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Table of Contents

<i>Towards a Hybrid Intralinguistic Subtitling Tool: Miro Translate</i>	
Laura Cacheiro Quintas	1
<i>VIP: Voice-Text Integrated System for Interpreters</i>	
Gloria Corpas Pastor	7
<i>Evaluation of NMT and SMT Systems: A Study on Uses and Perceptions</i>	
Emmanuelle Esperanca-Rodier, Caroline Rossi, Alexandre Berard and Laurent Besacier	11
<i>Speech Recognition in the Interpreter Workstation</i>	
Claudio Fantinuoli	25
<i>Building a Custom Machine Translation Engine as part of a Postgraduate University Course: a Case Study</i>	
Michael Farrell	35
<i>A Comparative User Evaluation of Tablets and Tools for Consecutive Interpreters</i>	
Joshua Goldsmith	40
<i>MT and Post-Editing from a Translator's Perspective</i>	
Dimitra Kalantzi	51
<i>Using Online and/or Mobile Virtual Communication Tools in Interpreter and Translator Training: Pedagogical Advantages and Drawbacks</i>	
Koen Kerremans and Helene Stengers	55
<i>When Google Translate is better than Some Human Colleagues, those People are no longer Colleagues</i>	
Samuel Läubli and David Orrego-Carmona	59
<i>On the Need for New Tools for “Translating Writers” in Industry</i>	
Claire Lemaire and Christian Boitet	70
<i>Designing a Multimethod Study on the Use of CAI Tools during Simultaneous Interpreting</i>	
Bianca Prandi	76
<i>Learning from Sparse Data - Meeting the Needs Big Data Can't Reach</i>	
Jon D Riding and Neil Boulton	89
<i>Terminology Management Tools for Conference Interpreters – Current Tools and How They Address the Specific Needs of Interpreters</i>	
Anja Rütten	98
<i>The SCATE Prototype: A Smart Computer-Aided Translation Environment</i>	
Vincent Vandeghinste, Sven Coppers, Jan Van den Bergh, Tom Vanallemeersch, Bram Bulté, Ayla Rigouts Terryn, Els Lefever, Iulianna van der Lek-Ciudin, Karin Coninx and Frieda Steurs	104
<i>The Localisation Industry Word Count Standard: GMX-V. Slaying the Word Count Dragon</i>	
Andrzej Zydrón	115

A Comparative User Evaluation of Tablets and Tools for Consecutive Interpreters

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Abstract

Since the release of the first modern tablets, practicing interpreters have begun to consider how tablets could be used to support their interpreting practice. The first phase of a recent mixed methods study assessed the pros and cons of different tablets, note-taking applications and styluses, finding that professional interpreters were effectively using tablets for consecutive interpreting in a wide range of settings (Goldsmith & Holley 2015). This paper presents the second phase of this pilot study, building on previous conclusions and a survey of practicing interpreters to derive an instrument for carrying out a comparative user evaluation of these tablet interpreting tools. In light of survey results, user preferences for tablet, application and stylus features were ranked. Results from the comparative user evaluation were also utilized to compare and contrast note-taking applications currently used by tablet interpreters. The conclusions of the user evaluation and comparison of note-taking applications are expected to serve as a useful guide to allow interpreters to pick the tablets, applications and styluses which best meet their needs for consecutive interpreting.

Keywords: tablet interpreting, consecutive interpreting, tablet, note-taking, comparative user evaluation

1 Introduction

As tablets have become more prevalent, pioneering interpreters have begun to use them in their daily work, even asking if they might constitute “the ideal boothmate” (Hof 2012). Practicing interpreters have examined the pros and cons of using tablets for interpreting and discussed resources and applications that could be useful in professional settings (Drechsel 2013a, 2013b, 2017; Drechsel & Behl 2016; Goldsmith & Drechsel 2015a, 2015b, 2016; Scott 2012). Interpreters have also described their experiences testing and using tablets for note-taking (Behl 2013a, 2013b, 2015; Rosado 2013); a few of them have provided more concrete recommendations for various applications, styluses and tablets (Goldsmith & Drechsel 2016; Rosado 2013).

