

Iz uredništva

Editorial

Povratak u budućnost stomatološkog obrazovanja

Patricia A. Reynolds
 Londonsko kraljevsko sveučilište, London, Ujedinjeno Kraljevstvo
 pat@madcap.demon.co.uk

Zakračunajte svoje knjižnice ako želite, ali ne postoje vrata, brava ili lokot kojima možete ograničiti moj um.

Virginia Woolf
A Room of One's Own, 1929.

Sažetak

Naši su studenti poput svjetionika, poput zrake svjetla na horizontu ali nedovoljno snažne. Uobičajene, provjerene edukacijske metode sigurno ih usmjeravaju prema luci, ali pitanje je imaju li dovoljno slobode i kreativnosti kako bi bezbrižno *plovili* po promjenjivom moru digitalnog doba? Naši studenti položili su kvalifikacijske ispite zato što su pametni i sposobni i nadamo se da će osvjetlati obraz naše ustanove, ali pitanje je iskorištavamo li mi maksimalno njihov edukacijski potencijal? Moramo se vratiti u budućnost kako bismo našli odgovore.

Ključne riječi

Stomatološko obrazovanje; studenti stomatologije; podučavanje

Uvod

Naši su studenti poput svjetionika, poput zrake svjetla na horizontu ali nedovoljno snažne. Uobičajene, provjerene edukacijske metode sigurno ih usmjeravaju prema luci, ali pitanje je imaju li dovoljno slobode i kreativnosti kako bi bezbrižno *plovili* po promjenjivom moru digitalnog doba? Naši studenti položili su kvalifikacijske ispite zato što su pametni i sposobni i nadamo se da će osvjetlati obraz naše ustanove, ali pitanje je iskorištavamo li mi maksimalno njihov obrazovni potencijal? Moramo se vratiti u budućnost kako bismo našli odgovore.

Ako zamislimo monokromnu, nepromijenjenu budućnost u kojoj profesor ispisuje kredom po ploči dok se prašina sliježe po predavaonici, tada smo zapeli u prošlosti (slika 1.) Ako od negativnog krenemo prema pozitivnom te interaktivno transformiramo ploču, dobit ćemo velik zaslon povezan s internetom na kojemu studenti mogu naći mnogo informacija za osobno ili zajedničko učenje. Dakle, ne mijenja se samo dostupnost tehnologije, mijenjaju se i mjesta na kojima se uči i postiže personalizacija toga procesa (1, 2). Naši tableti ne trebaju biti proizvedeni od gline kada svatko od nas može iskoristiti tehnologiju ekrana na dodir baš kao što to čine mala djeca, ili se njima možemo koristiti za komunikaciju (3).

Tehnologija – poboljšano učenje

Razvoj učenja poboljšanog tehnologijom (UPT-om) bio je sve samo ne jednostavan. Tehnologija je najčešće diktirala

Back to the Future of Dental Education

Patricia A Reynolds
 King's College London, London, UK
 pat@madcap.demon.co.uk

“Lock up your libraries if you like, but there is no gate, no lock, no bolt that you can set upon the freedom of my mind”

Virginia Woolf
A Room of One's Own, 1929

Abstract

Our students are like beacons, a bright light on the horizon, but with some way to go. Our educational methods that bring them safely into harbour have seen the test of time, but do we allow them enough freedom and creativity to sail their boats in the climate change of the digital era? Our students are chosen because they are smart and capable and we hope will bring credit to our institutions, but do we maximize their potential educationally? We need to go back to the future to begin to consider this.

Key words

Dental Education; Dental Students; Teaching

Introduction

Our students are like beacons, a bright light on the horizon, but with some way to go. Our educational methods that bring them safely into harbour have seen the test of time, but do we allow them enough freedom and creativity to sail their boats in the climate change of the digital era? Our students are chosen because they are smart and capable and we hope will bring credit to our institutions, but do we maximize their potential educationally? We need to go back to the future to begin to consider this.

