The Journal of the Association of Schools and Colleges of Optometry

OPTOMETRIC EDUCATION

Volume 37, Number 2 Winter/Spring 2012

Social Media in Optometric Education

Also Inside:

Association of Schools and Colleges of Optometry

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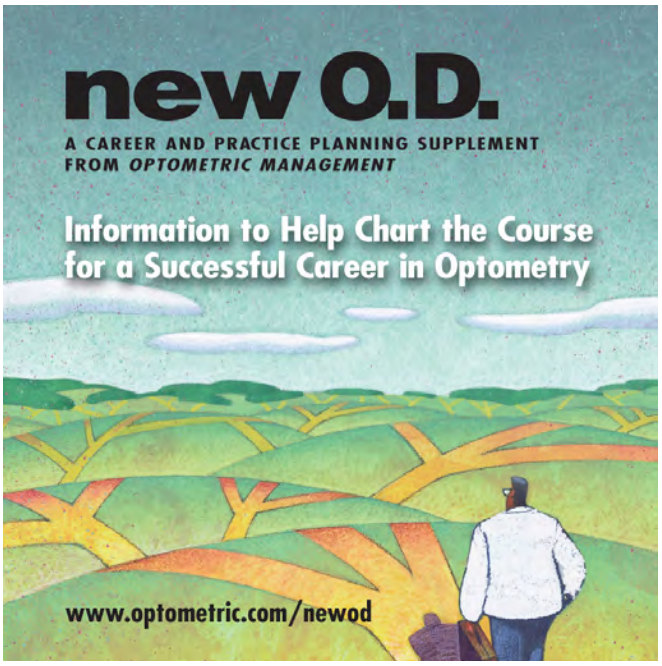

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INDUSTRY NEWS

The following companies support ASCO's national programs and activities benefiting the schools and colleges of optometry in the U.S. and Puerto Rico.

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As of Jan. 1, 2012

emPower! Eyewear Breaking New Ground

PixelOptics™

With the ongoing success of the roll-out of emPower! electronic-focusing eyewear, PixelOptics Inc. is leading a transformation in the way doctors and patients think about and use vision correction. emPower! gives patients who wear progressive lenses or bifocals unprecedented control over their vision.

Each lens contains a virtually invisible layer of liquid crystals that adjusts to provide an electronic add zone. In manual mode, a touch of the temple triggers the add zone, while another touch turns it off. A swipe of the temple activates automatic mode, and the add zone turns on and off in response to up and down head movements. PixelOptics says emPower! virtually eliminates the unwanted swim and uncomfortable head posture associated with traditional progressive eyewear designs.

A portable charger powers the lenses for two to three days with a single charge. For more information about emPower!, visit www.lifeactivated.com.

Contact Lens Companies Join Forces for Education

Four leading soft contact lens companies have teamed up to launch the STAPLE Program (Soft Toric and Presbyopic Lens Education Program). The goal of the collaboration among Alcon, Bausch + Lomb, CooperVision and Vistakon, a Division of Johnson & Johnson Vision Care Inc., is to bring hands-on fitting workshops to all schools and colleges of optometry in the United States and Canada.

STAPLE will provide more than 1,700 optometry students with an opportunity to fit patients with soft toric and multifocal contact lenses. The workshops are offered to the schools and colleges when they best fit into the current curricula, supporting and enhancing the education already offered. The STAPLE Program brings together students, industry and patients in a valuable, non-biased, hands-on fitting workshop.

For more information, a calendar of events, or to schedule a program, visit www.stapleprogram.com.

James is New Director, North America Marketing

Transitions

Transitions Optical Inc. appointed Sherianne James to the position of Director of North America Marketing. She succeeds Greg Marko, who is assuming the role of Director, Asia Pacific Marketing. James has been with the company since February 2011, when she began her tenure as Director of Global Consumer and Professional Insights.


Sherianne James

In her new position, James will be responsible for the development and implementation of organizational marketing plans in the United States and Canada. She will lead the team to develop and execute best-in-class trade and retail marketing programs and to maintain and develop relationships with the company's business and research partners.

Transitions Optical also reported that it is centralizing its multicultural marketing and education efforts into a comprehensive Transitions Cultural Connections initiative. In addition, to help educate diverse groups on their unique eye health risks, an interactive healthy sight risk assessment is being unveiled for consumers at www.HealthySightForLife.org/Cultural-Connections.

Four-Mirror Gonio Lens Features Compact Design

Designed for small anatomies and narrow palpebral fissures, Volk Optical's Mini 4 Mirror Gonio Lens delivers complete angle views. With slight lens rotation, the Mini 4 Mirror offers a full view of the chamber angle at 1.0X magnification. Volk's proprietary contact design has the stability of a flanged contact without the use of viscous interface solutions required by typical flanged lenses. Artificial tears or a thick natural tear layer is all that is required for patient comfort. A broadband coating on the lens reduces glare and reflections and maximizes laser throughput.

Glare Testing System Replicates Real-Life Vision

The newest addition to the Smart System line from M&S Technologies Inc. is the Glare Testing System (GTS), which provides a consistent technology for measuring the impact of glare on a patient's vision. Developed and engineered by M&S (patent pending) with the guidance of Jack Holladay, MD, this glare component offers the eyecare professional an enhanced method to further test patients who complain of poor vision at night, experience problems going from indoors to outdoors under bright sunlight, and have burgeoning cataracts.

The GTS utilizes long-life, high-intensity LEDs and is carefully calibrated to existing luminance standards for testing under glare conditions. The proprietary design allows for an equal distribution of light at any testing distance in order to replicate real-life experiences.

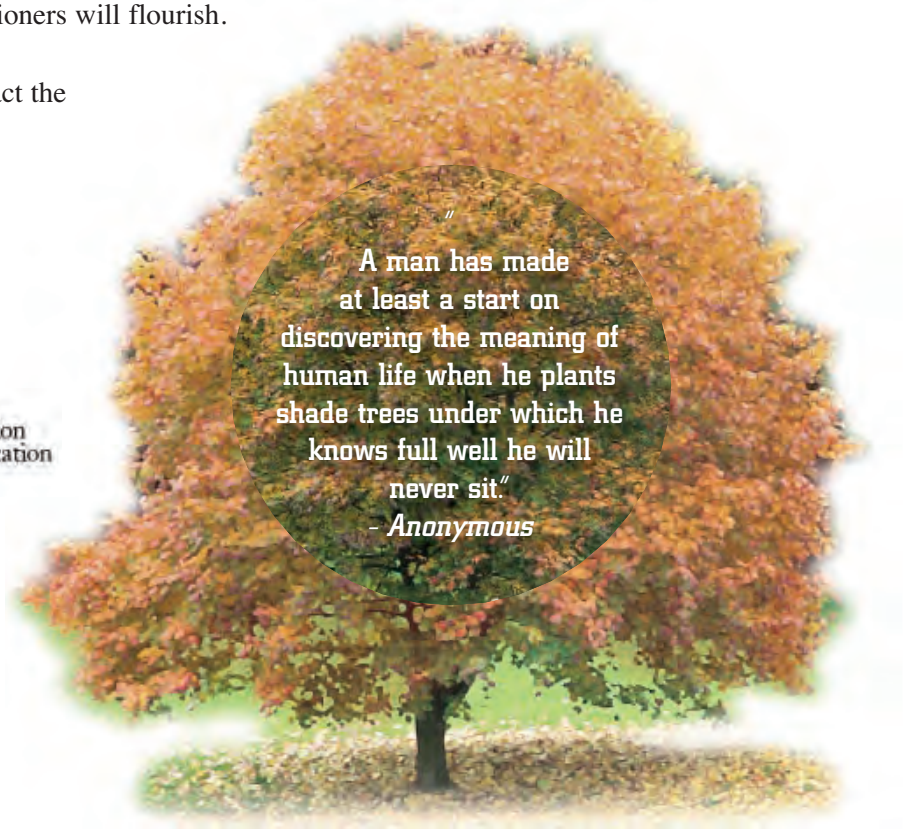
Have you thought about the future of Optometry?

We have!

The Partnership Foundation for Optometric Education is planting, cultivating, and nurturing. Together, this "true partnership" of state, regional, and national organizations is making a long-term investment in tomorrow. With the investment we make today in optometric education, future generations of practitioners will flourish.

For more information, contact the Partnership Foundation at www.opted.org or 301-231-5944, ext 3018.

Partnership Foundation for Optometric Education



EDITORIAL

Embracing Scholarship in Optometric Education

Aurora Denial, OD, FAAO

Over the past year and a half, I have had the pleasure of visiting 14 schools and colleges of optometry in the United States and Puerto Rico. My goal is to visit all of the institutions in the United States, Canada and Puerto Rico. The outreach visits allow me to tour the physical surroundings, gain insight into the unique culture of each school, and talk with faculty members about this journal, research, writing and scholarship in general. I have been enthusiastically received by the faculty and administration at each institution, and I have very much enjoyed the opportunity to get to know my colleagues.

My visits include a presentation on professional writing and the journal. I am continually surprised by the diversity of responses to the concept of scholarship and publication. Some faculty members express a genuine desire and excitement about scholarship but feel they lack the necessary skills and confidence. Others embrace scholarship and display a curiosity and creativity that propels them forward. Yet a third group seems somewhat apathetic or feels overwhelmed by the potential time commitment. Faculty, especially clinical faculty, may find themselves in situations where heavy teaching and service commitments limit their ability to participate in scholarship.

