Patricia A Reynolds, Brian Millar, Stephen Dunne

Je li e-učenje 'nezaobilazan' dio izobrazbe u stomatologiji? Iskustva londonskoga Kraljevskoga stomatološkog instituta

Is e-Learning 'inevitable' in dental education? Experiences from King's College London Dental Institute

Londonski Kraljevski stomatološki institut, Centar za fleksibilno učenje u stomatologiji
King's College London Dental Institute, Centre of Flexible Learning in Dentistry

Sažetak

Ovaj rad želi predstaviti iskustva četiriju različitih projekata e-učenja provedenih na londonskom Kraljevskom stomatološkom institutu (KCLDI), a potvrdili su kulturalne promjene u primjeni takvoga oblika učenja (e-learninga) u stomatološkoj edukaciji. Definicije e-learninga, fleksibilnog učenja te učenja na daljinu trenutačno se navode u uporabi u visokom obrazovanju u Velikoj Britaniji. Na KCLDI-ju su provedena četiri istraživanja različitih primjena tehnologije i to: CDROM za igre, PDA za korištenje u kliničkom radu, webcasting za trajan profesionalan razvoj (CPD) te online-učenje za CPD. U prva dva istraživanja bili su uključeni dodiplomski studenti, a u ostala dva poslijediplomski. Rezultati četiriju istraživanja pokazuju sve veću vrijednost e-učenja u stomatološkoj izobrazbi. Potrebe dodiplomskih studenata mijenjaju se u suvremenom tehnološkom i digitalnom svijetu, a poslijediplomski studenti najviše cijene ugodnost i učinkovitost pristupa tečajevima, jer se mogu dobiti na kombinirani način - online uz praktičnu nastavu. Kao najveći stomatološki fakultet u Velikoj Britaniji, s najvišom kakvoćom učenja i istraživanja, e-learning je našao svoje mjesto u curiculumu dodiplomskih i poslijediplomskih studenata, ali i kod CPD-a. Početak pristupa IVIDENT-u (Međunarodni virtualni stomatološki fakultet) pomoći će uskladiti standarde te poduprijeti Bolonjsku deklaraciju. E-učenje je neodvojiv dio stomatološke edukacije.

Uvod

Paneuropski sudionici radionice "Metode učenja" na ADEE-u (Europsko udruženje stomatoloških nastavnika) na Godišnjoj skupštini u Ateni godine 2005., zaključili su da je e-učenje neizbježan dio edukacijskog procesa (1). No, kao i kod svake nove teorije, za djelotvornost je potrebna potvrda u praksi. Za najučinkovitiji e-learning smatra se onaj koji vode nastavnici, a ne politika ili tržište (1). Danas se poželjnom smatra kulturološka promjena od tradici-

Introduction

e-Learning in dental education was considered 'inevitable' by the pan-European participants of the "Methods of Teaching and Learning Workshop" at the ADEE (Association of Dental Educators in Europe) Annual Conference in Athens in 2005 (1). However, like any new theory or practice, evidence of validity or effectiveness is essential. Indeed, the most successful e-learning has been seen as being academically led rather than policy or market driven (1). A

onalnoga prema kombiniranom pristupu, u kojem se e-učenje kombinira s učenjem "licem u lice" (2-4).

Ovaj će rad objasniti četiri projekta provedena na londonskome Kraljevskom stomatološkom institutu kako bi se ispitale nove i inovativne metode e-učenja u stomatološkoj edukaciji, uključujući CDROM, prenosive digitalne asistente (PDA), webcasting i kombinirani online-tečaj.

1. Procjena CDROM-igre u uzimanju anamneze;
2. Procjena vrijednosti PDA u kliničkom okruženju;
3. Razvoj tehnika webcastinga kako bi se ispunile potrebe stomatologa za trajnom edukacijom;
4. Procjena kombiniranog pilota za učenje u estetskoj stomatologiji na temelju modula iz MClinDenta

Definicije

Fleksibilno učenje

Slično je kao i "otvoreno" učenje, u kojemu je fokus na sposobnosti učenika da odluče što, gdje, kada i kako će učiti. E-learning je komponenta ili vrsta fleksibilnog učenja (5).