The first mention in the literature of using tablets for note-taking appears to date to 2014. In an article on “technology-assisted interpreting,” Costa, Corpas Pastor & Durán Muñes reported on glossary-building and knowledge management tools, the use of voice recorders for interpreter training, and note-taking applications. Although the article did not present empirical data, it noted that “more and more interpreters are turning to mobile devices to take notes” (Costa, Corpas Pastor & Durán Muñoz 2014b: 31) and suggested a few applications that the authors believed might prove useful for note-taking.

Since then, several empirical studies on tablet interpreting have considered how tablets are used by practicing interpreters for simultaneous interpreting and preparation (Paone 2016) and consecutive interpreting (Goldsmith & Holley 2015). In their study, Goldsmith & Holley found that the functionalities offered by using a tablet for consecutive interpreting might outstrip the functionalities offered by pen and paper. Furthermore, respondents reported that tablet interpreting equals or surpasses pen and paper interpreting in many contexts and settings, and that tablet interpreters appreciate the additional features offered by using a tablet for interpreting. Although tablet interpreting is generally well received in most settings, some concerns exist, and a series of factors occasionally lead practitioners to select pen and paper over

tablets. In the conclusions of their study, Goldsmith & Holley presented lists of the features that the pioneering tablet interpreters they had interviewed found relevant in their practice. An article by Goldsmith (forthcoming) summarizes these results, while a chapter by Drechsel & Goldsmith (forthcoming) considers issues such as cognitive load in tablet interpreting and the pros and cons of using tablets for conference preparation and simultaneous interpreting, arguing that tablets should be introduced into interpreter training programs.

A recent experimental study (Oceguera López, 2017) analyzed the effect of training on the acquisition of tablet interpreting skills. Over the course of four 40-minute sessions, eight undergraduate interpreting students were trained to use tablets for consecutive interpreting. During each session, participants took consecutive interpreting notes on a tablet and recorded their renditions of these speeches. Think aloud protocols revealed challenges such as the need to familiarize oneself with the note-taking software and the experience of rendering a speech from digital notes. A questionnaire identified similar benefits to those presented in Goldsmith & Holley (2015), although participants had mixed feelings about whether tablets outstripped pen and paper for note-taking, possibly due to their limited tablet interpreting experience. In the most novel part of the study, four participants transcribed their recordings and identified omissions, errors and incorrect use of vocabulary. The results indicated that tablet interpreting performance improved with training.

Related research has also investigated “simultaneous consecutive interpreting,” which entails recording a speech that would normally be rendered in consecutive mode, playing it back on headphones and rendering it in simultaneous mode; playback can be slowed down if necessary, e.g. for particularly difficult passages. Scholars have found that this approach resulted in better interpreting performance, which was seen in “more fluid delivery, closer source-target correspondence” (Hamidi & Pöchhacker 2007:14), greater accuracy, fewer “disfluencies” (hesitation phenomena), greater interpreter confidence, and a more complete rendition (Orlando 2014). Other studies have found that digital pens could be used for training budding interpreters: playing back recordings of the note-taking process helped promote metacognition, allowing students to identify gaps in their technique and design tailored strategies to address them (Orlando 2015a, 2015b; see also Orlando 2016). Recent technical developments also allow interpreters to use a tablet and stylus for simultaneous consecutive interpreting (El-Metwally 2017).

2 Methodology

Goldsmith & Holley’s (2015) pilot study represented the first stage in a multiphase mixed methods research project aiming to (1) map the field of those who use tablets for consecutive interpreting and (2) develop an instrument to evaluate the various tools and technology available in this field. Through six in-depth interviews with professional interpreters working in a wide variety of settings, they carried out the exploratory sequential design phase of this project, collecting and analyzing qualitative and quantitative data with a view to later developing an instrument (Creswell & Plano Clark, 2011; Creswell, Plano Clark, Gutmann, & Hanson 2003). After deriving a set of inductive codes and analyzing the in-depth interviews using NVivo™, Goldsmith & Holley (2015) presented a set of features to consider when assessing new and existing tablets, applications and styluses to determine their potential effectiveness.

