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iPASS Project: An Online Tutoring System
by Mark Rabinovich

One of the major challenges faced by the Campus Writing Center at Queensborough Community College (QCC), a member institution of the City University of New York (CUNY), has always been finding effective strategies for supporting remedial writing students. Since many of its tutees are part-time students and/or students whose first language is not English, the Campus Writing Center needed a way to provide more flexible meeting times and access to services outside of the Center's usual operating hours. An online tutoring system was one obvious way to meet these needs, and this option offered the additional benefit of providing a central location in which students could store and track multiple revisions of their work, access reference materials, exhibit creative work with their peers, and collaborate with others. However, we knew online tutoring would present its own challenges, as any system would have, in accommodating students with a variety of learning styles and needs. While tutors had already found strategies for dealing with this challenge in face-to-face tutoring, we were mindful of the need to adjust these strategies in order to accommodate remote and asynchronous learning.

Our response to these issues took the form of iPass, an online tutoring system that allows tutors and students to interact asynchronously, makes resources available to students at any time, and enables students to keep track of their entire body of work for the duration of their engagement with the Center. In this article, I describe the components of the iPass system and demonstrate how they address the challenges we faced. Based on the results of surveys and test data, I contend that the system has helped students improve the quality of their writing.

iPass: Design and Development

The iPass system has been in development since 2004 and has been in active operation since 2006. The philosophy of iPass is based on a constructivist approach derived from the theoretical frameworks set forth by Piaget (1954), Vygotsky (1962), and Bruner (1990) (Exhibit 1).

The Constructivist Approach

The philosophy behind iPass assumes that learning is a transactional and dynamic process that is not tied to a physical location or a specific schedule. In this context, the word "transactional" refers to the process of interaction between the learner (student author) and the task (that is, the requirements imposed by the student's writing assignment) as the student attempts to understand and express ideas. Transactional theory, as applied in iPass, invites students to reflect upon the unique perspectives they bring to each piece of writing and to acknowledge and examine the responses their writing evokes. It requires student authors to consider their identities, the prior knowledge they bring to the task, the expectations they hold, and the choices they make as writers.

The iPass system is designed to encourage active learning in a risk-free environment where students can use writing to demonstrate understanding and to express ideas via an interactive process of self-reflection, critical thinking, feedback, and revision. Rather than positioning themselves as the ultimate authorities in the learning process, tutors serve as facilitators; they avoid interfering editorially as such interference is akin to denying the student author's ownership of the writing process. Rather, tutors engage student authors in discussions about strategies that empower them to identify patterns in their writing and to find and correct

their own errors. This approach puts ownership of both the writing and the learning process in the hands of the student, allowing students to articulate their understanding of the task and their product through thoughtful collaboration, feedback, and revision. The iPass process represents constructivist theory applied in practice; the student author is the focal point of the task and engages in a dialogue with multiple partners—including tutors, instructors, and other students—about assignment expectations, their work's organization, and the writing process itself.

iPass System Design

At the design stage, we set out three fundamental criteria for the e-tutoring system:

- The primary purpose of the system is to assist QCC students in improving their writing skills.
- The tutoring system must be asynchronous so that students and tutors do not need to be online at the same time.
- The system should not contain any static manuals, textbooks, or other didactic materials designed for independent learning; rather, tutors add materials to the system in response to specific students' needs.

In addition to these requirements, we faced the additional challenge of figuring out how to train and certify online tutors (or, as we call them, e-tutors), who sometimes come from outside of QCC and often work remotely. We successfully addressed this challenge with a separate online system that allows us to conduct virtual interviews with registered e-tutor candidates and then run a series of online seminars to train and test provisional e-tutors, emulating real student situations and providing expert assessment ([Exhibit 2](#)).

We designed iPass so that we could perform system administration entirely online. The administrative side of the system allows for generating a number of analytical reports on both student and e-tutor performance, including e-tutor timecard reports that facilitate tutor payments. The reports are generated using [Web services](#) that allow for the dynamically changing parameters of the system, including tutor payments, forms, and other rules ([Exhibit 3](#)).

The iPass system is presented to users via a Web portal with separate portals for students and e-tutors. The student portal ([Figure 1](#)) offers access to five sections:

e-Files ([Figure 4](#)): An electronic filing cabinet where students can find tips and resources on test taking and preparation as well as study materials for CUNY's exit-from-remediation writing exam (the American College Test [ACT]) and the graduation/transfer exam (the CUNY Proficiency Exam [CPE]).

