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National POPS Website

Increasing Acceptance of Group Learning Exercises

Saving Time with PBL?

Evaluating Teaching-Learning Methodology

Online Lecture Recording and Learning Outcomes

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Message from Editor-in-Chief

Uldis N. Streips, Ph.D.
Editor-in-Chief

Dear JIAMSE readers!

Welcome to JIAMSE volume 18-2. This is an important issue, because with this issue we implement the decision reached at the IAMSE meeting in Salt Lake City to publish the Journal four times a year with every type of contribution included. Consequently, in this issue you will find research manuscripts, innovations, a case report, MERGE, letter to the editor, and also instructions for publication. Publishing four times a year will allow us to get your manuscripts published more quickly.

All we need to make this publication schedule a success is your cooperation. First of all, please contribute all that you do innovative at your schools for peer-review, as an innovation, an article, opinion, or letter to the editor. Remember your "solution" to the educational cases is also considered as a publication following editorial review. Educational publication may not be easy for many of you, as it was not for me, who are used to publishing classical bench research. This is one reason why we ran a workshop in Salt Lake City for publication in JIAMSE and other education venues, though we hope you would consider JIAMSE first for your work. This workshop will be repeated in Leiden at the next IAMSE meeting. However, even if not easy, our editorial team is very user-friendly and will work with you to make your work as publishable as possible.

I look forward to your submissions and in the meanwhile enjoy the educational work presented in JIAMSE Volume 18-2.

All best,

Uldis N. Streips, Ph.D.
Editor-in-Chief

The Medical Educator's Resource Guide

John R. Cotter, Ph.D.

The World Wide Web is always changing. New sites are added, some of the sites that we are familiar with are removed or become inaccessible (password protected) and others are revamped and/or the content is modified. In the process, the Uniform Resource Locator (URL) may no longer work, even when a site still exits, because the locator has been changed.

In this issue, the websites reviewed by the Resource Guide since 1999 that can be still located on the Web have been gathered and listed by subject. When necessary, the URL has been updated.

The original reviews for the websites in the new listing can be found in back issues of the Journal or its predecessor, the Basic Science Educator. The current list of websites includes the title of the website, the URL, the reviewer's name, the volume and issue number(s), the page number(s) and the year of publication.

If you know of a website that basic science teachers, clinical instructors, and students working in the medical sciences would find useful, please consider submitting a review to The Medical Educator's Resource Guide. You can do so by sending the review by e-mail (jrcotter@buffalo.edu).

GROSS ANATOMY

Center of Biostructure. [http://anatomia.wum.edu.pl/index2.htm]. Arber, B. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3. The practical examination section is currently password protected.

Medical Gross Anatomy Learning Resources. [anatomy.med.umich.edu/]. Davis, L. *Journal of the International Association of Medical Science Educators*. 2006; 16 (1): 2-3.

Online Tutorial for the Pterygopalatine Fossa. [https://www1.columbia.edu/sec/itc/hs/medical/anatomy_resources/anatomy/ppfossa/ppfossa_content.html]. Brueckner, J. *Journal of the International Association of Medical Science Educators*. 2006; 16 (2): 47.

Structure of the Human Body. [http://www.meddean.luc.edu/lumen/MedEd/grossanatomy/]. Dannenhoffer, R. *Basic Science Educator*. 1999; 9 (1-2): 43. The "Practice Exams" are password protected.

Vesalius. [http://vesalius.com]. Kolega, J. *Basic Science Educator*. 1999; 9 (1-2): 43. The site is limited to "Clinical Folios"; for a fee, registered subscribers can download and customize images for educational purposes.

BIOCHEMISTRY

Metabolic Pathways of Biochemistry. [http://www.gwu.edu/~mpb/]. Foresto, C.M. *Basic Science Educator*. 2001; 10 (1-2): 49-50.