Based on the conclusions of the first stage of this project, the study presented in this article set out to conduct a user evaluation by answering two questions:

- Which features of tablets, note-taking applications, and styluses are most important for tablet interpreters working in the consecutive mode?
- Which tools on the market offer the greatest number of these features?

Although user evaluations have yet to be conducted on tablet interpreting, several studies have assessed various terminology management programs for interpreters. For example, based on a literature review and a description of eight terminology management tools on the market at the time, Costa, Corpas Pastor & Duran Muñoz (2014a) aimed to establish a system for evaluating key features to determine the extent to which terminology tools met interpreters' needs. They awarded up to 10 points for five "fundamental" features and up to five points for 10 "secondary" features. For each feature, they established a system for awarding points; they then evaluated the tools they had selected based on the criteria they had identified and determined which tools best met the perceived needs of interpreters. Will (2015:187) analyzed a more limited set of four "generally available and utilized" terminology management tools based on three key criteria – view, data processing and operation and use – awarding 0 to 5 points for each of these criteria using the following point system: "not implemented or recognizable" (0), "insufficient" (1), "sufficient" (2), "satisfactory" (3), "good" (4), or "very good" (5).

These approaches to conducting a user evaluation present several methodological shortcomings. For example, the researchers selected features to assess based on their perceptions of which features were most important. In the case of Costa, Corpas Pastor & Duran Muñoz (2014a), the authors also decided that certain features were more relevant than others, awarding twice as many points to these features. Furthermore, the researchers selected the tools that they decided to evaluate based on their perception of which tools were most relevant. Finally, they used point scales to determine the extent to which a tool offered a given feature, yet neither approach seems to be based on scientific criteria. Costa, Corpas Pastor & Duran Muñoz (2014a) used variable criteria for awarding points – some features were awarded points on an "all or nothing" basis depending on whether or not a feature was present, while others had variable point values (e.g. 0, 3, 7, or 10 vs. 4, 7, or 10 vs. 5 or 10) that were assigned for seemingly unclear reasons. In the case of Will (2015), the difference between, i.e. "sufficient" and "satisfactory" seems to be unclear and subjective.

This study adopted a different approach to identifying which features to evaluate, determining the relevance of features, and awarding points based on whether these features were available in a given tool. The list of features was derived from the series of interviews with practitioners reported in Goldsmith & Holley (2015). Subsequently, practicing tablet interpreters were asked to rank the importance of each of these features by means of a questionnaire; responses were averaged to derive a weighting coefficient for each feature, allowing features to be ranked based on their importance. The questionnaire distributed to practicing tablet interpreters was used to select the tools that were evaluated for this study – this was considered to be a reliable indicator of the leading tools on the market. Finally, all features were assessed on a yes/no basis depending on whether or not a given application offered a given feature; a final score for each tool was calculated by multiplying the weighting coefficient by all available features and averaging the total values.

Data was collected using a questionnaire. Since research has shown that reliability and validity can be maximized by offering between four and seven options on rating scales (Lozano, García-Cueto & Muñiz 2008), that participants prefer a larger number of options (Muñiz, Cueto & Lozano, 2005), and that 6-response categories yield more consistent effects than 5-response categories (Moors 2007), six options were offered. Respondents rated each feature by answering the question "On a scale of 0 to 5, how important are each of these features for you?", where 0 represented "not important" and 5 represented "very important." A numerical scale with interval data was also expected to avoid some of the problems inherent in Likert scales, where the distance between ordinal responses like "always," "often," and "sometimes" is not always equal (Sullivan & Artino, 2013).

All participants completed the standard University of Geneva – Faculty of Translation and Interpreting informed consent form. All responses were anonymous and confidential, and were collected using an online survey tool. The questionnaire also gathered data on the tablets, operating systems, applications, and styluses used by respondents as well as statistical information.