E-learning

Učenje koje se koristi informacijskim i komunikacijskim tehnologijama (ICT), (6);

Učenje na daljinu;

Učenje kod kojega su instruktor i studenti na dvjema fizički odvojenim lokacijama - može biti sinkrono ili asinkrono te može uključivati korespondenciju, video ili satelitsku vezu, ili e-learning (7).

1. Procjena CDROM-igre u uzimanju stomatološke anamneze

Pozadina

Sposobnost učinkovite komunikacije ključni je element stomatologije. To se vidi i u važnosti tih tema u britanskome General Dental Councilu (8). Svrha igre uzimanja stomatološke anamneze jest poboljšati komunikaciju s pacijentom, stvarajući interaktivni program koji studentima omogućuje da razviju i provjere svoje oblike komuniciranja s pacijentima u simuliranim posjetima (Slika 1.).

cultural change from the traditional to a blended approach with e-learning meshing with face-to-face teaching is now being seen as desirable (2, 3, 4).

This paper will highlight four projects undertaken by King's College London Dental Institute to test new and innovative methods of e-learning in dental education including a CDROM, portable digital assistants (PDA), webcasting and a blended online course.

1. An evaluation of a CDROM game in dental history taking
2. An assessment of the value of PDAs in the clinical environment
3. Development of webcasting techniques to fulfill the continuing education needs of dentists
4. Evaluation of a blended learning pilot study in aesthetic dentistry based on modules from the MClinDent

Definitions

Flexible Learning

Similar to 'Open' learning where the focus is on the ability of learners to decide what, where, when and how they learn, eLearning is a component or type of flexible learning (5).

E-learning

Learning in a way that uses information and communication technologies (ICT), (6).

Distance Learning:

Learning where the instructor and the students are in physically separate locations. Can be either synchronous or asynchronous and can include correspondence, video or satellite broadcasts, or e-learning (7).

1. An evaluation of a CDROM game in dental history taking

Background

The ability to communicate effectively with patients is central to the practice of dentistry. This is reflected in the importance attached to teaching these topics by the General Dental Council of UK (8). The dental history taking game aimed to improve dentist-patient communication skills by producing an interactive program which enabled students to develop and test their strategies for communicating with patients using a simulated dentist-patient session (Fig 1).
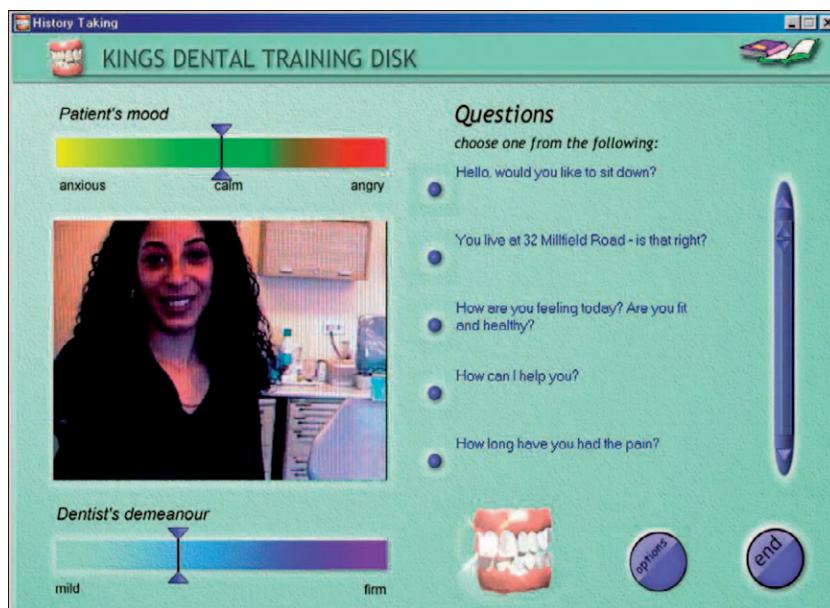
Slika 1. Snimka igre "Komunikacija i stomatološka anamneza"
Figure 1 Screen shot of Communications and Dental History Game

Materijal i metode

Osnovan je multidisciplinaran tim sa stručnjacima iz socioloških, stomatoloških, edukacijskih i informacijskih znanosti sa zadatkom da razvije igru koja je proizvedena na CDROM-u i zatim postavljena na web.