The Biology Project: Biochemistry. [http://www.biology.arizona.edu/biochemistry/biochemistry.html]. Sanhai, W.R. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

The (THCME) Medical Biochemistry Page. [http://themedicalbiochemistrypage.org/]. Marks, R. *Basic Science Educator*. 1999; 9 (1-2): 43. This site was formerly known as The THCME Medical Biochemistry Page. It is a modified form of the original and has been peer reviewed by MedEdPortal.

CELL BIOLOGY

CELLS Alive! [http://www.cellsalive.com/index.htm]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2002; 12 (1): 3.

EMBRYOLOGY

UNSW Embryology. [http://embryology.med.unsw.edu.au/embryo.htm]. Dlugos, C. *Basic Science Educator*. 2001; 10 (1-2): 51.

HISTOLOGY

Blue Histology. [http://www.lab.anhb.uwa.edu.au/mb140/]. Boggs, B.C. *Basic Science Educator*. 2001; 10 (1-2): 48.

Dr. B's Histo Review. [http://www.lifesci.rutgers.edu/~babiarz/DrBsRev.htm]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

HISTOLOGY HOME PAGE. [http://casweb.cas.ou.edu/pbell/Histology/histo.home.html]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2005; 15 (1): 2-3.

Histology of the Periodontium. [http://www.dental.pitt.edu/informatics/periohistology/en/gu0001m.htm]. Cho, M-I. and Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

HISTOLOGY Online. [http://som.umdnj.edu/histology]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2004; 14 (2): 40.

Interactive Histology Atlas. [http://w3.ouhsc.edu/histology/]. Brondon, P. *Journal of the International Association of Medical Science Educators*. 2007; 17 (2): 76-77.

Microanatomy Web Atlas. [http://cellbio.utmb.edu/microanatomy]. Sleilati, J. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

Internet Atlas of Histology. [http://www.med.uiuc.edu/histo/medium/index.htm]. Laemle, L.K. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

The JayDoc HistoWeb. [http://www.kumc.edu/instruction/medicine/anatomy/histoweb/]. Henson, J. *Journal of the International Association of Medical Science Educators*. 2006; 16 (1): 2-3.

the Virtual Slide Box. [http://www.path.uiowa.edu/virtualslidebox/]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2004; 14 (2): 40.

the Virtual Slide Box. [http://www.path.uiowa.edu/virtualslidebox/]. Lisjak, R. *Journal of the International Association of Medical Science Educators*. 2007; 17 (2): 76-77.

Welcome to Histology at SIU SOM. [http://www.siumed.edu/~dking2/index.htm]. Glomski, C.A. *Journal of the International Association of Medical Science Educators*. 2004; 14 (2): 40.

WebMic and Companion Manual of Histology Exercises. [http://people.musc.edu/~vslide/webmic/allgspez/WebMicGenOrg.html]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2007; 17 (2): 76-77. This site can also be assessed through MedEdPortal.

HEMATOLOGY

Atlas of Hematology. [http://pathy.med.nagoya-u.ac.jp/atlas/doc/atlas.html]. Glomski, C.A. *Basic Science Educator*. 2001; 10 (1-2): 48.

ATLAS OF HEMATOLOGY. [http://www.hematologyatlas.com/]. Glomski, C.A. *Journal of the International Association of Medical Science Educators*. 2005; 15 (2): 43.

BloodLine. [http://image.bloodline.net/]. Glomski, C.A. *Basic Science Educator*. 1999; 9 (1-2): 42.

Hematocell. [http://www.med.univ-angers.fr/disciplines/lab_hema/index.shtml]. Zaki, F. *Journal of the International Association of Medical Science Educators*. 2004; 14 (2): 40.

HemoSurf: An Interactive Atlas of Hematology. [http://e-learning.studmed.unibe.ch/hemosurf_demo/Demo_E/settings.htm]. Glomski, C.A. *Basic Science Educator*. 2001; 10 (1-2): 49. Access is restricted to a demonstration version.

