Malissa Martin, EdD, ATC, CSCS, *Column Editor*

Utilizing Web-Based Technology to Track Athletic Training Proficiencies

Marsha Grant-Ford, ATC, PhD • Montclair State University

*D*OCUMENTATION of clinical skills and competencies has been identified as a challenge to the accountability paradigm facing athletic trainers and other allied health educators, both from the standpoint of student evaluation and program accreditation.[1,2] The sequential clinical education rotations in athletic training education programs (ATEPs) also incorporate longitudinal skill development, which take place at numerous settings with multiple students at multiple levels of development. This compounds the problem for the ATEP faculty responsible for accountability and monitoring skill progression and competence development, since they must abide by rules established by the National Athletic Trainers' Association Educational Council, and provide security and protect confidentality.[3]

Notebooks and student logs that require the signature of the approved clinical instructor (ACI) are burdensome and bulky materials. If these materials are misplaced, the student may be required to repeat skills at semester end when grades are due. Additionally, using a master copy of student notebooks or logs means that at any given time, only the individual in possession of the documents (ACI, student, or course instructor) has the ability to track student progress. Software programs currently used to provide web-based tracking of medical residents may be adaptable for other health programs, but they are likely to be cost prohibitive for most ATEPs unless there is the opportunity to share resources with other health or medical programs within the institution. The purpose of this report is to present a viable use of web-based technology for tracking of athletic training clinical proficiencies that is consistent with available resources of a small ATEP and the clinic coordinator. The emphasis is intended to be the tracking process, rather than the assessment method. Some advantages and disadvantages uncovered during the implementation process are discussed.

Formatting and Manipulating the ATEP Skill Document

Several databases are easily adaptable for tracking athletic training proficiencies.[1] As cost is a consideration for programs with limited resources, Microsoft Office® (Microsoft Corporation, Redmond, WA) was selected for our program, based on its versatility and affordability for all clinic affiliates. The skill proficiencies for each clinical educational experience had been previously delineated by the ATEP program director and clinical coordinator according to the domains specified in the ATEP Task Manual (available to all students and clinical instructors). Fourteen weekly subsets of clinical outcomes for each clinical experience were created to frame the learning progression for the each clinical course, which utilized Microsoft Excel® (Microsoft Corporation, Redmond, WA) sheets. The clinical proficiencies are taught in the clinical course and evaluated during subsequent weeks according to the due date specified. A clinical course spans a full semester. A 4-point Likert scale was used to demonstrate progress or to gauge the extent to which a student performed a skill or global proficiency. The criterion is an entry-level athletic trainer. Other data recorded were the date(s) performed (demonstrating learning over time) and the initials of the ACI responsible for skill assessment
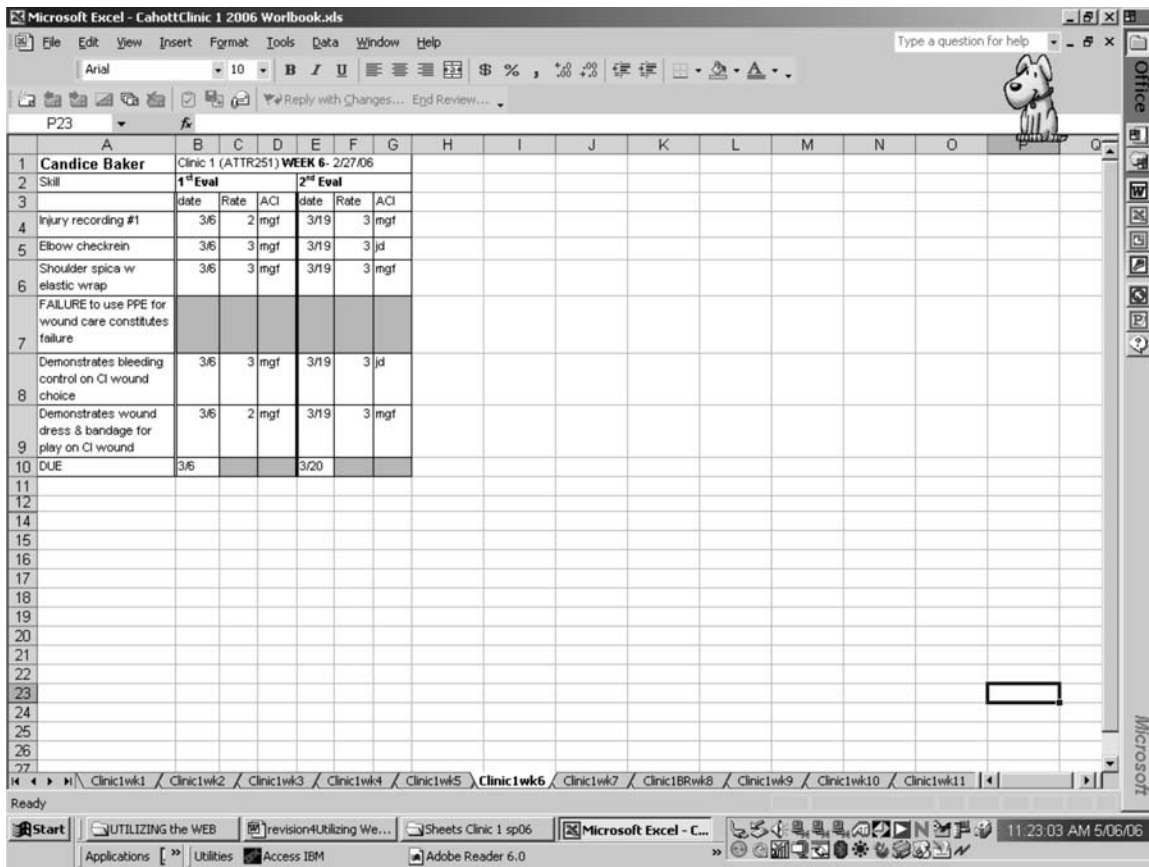
Figure 1 Completed student worksheet.