Barriers to Scholarship

Smesny et al., in 2001, undertook a review of barriers to scholarship in clinical professions such as medicine, dentistry, pharmacy and nursing. Limited time to engage in scholarly activities was a common barrier to scholarship.[1] Other common barriers to scholarship were identified as lack of appropriate promotion and or tenure guidelines specifically in recognizing other forms of scholarship, faculty members not being aware of other forms of scholarship and not knowing how to document other forms of scholarship, few role models/mentors, and an institutional culture that does not promote or foster scholarship.[1]

Understanding the Broader Definition of Scholarship

The scholarship of discovery (research) represents the traditional and familiar view of scholarship. However, there are other types of scholarship that may not be as well understood by faculty members. In1990, Ernest Boyer's landmark work, "Scholarship Reconsidered," expanded the definition of scholarship and more broadly defined it.[2] Boyer's interpretation of scholarship, which is widely embraced and accepted, is based on the scholarship of discovery, integration, application and teaching.[2] The scholarship of discovery represents original research; integration represents novel insights, interpreting themes in discoveries and identifying connections between discoveries; application indicates building bridges between theory and practice; and teaching represents communicating one's knowledge, facilitating student learning and the development of reflective knowledge about teaching and learning.

The broader definition of scholarship supports the concept of the Scholarship of Teaching and Leaning (SoTL). SoTL embraces teaching as a worthy subject for research with the goal of producing a public body of knowledge that is reviewed, developed and tested for the purpose of increasing effective teaching and student learning.[3] In their book *Advancement of Learning: Building the Teaching Commons*, Mary Huber and Pat Hutchings say "Teaching will be advanced when it is seen as intellectual work inviting careful deliberation among those who constitute the professional community and who take responsibility, as professionals in all fields must do, for improving the quality of the enterprise."[4]

What are some of the characteristics that scholarship must

contain to advance and move the profession forward? Lee Shulman, former President of the Carnegie Foundation, developed three criteria for the scholarship of teaching. Shulman says, "The work must be made public, must be available for peer review and critique according to acceptable standards, and it must be reproduced and built on by other scholars."[5]

Scholarship is important in every aspect of the profession of optometry. Original discovery brings new knowledge to the profession. The impact of new knowledge depends on the ability to integrate, teach and apply that knowledge to our current base of information. All faculties should be encouraged and supported in their efforts to pursue scholarship.

Starter Grants are Available

In an effort to provide faculty with opportunities for scholarship, I am pleased to report that this issue of the journal announces the 2012 Educational Starter Grant Program, which is sponsored by the Association of Schools and Colleges of Optometry and The Vision Care Institute, LLC, an affiliate of Johnson & Johnson Vision Care, Inc. The starter grants were first awarded in June 2011 to Dr. Rebecca Kammer and Dr. Patricia Sanchez-Diaz.

The goal of the grant program is to stimulate educational research and provide faculty an opportunity to get started. This is a terrific opportunity to get involved with an exciting project that can impact optometric educators. I encourage all faculties to consider this opportunity and submit a proposal.

References:

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STARTER GRANT PROGRAM FOR EDUCATIONAL RESEARCH EXPANDED FOR 2012

The Association of Schools and Colleges of Optometry (ASCO) and The Vision Care Institute, LLC, an affiliate of Johnson & Johnson Vision Care, Inc., are pleased to announce the 2012 Educational Starter Grant Program. Faculty members from the 21 ASCO member institutions are eligible to apply for grants under the program, which is dedicated to educational research.

The grants support the concept of the Scholarship of Teaching and Learning (SoTL). Although all types of educational research projects will be considered for a grant, priority will be given to those that embrace SoTL. SoTL applies to all disciplines and levels of academia. It embraces teaching as a worthy subject for research with the goal of producing a public body of knowledge that is reviewed, developed and tested for the purposes of increasing the effectiveness of teaching and student learning.

Four grants will be available this year. Last year, two starter grants were awarded. Rebecca Kammer, OD, FAAO, Southern California College of Optometry, received a grant for "Does Format Matter? Engagement of First-Year Students." Patricia Sanchez-Diaz, DVM, PhD, University of the Incarnate Word Rosenberg School of Optometry, received a grant for "Impact of Interactive Instructional Tools in Gross Anatomy for Optometry Students: a Pilot Study." Papers based on their research will appear in a future issue of the journal.

Additional information about the 2012 grant program, including applications, will be e-mailed directly to faculty members.

Another One May Be Just Around the Corner

Dominick M. Maino, OD, MEd, FAAO, FCOVD-A

Being somewhat chronologically enhanced, I've had the opportunity to experience several best days within the profession as a student, resident, faculty member and member of a number of optometric organizations. One such experience, long ago (but not so very far away) was when as students, my identical twin brother and I marched into Dr. Alfred Rosenbloom's office to tell him how to better run the Illinois College of Optometry (ICO). Dr. Rosenbloom, at the time, was both President and Dean of ICO. Always the ultimate gentleman, he patiently listened to how we could better get the word out about optometry and ICO and encouraged us to do so. To this day, whenever I see Dr. Rosenbloom, he reminds me of this event with a big smile on his face as he tells me how proud he is of my accomplishments. This was one of those best days because a giant within the profession took the time to listen to two newbies and encouraged us to work hard for the profession. I also consider it a best day when someone of Dr. Rosenbloom's stature believes what I have done to be of note.

Nothing Wrong with a Little Embarrassment

As the founding Pediatric/Binocular Vision resident* of ICO, I had several best days, including a trip to the Illinois School for the Blind with ICO's master of Low Vision Rehabilitation, Dr. Derrald Taylor. I was working with one of my colleagues preparing to examine a child who was in a wheelchair and wearing a helmet, seatbelt and elbow guards. I took one look at my motorically impaired patient and said to my resident colleague, "He won't be able to read the eye chart." The child looked up at me and said, "Hey, doc, ya wanna bet I can't read that eye chart?" Well, my already short Italian frame shrunk to about 2 inches from embarrassment. But this patient taught me never to assume what a patient can or cannot do. If anything, always assume the patient can do whatever you want until he or she proves you wrong.

Another lesson taught to me by a patient occurred at ICO. If you know me, you know how enthusiastic I tend to be. One day while in our Developmental Disabilities Service, I bounded into an examination room, saying very animatedly, "Hello, I'm Dr. Maino!" with a big smile on my face. The patient, who had been sitting in a wheelchair, flew out of the wheelchair into the air and proceeded to make a very nice three-point landing on the clinic floor. He was fine and I learned that patients with cerebral palsy have something called an exaggerated startle reflex. This patient taught me not only how to become a very calm "Zen Master" but also how to alter my approach to patients depending upon what is needed to obtain the best test results. Any day I learn something I did not know the day before (even if it is embarrassing) is one of my best days.

While seeking my master's degree in education at the University of Illinois at Chicago (UIC), I usually managed to talk my professors into allowing me to lecture within the course in place of writing a paper or some other course activity. More often than not, the professor said yes, and I had an opportunity to tell those who specialize in education all about what optometry has to offer. A couple of years after I completed my degree, one of ICO's first-year students came up to me and told me that she decided she wanted to be an optometrist, at least in part, because of my presentation during my course work at UIC. This was definitely a best day!

The many organizations I have worked with, including the American Academy of Optometry (AAO), the American Optometric Association (AOA), the Optometric Extension Program Foundation (OEPF) and the College of Optometrists in Vision Development (COVD), have all awarded me several opportunities for best days. Any day I have a course accepted by programs offered by the AAO and AOA, it is a best day. When the AOA became deeply involved in the eye and vision problems associated with simulated 3D content and asked me to assist in getting the word out, it was a best day. Anytime OEPF chooses to reprint a book I wrote, it is a best day. And when COVD asked me to assume the editor's role of its official journal, *Optometry & Vision Development*, it was a best day.

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Looking Forward to More Best Days

On May 1, 2012, Lippincott Williams & Wilkins will help me to have a best day in the near future when it publishes my next textbook, *Visual Diagnosis and Care of the Patient with Special Needs*. [co-edited with my fine colleagues, Dr. Marc Taub (SCCO) and Mary Bartuccio (NOVA)]

Finally, being able to work at ICO with all my friends and colleagues offers many best day opportunities. Today is such a day.

**Because all the new schools and colleges of optometry now have "founding" deans, not just the "first" dean of a program, I have chosen this phrase in keeping with the current terminology. At this point, I should put one of those smiley emoticons … but will refrain from doing so!*

Dr. Maino is a Professor of Pediatrics/Binocular Vision at the Illinois College of Optometry/ Illinois Eye Institute, a Fellow of both the American Academy of Optometry and the College of Optometrists in Vision Development, and the grandfather to Dominic IV and Vincenzo Maino (who give him many best days!).

This issue of the journal contains a paper that explores the influence of social network services. The range of influence of social network services, such as Facebook and LinkedIn, spans the educational, personal and professional arena. How have these services affected optometric education? What are the benefits? What are the risks? Are these services utilized at your institution?

Optometric Educators Respond

Jane Ann Munroe, OD
Director of Admissions

Southern California College of Optometry

Here at Southern California College of Optometry (SCCO), Facebook is the networking tool of choice for the Office of Student Affairs. As Director of Admissions, I started a Facebook Group in 2006. It now has more than 1,900 members. All issues related to the admissions process are discussed in forums hosted by me along with SCCO students. The most commonly discussed topic is preparation for the Optometry Admission Test (OAT), with pre-optometry students seeking specifics about how to successfully manage the task of taking the OAT.

On Facebook, I post links that serve to drive applicants to SCCO's Web site. I advertise admissions open houses and workshops and announce recruiting visits to pre-optometry clubs. I host links to videos about SCCO student activities and other campus events, all with content that has proven to be of interest to pre-optometry students.

SCCO has its own YouTube channel, and Facebook is the vehicle I use to promote the latest video uploads. We host a video series on YouTube, "What You Should Know — Optometry Admissions and SCCO," which features various topics designed to increase applicants' competitiveness as they plan a successful admissions strategy.

During a rolling admissions cycle, newly accepted applicants are added to their individual class Facebook Group. They get to virtually "meet" each other, find roommates and have their questions about student life answered by experienced upperclassmen. This process has been very useful in bonding students to SCCO as they wait out the long rolling admissions cycle. By the time orientation day arrives, the class has already bonded, having enjoyed a whole summer of various interactions facilitated by Facebook, such as "meet-ups" and group chats.

The only problem I've had implementing social networking has been to keep spammers off the site. To prevent this, I now require a message from applicants about why they want to join the group before I admit them. The reason I've had so few difficulties is that Facebook requires one's identity to be revealed. Pre-optometry students know they have high visibility when posting on this public forum; therefore, they are conscientious.