MICROBIOLOGY

All the Virology on the WWW. [http://www.virology.net/garryfavweb.html]. Somers, K.D. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

Malaria: An On-line Resource. [http://www.rph.wa.gov.au/malaria.html]. Buxton, B. *Journal of the International Association of Medical Science Educators*. 2003; 13 (2): 37.

Microbes.info. [http://www.microbes.info/index.html]. Booth, S.J. *Journal of the International Association of Medical Science Educators*. 2003; 13 (2): 38.

Medical Microbiology. [http://www.kcom.edu/faculty/chamberlain/index.htm#Clinical%20Cases]. Whitt, D.D. *Journal of the International Association of Medical Science Educators*. 2003; 13 (2): 37-38.

Medical Mycology. [http://www.medmicro.wisc.edu/resources/imagelib/mycology/index.html]. WaKabongo, M. *Journal of the International Association of Medical Science Educators*. 2003; 13 (2): 38.

NEUROANATOMY

Pathway Quizzes in Neuroanatomy. [http://www-medlib.med.utah.edu/kw/animations/hyperbrain/pathways/index.html]. Morgan, J.M. *Journal of the International Association of Medical Science Educators*. 2006; 16 (1): 2-3.

the whole brain Atlas. [http://www.med.harvard.edu/AANLIB/home.html]. Cohan, C.S. *Basic Science Educator*. 1999; 9 (1-2): 43.

MEDICAL NEUROSCIENCE. [http://www.lumen.luc.edu/lumen/meded/Neuro/]. Cotter, D.M. *Basic Science Educator*. 2001; 10 (1-2): 49.

Neuroscience Resource Page. [www.neuroanatomy.wisc.edu]. Koury, I. *Journal of the International Association of Medical Science Educators*. 2006; 16 (1): 2-3. The site does not appear display all possible images or videos.

Neuroscience Tutorial. [http://thalamus.wustl.edu/course/]. Foresto, C.M. *Basic Science Educator*. 2001; 10 (1-2): 50.

Promenade 'round the Cochlea. [http://www.iurc.montp.inserm.fr/cric51/audition/english/ptw/fptw.htm]. Reyes, S. *Journal of the International Association of Medical Science Educators*. 2003; 13 (1): 2-4.

Synapse Web. [http://synapse-web.org/index.asp]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2005; 15 (21): 2-3.

TEXAS TECH NEURO ATLAS. [http://www.ttuhsc.edu/som/courses/neuro/wygrt/index.html]. DelBroccolo, J. *Basic Science Educator*. 2001; 10 (1-2): 50.

ThJuland's MSers' Glen. [http://members.tripod.com/~ThJuland/]. Reed, J. *Journal of the International Association of Medical Science Educators*. 2005; 15 (1): 2-3.

WEBVISION: The Organization of the Retina and Visual System. [http://webvision.med.utah.edu/]. Slaughter, M. *Basic Science Educator*. 1999; 9 (1-2): 43-44.

PATHOLOGY

Cancer Teaching and Curriculum Enhancement in Undergraduate Medicine (CATCHUM). [http://www.catchum.utmb.edu/index.htm]. Finnerty, E.P. *Journal of the International Association of Medical Science Educators*. 2002; 12 (1): 3.

MECHANISM OF HUMAN DISEASE. [http://www.lumen.luc.edu/lumen/MedEd/Pathology/index.htm]. Shah, D. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

PATHOLOGY C601/C602 SLIDES & LABORATORY UNITS. [http://medsci.indiana.edu/c602web/602/C602web/Toc.htm]. Kanthan, R. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

peir.net: pathology education instructional resource. [http://peir.net/]. Nickerson, P. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

Renal Pathology Tutorial. [http://www.uncnephropathology.org/jennette/tutorial.htm]. Stefanick, B.K. *Journal of the International Association of Medical Science Educators*. 2003; 13 (2): 38.

The Internet Pathology Laboratory for Medical Education. [http://www-medlib.med.utah.edu/WebPath/webpath.html#MENU]. Keaney, C. *Journal of the International Association of Medical Science Educators*. 1999; 9 (1-2): 43.