(Figure 1). Each student's sheets are then uploaded to the intranet site for viewing by the student, course instructor, and/or clinical coordinator.

Both the ACI's desktop personal computers (PCs) and personal digital assistants (PDAs) accommodate the Excel® files. PDAs are available from the ATEP; however, several ACIs decline the use of the PDAs because use of an additional instrument at the point of care was found to require considerable time and effort for clinicians who are already overtaxed by the demands of clinical practice. Most ACIs, who are the sole clinicians at the site, find the PDAs to be a cumbersome addition to the necessary tools and equipment carried to the field; however, the ATEP faculties in clinical and lab settings are successful in using the PDA in the clinical education classroom. The PDA data are uploaded (hot-synced) to personal PCs to transfer student outcomes to the central database. Most of the ACIs enter student data directly to a PC and subsequently upload files to the intranet site via the web. Popular PDA and web resources are available in the athletic training literature.[1] Potentially, ATEPs with financial resources to upgrade to wireless technology would eliminate the upload step of the process.

Web Component

Web-based technology facilitates the clinical instructors' regular evaluations being incorporated into students' permanent files. The web-based application creates a mechanism for records of each student assigned to a particular ACI to be available for regular updates by the ACI and for updated student records to be instantaneously accessible to the ATEP faculty and the student. In addition to creating a way for ATEP faculty to more closely monitor the progress of students in clinical education classes, the web-based application is far superior to the physical, logistical, and security issues involved in hard-copy record keeping and transfer among clinical instructors. This application accommodates storage of student competencies through all clinical experiences until program completion.