- *My Learning Profile* (evaluation/writing style, which is updated dynamically based on system use) to reflect the student's preferred learning strategies.
- *The Writing Clinic* ([Figure 2](#)): A collaborative Web service that allows students to ask specific questions and submit writing samples for evaluation. They receive comments and answers from e-tutors within 48 hours.
- *iBlog* ([Figure 3](#)): A personalized student space where participants can post their own drafts and class writing assignments and showcase their work to others.
- *Writing Resources* ([Figure 5](#)): A compendium of external resources to be used in writing preparation.

e-Tutors can access each of the sections listed above from their portal ([Figure 6](#)) that has additional tutor-specific functionality, including access to the iTrain section ([Figure 7](#)), where they can review materials used in the initial tutor training to refresh or hone their skills, and to a payroll utility that allows them to indicate availability ([Figure 8](#)). The entire system was built in .NET based on a three-tier technology and uses an Oracle database as a backend storage solution.

The Learning Profile: Helping e-Tutors Target Their Responses

The pedagogy of the iPass system is founded on the premise of neurolinguisticprogramming, a teaching model based on the assumption that teaching must cater to the specific learning styles of students (Fleming 1995). More recent research suggests that aligning teaching methods to students' specific learning styles in a Web-based environment can improve the learning process and enhance retention (Walters and Egert 2000).

The iPass system uses the VARK learning style inventory originally developed by Neil Fleming and modified by the Campus Writing Center to help students assess their primary learning modalities (Figure 9). The inventory survey consists of 7 to 14 questions. Writing Center experts choose how many questions appear on the survey; a smaller number allows for faster registration but decreases the survey's accuracy while a larger number provides greater accuracy but demands that students take more time to complete the registration process. Survey results are stored in the database and are always accessible to students in their learning profiles where they are presented as a graph with text explanation (Figure 10). e-Tutors can also access a student's VARK results so that they may use the information to guide their tutoring approach, adjusting both their teaching style and the materials they use to fit the student's learning needs. For example, an instructor might decide to substitute an audio recording for a textual explanation when tutoring an auditory learner.

The Writing Clinic: Efficient Exchange of Information Between Students and e-Tutors.

The Writing Clinic section of the iPass system allows students and e-tutors to exchange information in a variety of ways by using methods that are appropriate for specific learning styles:

Auditory learners: The Writing Clinic includes an audio component that allows students to highlight a part of the text, select a voice type (according to pitch and speed), and click a "Read" button. An advanced text-to-speech engine converts the text to an audio recording, compresses it as an MP3 file (as the compact format greatly improves system response time), and sends the file to an embedded audio player in the

- *Visual learners:* Tutors can upload image and video files to the Writing Clinic and present them to students. The uploaded files are stored on the server in a database and the student can access them instantly.
- *Reading/writing-centered learners:* The Writing Clinic's rich text editor, which is based on an open-source text editor that has been modified for the purposes of this project, allows students to use text highlighting and modify font sizes and colors. It also gives e-tutors the ability to make editorial notes and changes (Figure 11).

This commitment to addressing diverse learning styles makes the student a keystone of the learning experience. As students become aware of their learning styles and e-tutors respond to student writing with techniques that address these preferred learning modalities, the dialogue between the student and the tutor explores the intent manifested in the student's written ideas.

The Drafting Process in iPass

iPass is designed to facilitate a workflow in which e-tutors do not take more than 48 hours (starting from the moment a student submits a writing assignment along with appropriate meta-information and relevant questions) to respond to a student request. The e-tutor response must include a detailed analysis of the written assignment as well as recommendations for its improvement. The 48-hour time limit not only helps to avoid delays but also encourages e-tutors to make their responses concise and relevant. iPass implements a "first in, first out" (FIFO) queue that allows tutors to choose which student submissions to work on (Exhibit 5). These aspects of iPass design enable a rich and interactive experience that helps students work on their writing skills in an efficient manner.

Once the student has received the tutor's response, the student can choose to respond and continue the exchange of submissions and responses until the desired results are achieved for a particular assignment. In

the case of a single writing assignment, student submissions can be viewed as sequential drafts, and the message exchange between the student and the e-tutor appears in the iPass interface as a continuous conversation.