Department of Pathology OnlineCase Studies. [http://path.upmc.edu/cases.html]. Panizzi, K.T.C. and Anderson, P.G. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

PHYSIOLOGY

Hypertexts for Biomedical Sciences. Pathophysiology of the Digestive System. [http://arbl.cvmbs.colostate.edu/hbooks/index.html]. Cotter, J.R. *Basic Science Educator*. 1999; 9 (1-2): 42.

RADIOLOGY

Ian Maddison's Radiology Website. [http://myweb.lsbu.ac.uk/~dirt/im0.html]. Saxena, A. *Journal of the International Association of Medical Science Educators*. 2004; 14 (1): 2-3.

Introduction to Chest Radiology. [www.med-ed.virginia.edu/courses/rad/cxr]. Wells, E.J. *Journal of the International Association of Medical Science Educators*. 2006; 16 (2): 46-47.

OTHERS

altavista Images. [http://www.altavista.com./]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2005; 15 (2): 43.

American Association of Anatomists. [http://www.anatomy.org/]. Stein, P. *Journal of the International Association of Medical Science Educators*. 2005; 15 (1): 2-3.

medicaleducation.nl. [http://medischonderwijs.nl or [http://medicaleducation.nl]. Pisarri, T. and Knoop, F. *Journal of the International Association of Medical Science Educators*. 2006; 16 (2): 46.

*e*medicine. [http://www.emedicine.com]. Andrus, S. *Journal of the International Association of Medical Science Educators*. 2005; 15 (1): 2-3.

Google Image Search. [http://images.google.com/imghp?%20hl=%20en&ie=UTF8&oe=UTF8&q]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2005; 15 (2): 44.

Google Scholar. [www.scholar.google.com]. Marusich, J. *Journal of the International Association of Medical Science Educators*. 2007; 17 (1): 3.

MedEdPORTAL. [http://services.aamc.org/jsp/mededportal/goLinkPage.do?link=home]. Cotter, J. R. *Journal of the International Association of Medical Science Educators*. 2007; 17 (1): 3-4.

Net Anatomy.com. [www.netanatomy.com]. Allen, K.C. *Journal of the International Association of Medical Science Educators*. 2006; 16 (1): 2-3. This site is only available through institutional subscription.

Picsearch. [http://www.picsearch.com/]. Cotter, J.R. *Journal of the International Association of Medical Science Educators*. 2005; 15 (2): 44.

WikipediA: The Free Encyclopedia. [http://en.wikipedia.org/wiki/Main_Page}. Aftab, Z. *Journal of the International Association of Medical Science Educators*. 2007; 17 (1): 4. This site is used by students to quickly search for background information.

LETTER TO THE EDITOR

The Medical University of South Carolina hosts the National POPS Website

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Group-based learning is a powerful educational experience, satisfactory for both students and faculty. Parker Small's POPS platform has been available for over 30 years and is widely used. The Clinical Correlation Exercises (CCE) platform is a derivative of POPS originated at the Medical University of South Carolina (MUSC), which emphasizes differential diagnosis and laboratory tests. At MUSC, the student feedback is highly positive; 90-94% of the student agree/strongly agree that "POPS and CCE are effective platforms to integrate clinical material in the Infection and Immunity course"
The POPS website (**http://etl2.library.musc.edu/pops/**) includes links to the following cases, in both Word and pdf formats (except when noted):

- AIDS
- Elderly with Pneumonia
- Hepatitis
- Immediate Hypersensitivity
- Immunodeficiency Disease
- Influenza: Serologic Diagnosis and Epidemiology
- Jaundiced Baby
- MI Sick (PDF only)
- Opportunistic Infections
- Painful Rash
- Paternity
- Tetanus Immunity
- Tuberculosis (2 versions)
- Transplantation Immunology (2 versions)

All cases can be freely downloaded and modified by the users. Users that modify cases are requested to forward an electronic copy of their version to virellag@musc.edu.