Some may consider the amount of time spent monitoring the pre-optometry Facebook Group a drawback. However, it gives group members the feeling that someone is always available should they need help. I monitor the group 24/7 with my iPhone. The constant monitoring is what makes my group so successful. It gives the feeling that "the lights are on and somebody's home." I perform this level of monitoring only for the pre-optometry student group. The incoming class Facebook Groups are virtually self-monitoring by class members' interaction. I check in weekly to make sure the momentum is maintained.

Best of all, when I make recruiting visits at various campuses, pre-optometry students have already "met" me on Facebook. I don't need to be "friends" with them on Facebook. Rather, I use Facebook's Group format to help them get to know me as an admissions officer. This creates an instant rapport with them and breaks the ice for a very effective campus visit.

Facebook has been the best tool in my toolbox when it comes to creating SCCO's public face and maintaining its Web presence.

Laura Falco, OD FAAO
Assistant Professor

Nova Southeastern University
College of Optometry

Social networking has grown exponentially over the past decade and has become a mainstay in today's culture. It is reconnecting people from earlier generations, helping to build both social and business networks and, for the current Millennial generation, is simply how people communicate. This is a powerful tool, and perhaps slightly misunderstood by the younger generation, as they may not realize that personal information put on these sites can become available to others and sometimes misconstrued. Many children in middle school, and perhaps elementary school, are already creating their own social networking pages.

The Good: At Nova Southeastern University College of Optometry, students, faculty and administration all develop Web pages for social networking. Faculty use Web pages as blogs to keep students in the loop on a range of information, from schedules of events to links to podcasts that make explanations of problems or answers to questions instantly available to the class as a whole. The administration developed a Web page to connect with current students and faculty as well as alumni to inform everyone about the current achievements of the college. Students maintain their own class pages for similar reasons. They, too, want to have a central location where they can log in and get up to date.

A social networking page can be designed to convey a certain image. It may convince someone that the images seen represent reality. Perception of a Web page and the reality of what really occurs are often not the same. This can be beneficial, or it can be a negative. What the user perceives is critical. The perception is often hard to change once it is made. These perceptions are most of the time inferred via uploaded images.

The Bad: From an educational standpoint, we have some concerns regarding the social networking sites that are run by students. We do not get to monitor class social networking pages for accuracy. We hope that misinformation is not disseminated. Clearly these sites give students the opportunity to share test questions and tips for getting through a course by cheating. We are leaving it up to the students to police themselves. Across the country, students have also set up blogs for the purpose of evaluating their schools and colleges of optometry. We worry that some students who are disgruntled by a certain event may choose to lash out online. Such posts, when left online, can be used by other students to make decisions and, even more disturbingly, could be used by optometry schools themselves as a mechanism for evaluating professors.

The Ugly: Based on conversations with numerous faculty members and students, the most worrisome part of social networking involves individuals who post private and personal information that is not fit to publish online. This can include inappropriate pictures of students or slandering certain classmates and instructors. Student interns may see a patient and proceed to post inappropriate pictures to their social networking accounts. It is conceivable that a patient could see these and become upset. Once students affiliate themselves with a university, what they post is a representation of not only themselves but also of the university. Also, future employers may decide to observe what an individual posts online and make an employment judgment based upon it. Therefore, it is crucial that individuals carefully consider what they post online.

Tiffenie Harris, OD, FAAO
Associate Professor

Western University of Health
Sciences College of Optometry

The Millennial generation of students readily engages in social media, specifically Facebook. I have seen the benefits of social media in terms of student recruitment and admissions. The students put together a Facebook group once admitted to the program. They motivate each other and maintain a level of excitement in their choice of optometry school. In addition, I have learned that they organize social events and network housing options all prior to arriving on campus. Utilizing Facebook while in school continues the close ties and support needed during the rigors of the curriculum.

In my opinion, the downside of social media is the addictive nature of it. It seems that students can't help but "check their status" whenever possible. My concerns lie in students' ability to manage their time wisely. The hours spent socializing on Facebook certainly must conflict with the time needed to study and/or practice clinical skills. Overall, I can appreciate the support system and networking that students can achieve using social media. Yet I will be optimistically cautious in their ability to multitask and stay focused.

Send Us Your Comments

Do you have any thoughts or insights related to how social network services have affected optometric education? Send your comments to Dr. Aurora Denial at deniala@neco.edu, and we will print them in the next edition of the journal.

More Feedback on the Previous Think Tank's Ethics Scenario

In the previous Think Tank, readers of the journal responded to a real-world situation described by an externship supervisor. (Student's Behavior Raises Questions. Optom Educ. 2011 Fall;37(1):17-18.) As the supervisor and a fourth-year student reviewed the chart of a patient the student was about to examine, they observed that the staff doctor who had seen the patient last had noted a nevus with "drusen-like" deposits in one of the eyes. Upon examining the patient, the student also made note of the nevus, specifying that it contained "drusenoid" bodies. However, when the supervisor asked for more details and a diagnosis, the student had no response. The supervisor examined the patient himself but found no nevus or lesion. After asking the student to point out the nevus, which the student was unable to do, the supervisor concluded the student reported the lesion simply because it had been noted — apparently erroneously — in the past.

The supervisor attempted to discuss the incident with the student, including explaining that such behavior on the part of a practicing optometrist could lead to liability in the perpetration of fraud, fines, prosecution and/or licensure consequences. The student refused to provide any explanation or comment.

Knowing that this was not the first bad encounter staff had had with this student, the supervisor reported the incident to a superior. Nothing more was said and no action was taken. The student finished the externship, graduated, received a license and was accepted into a residency program.

An additional response to this scenario follows.

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In response to this scenario, multiple concerns arise. First, were the actions of the student unethical? Were they unprofessional? I would venture to guess we all agree that what the student did is not how we want our students to act. Regardless of what one calls the student's actions, the important question is why the student behaved in this way. Was it lack of skill and knowledge, timidity, fear, a combination of many other possibilities, or worse, that the student just does not care!

The second faculty attending correctly reported the misadventure to a superior, who should have discussed what transpired with the student. However, it is my impression that some students are not very mature and do not take constructive criticism well, and this poses significant challenges for all faculty. Effectively dealing with students who exhibit undesirable behavior requires support from superiors and administrators. What might prevent such support? In today's educational milieu, it seems as if everyone wants to be liked by the students. This is evidenced by the extraordinary importance and value placed on student evaluations in the clinic and classroom. Therefore, unethical activity and bad behavior by students and faculty might go unreported and thus unpunished. Even if a complaint about a student or faculty member does "go up the ladder," decisions sometimes are overturned and the reporting faculty member may even be reprimanded.

Should what occurred have been discussed with the original faculty member? In an ideal world where faculty are experienced, mature and capable of taking constructive criticism, by all means. The case should have been reviewed with both faculty members. However, this can be difficult for the person in charge if he or she is younger than both faculty members, or when faculty members have an "I know it all and don't correct me" mentality, or when there is high yearly turnover of clinical faculty and residents. Another issue may be how different faculty members perceive this type of behavior. Faculty A might report an occurrence, while Faculty B does not. In these situations it is hard to be consistent, and this creates significant issues, from both the faculty and student perspective, that are also hard to manage.

From a professional standpoint, the student demonstrated a complete disinterest in learning from mistakes. Optometry is a "learned" profession and thus requires students to be intellectually curious. However, I do not totally blame the student. Intellectual curiosity must be demonstrated by faculty early in a student's professional education. If faculty do not demonstrate a curious mindset, how does one expect students too?

Novel Approaches to Educational Technology: Lessons Learned from Steve Jobs

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At the American Academy of Optometry meeting last October in Boston, many of us saw the glass walls of the Apple Store covered with Post-It note dedications, and the sidewalk stacked with iPod cases and McIntosh fruit. Those who weren't there perhaps saw a similar outpouring of emotion on social networks. Some were surprised that these expressions of grief stretched around the globe at the untimely loss of the co-founder and longtime CEO of Apple, Steve Jobs.

When his biography, *Steve Jobs* by Walter Isaacson, went on sale, it outsold all other books printed in 2011, a particularly remarkable achievement considering it was rushed to publication in late October. Those who remember Jobs from the Macintosh computer may have wondered why so many felt this way, particularly in a persistently Windows world. But whether one is an Apple or PC user, it is undeniable that Jobs' foresight and innovation changed the way we use computers, particularly in the area of educational technology.

Although I am recording these thoughts on a Macintosh laptop, I wasn't always an Apple user. I was one in that fortunate first generation of students who came of age with the first personal computers in the 1980s, but I was a PC user. In fact, before entering optometric education, I once taught Microsoft applications (before they were available cross-platform) and even DOS 6.22. Yet I couldn't help but notice the innovative products that Apple developed, particularly after Jobs' triumphant return in 1997.

As optometric educators, whether we use Macintosh, PC, or both, we can benefit from reflecting on the following six lessons that Jobs taught us.

Lesson #1: Market Research Can Lead You Backward, Not Forward

Consumers, be they retail customers or optometry students, are often more comfortable with what they know than what they don't. Imagination of how things could be can fail the young and the old alike. Jobs knew this. In the early days of Apple Computer, the Apple II generated more than two-thirds of the company's profit. It's hard to believe that a circuit board and attached keyboard was all it was.

If Jobs had surveyed his customer base back then, he would have only made the small stylistic changes in Apple's best-selling product, like improving the keyboard and adding an internal (albeit floppy) disc drive. If market research had been important to Jobs, the sleek, stylish Apple IIc would have marked the end of a good run for the company, and it probably wouldn't be with us today.

Fortunately, Jobs trusted his intuition more than market research. Despite the fact that there seemed to be no demand for it, he insisted that Apple pursue a new, all-in-one computer, which eventually became the first Macintosh. While Xerox can be credited with invention of the first graphical user interface, it was Apple that was able to mass-manufacture and popularize it. This eventually gave us the Macintosh OS X, and led Microsoft to mimic it with Windows. This benefitted us all (except in the short term, DOS teachers like me).