U igri student na početku odabire jednog od dvaju pacijenata. Zatim može odabrati vlastito stajalište (blago ili čvrsto) te što pacijent osjeća (strah ga je ili se ljuti). Student zatim odlučuje na temelju pitanja u anamnezi, što je odgovor na pacijentovu snimku dok odgovara. Zatim se odabire sljedeće pitanje i mijenja stajalište prema situaciji. Bodovi se dobivaju promjenom boje i gubitkom zuba na slici čeljusti.

To je istraživanje provedeno kako bi se otkrilo koliko to iskustvo razvija općenite sposobnosti rješavanja problema te stajalište studenata prema učenju teorijom planiranog ponašanja (TPB). TPB prepoznaje četiri tipa u jakoj vezi s vjerojatnošću određenoga ponašanja (9). Edukacijska evaluacija temeljila se na dvama online-upitnicima, a ispunjavali su ih studenti druge godine petogodišnjeg studija. Prvi je procjenjivao funkcionalnost i edukacijsku vrijednost CDROM-a, a drugi je razvijao test sposobnosti. Rezultati testa sposobnosti uspoređivali su se s godinom koja nije rabila CDROM. Zaključci u sklopu skupina studenata koristila su se kako bi se procijenila sposobnost studenata da rabe software i strategiju rješavanja problema (Slika 2).

Materials and Methods

A multi-disciplinary team in the social and behavioural sciences, dentistry, education and information technology was formed to develop the game which was produced on a CDROM and then web-enabled.

The Game was designed so that the student initially chose one of two patients to take a history from. The student then moved a cursor to modify their own demeanour (mild or firm) and the patient's mood (anxious or angry). Decisions were then made by the student on the questions in a patient's history, in response to a video of the patient's response. The player then chose another question and changed their demenour as they felt appropriate. Scoring was by the colour change and loss of teeth in the image of the jaws.

To identify to what extent this experience develops their general problem solving skills, and their attitude towards this learning experience through the Theory of Planned Behaviour (TPB). TPB identifies four constructs which are strongly related to the likelihood to behave in a certain way (9). The educational evaluation used two on-line questionnaires completed by dental students in year 2 of the 5 yr course. The first evaluated the functionality and educational value of the CDROM and the second developed the attitude test. The results from the aptitude test were compared to a year that had not used the CDROM. Observations of a subset of students were conducted while using the program to assess the students' ability to use the software and their problem solving strategies (Fig 2).

Slika 2.   Opažanja studenata koji su se koristili igrom "Stomatološka anamneza"
Figure 2   Observation of students using the Dental History Game

Rezultati

Upitnike su ispunila 144 studenta. Svi su imali pozitivna stajališta o uporabi CDROM-a te su predložili neke manje poboljšice, kao na primjer promjenu boje i tipova pacijenata. U usporedbi sa studentima koji se nisu koristili CDROM-om ranijih godina, imali su pozitivno stajalište prema poboljšanju odnosa s pacijentima te ozbiljne namjere da bolje komuniciraju s pacijentima.

Srednje vrijednosti TPB-a za CDROM:

- Stajalište 37,2 (vrlo pozitivno stajalište);
- Subjektivna norma 1,17 (potpora za komunikaciju u glavnoj skupini);
- Predviđena kontrola ponašanja 0,41(studenti smatraju da samo donekle mogu kontrolirati svoje dobro komuniciranje);
- Namjera ponašanja 1,31 (ozbiljna namjera za boljom komunikacijom).

Opažanja studenata pokazuju da su oni poboljšali rješavanje problema uporabom sustavnog pristupa u odnosu prema pacijentu i uzimanju anamneze.

Zaključak

Igra je korisna pomoć u učenju kako komunicirati s pacijentom. Iskustvo učenja visoko je ocijenjeno kao sredstvo poboljšanja odnosa prema pacijentu. Studenti su pokazali da razvijaju metakognitivne strategije tijekom rješavanja problema u igri.

Results

The questionnaires were completed by 144 students (100% of the class). Students were positive about the use of the CDROM and suggested some minor improvements such as colour changes and types of patient. Compared to a sample of students who had not used the CDROM in previous years, the students felt more positive about communicating with their patients and expressed stronger intentions to communicate well.

TPB Mean Values for CDROM

- Attitude 37.2 (very positive attitude),
- Subjective norm 1.17 (support for communication in peer group),
- Perceived behavioural control 0.41 (students only feel they have a small degree of control over their ability to communicate well),
- Behavioural intention 1.31 (strong intentions to communicate well).