If we imagine a future that is monochrome, writing laboriously with chalk on a blackboard and filling the room with dust, we are enacting the past (Figure 1). Go from a negative to a positive, and the white board is colourful and interactive - a large internet connected screen which students can capture any amount of information for their personal and networked study. It is not just the affordances of technology that is changing, but the learning spaces and the personalisation of learning (1,2). Our tablets need not be made of clay when we can each make meaning out of using touchscreens - just like young children try to do - or even use them to communicate as telepresence robots (3).

Technology-Enhanced Learning

The advent of technology-enhanced learning (TEL) has been a bumpy ride, compounded by technology



Slika 1. Ploča i kreda
Figure 1 Blackboard and chalk

stupanj edukacije na sveučilištima, a zanemarivala se osnovna pedagoška izobrazba. Istraživanja o ograničenjima UPT-a već su poznata (4), no naši studenti ipak žive u tehnološki orijentiranom svijetu i uglavnom upotrebljavaju te suvremene naprave za igranje, a ne za izobrazbu. Današnje ozbiljnije igrice stvorene su kako bi podupirale proces učenja (5). Društvenim mrežama koristimo se kako bismo razmjenjivali znanje, uz dužno poštovanje svih popratnih problema digitalnog profesionalizma (6).

Inovacija i ishod

Inovacija se oduvijek smatrala perifernom ili dodatnom aktivnošću, ali inovacija nije samo gledanje u kristalnu kuglu. Trebali bismo pozitivno poticati tu vještinu kako bismo prihvatili nove ideje u istraživanju i razvoju. Tijekom školovanja i obrazovna ustanova i studenti mogu svojim kritikama pomoći u rješavanju trenutnih problema u profesiji. Trebali bismo se upitati priprema li sadašnji nastavni plan adekvatno i besprijekorno studente za njihova buduća zanimanja. Primjer devetogodišnjeg pokušaja (do 2007. godine) da se usklade programi dentalne edukacije u više zemalja predstavljen je u europskom programu nazvanom *Dented* (7). Osim očekivanog rezultata, a to je konsenzus kad je riječ o najboljim nastojanjima u dodiplomskom školovanju, uočili smo još četiri neočekivana. Nabrojiti ćemo ih.

- 1.) Pojavile su se vrlo povezane mreže kolega, a mnogi od njih danas vode školske ustanove i međusobno surađuju. Primjerice, Sveučilište u Bresciji u sjevernoj Italiji uvrstilo je u svoj program 12 godišnjih kolokvija o temi inovacija u obrazovanju (8).
- 2.) Stajališta studenata bila su globalna i vrlo slična.
- 3.) Profesori su bili odani poslu, ali uglavnom ograničeni lokalnim ili nacionalnim sustavom školovanja.
- 4) Ponovno je pokrenuta Udruga europskih studenata dentalne medicine (European Association of Dental Students – EDSA) što je olakšalo buduću održivost. Stomatološki fakultet Sveučilišta u Zagrebu vrlo je dobro obavio taj posao. Potvrda za to su ljetni kampovi i četiri virtualna svjetska kongresa u organizaciji EDSA-e zagrebačkih studenata (9).

so often driving education in many Higher Education establishments, when knowledge of best pedagogical practices is often studiously ignored. The study of the barriers to TEL is well known (4), yet our students live in a technology-mediated world, and they use tools for play that could be used for education. Serious games, for example, are now being used to support learning (5). Social networks are often accessed by students for sharing knowledge with all the attendant issues of digital professionalism (6).

Innovation and outcomes

Innovation is too often seen as a peripheral or add-on activity, but innovation is not just crystal ball gazing. We should positively encourage this skill to embrace new ideas for research and development. In education, staff and students can critically help problem solve many of the current burning issues in our own profession. We might well ask, for instance, whether the design of our curricula adequately and seamlessly prepares the student for their future practice. An example of a nine year attempt to harmonise dental education across borders was given by the major European funded dental education project ‘Dented’ that ran until 2007 (7). Beyond the expected outcome of consensus across borders globally over best practices in an undergraduate dental curriculum, four somewhat unexpected observations accrued:

- 1) A strong network of peers grew, many of whom are now leaders in their own Schools, who now work collaboratively. For example, The University of Brescia in North Italy has hosted 12 annual colloquia, more latterly considering innovation in education (8).
- 2) Student attitudes were global and very similar across borders;
- 3) Teaching staff were notably dedicated, but were often limited by their local and/or national regime;
- 4) The rekindling of the European Association of Dental Students (EDSA) facilitated future sustainability. This is something that Zagreb University, School of Dental Medicine, has done very well recently. The Summer Camps and four Virtual World Congresses run by the

Zato ako zanemarimo inovaciju i kreativnost, dovodimo u opasnost kritičko i kolektivno razmišljanje te učinkovito globalno obrazovanje.