Another idea Jobs took from Xerox and made popular was the computer mouse. You couldn't ask consumers what they thought of a computer mouse back then; no one knew what they were. But Jobs correctly intuited that end-users of technology wanted to use their hands to manipulate technology, a truth that led Apple to the mouse as well as the touch screens on iPhones and eventually iPads.

The lesson that market research is overrated can be applied to optometric education. For example, I have noticed that many of my students have a hard time weaning themselves off hard-copy paper notes and exams. They aren't asking for change. However, when given the opportunity to go paperless for lectures and exams, they discover the many benefits. For example, many can type faster than they can write; many prefer the ergonomics of an upright computer

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display over flat hard copy; and in this age of disappearing print media, they all benefit from having a light, portable, digital version of their notes to take on their external rotations.

It's hard to believe that the younger generation would have trouble adjusting to change. After all, today's students have taken their Optometry Admission Test on a computer and will soon take parts of their national board exams that way. However, we are creatures of habit, and the more demands that are put on our time, the more we tend to resort to familiar old habits. The same is true of students. They will not demand change, and there are no more early adopters of technology among them than there are among their teachers. So, while we need to pay heed to course and instructor reviews the students take the time to fill out, when students bemoan learning new and clearly improved ways of learning, we need to remember that young and old alike do not generally enjoy learning new tricks.

Lesson #2: Innovate To Where Things Are Going, Not Where They Are Now

The greatest ice hockey player of all time, Wayne Gretzky, is credited with saying "Skate to where the puck will be, not where it is." Jobs knew how to apply this principle to technological innovation. While at Apple and his startup NeXT, he was famous for making technological changes before it was clear where technology was going. Eventually, Apple products drove innovation – they determined where the puck would be. You might say they became the puck. Examples abound.

It seems obvious in retrospect that floppy discs would disappear, but when the first bond-blue iMac was released in 1998 with a CD-ROM but without a floppy drive, it surprised many. Less-often mentioned is the removal of the parallel printer port, and its replacement with up-and-coming USB interfaces. Apple did this because USB ports were demonstrably better: they were smaller, had no pins to bend, and even allowed small peripherals to draw power. Though printer manufacturers and others had to scramble to make adaptors for proprietary Apple peripherals, this seed change allowed the company to tap into the future.

Jobs wasn't even afraid of abandoning the keyboard. It turns out that like the floppy disc drive that everyone thought was essential at one time, once you abandon hardware that has outlived its usefulness, there's no going back.

How does this impact optometric education? From continuing education lecturers using their iPads to deliver content, to interns in our clinics inputting data into the electronic health record without a keyboard, these devices do more than save you a sore back hauling a heavy laptop around. They make computing fun. Optometric educators need to recognize that if we want students to continue working on our classes at home, we need our lessons to be compatible with a tablet digital interface, or smaller. It may not be in our nature for most of us to embrace change, but remember, it's not where the puck is. It's where it will be.

Lesson #3: Technology Is Better With Limited Options

One of the few compromises Jobs made in the original Apple II was allowing those eight expansion slots that were so popular in the 1980s. The hollow space that eventually led many of us to have large computer towers on (or under) our desks was a security blanket for customization that many of us would never need. Jobs realized this, and he vowed never to make that mistake again. Soon, Apple products from the iMac to the iPhone would become slimmer and sleeker, but did not have cases the consumer could open, or space inside to monkey around. While this would provoke the ire of some consumers when their rechargeable iPod battery needed to be replaced, Jobs understood that in general, the fewer options that we have, the fewer things that can go wrong with technology.

Here's an area in which students often teach us. While respecting HIPAA, they prefer to use their smartphones to take pictures of ocular disease through the slit lamp. They find it simpler than taking their patients to the fundus cameras with much higher resolution. Even when said camera is in the room with them, if it's too complicated to use, they will gravitate to their much less powerful, but familiar, camera phone. While privacy issues are paramount, I understand their inclination.

It reminds me of the iPod Shuffle, a device so small and light they have even removed the display. You can skip a song, but you can't see what's on it, or even what's playing. You have to listen. Shuffles are inexpensive, and the battery lasts a long time. You can choose the color of the case, but otherwise, you have limited options.

We'd do well to learn from this example. Sometimes when I replace a piece of diagnostic equipment, instruct a patient on a treatment plan, or even teach a student how I perform my refractions, I think of the principle of the superiority of limited options. When designing and delivering lectures for the information era, when we are increasingly moving from the "sage on the stage" to "the guide on the side," we need to constantly be aware that less is often more.

Lesson #4: Print Media Have Been Traded For Desktop Publishing

Early Macintosh computers democratized desktop publishing and graphic design. While Windows computers have largely caught up, Apple's contributions under Jobs' leadership cannot be overstated. Graphic design goes beyond the eponymous profession to include what we optometric educators create daily with our PowerPoint and Keynote presentations. But has it impacted literacy among our students?

Many in education who remember the world before digital connectivity was ubiquitous can be quite displeased when confronted with students who eschew traditional textbooks. While this may be a trait of many who came of age at the turn of the millennium, it is also true that they are, as a rule, a very creative generation.

In other words, some have argued that what we've lost in reading literacy, we've gained in design and execution of creative projects. While I would not say students today are better at writing than reading, I would say their grand rounds presentations are often more facile than those assembled by seasoned optom-

etric physicians who are not educators. And have you seen the review packets they put together from their class notes and freely share? It makes you wonder how the NBEO prep courses are able to sell what they have to offer in this collaborative age.

An unforeseen challenge of the creative age is one that concerns many educators: intellectual property. This concern leaves us in a rather conflicted position. On one hand, many teachers regularly cite the Fair Use law when they educate their students with limited use of copyrighted material. On the other hand, we are often very protective of our own intellectual property, despite the Optometric Oath that we will "share information cordially and unselfishly with my fellow optometrists and other professionals for the benefit of patients and the advancement of human knowledge and welfare." How can we reconcile these contradictory principles?

With the invention of iTunes, Jobs was in the center of this debate. He was eventually able to succeed where no one else had when he successfully negotiated with all the record companies to include their music catalogs for sale on iTunes, in order to counter online piracy. Now, iTunes allows both Windows PC and Macintosh users to legally download and own audio and video content of all sorts, including video podcasts of optometric education on iTunes University. Mine are up there.

Of course, digital democratization cuts both ways. Just as digital photography has made imaging available and affordable to us all, and legal digital music has freed us from being hostage to buying an entire album to own one good song, we cannot always protect our intellectual property as we would like. For my part, I have chosen to video podcast using classroom capture technology and offer it to all on a public iTunes U channel using a Creative Commons, non-commercial, no-derivatives license. My students appreciate it.

Lesson #5: Fewer Versatile Devices Are Better Than Many

Jobs and the company he helped found and run for most of his life hit a home run with the invention of the iPhone. Now in its fourth incarnation (with a fifth eagerly anticipated on the horizon), the iPhone combined a telecommunications device with not just a high-quality camera but a robust MP3 player, usable calendar and e-mail device. True, it costs more than other smart phones, but by now it is obvious that many find the cost worth it. Why? Many remember when a digital calendar and address book were kept on a Palm Pilot, and phones, music players and cameras were separate devices. It wasn't that long ago when your music collection took up a whole wall of your house, and your calculator and travel alarm were separate appliances.

Like the pre-iPhone era, the optometric exam room has become cluttered, and our latest gadgets like scanning laser ophthalmoscopes cost tens of thousands of dollars. No solo practitioner can afford to own the diagnostic equipment that seems to be necessary to meet the emerging standard of care. Yet the optometrist with a retinoscope and BIO can still address more chief complaints for the average patient arguably better than the same doctor can with only an optical coherence tomographer. To a great degree, it can be argued that the equipment our students buy (and haul around to various clinics and rotations) can often be used to address as many chief complaints as the much more expensive rooms full of equipment the schools provide. While we all know that we need cutting-edge special testing ability for the care of our most challenging patients, the equipment we all purchased as students tends to get used on most everyone our interns see.

As we move toward digital phoropters and beyond, it's worthwhile to ask ourselves how many devices we need, and plan accordingly. From a patient's point of view, it may be fewer than we think.

Lesson #6: Those Who Say It Can't Be Done Should Stop Interfering With Those Who Are Doing It

By all accounts, Jobs was no saint. He had an abrasive personality and, while he could be charming, he also had an uncanny knack of cutting you off at the knees if you did what he considered substandard work. He believed that if you allowed B-level players on the team, they would drag the A-level players down.

You have to admire where this philosophy got Apple. When the plastic screen on the prototype for the first iPhone that Jobs was carrying around in his pocket for weeks became scratched, he demanded that the rollout be stopped until a durable glass screen could be found, manufactured, cut and shipped. It turned out Corning Glass of New York had a patent for nearly unbreakable "Gorilla Glass" that was invented in the 1960s but never found an application until the iPhone. Jobs convinced Corning to retool a factory in Kentucky and ramp up production of all the Gorilla Glass they could make. And in eight short months, they delivered.

Jobs' famous "reality distortion field" had a way of convincing those around him that what was thought to be impossible was in fact possible. Very few people possess this gift. Yet it's human nature to underestimate our potential. As optometric educators, we are charged with inspiring the optometrists of tomorrow to achieve all that they can, often more than they themselves believe they can.

We have to remember how stressful optometry school can be. Many students have never faced the massive credit loads, lab schedules and practice requirements that we rightfully expect of them. While all of the schools and colleges recruit students they believe will succeed and be an asset to our profession, there are times when even the best students become homesick, are disappointed by a poor proficiency score or midterm exam performance, or are taken off guard by a particularly challenging patient encounter.

At times like these, we need to remember that we optometric educators are, like Jobs, the bigger-than-life personality the students need to lean on for encouragement, inspiration and, sometimes, the tough love that teachers need to exhibit to bring out the best in their students. In this way, Jobs' legacy can be a lesson for all of us.