The student observations indicated that students enhanced their problem solving skills by using a more systematic approach to questioning patients.

Conclusions

The game was clearly a useful adjunct to learning dentist-patient communication. The learning experience was rated highly and resulted in positive attitudes towards patient communications. Students demonstrated developing metacognitive strategies in trying to solving the puzzle of the game.

2. Procjena vrijednosti prenosivih digitalnih asistenata (PDA) u kliničkom radu

Pozadina

Svrha projekta bila je procijeniti moguću edukacijsku korist od PDA-a i umreženog učenja prikupljanja podataka te njihovu obradu u kliničkoj edukaciji. U svakodnevnom radu studenti na sveučilištima sve se češće koriste PDA-om, ali ga primjenjuju i za osobne potrebe (Slika 3.). Stomatološki podaci o pacijentu bilježe se na papiru i sustavom bilježenja podataka. Uvodi se nov elektronički karton (EPR). Studenti imaju pristup virtualnoj okolini za učenje (VLE, WebCT) preko fakultetske mreže i interneta.

2. An assessment of the value of portable digital assistants (PDA) in the clinical environment

Background

The aim of this project was to assess the potential educational benefits of PDAs for networked learning, data collection and information processing in a clinical learning environment. Students at universities are increasingly using PDAs in their daily work and for personal use (Fig 3). Dental patient data is currently recorded both on paper and with a data capture system. A new electronic patient record (EPR) is now being introduced. Students have access to a Virtual Learning Environment (VLE) (WebCT) through the College network and the Internet.
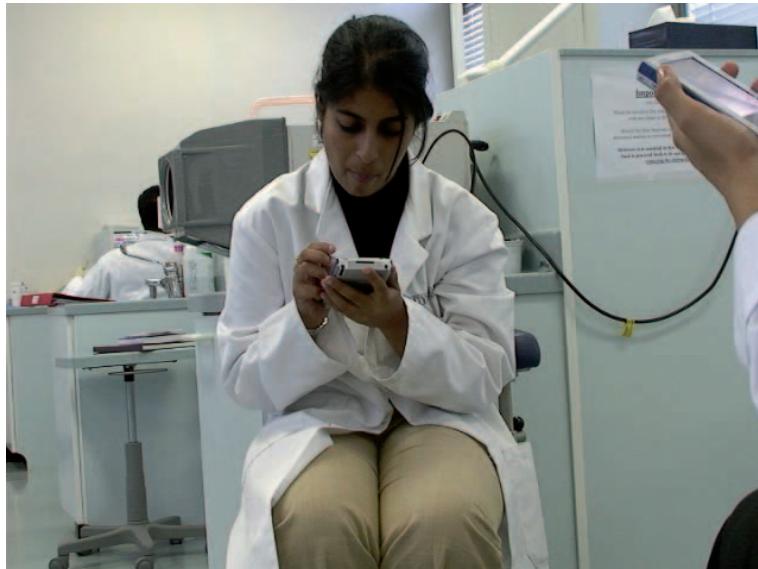
Slika 3. Studenti se koriste PDA-om u kliničkom radu
Figure 3 Students using PDAs in the dental clinic

Materijal i metode

U istraživanju se željelo doznati koliko studenti rabe bežične umrežene PDA-e (darovala Toshiba) za pristup VLE-ima na klinici te za ostale zadaće izvan stomatološkog fakulteta. Projekt je imao tri dijela: tehnički, edukacijski i primijenjeni. Jednostavan način istraživanja omogućio je polovici skupine od 12 studenata da se šest tjedana koristi PDA-om, a zatim je to učinila druga polovica skupine. VLE je omogućio pristup višestrukim medijima, tekstovima, slikama, alatima za procjenu, itd. Edukacijska evaluacija uključivala je upitnike prije istraživanja i nakon njega, razgovore te analize skupine.

Materials and Methods

The study investigated the students' use of wireless networked PDAs (donated by Toshiba) to access their VLEs in the Team Care clinic and for other programme tasks outside the Dental Institute. The project involved three phases of investigation: technical, educational and implementation. A simple cross over designed trial enabled half a student group of 12 to use the PDAs for 6 weeks, followed by the other half. The VLE allowed access to multiple media, including texts, images and webcasts and evaluation tools. The educational evaluation used pre and post trial questionnaires, interviews and focus groups.