The survey was circulated over social media and email, including via the “Interpreter Technology group” on Facebook, which has over 500 members. Using a variant on snowball sampling, participants were encouraged to forward the survey to any other tablet interpreters they knew.

3 Population

Eleven (11) respondents completed the survey. In the additional information category, one respondent indicated that s/he worked as a full-time translator rather than as an interpreter. Consequently, this response was excluded from results.

The ten respondents included in the population ranged in age from 27 to 57 ($\bar{x} = 42$). Respondents’ professional domiciles were located in North America (25%) and Europe (75%).¹ Eight of the participants (80%) were a member of at least one professional translation and/or interpreting association. All but one participant (90%) worked with at least two active languages; most had several additional passive languages ($\bar{x} = 2.1$). Respondents worked in a wide range of interpreting contexts, including conference interpreting (70%), diplomatic interpreting (50%), community interpreting (40%), legal / court interpreting (40%), medical interpreting (40%), business interpreting (30%), and media interpreting (20%).² Respondents had between 3 and 32 years of professional experience ($\bar{x} = 13.7$) and between 2 and 7 years of tablet interpreting experience in the consecutive mode ($\bar{x} = 4.6$). Respondents worked frequently in consecutive mode ($\bar{x} = 9$ days / month), and had used tablets for over 1300 total assignments ($\bar{x} = 165.6$).

4 Results

Although every effort was made to promote the survey and reach potential tablet interpreters, only 11 individuals responded; one participant was not an interpreter, and this set of responses was discarded. Given the small number of respondents, the results are not expected to be statistically significant. In light of this, results should be construed as indicative of current trends; further research will be needed to determine the size of the entire population of tablet interpreters and assess whether the results presented herein can be generalized to the population as a whole.

Surprisingly, 90% of respondents used an iPad; only 1 participant (10%) used the Microsoft Surface. Five respondents (50%) used an iPad Pro, although sizes varied – one respondent used the 9.7” iPad Pro (10%), two used the 10.5” iPad Pro (20%), one used the 12.9” iPad Pro (10%), and one respondent did not indicate iPad size. Non-iPad Pro users utilized several different types of iPads, including the iPad Air (10%), iPad mini (10%), and iPad 2 (10%). Results therefore indicate that tablet interpreters used tablets offering a variety of form factors, from the 7.9” iPad mini to the 12.3” Surface Pro or 12.9” iPad Pro.

Six of the ten respondents (60%) used first-party styluses – either the Apple Pencil (50%) or Surface Pen (10%). Respondents – especially those with older iPad models – also used a variety of third-party styluses, including active styluses (53 Pencil and Apex) and passive sty-

¹ Several respondents left the questions about professional domicile, average days of consecutive assignments per month, and total number of consecutive assignments blank. These responses have been excluded from the statistics presented herein.

² These categories were derived from self-reported data in Goldsmith & Holley (2015).

luses (Wacom Bamboo and Maglus). Interestingly, in response to the question about stylus(es) used, one participant wrote “none,” perhaps indicating that a finger was used for note-taking.

Nearly every respondent who indicated their operating system used the most up-to-date operating system available. This is particularly relevant for iPad users utilizing iOS 11, which was released just three weeks before the survey was conducted, potentially indicating that tablet interpreters tend to be early adopters of technology.

In terms of note-taking applications, the Surface Pro user utilized Nebo, while iPad users worked with Notability (60%), Noteshell (30%), Penultimate (30%), Bamboo Paper (20%), iOS Notes (20%), AudioNote (10%), GoodNotes (10%), and Whink (10%). Several respondents indicated that they use a variety of note-taking applications.

Additional applications used for support while taking notes included document annotation applications such as Readdle Documents (30%) and Adobe Reader (10%); dictionary applications such as Linguee (30%), WordReference (10%) and various unnamed dictionary applications; glossary applications such as Interplex (10%), BoothMate for Interpreters’ Help (10%), an unnamed “glossary application,” Proz.com glossaries accessed through a web browser (10%), and iBooks for viewing one’s own glossaries (10%); word processing and office suites such as Mobisystems (10%); and other applications, like a web browser (20%) or Productivity (10%).³ In short, it appears that document annotation, dictionary, and glossary applications are most frequently used alongside note-taking applications for multi-tasking purposes.