Social Media in Optometric Education

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Abstract

Today's students like to stay connected with friends via social networking sites. We have investigated the use of social media in optometric education. A Facebook page was created for two optometric courses to provide students with additional course resources and the ability to interact with the instructor and other students outside of the classroom. We conducted a survey to assess student attitudes regarding this new educational resource. Students' opinions regarding the usefulness of Facebook were very positive. Educators should consider the addition of social networking to their course resources to enhance the educational experiences of today's students.

Key Words: *optometric education, social media, Millennial generation, technology*

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Dr. Fecho is an Assistant Professor at Nova Southeastern University. His current research interests include the use and effectiveness of technology in optometric education. He is course instructor for the Anomalies of Binocular Vision I course and the Optometric Theory and Methods I course.

Introduction

One of our challenges as optometric educators is choosing educational resources and delivery methods that are effective for our students. To choose appropriate educational tools, we should learn more about the characteristics of the current generation of optometry students. Most of us would probably agree that, with access to computers, cellular phones and other digital devices, optometry students today are more technologically advanced than previous generations. Today's optometry students are part of what is known as the Millennial generation (those born between 1982 and 2002). Millennial students are characterized as tech-savvy, multitasking, and socially conscious. Another characteristic of this generation is that they have grown up in a digital environment. They do not remember a time before cell phones and computers and are constantly "connected." Part of this connectivity involves participating in social networks. Many of our students spend a significant amount of time on their Facebook pages. According to an article on the Web, in February 2010, the average user spends 55 minutes a day on Facebook.[1] A recent survey found that college students spend an average of three hours a day on Facebook.[2]

Social networks have been described as "interactive websites designed to build online communities for individuals that have something in common."[3] Social networking sites allow users to share files, chat and maintain a blog or discussion. These sites include the ability to set up groups and pages that can be private or public. Users need a valid e-mail address to set up an account, and no fees are associated with creating an account. Access to sites like Facebook and MySpace is free and no special software is required to use these sites. In addition, Facebook has applications (apps) for smartphones, iPods and iPads. This makes these social network sites very accessible.

Regardless of how you feel about the presence of social media in your students' lives, social networking services, such as Facebook, MySpace and Linke-

dIn, appear to have become a permanent part of American culture. With more than 600 million active users as of January 2011, Facebook is the second most visited Web site in the United States.[4] We have noticed a majority of our optometry students have smartphones and spend a significant amount of time accessing their social networking sites. In addition to being tech-savvy, Millennial students have been described as "optimistic, assertive, positive, friendly, cooperative team players who gravitate toward group activities."[5] It is this desire for cooperative behavior that makes social networking sites attractive as an educational tool. Considering the growth of Facebook in recent years and the fact that nearly half of Facebook users are 18 to 34 years of age, it seems reasonable that faculty in higher education should be able to utilize the social network to communicate with students outside the classroom.[6]

Many of the reports of using social network sites in higher education are from experts in technology and education. Using social media with undergraduate students "can expand the dialogue outside the classroom or campus" and "build better communication channels with students" and therefore enhance student engagement.[7] If faculty are willing to familiarize themselves with the available social networks, these networks can be used to enhance student learning in higher education.[8] One of the barriers to integrating new technology into higher education is reluctance on the part of faculty to adopt these new technologies. The National Center for Education Statistics found that faculty reluctance was a major impediment to integrating new technologies, such as social network sites, into teacher educational programs.[9] These researchers found that among college students and college faculty, college students were more open to the idea of using Facebook for education.

There are several reports of using social networks in health professions education. Daniel George and Cheryl Dellasega, educators at Penn State College of Medicine, have experimented with using Twitter with small groups (15 students) in elective courses to encourage students in writing assignments.[10] They noted that with the numerous ways to access social media (laptops, smartphones, tablets and netbooks) and the amount of time students spend on social networking platforms, medical educators have an opportunity to use social media to share content with students both inside and outside of the classroom.[10] Australian medical educators used Facebook Groups to encourage collaboration between student groups.[11] They found that students preferred Facebook to the university's online learning management system (LMS) even though the university's system offered all of the features (group management, threaded discussion, file sharing and messaging) required to complete an assigned class project.[11] In this case, students reported they found Facebook simpler and easier to use than the LMS. Pharmacy educators have reported success with utilizing Facebook with their courses.[12] In the published report available, educators used Facebook Groups to provide a forum for out-of-class discussions. Students were required to participate in online discussions via a Facebook Group. Participation in the discussion was part of the students' course grade. Students felt the course Facebook Group enhanced their experiences in the course.[12]

We initiated a pilot study to examine student preferences between a course blog and a course Facebook page for exam preparation in the spring of 2010. A Facebook page was created for the Ophthalmic Optics II course to enhance student-teacher communications as the students prepared for their final exam in the course over a two-week period. Facebook is a Web site created to provide users with a medium in which to share personal information about their lives, including text updates, pictures and video. As a result, extensive networks of friends and family evolve as individuals search for and connect with family and friends. Businesses have also taken advantage of the wide use of Facebook to increase their marketing presence. In our pilot study, it was believed the Facebook page would allow real-time communications once the lectures for the semester were finished. During this same period, a separate course blog was also available. All course information, additional problem sets and reviews were posted to the Facebook page and were also available on the course blog. A survey was conducted via the Internet after the course ended to determine student attitudes toward the Facebook page and course blog. The response rate to the study survey was 42% with very favorable comments about the creation and maintenance of the page. The pilot study survey also found that the Facebook page was used slightly more than the blog page.[13]

The purpose of this study was to examine student opinions on the usefulness of a course Facebook page to enhance student educational experiences in a traditional optometric course. Our desire was to repeat as well as elaborate on data collected during the pilot study to see if the favorable responses we received were not just an anomaly due to the newness of the concept. Also, we wanted to expose the students to the course Facebook page over a longer period of time (two semesters).

Methods

A Facebook page was created and maintained during two semesters for our Ophthalmic Optics courses. Facebook was chosen because of the high percentage of college students that already have a Facebook account. Facebook allows anyone with an account to set up a page, separate from their profile. While Facebook profiles can be made private, Facebook pages cannot be made private and are available to anyone with a Facebook account. Facebook pages allow account holders to become "fans" of the page, which allows them to post comments on the page and interact with other fans.

The course instructor made regular (at least weekly) postings of additional course resources on the Facebook page. These included lecture summaries, unit study guides, additional problems sets, links to relevant Internet resources and exam reviews. Because of Facebook's ability to provide push notifications, students who were fans of the page received notification, via e-mail or their Facebook profile, when new information or resources were placed on the page. Students who were not fans of the

page could view all of the content but could not post comments and would not receive notifications of changes.

We solicited the students who had completed Ophthalmic Optics I and Ophthalmic Optics II to participate in an anonymous Internet-based survey. The survey met the requirements of the university's Institutional Review Board. Participation in the survey was entirely voluntary and non-participation carried no penalties to course grade or exam scores. Several repeated questions from the original pilot study and some new questions developed for the current survey were asked of the new class of students.

Fifty-three of the 98 students (54%) enrolled in the courses responded to the 14-question survey. Questions included whether or not students had a Facebook account, were "fans" of the page, and how many times per week they accessed the Facebook page. In addition, the survey contained seven questions regarding their experiences with the Facebook page. **(Table 1)** These questions were answered using a standard Likert scale: "Strongly Agree" – "Agree" - "Neutral" - "Disagree" - "Strongly Disagree."

Results

Of the 53 students who responded to the survey, 52 had Facebook accounts and 51 (96%) were "fans" of the Ophthalmic Optics page. Although we do not know how many of the 98 students enrolled in the class had Facebook accounts, 81 (83%) of the students became fans of the page. Students reported that they accessed the page an average of 3.4 times per week.

Table 1 presents the Likert questions asked in the survey along with the responses and the average response for each question. It is interesting to note that the combined percentage of respondents who "Agree" or "Strongly Agree" with the statements associated with usefulness (100%), enhanced course experience (98%), improved material understanding (98%) and was useful for exam preparation (100%) was at or above 98%.

Table 1
Student Opinions about Using Facebook Page for the Ophthalmic Optics Course

** indicates question repeated from pilot study*
(#) represents number of responses in category

Survey Question	Strongly Agree	Agree	Neutral	Dis-agree	Strongly Dis-agree	Mean (n=53) St.Dev.
* I found the information on the Facebook page useful	92% (49)	8% (4)	0%	0%	0%	4.92 0.27
* The Facebook page enhanced my experience in the Ophthalmic Optics course	85% (45)	13% (7)	2% (1)	0%	0%	4.83 0.43
* I have a better understanding of Ophthalmic Optics by using the Facebook page	77% (41)	21% (11)	2% (1)	0%	0%	4.75 0.48
* The Facebook page was useful in preparing for course exams	96% (51)	4% (2)	0%	0%	0%	4.96 0.19
I found the Facebook page easy to navigate	74% (39)	21% (11)	5% (3)	0%	0%	4.68 0.58
I found access to the Facebook page convenient	92% (49)	8% (4)	0%	0%	0%	4.92 0.27
Being able to interact with classmates concerning Ophthalmic Optics content was important to me	79% (42)	15% (8)	6% (3)	0%	0%	4.74 0.56
I found frequent news page updates from the Ophthalmic Optics Site distracting	11% (6)	6% (3)	11% (6)	23% (12)	49% (26)	2.00 1.32
I am concerned about the public viewing class content on the Ophthalmic Optics Facebook page	0%	10% (5)	32% (17)	32% (17)	26% (14)	2.25 0.96

It may have been because of the familiarity of using Facebook, but the vast majority felt the site was easy to navigate (95%) and very convenient to access (100%). Ninety-five percent of students who responded felt that being able to interact with classmates concerning course content was a valuable benefit of the page. Facebook privacy was less of a concern than anticipated by the authors. Only 10% agreed or strongly agreed with the statement concerning public viewing of content or comments.

Because students or instructors could make changes to the Facebook content and comments at any time, resulting in a notification to the fans of the page, we were concerned that the number of notifications would become distracting. Opinions about frequent page updates appear to be the most diverse survey comment. Seventy-two percent of survey responders felt that the frequency of updates was not distracting.