Rezultati

Tehnička procjena pokazala je da je jednostavno sigurno spojiti bežični PDA na fakultetsku mrežu te pristupiti različitim oblicima medija. PDA se koristio za svakodnevne zadaće, kao što su studentov i pacijentov dnevnik. To što nema žica i može se prenositi, ocijenjeno je vrlo pozitivno. No, najveći nedostatak bio je kratkotrajnost baterije. Bilježenje je bilo brže, a točnost podataka o pacijentima veća.

Edukacijska procjena pokazala je da su dva od 12 studenata osjetili manjak pouzdanja općenito u ICT-u, a time i u uporabi PDA-a. No, svi su se htjeli ozbiljnije koristiti programom ICT-a te su se složili da će imati više koristi budu li postali "vlasnici" PDA tijekom petogodišnjega školovanja.

Zaključak

PDA se smatra visoko prihvatljivim načinom pristupa online-izobrazbi. Zbog toga KCLDI planira preporučiti da se svi studenti ubuduće mogu koristiti tom napravom. Potrebna su daljnja istraživanja kako bi se otkrila uporaba mnogih novih tehnologija u dodiplomskom programu.

3. Razvoj tehnika webcastinga za trajnu edukaciju stomatologa i ljekarnika

Pozadina

Noviji propisi o obvezatnoj trajnoj edukaciji (CPD-u) u Velikoj Britaniji tražit će od stomatologa i ljekarnika da održavaju sposobnosti i znanja tijekom cijeloga radnog vijeka (REF), (10). Moguća poteškoća za sve jest vremenska obveza da sudjeluju na odgovarajućim edukacijskim tečajevima. Čisto učenje na daljinu na temelju teksta nije uvijek prikladno za individualne načine učenja te mu manjka aktivnost. Rješenje bi mogao biti internet, zahvaljujući tehnici poznatoj pod imenom webcasting (snimke koje se prenose preko interneta). Korištenjem mogućnosti koje nudi online-učenje, mogu se osigurati visokokvalitetni tečajevi.

Materijali i metode

Svrha istraživanja bila je razdijeliti materijal CPD-a na što je moguće više različitih formata me-

Results

The technical evaluation demonstrated that it was simple to connect the wireless PDAs securely to the College network and access multiple forms of media. The PDA was easily used for daily tasks such as a student and patient diary. Lack of trailing wires and the portability were particularly appreciated. However, the main drawback was the battery life. There was faster notation and greater accuracy of recording patient data.

The educational evaluation revealed that 2 out of 12 students felt a lack of confidence in general ICT and hence PDA use. However, all students wanted a more joined up approach to using ICT in their programme and all agreed that they would gain more benefit if they were to have 'ownership' of PDAs over the 5-year programme.

Conclusions

The PDA was considered a highly acceptable mode of access to on-line education. As a result King's College London Dental Institute plans to recommend that all students will be able to use this device in the future. Further research is needed into how students use a range of new technologies in their undergraduate programmes.

3. Development of webcasting techniques to fulfill the continuing education needs of dentists and pharmacists

Background

Recent requirements for mandatory Continuing Professional Development (CPD) in UK will require dentists and pharmacists to maintain their skills and knowledge throughout their professional lives (10). A potential drawback for many dentists and pharmacists is the time commitment to attend appropriate educational courses. Purely text-based distance learning courses do not always meet individual learning styles and lack interactivity. The internet may offer a solution, particularly through a technique called webcasting (streaming media such as video across the web). By utilising the potential offered by web-based learning, high quality courses can be provided on-line.

Materials and Methods

The aim of this investigation was to disseminate CPD material in a variety of rich media formats to

đu 50 ljekarnika i 50 stomatologa, posredstvom tehnologije webcastinga. Podijeljena je kombinacija audio, video i animiranih dijagrama s online-interaktivnošću unutar VLE-a (WebCT). Predavanja stručnjaka prenosila su se na internetu, zajedno sa zabilješkama i ilustracijama, a bila su dostupna cijeli tjedan 24 sata na dan, kako bi se osiguralo prikladno vrijeme za sve sudionike.

Za korisnike su razvijeni različiti paketi, uključujući i zajedničke webcastove. (Tablica 1.). Svaki program je imao akreditiranu CPD, tako da se mogao koristiti i za vlastiti CPD. Sudionici su pozvani da ispune online-upitnike o procjeni te se s njima razgovaralo na kraju projekta. Rezultati su analizirani uglavnom kvantitativnim metodologijama koje podupiru tri britanske mreže LTS-a.