Development of the web-based application was accomplished through the collaborative efforts of the

Information Technology (IT) and ATEP faculty. The ATEP faculty divided the proficiencies in accordance with clinical course objectives and transformed that data from Microsoft Word® into Microsoft Excel® format suggested by IT. An Open-Source Web Portal was used to house the Excel® files. The portal application is called Metadot, which is run on a Red Hat Linux 9.0 server, running Apache web services (2.0). The web pages that host the evaluations are run using the Perl Scripting Language. User data and site content are stored and managed in MYSQL Relational Database Management System.

The ATEP clinical coordinator forwards a list of the individuals who were authorized to view the various files to the IT staff. Students and ACIs (both on and off campus) are given access to the secure site by the IT administrator through e-mail; each individual sets his/her own passwords. The program director and clinical coordinator have "administrator" privileges for all students and are responsible for the initial document upload. Each ACI has "evaluator" (instructor) privileges for all assigned students for the current rotation. ACIs access course proficiency evaluations, download the forms, enter assessments, and upload the data back to the server. Student access is limited to viewing and printing personal forms only. All users have access to the files on campus or from any location in the world with Internet access (Figure 2). This flexibility was formerly unprecedented. At the end of the clinical rotation, the competency forms are printed and stored in the student's file and the electronic files are archived.

Challenges and Pitfalls

Use of web-based technology to track athletic training clinical proficiencies is not without challenges, which must be addressed before electronic management of clinical proficiencies becomes a viable option for ATEPs. Electronic file management requires that ACIs have hardware with a minimum of Microsoft 2000 ® (Microsoft Corporation, Redmond, WA) capabilities and Internet access. Computer hardware configuration and type of Internet access (dial-up, broadband, etc.) are factors affecting file transmission time and whether or not the hardware can accommodate a PDA.
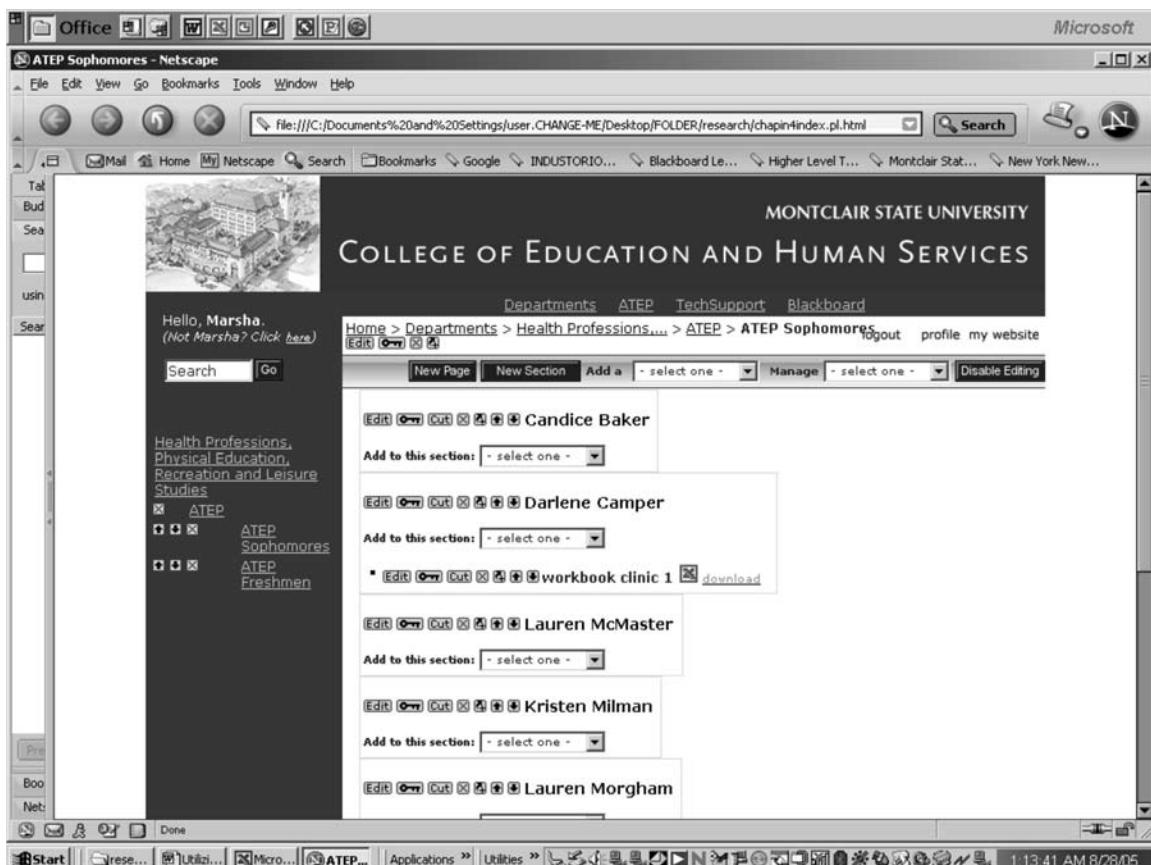

