Benefits of C-Print®: What Does Research Say?

Research has played a key role in the development of the C-Print System. An important function of this research has been to determine the extent that various features of the service benefit students. Following are research-based answers to frequently asked questions about the benefits of C-Print.

What benefits does C-Print provide?

What benefits does C-Print provide compared to interpreting support services?

The following research indicates that deaf or hard-of-hearing students understand and remember teachers’ lectures and other classroom information at least as well, and sometimes better, with C-Print, compared to interpreting. In two questionnaire studies with deaf or hard-of-hearing college students, students who had used C-Print and who had also used interpreting in classes were asked to rate as a percentage, the amount of information that they understood in class.

- Students assigned higher ratings of understanding for C-Print than for interpreting, and the difference between the mean ratings for these two services was statistically significant in each study (Elliot, Stinson, McKee, Everhart, & Francis, 2001; Stinson, Stinson, Elliot, & Kelly, 2004).

In one experiment with deaf or hard-of-hearing high school students and a second with college students, retention of lecture information, as measured by objective recognition and recall tests, was compared for videotaped C-Print and interpreted presentations:

- High school students retained significantly more information from the C-Print presentation than the interpreted one (Stinson, Elliot, Kelly, Liu, & Stinson, 2004).

- Results for college students suggested that C-Print provided benefits not provided by interpreting, although there were not overall differences in retention between the C-Print and interpreted presentations. Specifically, results indicated that with C-Print students retained enough information regarding specific terms, spelling, etc., so that they did not need the text provided with C-Print to resolve ambiguities. However, with interpreting, students needed notes from a notetaker to clarify uncertainties about specific terms in the lecture (Stinson, Stinson et al., 2004).

According to interviews with deaf or hard-of-hearing college students who used C-Print:

- C-Print includes more of the actual vocabulary used by the professor and this is beneficial for test preparation and learning the course material (Elliot et al., 2001).
**What benefits does C-Print provide compared to notes from a notetaker?**

After the C-Print captionist finishes producing the real-time text for a class, the saved text is available for further study by students. How do students benefit from this text, compared to benefit from notes taken by a volunteer or paid notetaker? In questionnaire studies, deaf or hard-of-hearing college students who have used C-Print and notes from notetakers have reported that:

- They used the saved C-Print text for study significantly more than they used notes from notetakers (Elliot et al., 2001; Stinson, Stinson et al., 2004).
- They rated the C-Print text as more helpful than notes from notetakers (Stinson, Stinson et al., 2004).
- They used more study strategies, such as highlighting and outlining, with the C-Print text than with notetaker notes (Stinson, Stinson et al., 2004).

**What benefits does C-Print provide compared to other speech-to-text support services?**

C-Print research staff are not aware of any research that has directly compared specific speech-to-text support services with each other (e.g., C-Print, Communication Access Real-time Translation [CART], other computerized QWERTY keyboard-based approaches, and other automatic speech recognition approaches).

In the 1980s, researchers at NTID conducted a study that compared students’ ratings of comprehension of CART with comprehension of interpreting. This study also compared helpfulness of the text produced with CART with notetaker’s notes. Since the questions used in this study (Stinson, Stuckless, Henderson, & Miller, 1988) were very similar to those used in studies with C-Print, it is possible to infer from examining these CART and C-Print studies that:

- Both C-Print and CART provide comprehension of a lecture equal or better to that of an interpreter (Elliot et al., 2001; Stinson et al., 1988).
- Students rate the text provided by C-Print and by CART as more helpful than notes taken by a notetaker (Stinson, Elliot, et al., 1988; Stinson, Stinson et al., 2004).
- Mean scores for these two studies indicate that ratings for CART and for C-Print were similar.

**Other benefits of C-Print.**

According to interview studies:

- College students perceived C-Print as providing complete information that included all, or almost all, the important points and details communicated in the classroom, even though C-Print does not provide a verbatim display of the lecture and discussion (Elliot et al., 2001).
- The highlighting and notetaking features of the student (client) version of the C-Print software appear beneficial to many students. High school students reported that these features help make class information more salient, meaningful, and easier to use in later study (Elliot, Stinson, Francis, Coyne, & Easton, 2003).
Who can benefit from C-Print?

Proficiency in reading and writing is a determinant of benefit from C-Print. The minimum reading level for benefit is approximately the 4th grade. Preference for or proficiency in either sign or spoken communication appears unrelated to benefit from C-Print.

- Students with reading levels of 4th grade and above in the experiment with high school students remembered more information from the C-Print presentation than from the interpreted one (Stinson, Elliot et al., 2004).

- Students who were more proficient readers in the high school and college experiments recalled more information from C-Print presentations than less proficient readers (Stinson, Stinson et al., 2004).

- In one of the questionnaire studies with college students who used C-Print, more favorable ratings of the C-Print real-time display and the text were associated with higher reading proficiency (Elliot et al., 2001).

- In the two questionnaire studies and two experiments, neither self-ratings of preference for sign communication nor preference for spoken communication were related to preference for or performance with C-Print (Elliot et al, 2001; Stinson, Stinson et al., 2004; Stinson, Elliot et al., 2004).

Please contact our office if you have any questions or would like additional information.

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References