4.1 Ranking of features

Based on answers from respondents, the arithmetic mean was calculated for each feature. These results were then ranked from highest to lowest to determine the most and least relevant features for each of the three categories: tablets, applications and styluses. Given the limited number of respondents, other more advanced statistical tests were not applied, as it was not expected that they would yield statistically significant results. As such, the results below should be taken as preliminary, reflecting the nature of this pilot study.

Table 1 presents a ranking of features that interpreters seek in tablets. Unsurprisingly, interpreters seek tablets that run smoothly and quickly, are portable, reliable, durable, and unlikely to crash, and offer good battery life. As they use their tablets for consecutive interpreting, it comes as no surprise that low latency, a smooth, quick writing experience, and a clear, easily visible screen are also important. When it comes to internet access, interpreters prize wireless access over 3G/4G functions, perhaps because they tend to work in locations where Wi-Fi is available or tether their tablets to their smartphones. Although participants used tablets of various sizes, they nevertheless found that the size of their tablet was important. Of slightly less importance were filing and organizing capabilities, multitasking and split-screen functionalities, appearance, boot time, and built-in wrist protection. Interestingly, the availability of a USB port, ability to disable multitasking gestures, and cost were seen as being among the least important features.

Table 2 presents a ranking of features that interpreters seek in note-taking applications. When it comes to note-taking applications, tablet interpreters appreciate reliable, stable applications that are easy to use. The writing experience is key – applications should allow for fast, smooth writing, offer palm rejection and good handwriting recognition, and result in notes that are clear and easy to read. Respondents seemed to prefer vertical scrolling over horizontal page turns; in both cases, being able to move from one section to another within a set of notes was crucial. Changing between ink colors or stroke thickness, backing up notes to the cloud, organizing and filing notebooks, or zooming in was somewhat less important. Custom paper,

³ One respondent listed an application named “Interpret,” which to the author’s knowledge, does not exist.

Tablet features	Rating
Runs smoothly and quickly	5
Portable	4.9
Reliable	4.9
Battery life	4.7
Screen is clear and easily visible	4.7
Stable build / not likely to crash	4.7
Sufficient memory	4.7
Writing speed	4.7
Durability	4.6
Weight	4.5
Internet access (Wi-Fi)	4.4
Reference materials/documents easily accessible	4.4
Size	4.4
Writes smoothly	4.4
Filing and organizing capabilities	4.1
Limited number of cables	4
Split screen functionality / multitasking	4
Comfort	3.9
Professional appearance	3.9
Boot time	3.8
Built-in wrist protection	3.7
Quick learning curve	3.7
Internet access (3G / 4G)	3.7
USB port available	3.1
Ability to disable multitasking gestures	3
Cost	2.8

Table 1. Ranking of tablet features.

converting handwriting to text, cut and paste, bookmarks, and embedding files into notes were among the least relevant features. Yet again, cost came in last in the ranking.

Table 3 offers an overview of features interpreters seek in styluses. Tablet interpreters appreciate styluses that are comfortable, durable, and pair with tablets and applications. The stylus should write quickly and quietly, glide smoothly on the tablet, and feel natural. Rechargeable styluses that charge via USB or similar are preferred over styluses with replaceable batteries; fine-tipped nibs are preferred over softer, rubbery nibs. Features such as appearance and heft are slightly less important, while buttons offering additional functionalities, a built-in pen clip, and the ability to lodge the stylus inside the tablet are seen as even less important. For the third time, cost was among the least important features.

Overall, interpreters working in the consecutive mode seek tablets, note-taking applications and styluses that are reliable, durable, and comfortable to use, offering a smooth writing experience and resulting in clear, easy-to-read notes. Other features – such as the ability to organize and file notes – and additional options – such as a variety of ink colors and thicknesses and professional appearance – are slightly less important. USB ports, buttons with added functions, a pen clip, the ability to lodge the stylus inside the tablet, and features such as cut and paste, bookmarks, and embedding seem to be among the least useful features. Finally, cost was consistently rated among the least important features, perhaps indicating that tablet interpreters are willing to invest more in equipment that allows them to do professional work.