Figure 1   Reaching directions for the Star Excursion Balance Test.

Our ATEP did procure PDAs (on long-term loan from another departmental research project) for ACI use in recording skills completed at a remote location away from the ACI's PC. Also, since the ATEP is not yet in a position to supply computers to those who serve as ACIs, some older computers are not compatible with the PDA capabilities. In addition, off campus networks and dial-up access are slower and less reliable than campus network computers. Only university ACIs have access to the university's wireless network. Presently, the university does not offer hardware, software, or technical support and resources for non-university employees.

Each ACI receives personal instruction, written instructions, and e-mail and telephone support from the clinical education coordinator; however, the amount and level of technical support needed by some ACIs was initially underestimated. Although the process was not difficult, downloading and assigning file extensions, organizing the desktop, and performing various other tasks required more technical support than the clinical coordinator was able to supply. In hindsight, assumptions regarding the computer literacy skills of the CIs should not have been made, and training sessions implemented as a supplement to the required ACI training were inadequate.

Summary

ATEPs have the flexibility and autonomy to order learning objectives and clinical proficiencies within the context of the philosophy and the guidelines of the accrediting body. This web-based tracking system has proven to be an innovative and cost-effective way for ATEP programs with limited resources to solve the logistical and confidentiality challenges associated with tracking athletic training student competencies. A user-friendly and easily-navigated electronic learning portfolio may also be realized. Our experience demonstrates that increased student autonomy encourages ownership of this aspect of the educational process.[4,5,6]

References

1. Cuppett, MM. Documenting clinical skills using personal digital assistants. *Athletic Ther Today*. 2003;8(6):15-20.
2. Ashworth P, Morrison P. Problems of competence-based nurse education. *Nurs Ed Today*. 1991;11: 256-260
3. National Athletic Trainers' Association (NATA). *Athletic Training Educational Competencies*, 3rd ed. Dallas, Tex: National Athletic Trainers' Association.
4. Dornan T, Maredia N, Hosie L, Lee C, Stopford A. A web-based presentation of an undergraduate skills curriculum. *Med Ed*. 2003; 37: 500-508.
5. Triola MM, Feldman HJ, Pearlman EB, Kalet AL. Meeting requirements and changing culture. The development of a web-based clinical skills evaluation system. *J Gen Intern Med*. 2004; May;19 (5 Pt 2):492-5.
6. Dornan T, Lee C, Stopford A, Hosie L, Maredia N, Rector A. Rapid application design of an electronic clinical skills portfolio for undergraduate medical students. *Comput Methods Programs Biomed*. 2005; April: 78(1):25-33.

Acknowledgment

Author-Marsha Grant-Ford, ATC, PhD is the clinical education coordinator for the athletic training education program at Montclair State University. She has over 15 years of experience as an athletic training educator and has had international clinical experiences as well as at the secondary school level and all three NCAA division levels.