Case Writer Instructions

JIAMSE Medical Education Case Study

First – THANKS so much for agreeing to write a case for our Medical Education Case Study. This is a valuable contribution to our journal and to our readership, as they think about how to effectively work with situations in their own institutions. All in the effort to improve how we each educate ourselves and others in our medical education responsibilities.

Examples of areas that might be of interest:

1. Course director interaction with students.
2. Individual faculty interaction with curriculum office.
3. Faculty affairs office issues revolving around teaching and tenure/promotion, faculty development, etc.
4. Use of IT in teaching.
5. Student affairs issues

Our request of you is:

1. Write a description of your dilemma or interesting situation that you are interested in how others might respond. This description should end with one or a few questions that you expect responses to address. This should be about 2 pages (single space, Times New Roman, 12 font, 1inch margins on all sides).
2. If possible give a "catchy" title to the case. If not "catchy", at least give it a descriptive title. In either case try to keep the title length to about 50 characters or less.
3. Provide your name, title and institutional affiliation and location. Students and residents – please provide your year of training (i.e. MS 1, PG2, or fellow) as your titles.
4. Send your document to Kathryn.mcmahon@ttuhsc.edu.
5. Upon review of the case, if modifications are needed, send your revisions within 2 weeks of receipt.

We will ask respondents to

1. Read the case and give us their "first impression" response to the questions you pose.
2. Draft a short (3 to 4 paragraph) response to the questions posed or at least one of the questions posed in the case.

Any questions or comments can be sent to Kathryn.mcmahon@ttuhsc.edu.

Respondent Instructions

JIAMSE Medical Education Case Study

First – THANKS so much for agreeing to be a respondent for our Medical Education Case Study. This is a valuable contribution to our journal and to our readership as they think about how to effectively work with situations in their own institutions. All in the effort to improve how we each educate ourselves and others in our medical education responsibilities.

Our request of you is:

1. Read the case and give us your "first impression" response to the questions posed.
2. Draft a short (3 to 4 paragraph) response to the questions posed or at least one of the questions posed in the case.
3. Provide your name, title and institutional affiliation and location. Students and residents – please provide your year of training (i.e. MS 1, PG2, or fellow) as your titles.
4. Send your document to Kathryn.mcmahon@ttuhsc.edu within 2 weeks of receipt.

Any questions or comments can be sent to Kathryn.mcmahon@ttuhsc.edu.

INNOVATION

Increased Acceptance of Group Learning Exercises by Second Year Medical Students from 2001-2007

Laura M. Kasman, Ph.D., Gabriel Virella, M.D., Ph.D., Gene E. Burges, M.D., Ph.D.

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INTRODUCTION AND RESULTS: The MUSC medical microbiology and immunology course is an 11 credit hour, integrated, second-year course that in the 2007-2008 academic year included 36 contact hours of small group learning exercises. This represented a 20% increase in small group contact hours from 2001-2002. Small group exercises included both Patient Oriented Problem Solving (POPS) and Clinical Correlation Exercises (CCE), the increase in contact hours being entirely made up by new POPS.

Over the same period, the percentage of students who strongly agreed that small group exercises were more effective than lectures in improving retention of material increased from 59% to 77% (a 30% increase). The largest increases in student satisfaction appeared to correlate with the addition of post-tests to CCE exercises in 2006-2007, a modification suggested by students in past evaluations. Post-tests were previously only given after POPS exercises.

POPS and CCE are open-book learning exercises administered to groups of four students. The POPS format splits the information into four different packages, so that students have to share information during the activity. The CCE exercises are a derivative of POPS, originated at MUSC, which emphasize differential diagnosis and laboratory tests. Students receive identical information, including a detailed faculty-generated discussion of each case.

METHODS: From 2001-2008 approximately 35 groups of 4 students met for 15 (2001-2004) or 18 (2005-2008) two hour small group sessions over the 15 week course. Fourteen faculty in 7 classrooms facilitated student groups and administered post-tests. Students were allowed to form groups of their choosing, but student groups and faculty facilitators were constant for the duration of the course. Attendance was mandatory. Post-tests were 10-14 question computer-graded quizzes. Students were provided with explanatory answer keys immediately after each quiz. Quiz grades were recorded, but were mostly used for student self-assessment. Student assessment of the course was by PACE or E-value web-based course evaluation (response rate >90%).