Note-taking application features	Rating
Clear and easy to read	4.9
Pairs with stylus	4.8
Reliability	4.7
Comfortable to use	4.6
Smooth writing	4.6
Stable build / limited crashing	4.5
Writing speed	4.5
Palm rejection / wrist protection	4.3
Erasing	4.2
Speed of page turns	4.1
Vertical scrolling	4
Quality of handwriting recognition	3.9
Split screen functionality	3.9
Connectivity with other applications	3.7
Quickly change color or thickness of ink	3.7
Experience mirrors writing on paper	3.6
Visualize multiple pages simultaneously	3.6
In-app access to dictionaries / reference materials / internet	3.4
Variable stroke thickness	3.4
Cloud backup available	3.3
Filing and organization of “notebooks”	3.3
Variety of ink colors	3.3
Zoom	3.3
Horizontal page turns	3.2
Custom paper available	2.8
Converts handwriting to text	2.7
Cut and paste	2.6
Ability to add bookmarks for in-app navigation	2.5
Embed other files into “notebooks”	2.5
Cost	2.4

Table 2. Ranking of note-taking application features.

4.2 User evaluation of note-taking applications for consecutive interpreting

As all but one respondent was an iPad user, the user evaluation was limited to note-taking applications utilized for consecutive interpreting on the iPad. All applications mentioned in the survey were assessed to determine which note-taking features they offered.

Testing was conducted on a 2016 iPad Pro 9.5” (Model number MLMV2LL/A) running iOS 11 and using an Apple Pencil (Model number MK0C2AM/A).

Table 4 presents a user evaluation of the eight note-taking applications that respondents reported utilizing for consecutive interpreting.⁴ Four applications – Noteshell, GoodNotes, Notability and Penultimate all scored similarly, offering approximately 85% of the most commonly appreciated features. Whink, iOS Notes, and Bamboo Paper offered fewer features, while Audio Note clearly lagged behind its competitors. However, only Audio Note and Notability offer recording that is synched with notes – a feature which is necessary for simultaneous consecutive interpreting, but which did not emerge during the interviews conducted during the first round of this study in 2015 (see Goldsmith & Holley, 2015).

⁴ The following versions of each application were tested: AudioNote 2 (2.0.1), Bamboo Paper – Notebook (2.1.5), GoodNotes 4 (4.12.6), iOS Notes (iOS 11.0.2), Notability (7.0.2), Noteshell 2 (1.3), Penultimate (6.2.2), Whink (5.2).

Stylus features	Rating
Comfortable to hold	4.9
Durability	4.9
Integration / pairing with tablet	4.9
Writing feel (natural)	4.9
Writing volume (silent)	4.8
Compatible with all apps	4.7
Pairs with apps	4.7
Charges via USB (or similar)	4.6
Fine-tipped nib	4.6
Glides well	4.6
Natural hand position	4.5
Writing speed	4.5
Size similar to a pen	4.4
Replacement nibs available	4.3
Professional look	3.8
Heft	3.6
Replaceable batteries	3.3
Button with added functions	3.2
Softer/rubbery nib	3
“Spring” on screen	3
Cost	2.9
Built-in clip (pen clip)	2.7
Lodges inside tablet	2.4

Table 3: Ranking of stylus features

Of course, a yes/no scale calls for clarity of definitions, and may mask minor differences between applications. For the sake of this evaluation, for example, the “variable stroke thickness” category was defined as a minimum of five stroke thicknesses; several applications with only three stroke thicknesses were not awarded points for this category, and other applications offered 10, 16, or even unlimited customizable thicknesses. Similar variety was detected in the “variety of ink colors” category, the number of active styluses an application paired with, number of other applications an application could connect to, number of levels for filing and organizing notebooks, split screen functionalities, and number of different types of files that could be embedded into notebooks. This level of detail was lost by adopting a yes/no filter for evaluation applications. Nevertheless, this type of assessment paved the way for conducting a scientifically-motivated user evaluation which bore in mind the preferences of practicing tablet interpreters.