When the students had the opportunity to comment on the advantages and disadvantages of the use of Facebook to augment the didactic course, there was a positive theme to the responses. We

have paraphrased the most common comments as shown in **Table 2**.

Discussion

Approximately 80% (81 out of 98) of students enrolled in the course became fans of the page. Students did not need to be fans to view the materials on the page, but they would not receive the "push" notifications provided to fans when new materials were posted, and it was their responsibility to monitor for updates. Students who were not fans were not able to post comments or questions on the page. Students reported they accessed the page an average of 3.4 times per week; however, activity on the page increased dramatically on the days immediately before the exams. This was the case for both semesters. We had observed the same behavior on course blogs. Many of the students' comments on the advantages of the Facebook page related to the ability to obtain "last minute" help prior to an exam either from the course instructor or other students. The page allowed real-time communications between students and the instructor and between students and classmates. In addition, the Facebook page promoted collaboration between students related to learning and studying. Some of our students were concerned that other students could post erroneous information on the site. Comments and posts should be monitored to minimize this, and corrections should be made if blatant errors are detected. Although students may see this as a disadvantage, it may be an opportunity for faculty to clear up misconceptions about course material. In addition, some students reported that the posting of redundant questions or comments distracted them.

An instructor must be aware that students who do not have Facebook accounts will simply not have access to this resource. Students may not be interested in joining Facebook or may think there are fees associated with joining the site. Some students expressed concerns about privacy; however, with the proper privacy settings, the students' personal information cannot be viewed except by personally approved "friends." Faculty considering a Facebook course page should be aware that pages, unlike groups, cannot be made private. Therefore, anyone with a Facebook account can access the page. This may limit the content of the page, and anyone making posts to the page should be aware of the public nature of the content. In this case, a Facebook page was chosen over a Facebook Group because the group option does not push content to group members' walls. Part of the attraction of using Facebook is that it integrates with the students' daily Facebook activity and this seems to work better with a Facebook page.

One caution for instructors considering the use of social networks in a course where students will use the Web site for exam preparation is to establish the instructor's role in participation in discussion immediately prior to an exam. Students should be aware of the cutoff point for new materials and discussions. The same applies to using e-mail to answer questions prior to an exam. In our case, the instructor was available up to at least 11 p.m. the night before exams. The response to this from students was overwhelmingly positive. Many students acknowledged that this was beyond their expectations and they greatly appreciated the instructor's availability at the "last minute." Today's students want their instructors available at their convenience, and instructors considering venturing into social networking as part of their course delivery should be aware of students' expectations and set the rules early in the process. As previously noted, the primary obstacle to integration of new technology into higher education is reluctance on the part of faculty. Students have reported that they like the use of social networking sites, especially Facebook, in the delivery of course materials.[6]

Table 2
Student Opinions of the Advantages and Disadvantages of Using Facebook as a Supplement to the Ophthalmic Optics Course

Advantages	• Instant feedback to students • Ability to benefit from classmates' questions and comments • Access to additional problem sets • Access to professor outside traditional office hours both asynchronously and in "real-time" • Ability to receive push notifications when new content was available • Familiarity with current technology • Promoted collaboration related to learning and studying • Allows for discussions outside of the classroom
Disadvantages	• Students who do not have a Facebook account do not have access to this resource • Posting of incorrect or irrelevant information by fellow students • Posting of redundant questions or comments

Conclusion

Because today's college students spend a considerable amount of time using social networks, we evaluated student acceptance of a course Facebook page for two of our traditional optometry courses. The course social network page had many advantages over traditional e-mail and course blogs. It allowed for more interactivity and collaboration between instructors and students. Students benefitted from their classmates' questions and understanding of the course materials. It did require a little more monitoring of class activities outside the didactic setting, but the improved student attitudes and more frequent student engagement in the content of the course were the rewards.

Our work, along with the work of other educators in higher education, demonstrates that students like using social media, particularly Facebook, to receive course information and collaborate with faculty and other students outside of the classroom. Based on our students' acceptance of educational use of social media we are encouraged to expand the use of Facebook to include other courses in the optometry curriculum. Since Facebook is already a part of our students' daily lives, we are likely to experience greater acceptance than with other forms of educational communication. We feel caution should be exercised if social media sites are used to discuss patient management due to

privacy issues.

We believe further studies need to be performed to examine the educational effectiveness of using social media sites as educational or communication tools in optometric education. However, one of the difficulties with measuring the effectiveness of a new learning tool is the management of student fairness in access to the information presented if the study has the potential to alter final course grades. A carefully designed study would be valuable in assessing the effectiveness of this or any new communication tool in the optometry profession or any other educational field.

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A Portfolio to Assess Clinical Competencies, Assist Learning and Develop Professionalism in Eye Care Education

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Abstract

Background: *Formative assessment can assist students in acquiring clinical and professional competencies. Many tools exist in medical education literature, assessing various components of learning. However, using multiple processes is administratively complex.* ***Methods:*** *Using best practice in medical education, we integrated multiple processes into a portfolio for the Postgraduate Diploma in Eye Care.* ***Results:*** *The portfolio contains objective structured clinical examination guidelines, mini-clinical evaluations, learning journals, performance appraisals and patient feedback to assess development of competencies, assist learning and provide feedback to staff and students. Evaluation by supervisors and students showed good portfolio face validity and acceptability.* ***Conclusion:*** *Similar clinical portfolios could be applied to competency-based optometry programs.*

Key Words: *education, assessment, competencies, optometry, portfolio*

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Background and Objectives

For students to become accomplished and socially accountable providers, eye care education programs should aim for students to acquire clinical and professional competencies.

The Postgraduate Diploma in Eye Care (PGDEC) is a one-year, competency-based program for mid-level eye care providers delivered at Divine Word University in Papua New Guinea, in partnership with The Fred Hollows Foundation New Zealand and the National Department of Health.[1] It was developed to address the shortage of eye care providers and help reduce the burden of avoidable blindness from conditions such as cataracts and uncorrected refractive errors.[2,3] The PGDEC provides qualified nurses and other health workers with specialist eye care education. This enables them to provide eye care autonomously at an advanced nursing or allied health personnel level. As such, the PGDEC includes, among others, clinical courses on refraction, essential eye care and operating theatre assistance.[4]

While developing the assessment structure of the PGDEC, we sought methods that would monitor and measure the development of clinical and professional competencies, as well as assist student learning. To encourage effective learning, it was also deemed important to include feedback sources for students. A plethora of learning tools, assessment methods and feedback mechanisms have been described in health professions education literature. A single method is unlikely to assess all components of competency development and performance. Instead, because various methods assess different aspects of performance, it is deemed preferable to use a series of snapshots of performance, using different techniques. However, adopting multiple processes of assessment can become administratively complex and time-consuming for students and supervisors. Therefore, we developed an assessment tool in order to integrate multiple methods into one assessment tool.

We identified various tools to assess and measure competency. These were adapted and combined into a clinical portfolio for use in the PGDEC. This paper reports the development and implementation of the PGDEC portfolio and its subsequent evaluation by faculty and students after a one-year pilot program. It also makes recommendations for implementation of portfolios in optometry degree programs.

Methods

Portfolio development

A portfolio can be generally described as a collection of material that provides evidence that learning has occurred.[5,6] The materials report on tasks fulfilled, feedback received and progression of competency. As a learning tool, portfolios have been heralded to be useful for feedback but also as a stimulus for reflection and self-assessment.[7] They are effective for both formative and summative assessments.[7,8]

Portfolios as described in the literature range from the almost completely free form to the highly formatted with strictly prescribed content. All of these, to differing extents, have been found to be beneficial to the development of competencies.[6,7]

When developing the PGDEC portfolio, we sought to identify elements we considered most pertinent to the program's competencies, based on best practice in health professions education. We conducted a review of medical, nursing and allied health education literature to identify valid, objective and reliable assessment methods suitable for the PGDEC's clinical and professional competencies. The tools were adapted and integrated into a single clinical portfolio format, in the form of a binder divided into different sections. Grouping all processes into one document aimed to simplify and harmonize the administrative processes related to multiple assessment methods. Guidelines for the assessment and development of competencies ensured students and supervisors were cognizant of clinical learning objectives, expected levels of performance and grading policies.

Portfolio components

All components selected for the PGDEC portfolio assess different aspects of clinical and professional competencies. Selection criteria included documented validity, reliability and objectivity, in addition to simplicity, efficiency and user-friendliness. Methods were chosen for use as both formative and summative assessment in pre-clinical and clinical settings, using approaches of continuous feedback and reflective learning.

The first assessment method we selected was the Objective Structured Clinical Examination (OSCE). It consists of a series of short clinical examinations, which a student performs on a patient in a controlled setting, under the observation of an examiner supervisor. This method has been adapted for clinical examinations by optometry accreditation bodies.[9,10] The examiner grades the performance of the student according to a standardized list of clinical procedural and behavioral steps, typically in the form of a yes/no checklist.[11-13] Objectivity, validity and inter-rater reliability of the OSCE have been confirmed in numerous reports.[11,12,14,15]

We adapted this method by developing OSCE checklists and assessments grids for all core clinical competencies of the PGDEC, in line with academic objectives.[6] **(Table 1)** These served as a step-by-step description of procedures for students and supervisors to be cognizant of standards and essential steps. Examples of competencies in the PGDEC's clinical courses include slit lamp examination, retinoscopy, sterilization of instruments, etc. Competencies such as formulation of differential diagnosis and management plan were common to both the refraction and essential eye care courses. Supervisors used OSCEs for summative practical assessments during the pre-clinical stage. However, their use was also formative; students were encouraged to use them to learn their skills and assess each other, and they kept them as reference clinical protocols during clinical rotations.[16]

The second method selected was the mini-clinical evaluation (mCEX).[17-19] This method allows supervisors to assess clinical skills during patient encounters in the student's clinical training, and has good inter-rater reliability, construct and predictive validity.[17,20,21] Encoun-

Table 1
Excerpt of Objective Structured Clinical Examination Guidelines for Developing Clinical Competency

COMPETENCY ASSESSMENT	VISUAL ACUITY		
Skill Element	Did the candidate...		Comments
	yes	no	
Chart correct distance			
Adequate lighting			
Patient instructions clear and concise			
Start with right eye then left			
[...]			
Record data adequately			
Perform skill in efficient way (time, logical sequence of actions)			

	Unsatisfactory Below Entrance level of competency	Satisfactory Achieved Entrance level of competency	Very good Above Entrance level of competency	Comments / retest
Overall assessment of competency for this skill				

ters are marked according to the quality of the essential elements of patient encounters, including history-taking, examination skills, efficiency and organization, clinical decision making, etc. **(Table 2)** We evaluated students with mCEX during most patient encounters in the clinical rotation, taking into consideration the type and complexity of the encounters. This enabled us to discuss cases and provide feedback at the end of the clinic each day. Completed mCEX forms, along with supervisor feedback, were returned to students and consigned to the portfolio.

