic, proficient, or advanced, based on MSDE definitions for Grade 5 MSA tests. Compared to grade-level standards, pilot students did not demonstrate academic proficiency, as follows:

- Participated and did not achieve proficiency: 11, 92%
- Did not participate: 1, 8%

Progress Towards IEP Goals

Results for student progress toward IEP goals are not reported, because no IEP progress notes for students at one school were recorded in the relevant MCPS database (i.e., Online Administrative Student Information System/Special Services) for the entire school year.

Question 6: What were the experiences of school-based staff with the FC pilot?

Success of FC Pilot

All interviewees responded to the following question: “The goal of the FC pilot is for the participating students to demonstrate their learning of the general education curriculum, initially through FC and longer term, through independent communication without facilitation. In your opinion, how successful has the pilot been?” Staff answered on a scale of 1 to 5, where 1 was not at all successful and 5 was very successful. Responses across the 12 interviewees ranged from 1–4.5. The median response was 3, which indicated limited or partial success; most interviewees indicated that the students did not demonstrate learning at a fifth grade level, as confirmed by the results above for academic proficiency. However, several interviewees said that students did demonstrate some learning or referred to variations in the level of success, either between students or across the year for one or more students (i.e., growth or regression).

Factors That Contributed to Success of the FC Pilot

Interviewees identified factors that contributed most to the success of the FC pilot (Table 9). Almost all interviewees mentioned the paraeducator facilitators. One half (six) referred to the Grade 5 teachers and the pilot students themselves. Fewer respondents mentioned parents (five), the principal (three), or general education classmates of the pilot students (three).

Table 9
Frequency of Comments on Factors That Contributed to the Success of the FC Pilot ($N = 12$)

Factor	Frequency	Typical comment
Paraeducator facilitators	10	Know when to back off and when to encourage
Grade 5 teachers	6	Stretched to accommodate students; open-minded
Pilot students	6	Students engaged and open to learning
Parents	5	Invested, want what’s best for students
Principal	3	Talking, scheduling
General education students	3	Very patient and respectful with pilot students

Suggestions to Address Challenges of Pilot

When asked what should be done differently to address the challenges encountered in the pilot, interviewees identified several issues (Table 10). The most frequent suggestion (9 of 12) was to provide supports to address pilot students’ behavioral (e.g., autistic, self-stimulation) and emotional needs that were unrelated to communication; this category included requests to reduce disruptions by the pilot students to other students. The second most frequent suggestion (7 of 12) was to improve preparation by providing more structure, support, or general information to staff. This request reflects interviewees’ reports, noted above, that they were less than adequately prepared for the pilot. Specific requests were to receive ongoing information and more support for general education teachers, due to the emotional and time demands from the pilot students.

Table 10
Frequency of Suggestions to Address Challenges Encountered in the FC Pilot ($N = 12$)

Suggestion	Frequency
1. Provide supports to address student's behavioral and emotional needs unrelated to communication, reduce disruptions to other students.	9
2. Improve preparation though more structure, support, or general information to staff.	7
3. Start pilot at earlier grade level or ease students into changes, especially MSAs.	6
4. Provide classroom teacher, FC coordinator, or case manager for pilot students.	6
5. Address curriculum issues (i.e., modifications, student absences).	6
6. Provide more guidance to teachers about grading issues.	4
7. Arrange for all team members to meet together.	4
8. Support facilitator paraeducators (various suggestions).	4
9. Support pilot students (various suggestions).	4
10. Manage parent involvement (various suggestions).	3
11. Reduce changes and inconsistency, especially of staff.	3
12. Provide more feedback/less visits.	3

Suggestions 3–5 came from one half (6) of the interviewees; suggestion 3 was to start the pilot at an earlier grade level or to ease the students into general education classrooms so as to help the students cope with a general education curriculum and standardized tests. Comments indicated that the pilot students' first experience with MSAs was very negative; for example, the tests were described as “a shock” and students had “major melt downs” on every testing day. Staff reported that the negative impact (e.g., anxiety, poor relations with other students) on individual students lasted from three weeks to three months. Suggestion 4 was to provide a classroom teacher, FC coordinator, or case manager for the pilot students. This staff member should oversee curriculum and lesson modifications to ensure that work is appropriate, fill in the gaps in students' knowledge, oversee the facilitator paraeducators, and substitute for the facilitators. This suggestion may reflect the fact that although the students at both schools started with a homeroom teacher, one of those teachers left the school system during the third quarter and was not replaced. Suggestion 5 was for help with two curriculum issues: modifications of lessons to suit the needs of the pilot students; and help with addressing students' reduced exposure to the curriculum because of their frequent late arrivals to the classroom, breaks during class, and absences. One idea for the latter was to identify the most critical times to be in class.