50 pharmacists and 50 dentists using webcasting technology. Delivery included a combination of audio, video and animated diagrams with on-line interactivity within a virtual learning environment (WebCT). Lecture topics from experts were video and/or audio streamed over the Internet with lecture notes and illustrations. These were available 24 hours a day, 7 days a week to ensure a convenient time for all recipients.

Various packages, including joint webcasts were developed for use by the practices (Table 1). Each programme delivered accredited CPD that could be used towards the development of a personal CPD portfolio. Participants were invited to complete all packages and evaluation questionnaires on-line and were interviewed towards the end of the project. The results were analysed using mainly qualitative methodology supported by three UK LTSN's (Learning and Teaching Support Networks).

Tablica 1. Različiti paketi uključujući i zajednički webcastovi
Table 1   Various packages including joint webcasts

CPD-naslovi uključuju • CPD titles included	
	korištenje lijekova • Medicines Management
	hitna medicinska stanja • Medical Emergencies
	antibiotike • Antibiotics
	upravljanje u kliničkim ustanovama • Clinical Governance
	dobru komunikaciju • Good Communications
	vitamine i minerale • Vitamins and Minerals
	akupunkturu i hipnozu • Acupuncture and Hypnosis

Rezultati

Sudionici su naveli da su web stranice zanimljiv način na koji se može dobiti CPD te da su uživali u programima. Glavna zapreka da se ispuni cijeli paket bila je dostupnost tijekom rada. Nakon predavanja uživo, u kojemu je sudjelovalo deset ljekarnika, taj način prijenosa znanja ocijenjen je kao posebno vrijedan.

Poboljšanja tijekom trajanja projekta pomogla su u interaktivnosti i prezentaciji na ekranu. To se osobito cijenilo u ordinacijama i ljekarnama, gdje je spajanje na internet bilo putem veze dial-up.

Results

Participants reported that the web-site was indeed a very interesting way for the delivery of their CPD and enjoyed accessing the programmes. The main barrier to completion of the packages was the availability of practice time. Following a live broadcast where ten pharmacists participated, it was reported that the mode of delivery this was especially valuable.

Improvements in webcasting technology during the course of the project enabled enhanced server delivery and improved interactivity and screen presentation. This was much appreciated by dental practices and pharmacies whose internet access was mainly by dial up connectivity at this time.

Zaključak

Uporaba web-interaktivnih edukacijskih resursa koji sadržavaju različite medije, smatra se korisnom za dobivanje CPD-a, posebice u ordinacijama i ljekarnama koje imaju mnogo posla.

Conclusions

The use of web-based interactive educational resources using a variety of rich media was considered a useful way of accessing CPD by professionals in busy dental practices and pharmacies.

4. Procjena kombiniranog pilota za edukaciju u estetskoj stomatologiji, na temelju modula s MClinDenta

Pozadina

Kao rezultat obveznatnoga CPD-a u Velikoj Britaniji za sve registrirane doktore opće stomatologije (GDP), raste potreba za kratkim tečajevima CPD-a. Tradicionalne tečajeve čine predavanja i vježbe. No, sudionici ne mogu duže biti nazočni u poslijediplomskim središtima te se ponudom kombiniranog pristupa učenju mogu educirati na intenzivnim praktičnim nastavnim jedinicama, budući da su akademsku građu proučili prije na internetu. Taj projekt trebao je procijeniti djelotvornost kombiniranih učenja na području estetske stomatologije za CPD GDP-a.

Materijal i metode

Odabrano je Poslijediplomsko stomatološko središte u Ketteringu zbog središnjeg smještaja, a osoblje je htjelo sudjelovati. Određene jedinice iz online- studija "master" (MclinDent) http://www.kcl.ac.uk/dentistry prilagođene su i postavljene kao dostupne za 12 GDP-a koji su se prijavili za kombinirani kratki tečaj iz estetske stomatologije. Prije tečaja morali su ispuniti upitnik kako bi se provjerilo znanje o ICT-u, sposobnosti učenja i stomatologiji. Svi sudionici imali su osnovne sposobnosti te su bili svjesni da sudjeluju u dvodijelnom kombiniranom tečaju. Dobili su korisnička imena i lozinke, kako bi se mogli uključiti u online-tečaj.