5 Conclusions

This study represents the first comparative user evaluation of tools used by tablet interpreters working in the consecutive mode.

Given the limited size of the population, the results of the pilot study are not statistically significant, and therefore should not be generalized to the larger population. Future research would be needed to determine the size of the population; various filters – including membership in a professional association or interpreting and tablet interpreting experience – could also help to clearly define the population and determine how many members of the larger population of interpreters are also using a tablet for note-taking in consecutive mode.

NB: Shaded boxes indicate availability of feature		Coefficient	Audio Note	Bamboo Paper	Good- Notes	iOS Notes	Not- ability	Note- shelf	Pen- ultimate	Whink
Clear and easy to read	0.98									
Pairs with stylus	0.96									
Reliability	0.94									
Comfortable to use	0.92									
Smooth writing	0.92									
Stable build / limited crashing	0.9									
Writing speed	0.9									
Palm rejection / wrist protection	0.86									
Erasing	0.84									
Speed of page turns	0.82									
Vertical scrolling	0.8									
Quality of handwriting recognition	0.78									
Split screen functionality	0.78									
Connectivity with other applications	0.74									
Quickly change color or thickness of ink	0.74									
Experience mirrors writing on paper	0.72									
Visualize multiple pages simultaneously	0.72									
In-app access to dictionaries, etc.	0.68									
Variable stroke thickness	0.68									
Cloud backup available	0.66									
Filing and organization of “notebooks”	0.66									
Variety of ink colors	0.66									
Zoom	0.66									
Horizontal page turns	0.64									
Custom paper available	0.56									
Converts handwriting to text	0.54									
Cut and paste	0.52									
Ability to add bookmarks	0.5									
Embed other files into “notebooks”	0.5									
Cost	0.48		Free / \$6.99/yr. (pro)	Free, in-app purchases available	\$7.99	Free	\$9.99	\$4.99	Free	\$2.99
AVERAGE			57.83%	72.38%	85.63%	75.16%	84.99%	86.84%	84.80%	78.96%

Table 4: User evaluation of note-taking applications for tablet interpreting

Despite these limitations, the study presents the first ranking of features that are important for tablet interpreters working in the consecutive mode. Overall results indicate that interpreters seek tablets, note-taking applications and styluses that are reliable, durable, and comfortable to use, offering a smooth writing experience and resulting in clear, easy-to-read notes. Other features are somewhat less important; cost was consistently among the least important features, indicating that interpreters may be willing to invest in the tools they need to do professional work.

Results also indicate that tablet interpreters working in the consecutive mode most frequently use the iPad Pro and utilize tablets offering a variety of form factors; first party styluses – especially the Apple Pencil – are their styluses of choice. Tablet interpreters utilize a variety of applications for note-taking and to support their consecutive interpreting practice, although Notability was far and away the most popular note-taking application used by respondents in this study. Document annotation, dictionary, and glossary applications were most frequently used alongside note-taking applications for multi-tasking purposes.

Four note-taking applications – GoodNotes, Notability, Noteshef, and Penultimate – all scored similarly, offering the greatest number of features appreciated by tablet interpreters working in the consecutive mode.

This pilot study presents a novel methodology for conducting a user evaluation of interpreting technology. It entails conducting broad, interview-based research to survey the field and determine relevant features, running a survey to test these features among practitioners, deriving ranking and weighting from their answers, and evaluating the tools they report using.

Despite the limitations inherent in any pilot study, the conclusions of the user evaluation and comparison of note-taking applications are expected to serve as a useful guide to allow interpreters to pick the tablets, applications and styluses which best meet their needs for consecutive interpreting. It is expected that study results could give rise to a guide for interpreters interested in learning how to use these tools and shape future training courses on tablet interpreting.

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