In addition to offering a direct response to the student, an e-tutor can also assign numerical scores to and add comments for specific aspects of the student's performance, including the student's management of time, the appropriateness of content given the assignment, and the quality of the student's text with respect to grammar and other issues (Figure 12).

iBlog: The Platform for Expression

The iBlog section of the iPass project allows students to form communities and post their work both to their peers and to the world at large. By exposing their work to peer commentary, students gain additional input on the quality of their writing and build confidence in discussing their work with others. iBlog uses open-source blogging and forum tools to provide students with an open platform for expression. (For a detailed discussion of blogging tools and platforms, see Lindahl and Blount 2003). All students have their own public-facing blogs where they can post records and send out links to their peers. To ensure consistency as well as academic integrity, the blogs are moderated by e-tutors and system administrators. In particular, all initial posts by new student users of the system are retained for review by tutors and administrators before being published. For subsequent posts, a subset of all posts for any given day is selected at random and sent to tutors for review. Authors of offensive or inappropriate posts are asked to review and revise the relevant posts using a process similar to iPass's tutoring process. In general, students are asked to post entries that are related to their assignments and other writing-related activities.

Evaluating iPass Success

The iPass Project has been in active use at Queensborough Community College since the spring of 2006. During the most recent semester for which information is available, Fall 2007, 373 students took advantage of iPass tutoring services.

The success of iPass was evaluated using two indicators: (a) the opinion data reported by students and tutors and (b) various standardized and class examination results. Since one of the purposes of the project was to alleviate or eliminate the logistical difficulties associated with the tutoring process, we conducted satisfaction surveys among the students at the end of the 2006-2007 academic year. In these surveys, we asked students to compare their iPass experiences with any prior experiences they had had with remedial writing assistance, both at our writing center and elsewhere. We also asked them to evaluate individual aspects of the system and report on the extent to which each component contributed to their learning process. In addition, the students were asked to consider the known potential pitfalls of online learning systems outlined by Hara and Kling (1999) and comment on whether iPass addressed these issues. In general, students reported high levels of satisfaction with iPass based on a variety of criteria (Exhibit 6).

In order to measure the success of the iPass project in improving student writing, we compared the number of students passing standardized exams over two consecutive academic years. We also looked at the number of students who attained a grade of C+ or above in writing-centered classes. The only new factor in the second set of grade and exam score data was the introduction and increased usage of the iPass system. We found that iPass produced significant improvements in student outcomes (Exhibit 7).

iPass vs. In-Person Tutoring

iPass is not intended to replace in-person tutoring or discussion; rather, it serves students when traditional on-site learning resources are inaccessible or unavailable. It untethers students from a specific physical location or a strict schedule, allowing them to access the system at any time of day from any location with an Internet connection. The system also provides tutees with the additional benefit of anonymity as student-author identities are not known to e-tutors. This anonymity ensures that even the most reluctant students feel safe to explore their writing options in a risk-free environment.

Conclusion

In the upcoming semesters, the Campus Writing Center is planning to expand the reach of the iPass project. Up until this point, the system has been used exclusively within the context of remedial writing tutoring; next, we intend to explore whether it can be useful in other university environments where collaborative learning is preferred. To this end, the software will be adjusted for use in specific classes in multiple departments.

From the features standpoint, we are concentrating on upgrading iPass so that it incorporates the more-advanced editing and tracking features enabled by modern browsers. We are planning to introduce accessible content for students with disabilities, and we will use Adobe Flex technology to create more application-like features, such as advanced user interfaces for managing content and an editor that would allow for working offline. As we continue forward, we plan eventually to open-source the iPass software and make it available to other institutions.

References

Bruner, J. 1990. *Acts of meaning*. Cambridge, MA: Harvard University Press.

Fleming, N. D. 1995. I'm different; not dumb. Modes of presentation (VARK) in the tertiary classroom. In *Research and development in higher education, proceedings of the 1995 annual conference of the Higher Education and Research Development Society of Australasia (HERDSA), Vol. 18*, ed. A. Zelmer, 308-313. Rockhampton: Central Queensland University.

Hara, N., and R. Kling. 1999. Students' frustrations with a Web-based distance education course. *First Monday* 4 (12). http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/710/620 (accessed January 7, 2009). Archived at http://www.webcitation.org/5dg16LLoG.

Lindahl, C., and E. Blount. 2003. Weblogs: Simplifying Web publishing. *Computer* 36 (11): 114-116.

Piaget, J. 1954. *The construction of reality in the child*. Trans. Margaret Cook. New York: Ballantine.

Vygotsky, L. V. 1962*. Thought and language*. Cambridge, MA: MIT Press.

Walters, D., and C. Egert. 2000. Can consideration of learning styles improve Web-based learning? In *Proceedings of WebNet 2000 World Conference on the WWW and Internet*, ed. G. Davies and C. Owen, 961-962. Norfolk, VA: Association for the Advancement of Computing in Education (AACE).