Intenzivan tečaj popraćen je upitnikom i ciljanom skupinom. Upitnicima se željelo procijeniti stomatološko znanje prije tečaja i nakon njegova završetka.

Rezultati

Tečaj kombiniranog učenja pohađalo je 14 kolega. Većina se uspješno prijavila, jedina je poteškoća bila točno prenošenje korisničkog imena i lozinke. Kada su to riješili, bez problema su pristupili gradivu za tečaj. Upitnik prije tečaja otkrio je da nitko još nije sudjelovao u takvom obliku nastave, a njihovo mišljenje bilo je da takva vrsta izobrazbe neće uspješno prenijeti znanja o praktičnim stvarima. Rezultati nakon tečaja otkrili su da je većina sudionika (80%) preferirala takvu vrstu izobrazbe, a ne tradicionalne dvodnevne tečajeve koji zahtijeva-

4. Evaluation of a blended learning pilot study in aesthetic dentistry based on modules from the MClinDent

Background

As a result of mandatory CPD in UK for all registered General Dental Practitioners (GDPs), there is an increasing demand for short Continuing Professional Development (CPD) courses. Traditional courses typically contain a mix of lectures and hands-on components. However, participants may not be able to attend Postgraduate Centres for extended periods of time and by offering a blended learning approach GDPs will only need to attend the intensive practical classes, the academic material having been previously studied online. This project aimed to assess the impact of a blended learning short course in aesthetic dentistry for the CPD of General Dental Practitioners.

Materials and methods

The Postgraduate Dental Centre at Kettering was selected as the venue as it has a central location and its staff were keen to participate. Selected units from an online Masters degree (MClinDent) http://www.kcl.ac.uk/dentistry were modified and made available online to 12 GDPs who had applied for a blended short course in Aesthetic Dentistry in Kettering. A pre-course questionnaire covered prior knowledge of ICT, learning skills and dentistry. Participants all possessed basic ICT skills and were aware that they were undertaking a two-part blended course. They were issued with usernames and passwords to access the online course.

The intensive, lecture-free course was followed by a post-course questionnaire and a focus group. The questionnaires were designed to assess pre- and post-course dental knowledge.

Results

14 students signed up for the Aesthetic Dentistry CPD course by blended learning. Most students were able to login satisfactorily to the online course material, the main difficulty being able to accurately transcribe the usernames and passwords. Once resolved, the students gained problem-free access to online course materials. The pre-course questionnaire revealed that none of the participants had experienced this type of course before, and their perception was that an online course would not successfully deliver knowledge about a practical subject. Post-course

ju osobnu nazočnost. Svi sudionici dobili su dobre ocjene - s više od 75% uspješnosti. Nakon tečaja pozitivni komentari u upitnicima odnosili su se na specifične prednosti online-učenja, na primjer na mogućnost da rade vlastitim ritmom, uz normalni rad. Osim kvalitete sadržaja i prednosti medija na kojem se dobivaju informacije istaknuti su također lakoća pristupa i "navigacije" kroz sadržaje. Negativni komentari odnosili su se na lošu administraciju tijekom dodjeljivanja korisničkog imena i lozinke.

Zaključak

Kombinirani pristup za kratke tečajeve CPD-a dobro je prihvaćen te je ispunio očekivanja više od 90% sudionika. Taj način prijenosa znanja treba se proširiti i na druge dijelove CPD-a, a mora ga se i dalje istraživati. Druga središta u Velikoj Britaniji također razmišljaju o uporabi tog modela i sadržaja primijenjenih za pristup online.

Sveopća rasprava i zaključak

Iako su ta četiri projekta samo mali, ali raznolik uvid u sve više dokaza o mjestu e-učenja u stomatološkoj edukaciji, postoji niz novih tehnologija koje obećavaju, kao što je uporaba prijenosnih telefona i bežične veze. Jasno je da će se mlađi naraštaji bez problema koristiti tehnologijom u izobrazbi, ili u kliničkom radu ili kod automatiziranih aktivnosti. Kao koristan način CPD-edukacije poslijediplomski studenti smatraju kombinirano učenje, jer imaju pristup online građi bez obzira na to koliko vremena provode u ordinacijama.