Izazovi i mogućnosti obrazovanja

Mnogo je mogućnosti za obrazovanje ako razumijemo sve pedagoške prakse koje omogućuje tehnologija. U stomatologiji je napredak u proizvodnji ekrana na dodir omogućio razvoj 3D tehnologije (10). Zbog toga što slika govori tisuću riječi, vrlo je važno biti vizualno pismen (11). Unatoč tomu vrlo je važno ne misliti da postoji konačno rješenje. Primjer je nedavni sve veći interes za MOOC (Massive Open Online Courses) (12). Iako se mnoge škole orijentiraju u tom smjeru, rezultati mogu biti potpuno različiti, primjerice, kod korištenja inovativnih filmova u izobrazbi (13). Dakle, nije bezvezni san besprijekorna povezanost alata za UPT-e s kontrolom njihove kvalitete, elementima sigurnosti i analizama poduprtima najboljim pedagoškim načelima koja osiguravaju da se maksimizira svako iskustvo pacijenata. Taj san već je ostvarila britanska vlada u sklopu projekta UDEENTE (Universal Dental Learning) (14). Vrlo često napredak u tehnologiji zadovoljava želje tržišta, a akademski napredak završi u političkom nezadovoljstvu. Povijest se uglavnom ponavlja, bilo to dobro ili loše. Srećom svi izumi pronađeni prije svojeg vremena uglavnom se ponovno izume te se kao feniks uzdignu iz pepela.

Povratak u budućnost

Pa, vratimo se onda u budućnost. To što smo naučili od Platona jest da je odmak od verbalne tradicije učenja prema zapisivanju bila vrlo moćna promjena zato što je znanje moć. Gutenberg i Caxton stvorili su tiskarski stroj u 15. stoljeću, što je znatno pridonijelo revoluciji obrazovanja jer su se knjige mogle brže širiti. Digitalno doba ima jednak utjecaj (15). Mišljenje ljudi brzo se mijenja jer im je u svako doba dostupno mnoštvo informacija. Moramo biti sigurni da naši studenti mogu *ploviti* tim jako dubokim *mobilnim oceanom* te uspješno izbjeći velike *morske pse i mala bića* koja bodu i peckaju. Većina bi se trebala složiti s činjenicom da je pristup poduprt činjenicama, posebno u analizi (16), jedini način koji vodi do ispravnog zaključka. To se danas postiže prihvaćenim alatima i instrumentima, ali ne treba zaboraviti na to koliko je važna kvalitativna istraživačka metodologija i opisni alati. Nakon obrađenih podataka i informacija uočimo sve više promjena i kulturnih pomaka u obrazovanju, pa će na kraju sve dobiti novo značenje. Procjene se već sada mijenjaju od sumativnih testova prema formativnom pristupu. Zbog toga bismo trebali mjeriti rezultat učenja, a ne samo ponavljanje činjenica (17).

EDSA students from Zagreb for a global audience, are testament for this (9).

So if we ignore innovation and creativity, it is at our peril because we deny aspirational thinking, connected collective thinking, and effective globalisation of education.