The problem of student absences was associated with suggestion 6 from four interviewees for more guidance about grading. Due to absences, the pilot students missed lessons or directions, and hence the teachers had less input. As presented above, teachers were unable to grade almost one quarter of the content areas due to missing data. Student absences, along with the slower pace of the students' typing, meant that they did more schoolwork as homework, which was a second issue; teachers had concerns about authorship of homework because the style of writing on assignments done at home differed from writing done at school. Suggestion 7, from four interviewees, was to have common meeting times for all team members, including facilitator paraeducators and the FC classroom teacher. Suggestions 8–10, from three or four interviewees, were various suggestions on ways to support facilitator paraeducators, support the pilot students, or manage parent involvement. Three interviewees asked for fewer changes, especially of staff, and for more feedback but fewer classroom visits.

Discussion and Recommendations

One of the goals for this evaluation was to address concern about authorship of messages for FC users in the FC pilot. To have confidence that each student's typed message about schoolwork demonstrated the student's knowledge and learning (as opposed to the facilitator's), it was important to examine whether the facilitators implemented FC as intended and whether the students acquired the necessary FC skills. Based on observations, the level of implementation by facilitators was moderate for physical and emotional supports, but low for communication support. Students demonstrated a high level of physical skills, but a low level of message production and independence skills. Further, there was a low or moderate level of implementation for the school-based best practices that address authorship. These areas of less than full implementation, although not unexpected for the initial year of a project, make it less certain that the students' typed messages about schoolwork demonstrated their own learning. However, school staff interviewees were relatively confident that the messages produced through FC—especially work done at school—could be attributed to the student users.

A second goal for the evaluation was to study an approach that MCPS had not previously used. In terms of students' experiences, they regularly used FC to participate in classroom activities (e.g., warm-ups, worksheets, writing, responding to teacher questions), but rarely used it to communicate directly with peers. School staff identified the paraeducator facilitators, the Grade 5 teachers, and the pilot students as key factors that contributed most to the success of the FC pilot. With respect to the study's goal of examining the pilot's efficacy, there were successes and challenges. Even though students previously had limited exposure to the on-grade-level curriculum, their report card grades indicated academic proficiency at a Grade 5 level for about one half of content areas. The students did participate in standardized tests for the first time but without FC; the results indicated very limited academic proficiency at an on-grade level. Most school-based staff indicated that the pilot was somewhat, but not fully successful, in meeting its goal: that participating students demonstrate their learning of the general education curriculum, initially through FC and longer term, through independent communication without facilitation.

All students in the FC pilot will enter Grade 6 in fall 2014 but not all the facilitator paraeducators will continue with them. There are no plans to create another cohort of elementary school students using FC, because the project is still in the pilot phase. The following recommendations concern only the pilot students as they transition to middle school and new teachers. Based on findings from the evaluation, program staff should focus training, guidance, and other supports on the following areas to ensure student success:

- Provide professional development to relevant middle school staff (especially facilitators and teachers with pilot students in their classes) during the summer.
- Ensure that new paraeducator facilitators implement physical, emotional, and supports to students as intended, with more emphasis on communication supports.
- Provide opportunities for students to begin facilitation with the new paraeducators in the summer, so that facilitators have more experience before classes start.
- Increase student message production and independence skills when using FC at school.

- Identify a case manager for the pilot students to provide best practices and supports, as follows:
 - Provide facilitation to students when paraeducators are absent.
 - Ensure that each student has multiple facilitators.
 - Create and analyze portfolios of student typing.
 - Create and oversee formal plans for fading physical support.
 - Provide or oversee curriculum and lesson modifications to ensure that work is appropriate and to fill in gaps in students' knowledge, as needed.
 - Lessen the impact of students' frequent absences on their exposure to the curriculum by identifying critical times for students to be in class, in consultation with their teachers.

- Encourage students to type more frequently on an iPad tablet at school to support creating a portfolio and monitoring of both student skills and facilitator supports. Teach staff how to save and print typing output.

- Provide supports to address students' behavioral and emotional needs, unrelated to communication, to help students and to address concerns about disruptions to other students.
- Improve preparation for all school staff involved with pilot students by providing more structure, support, and general information to them and by ensuring that paraeducator facilitators attend the initial professional development sessions.
- Provide guidance to teachers about grading, with respect to absences and authorship concerns.
- Explore options for paraeducator facilitators to attend team meetings.

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Appendix

Table A
Number and Type of Language Function in Messages from Students ($N = 12$)

Student	# of language functions	Type of language function				
		Learn	Get things	Create a world of imagination	Express personal feelings	Create interaction with others
1	1	Yes	No	No	No	No
2	1	No	No	Yes	No	No
3	2	Yes	No	No	Yes	No
4	2	Yes	Yes	No	No	No
5	2	Yes	Yes	No	No	No
6	2	Yes	Yes	No	No	No
7	2	Yes	Yes	No	No	No
8	2	Yes	Yes	No	No	No
9	2	Yes	Yes	No	No	No
10	2	Yes	Yes	No	No	No
11	3	Yes	Yes	No	Yes	No
12	3	No	Yes	Yes	No	Yes

Note. No message had the following functions: to control behavior or to communicate information.