Feedback and self-reflection can be useful in developing professionalism.[22,23] We thus incorporated three elements that support these into the portfolio. First, to establish a habit of self-reflection, a learning journal section was built into each of the mCEX forms. **(Table 3)** A learning journal integrates reflection into clinical care, an essential skill for lifelong learning,[7] and serves to develop the learner's critical thinking. This component calls on the student to recall the main aspects of each case and identify key learning points, elements performed well, improvements needed and a learning plan. Second, we incorporated performance appraisals, where supervisors and students jointly assessed professionalism and other aspects of patient-centered care at the midpoint

Table 2
Mini-Clinical Evaluation (mCEX) Assessment Template with Grading Guidelines

	Unsatisfactory Below expectations / unacceptable	Borderline Needs some improvement	Satisfactory Meets expectations	Very good Above expectations	N/A Unable to comment	Supervisor's comments
Information gathering (case hx)	☐ ☐	☐	☐	☐ ☐	☐	**Strong points:**
Examination skills execution	☐ ☐	☐	☐	☐ ☐	☐	
Efficiency & organization	☐ ☐	☐	☐	☐ ☐	☐	
Diagnosis/ DDx	☐ ☐	☐	☐	☐ ☐	☐	
Treatment/Management plan	☐ ☐	☐	☐	☐ ☐	☐	
Record keeping	☐ ☐	☐	☐	☐ ☐	☐	**Suggestions for development:**
OVERALL CLINICAL CARE	☐ ☐	☐	☐	☐ ☐	☐	
Complexity of patient encounter simple ☐ ☐ ☐ complex						
Additional comments Hygiene considerations: Communication/attitude:						_____ **Supervisor signature**

Unsatisfactory: Unacceptable level of patient care. The student's performance showed many areas of weakness or of inappropriate clinical care. Below expectations for this level of training.

Borderline: The student's performance showed some areas of weakness and/or elements requiring improvements.

Satisfactory: The student performed well, to the expected level of competency for this point of the training. Appropriate for level of training. Most patient encounters performed adequately are expected to be marked in this section.

Very good: The student demonstrated impressive skills, knowledge and/or attitudes, above expectations for the level of training. Reserved for instances where distinction is awarded.

Table 3
Learning Journal Section of Mini-CEX Assessment Template

Main points of this encounter . . . . . .

Important points I have learned . . . . . .

. . . . . .

Elements(s) of the encounter where I performed well . . . . . .

. . . . . .

Elements(s) of the encounter that could improve next time . . . . . .

. . . . . .

My learning plan to improve myself . . . . . .

. . . . . .

How will I apply these skills & knowledge in my work. . . . . .

and the end of the clinical rotation.[24-26] **(Table 4)** Third, anonymous patient feedback forms[27-29] **(Table 5)** were distributed to a sample of each student's patients and subsequently added to this section of the portfolio.

The final section summarized competency development and attainment assessed by the previous sections. It contained logs to help students and supervisors track patient encounters, procedure count and competency attainment.[7,24-26,30,31] **(Table 6)** The clinical competency log contained competency development milestones, which included Entrance (prerequisite before commencing clinical rotation), Level 1 (minimum standard for expected competency) and Level 2 (advanced level of competency). These milestones had been developed for each competency through consultation with four supervisors. **(Table 7)** The log allowed students and supervisors an overview to track performance from the first days of preclinical training until graduation. The use of logs also identified necessary remedial interventions so these could be undertaken as soon as they appeared necessary. Procedure and patient encounter counts were checked regularly by supervisors during clinical rotations to ensure students were appropriately assigned to obtain adequate clinical exposure and case mix.

Portfolio implementation

The portfolio includes a user's guide to ensure its comprehension and effective use. This includes lists of competencies to be attained in each of the modules, explanations of the competency milestones, policies and grading guidelines for each portfolio component. In addition, the Head of Department held an orientation session for both students and supervisors explaining the use and benefits of the portfolio. Expectations for various stages of competency development were detailed, and students were instructed on how to use it as a learning tool. The importance of quality self-reflection and the value of the feedback components were stressed. Questions were invited and answered. The Head of Department, also involved in clinical supervision and assessment, was available for queries and guidance on portfolio use throughout the preclinical sessions and clinical rotation.

Table 4
Excerpt from Performance Appraisal Forms

PERFORMANCE ELEMENT	RATING			COMMENTS
	1 Less than standard for expected competency Unsatisfactory	2 Standard for expected competency Satisfactory	3 Exceeds expected standards Awarded distinction	
ATTENDANCE				
Always punctual with high attendance rate				
COMMUNICATION SKILLS				
Type and level of language				
[…]				
EQUIPMENT CARE + MAINTENANCE				
[…]				
INTERPERSONAL SKILLS				
[…]				
TEAMWORK				
[…]				
HYGIENE/OCCUPATIONAL HEALTH + SAFETY				
[…]				
OVERALL PERFORMANCE				

Table 5
Items Included in Patient Feedback Forms

Rating scale:			
Excellent	Good	Average	Unsatisfactory
1. Waiting time and efficiency of the student 2. Attitude, consideration and care from student 3. Explanation about tests that were performed and their results 4. Overall impression of the student's competency 5. Other comments or suggestions:			

Table 6
Clinical Competency Log (Sample)

Skills	# of times skill is performed (indicative only – frequency does not guarantee competency level)	Competency level attained by student (supervisor initials & date)		
		Entrance level Prerequisite to perform in clinical rotation	Level 1 *Minimum* standard for expected competency	Level 2 *Advanced* standard of competency
Core REFRACTION skills				
Objective refraction (retinoscopy)	□□□□□ □□□□□ □□□□□ □□□□□ □□□□□ (25)			
Subjective refraction (sphere)	□□□□□ □□□□□ □□□□□ □□□□□ □□□□□ (25)			
Subjective refraction (sphero-cyl)	□□□□□ □□□□□ □□□□□ □□□□□ □□□□□ (25)			
Presbyopic refraction	□□□□□ □□□□□ □□□□□ □□□□□ □□□□□ (25)			
[…]				
Complementary REFRACTION skills				
Lensometry	□□□□□ □□□□□ □□□□□ (15)	Minimum competency attained:		
[…]				

The student portfolios were used from the beginning of pre-clinical training until the end of the PGDEC's six-month clinical rotation, which concludes the program. They were collected at the midpoint and at the end of the clinical rotation. Grades were assigned during meetings led by the Head of Department with two or three clinical supervisors, all of whom had assessed students. They examined each portfolio's contents and translated them into a final numerical grade. This involved, in part, summarizing the continuous assessment from the mCEX encounters, examining and updating competency logs, and translating the level of attainment of competencies into a numerical grade, following the guidelines included in the portfolio. **(Table 8)** A portion of the final grade was assigned to the quality and completeness of the reflective learning entries.

The implementation process was evaluated. In its first year of use, the portfolio was piloted and revised, based on continuous ad hoc student and supervisor feedback. At the end of the year, a survey was distributed to students and supervisors to assess face validity and acceptability. **(Table 9)** The survey's first objective was to ask users about the portfolio's value as a formative and summative tool, i.e., to assess its face validity. Such questions included, for example, the user's perception of the mCEX or

Table 7
Example of Milestones in Competency Attainment

Competency	Entrance level Prerequisite to perform in clinic setting	Level 1 *Minimum* standard of competency	Level 2 *Advanced* standard of competency
Case history-taking	Asks most relevant questions for comprehensive case history in a logical sequence. Can perform skill in a controlled setting or a simple case in clinical setting.	(Entrance level +) Elicits pertinent patient information in simple and moderately complex cases. Uses some appropriate questions to obtain further information. Links some data to overall clinical picture/diagnosis & management.	(Level 1 +) Logical, thorough and efficient history-taking for most cases, including most complex cases. Facilitates patient's telling of story, effectively uses appropriate questions. Able to identify most relevant data and link to clinical picture/diagnosis and management.

Table 8
Excerpt of Grading Policies Used to Convert Competency Attainment to Numerical Grade

[…]

This global assessment is based on each student's clinical competency log, which in turn is a reflection of the student's performance during the whole of the clinical rotation. The following guide is used to determine the numerical value of the final mark (on 35):

0 – 15	Failing grade. The student has attained Level 1 of competency in less than 75% of core competencies.
16 – 29	Passing grade. The student has attained Level 1 of competency in at least 75% of core competencies. The student may have attained Level 2 competency in up to 50% of core competencies.
30 – 35	Distinction. The student has attained Level 2 of competency in more than 50% of core competencies.

The final numerical value (within the appropriate range) is influenced by an overall qualitative impression of the student's clinical performance by the team of supervisors.