Educational challenges and opportunities

There are huge opportunities for education generally, through understanding best pedagogical practices of the affordances of technologies. In Dentistry, the advent of the use of touch through haptics (the sense of touch) is gaining pace with new simulation opportunities in 3D (10). The appreciation of visual literacy is becoming apparent – a picture paints a thousand words (11). However, it is important not to think that there is one ultimate solution. An example of this is the sudden interest in MOOCs (Massive Open Online Courses) (12). Although many schools are signing up to these market driven courses, the outcomes may be quite different – for instance the innovative use of videos in medical education (13). Seamless connectivity of TEL tools with quality assurance, security elements and analytics, underpinned by the best pedagogical principles that ensure the student experience is maximised, is not a pipe dream. It has already been realised with a UK Government funded project - UDEENTE (Universal Dental e-Learning) (14). But so often advances are driven by market forces, not academic advances that frequently set sail in seas of political discontent. But history does have a habit of repeating itself – good and bad. Fortunately good ideas and innovations that are before their time, are very likely to be re-invented – like a phoenix rising out of the ashes, someone else will carry the torch.

Back to the Future

So let's go back to the future. What is clear is that we have learnt from Plato that moving from an oral tradition to writing, even on papyrus, is powerful, as knowledge is powerful. Gutenberg and Caxton's presses brought print to the population in the 15th century, and this revolutionised education through books. The digital era is doing the same (15). The public expectation is changing - they can freely access the information highway. We need to make sure that our students can navigate well in this very deep mobile ocean, avoiding large sharks and smaller stinging creatures. Most will agree that an evidenced base approach, especially to analytics (16), is valuable to justify and reach conclusions. This is achieved using today's accepted tools and instruments but we should not forget the important role of qualitative research methodology and descriptors. There will be more transformation changes and cultural shifts in education, as we manage data, information and make new meanings. Assessments are already changing from summative rote-learning tests

Iako imamo što ostaviti našim studentima, mogli bismo se iznenaditi shvativši da bi oni mogli biti spremniji za budućnost nego što nam se čini. Većina njih djeca su tzv. *mrežne generacije* te su tehnološki pismeni i sposobni prihvatiti virtualne, vizualne i taktilne oblike učenja. Jedini razlog zašto još uvijek pišu jest to što ih mi tako učimo.

Trebali bismo učiti iz prošlosti, ali naš način djelovanja trebao bi biti suvremen i vizionarski – zašto se koristiti sekretima kad imamo GPS? Naše poučavanje trebalo bi biti usmjereno prema studentima kako bi njegovo korijenje izraslo u čvrsto stablo koje razlistanim granama daje ogranke za nove generacije. Bilo bi šteta izgubiti studente koji će posaditi sjeme u nekoj drugačijoj, plodnijoj zemlji. Kako smo mi edukacijski uzor, ne smijemo zaboraviti vrijednost kombiniranog načina poučavanja (tete-a-tete i s UPT-om) zajedno s modernim metodama i planom poučavanja. Povezanost znači da je globalizacija edukacije već stigla.

Ovaj časopis je lider u spajanju starih i novih načina, publikacija s međunarodnom recenzijom i dostupan je svima na internetu i kao tiskano izdanje. Ovaj medij predstavlja poruku (18). Osnovni zakoni fizike, ali i povijest, govore nam da voda uvijek probije svoj put, da kamen tone, te da se vodom zemci mogu prilagoditi, promijeniti i na kraju čak letjeti. Sisavci će naslijediti dinosaure.

Naši studenti naša su budućnost i dužnost nam je nadahnuti njihovu sudbinu.

towards a more formative approach, for instance. We need to measure outcomes of learning, not regurgitation of facts (17).

We will leave a legacy to our diverse student body, but they may be more prepared for the future than we think. Mostly born in the ‘Net- Generation’, they are already technologically savvy and able to embrace new virtual visual and tactile literacies. They write by rote because we train them to. We should learn from the past but our practice should be contemporary and visionary – why use sextants when we have GPS (Global Positioning Systems)? Our teaching should be student-centred so that we roots of learning lead to a solid trunk - then giving rise to branches that grow and blossom to spawn the next generation. It would be a shame to lose students who will sow seeds in more fertile ground elsewhere. We are also role models and should not lose sight of the evidence of the value of a blended approach (face-to-face combined with TEL) to modern educational methods and good learning design. Connectivity means that the globalisation of education is already here.