Studenti će se bez problema koristiti ICT-om za svoju buduću edukaciju, a kao što je istaknuto na posljednjoj radionici ADEE-a naslovljenoj "e-učenje – koje su potrebe?" (REF), (11), razvoj Međunarodnoga virtualnog stomatološkog fakulteta (IVIDENT-a) osigurat će zajednički i prilagođen e-learning u svim specijalnostima, što neće samo odgovarati potrebama studenata, nego i zajedničkim standardima. To će također ojačati duh Bolonjske deklaracije (REF), (12).

Praktični tečajevi "na vrijeme" osigurat će veću fleksibilnost tijekom učenja i više će se vremena moći provesti u ordinaciji. Pacijenti, posebice djeca,

results showed that a majority of delegates (80 per cent) enjoyed the course format and that they preferred it to the traditional equivalent two-day course requiring attendance in person. All delegates received good marks in the course assessment of over 75 per cent. Positive comments from the post-course questionnaire related to specific advantages of studying online, for example being able to work at one's own pace whilst maintaining a busy work schedule. The quality of the course content, the advantages associated with the convenient delivery medium, ease of access to and navigation through content also featured, along with enjoyment of the content itself. Negative comments related to poor face-to-face administration in delivering logins and passwords.

Conclusions

The blended approach for a short CPD course was highly acceptable and accessible and met learning objectives for more than 90 per cent of the participants. This mode of delivery should be expanded to other areas of CPD and further research undertaken. Other centres in the UK are considering using this model and course content designed for online delivery is already under development.

Overall Discussion and Conclusion

Whilst the four projects above offer a small but varied insight into the accumulating evidence base of e-learning in dental education, there are many other emerging technologies that have promise for the future such as the use of mobile and wireless. It is clear that the younger generation have little difficulty in using the technology for learning or in the clinics for automating activities. As a convenient way of delivering CPD postgraduates find the blended learning approach the most desirable and having access to online materials suited their time management in practices.

The students qualifying now will utilise ICT with ease for their future education, and as highlighted at the last ADEE meeting Workshop on the 'e-Learning – what are the needs' (11) the development of an International Virtual Dental School (IVIDENT) to provide shared and customised e-learning across specialties will not only suit the student's learning needs but also converge standards. It will also enable the spirit of the Bologna Declaration to be further implemented (12).

Just-in-time courses in practices will provide a greater flexibility in training with less time away

također će se sve više koristiti internetom kao izvorom informacija, a praktičari će bolje shvaćati želje pacijenata, osobito onih s posebnim potrebama – u tom slučaju internet je posebno fleksibilan. Integrirani e-learning bit će nezaobilazan, posebice u kombiniranom pristupu.

from the practice. Patients, especially children, will also be increasingly conversant with the use of the internet for gaining information, and practitioners will be expected to reflect this in their understanding of their patients' needs, especially those with disabilities, where the internet can be so flexible. Integrated e-learning especially in a blended approach is becoming 'inevitable'.

Abstract
This descriptive paper aims to demonstrate how experiences of e-learning through four different e-learning projects undertaken at King's College London Dental Institute (KCLDI) are validating the cultural change towards the use of e-learning in dental education. Definitions of e-learning, flexible learning and distance learning are stated as currently used in higher education in UK. Four investigations undertaken at KCLDI were chosen to represent four different uses of technology, namely CDROM for gaming, PDA for use in clinics, webcasting for Continuing Professional Development (CPD), and blended online learning for CPD. The first two studies involved undergraduate students and the latter two, postgraduate students. Results of the four investigations are presented which demonstrate the increasing value of e-learning in dental education. The needs of the undergraduate are changing in a modern technological and digital world, whilst the postgraduate convenience and efficiency of access to courses, delivered in a blended approach - online coupled with practical tuition - is most highly prized. As the largest dental and medical school in UK, with the highest accolades in teaching quality and research, e-learning has become embedded within the delivery of the curriculum for both undergraduates, postgraduates and in CPD. The advent of an IVIDENT approach (International Virtual Dental School) is advocated to help converge standards and support the Bologna Declaration. e-Learning in dental education is considered 'inevitable'.

Address for correspondence
Patricia A Reynolds
King's College London Dental Institute
Centre of Flexible Learning in Dentistry
Floor 3, Strand Bridge House, 138-142 Strand
London WC2N 1HH, UK
Tel: +44 20 7848 1235
Fax: +44 20 7848 1366
pat@madcap.demon.co.uk

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