[…]

Table 9
Excerpts of Portfolio Evaluation Questionnaires Distributed to PGDEC Students and Supervisors

Examples of items surveying validity of portfolio:						
		Strongly disagree (-2)	Disagree (-1)	Agree (1)	Strongly agree (2)	N/A
The OSCE guidelines for skills assessment						
[…]						
7	provided a fair assessment during practical examinations	☐	☐	☐	☐	☐
8	were a useful reference to include in the portfolio	☐	☐	☐	☐	☐
[…]						
Examples of items surveying acceptability of portfolio						
		Strongly disagree (-2)	Disagree (-1)	Agree (1)	Strongly agree (2)	N/A
The mCEX guidelines for skills assessment						
[…]						
13	were completed for all patient encounters	☐	☐	☐	☐	☐
14	were simple to fill out	☐	☐	☐	☐	☐
15	were completed the same day the patient was seen	☐	☐	☐	☐	☐
[…]						

the OSCE as fair assessment methods. The survey also aimed to gauge the acceptability of the portfolio to the user. For example, users were asked about the portfolio's ease of use and its administrative burden. Questionnaire items were constructed using a Likert scale, and answers were converted into numerical scores for items relating to face validity and acceptability. Average scores were compiled. Sample size (n = 9 supervisors and 10 students) did not allow inference of statistical significance. In addition, open-ended questions allowed for comments and suggestions for improvement.

Results: Evaluation of Portfolio Implementation

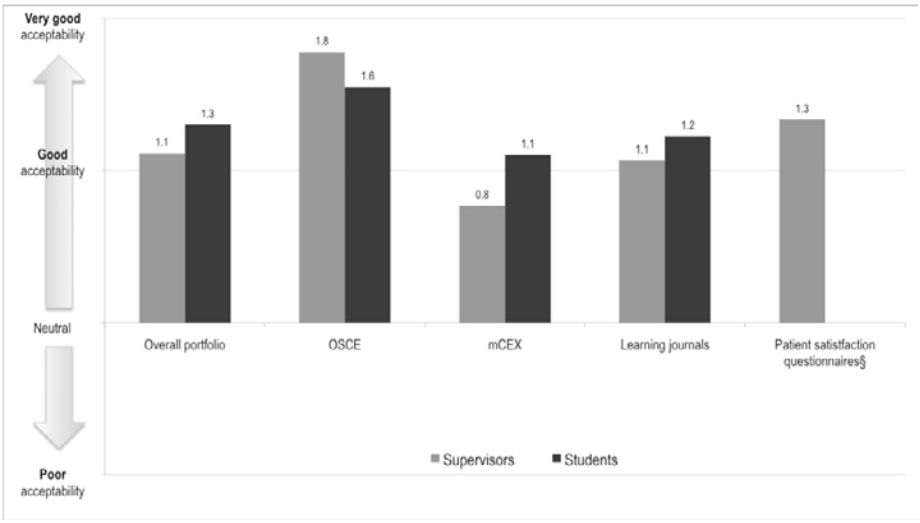
Acceptability and face validity of the overall portfolio were rated as good (or better) by both supervisors and students. **(Figures 1 and 2)** Individual components (OSCE, mCEX, learning journals, performance appraisals, patient feedback) were perceived as acceptable and good. In general, comments were positive. Supervisors and students appreciated the clarity and objectivity of defined performance and assessment criteria for OSCE and mCEX components. However, learning journal sections in the mCEX forms were reported by some students as being too long to fill out and repetitive. Logistics for gathering patient feedback needed to be improved. Indeed, as patient selection was not always easily randomized in the midst of a busy clinical environment, this can lead to an uneven distribution of case mix. Grades assigned to the quality of reflective learning were in general relatively high because learning journal entries were mostly honest and constructive, indicating motivation in learning and increasing self-confidence with the attainment of competencies.

Discussion

Strengths of the PGDEC portfolio

Our clinical portfolio was intended to support students' acquisition of competencies by providing precise guidelines on technical skills and explicit outcomes (OSCE), showing progress (clinical logs) and supporting the development of professionalism and socially accountable quality care (learning journals, patient feedback forms). Eval-

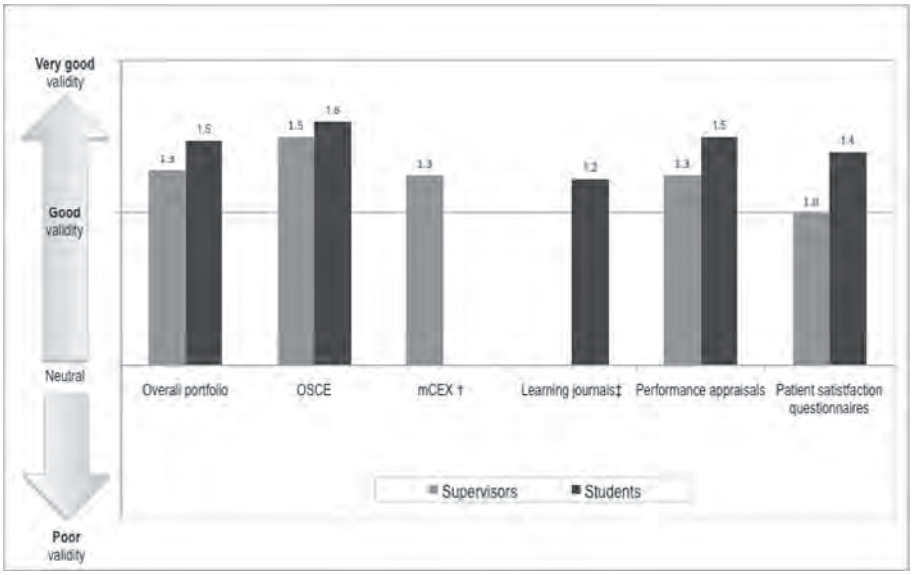
Figure 1
Average Questionnaire Response Scores for Acceptability of PGDEC Portfolio (n = 9 supervisors, 10 students)



Score legend:
-2 = very poor acceptability
-1 = poor acceptability
1 = good acceptability
2 = very good acceptability

§ - only supervisors were surveyed on acceptability of patient satisfaction questionnaires

Figure 2
Average Questionnaire Response Scores for Validity of PGDEC Portfolio (n = 9 supervisors, 10 students)



Score legend:
-2 = very poor validity
-1 = poor validity
1 = good validity
2 = very good validity

† - only supervisors were surveyed on validity of mCEX
‡ - only students were surveyed on validity of learning journals

uative data on face validity show that users perceive the portfolio as effective in performing these functions, for all its components.

As an assessment tool, our portfolio aimed to support supervisors in assessing the acquisition of competencies by using more objective methods, defined performance criteria and an indication of students' clinical and professional performance. This was also reflected positively by the supervisor survey data.

The portfolio combines multiple assessment processes, but as reflected in the acceptability data of the survey, it did not impose an onerous administrative burden for users. As students had the portfolios with them at all times, these proved to be an accessible way of pinpointing a particular student's area of difficulty at any given time, allowing for quick identification of those requiring assistance. This was done a number of times throughout the clinical rotation. Supervisors were easily able to substantiate their impressions of weaknesses in performance, usually during daily case discussions and mCEX grading. Mid-rotation grading meetings again allowed for reflection on the progress of students, when portfolios were systematically examined by a group of supervisors. This led to timely remedial measures, such as adjusting patient load to reinforce given competencies or providing individual tutoring.

The potential for inter-rater variability of grading remains a challenge with any assessment tool. Although this was not evaluated in this portfolio, we attempted to minimize bias by a number of measures. These included the explicit description of guidelines for OSCE grading of clinical procedures and for mCEX assessment of patient encounters, instruction in the use of this tool, and using group consensus to arrive at final grades.

Considerations for implementing a portfolio system

The effective implementation of a portfolio requires:[7]

- adequate introduction and mentoring about its use; in our case, this was done during the introductory briefing session and grading meetings
- integration with other assessment procedures in the program; ours served as the central element for both formative and summative assessments, with grading aligned with academic objectives
- provision of guidelines to students and teachers; we included the user's guide to optimize clarity, objectivity and transparency of performance and assessment
- user-friendliness that includes limited time demands on students and supervisors; positive survey results from students and supervisors on acceptability reflect the ease of use of the portfolio.

Implementing a portfolio, as with any assessment tool, requires a certain amount of ongoing administrative effort to remain effective. This includes:

- periodic monitoring and reviewing of student results to identify students requiring additional assistance; in our small PGDEC group of 10 students per year, this did not prove problematic, but could be time-consuming for larger student cohorts
- checking that the students' assessment, especially their self-reflective entries, remain meaningful and constructive; although our evaluative data include comments on learning journal entries being tedious at times, the grades allocated to the quality of journal entries reflected relevant and honest comments
- monitoring and evaluation for potential improvements in content and format by gathering and addressing feedback from both students and supervisors
- establishing a system to transfer assessment results into an acceptable format for the institution's academic policies.

Application to optometry degree programs

So far, our experience with using a portfolio in eye care education is limited to the PGDEC as described. Despite larger class size and longer duration, portfolios may be equally applicable to optometry programs. Similar to other health professions education, these have similar requirements for effective learning and assessment of clinical and professional competencies, and for successful learning through feedback.

As central stakeholders in the assessment of clinical competencies, faculty and administrators responsible for clinical and pre-clinical training should lead the process of portfolio development and implementation. Student input and feedback should also be sought. A careful analysis of needs and resources can help select core competencies for assessment, assessment methods and grading guidelines. Human and technological resources should be allocated for the monitoring and evaluation of the portfolio and mentoring of supervisors and students.[5,6]

For courses with durations longer than a year, ongoing portfolio assessment processes could track the acquisition of competencies from first-year pre-clinic sessions to final-year clinical rotations.

Electronic portfolios may increase efficiency where the class sizes are larger. In addition, these have been shown to facilitate centralized competency monitoring over time, allow easy access for all faculty involved in competency assessment, integrate monitoring and evaluative components, and increase motivation and reflective learning components.[32-35]

Conclusions

As optometry and other eye care education programs continue to move towards competency-based curricula, educators require appropriate tools to support the acquisition and assessment of competencies. A portfolio integrating multiple evidence-based tools has demonstrated successful comprehensive assessment of clinical and professional competency development in a program with small class size. Portfolios could be adapted for larger optometry programs by analyzing program needs before developing and piloting relevant portfolio elements. Using electronic platforms could facilitate implementation and use.

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