This Journal has been a leader in linking the old with the new, an open publication with international peer review, but also available in the older technology of print. The medium is the message (18). Basic physics and history tells us that water finds it’s own level, rocks will sink, amphibians will emerge and fly. Mammals will succeed dinosaurs.

Our students are our future, we have a duty to inspire their destiny.

References

- Laurillard D. E-Learning in Higher Education. In: Ashwin, P - editor. *Changing Higher Education: The development of learning and teaching.* (Staff and Educational Development Series SEDA). London and New York: Routledge; 2005. p. 71-84.
- Reynolds PA, Dunne S. Is e-Learning ‘inevitable’ in dental education? Experiences from King’s College London Dental Institute. *Acta Stomatol Croat.* 2007;41(1):3-12.
- YouTube [database on the Internet]. Double Robotics – Telepresence robot for telecommuters [cited 2014 February 22]. Available from: <http://youtu.be/Oan9TMB47Do>
- Schönwetter DJ, Reynolds PA. Discovering solutions to online learning barriers: Survey of EU Health-Educators. *Eur J Dent Educ.* 2013 Feb;17(1):e126-35.
- de Freitas S. Using games and simulations for supporting learning. *Learning, Media and Technology.* 2006;31(4):343-358.
- John BA. Kinship - King’s Social Harmonisation Project. Pilot phase of a social network for use in Higher Education (HE). *Bull Group Int Rech Sci Stomatol Odontol.* 2012; 51(3): 19-22.
- Reynolds PA, Eaton KA, Paganelli C, Shanley D. Nine years of DentEd-a global perspective on dental education. *Br Dent J.* 2008 Aug 23;205(4):199-204.
- Reynolds PA, Paganelli C, Dunne S, Wilson N. The Anglo-Italian collaboration: a report of the first steps in implementing the Bologna Declaration. *Eur J Dent Educ.* 2005 Aug;9(3):137-40.
- 4th Virtual World Congress of Dental Students [cited 2014 Feb 22]. Available from: <http://www.virtualdentalcongress.com>
- San Diego JP, Cox MJ, Quinn B, Newton JT, Banerjee A, Woolford M. Researching haptics in higher education: The complexity of developing haptics virtual learning systems and evaluating its impact on students’ learning. *Computers and Education.* 2012;5(1):156–166.
- Naghshineh S, Hafler JP, Miller AR, Blanco MA, Lipsitz SR, Dubroff RP, et al. Formal art observation training improves medical students’ visual diagnostic skills. *J Gen Intern Med.* 2008 Jul;23(7):991-7.
- Daniels J. Making Sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education [serial on the Internet].* 2012 [cited 2014 Feb 22]. Available from: <http://www.jime.open.ac.uk/article/2012-18/html>
- Mansfield K, Parker-Newlyn L. Understanding Common Diseases. Open2Study, University of Wollongong; 2013 [cited 2014 Feb 22]. Available from: <https://www.open2study.com/courses/understanding-common-diseases>
- Reynolds P. ULENTE (Universal Dental E-learning) A Golden Opportunity for Dental Education. *Bull Group Int Rech Sci Stomatol Odontol.* 2012 Jan 10;50(3):11-9.
- Schönwetter DJ, Reynolds PA, Eaton KA, de Vries J. Online learning in dentistry: An overview of the future direction for dental education. *J Oral Rehabil.* 2010 Dec;37(12):927-40.
- Gibson D, Jakl P. Data challenges of leveraging a simulation to assess learning. [cited 2014 Feb 22]. Available from: http://www.academia.edu/4589984/Data_challenges_of_leveraging_a_simulation_to_assess_learning
- Arevalo CR, Bayne SC, Beeley JA, Brayshaw C J, Cox MJ, Donaldson, et al. Framework for e-learning assessment in dental education: a global model for the future. *J Dent Educ.* 2013 May;77(5):564-75.
- Gibson T. Marshall McLuhan’s “Medium is the Message”: Information literacy in a multimedia age. *MediaTropes eJournal [serial on the Internet].* 2008 [cited 2014 Feb 22]; Vol 1:I–XIV. Available from: <http://www.mediatropes.com/index.php/Mediatropes/article/viewFile/3006/1479>