CONCLUSIONS: The data suggest a general increase in satisfaction with group learning techniques among second-year medical students over the past 6 years, which may have been enhanced by addition of

post-tests with immediate feedback at the end of all exercises.

RESOURCES:

National POPS Website:
http://etl2.library.musc.edu/pops/med_ed/mededportal_pops.doc

National CCE Website
http://etl2.library.musc.edu/pops/med_ed/mededportal_cce.doc

INNOVATION

Saving time with PBL?

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Small group teaching, and problem-based learning (PBL) in particular, demands greater time from faculty than a lecture format, but rewards active learning for development of clinical reasoning skills. How can faculty time be used judiciously, and still retain a small group format? We instituted an integrative PBL model at the end of the 2nd year curriculum that combined faculty, subject material, quiz and examination items, as well as contact hours across 3 existing courses. Each course previously had its own small group sessions. Time was saved with fewer faculty development sessions, substitution of wrap-up sessions for small group hours, and by having students work on their own for a two hour session without faculty facilitators. There was a 56% reduction in faculty time required with the integrative format. Student adherence to goals of the sessions were enforced through required attendance, quizzes that covered the content of the sessions, randomly calling on students during wrap-up sessions to discuss the findings, and having each small group compose a summary of their findings for each session. The students were engaged, as reported by faculty facilitators, the faculty were enthusiastic, students called on in wrap-up session gave excellent responses, and ratings from student evaluations were equivalent to those of other small groups for the whole year. This integrative format had advantages through placement at the end of the 2nd year: this wasn't the first PBL session of the year and students were familiar with the format, the knowledge base of students was considerable, and there was a core of faculty already assigned to small group teaching. Through integration, the small group size went down (7 to 8 students per group, instead of 8 to 10 in existing courses), and in the student-run session the student roles were sometimes different from those with faculty present – some students became more active participants. The major disadvantages of this format included coordinating schedules of faculty from multiple departments, providing multiple faculty review sessions given by development person because of irregular faculty schedules, and course directors other than the lead author made little attempt to familiarize themselves with wrap-up format.

INNOVATION

Strategy to Help Medical Students Learn Biochemistry Despite Course Structural Problems

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Our Medical Biochemistry course is a compact, primarily lecture-based course. There are four instructors in the course, each with different teaching styles, emphases and goals. The high density of lectures causes a problem for students who do not adopt strong study habits from the outset of the course since there is no opportunity to catch up. Additionally, the very distinct teaching styles of the participating faculty leave many students frustrated and confused about how and what they should be studying. After trying various strategies with mixed success over the past several years, we have recently implemented a tool that helps to solve both of these problems. The course director worked with the other teaching faculty to write a set of USMLE-format quiz questions that cover key concepts from each lecture. After one or a small set of lectures has been presented, a 5-10 question quiz is released on the course WebCT site. Students have 3 days to complete each open-book quiz. They are encouraged to consult other students and use reference materials. In the spirit of self-assessment, students may re-submit the answers once to improve their score. The WebCT program is set for timed access to the quizzes and manages the grades. The 41 quizzes (317 total questions) count for a total of 10% of the course grade, enough to engage the attention of the students. As the course progresses the quiz questions become progressively more complex, building on previous material. The frequency and progressive nature of the quizzes encourage students to adhere to a more optimal study schedule and to retain previous concepts. These quizzes have increased consistency throughout the course and have helped to focus attention on the key objectives of the more complex lectures. All of the students participated and achieved an average cumulative quiz score of 93%. The vast majority of students reported that the quizzes were very (85%) or moderately (10%) helpful. Importantly, the mean on the comprehensive final exam increased 11% compared to that on a similar exam given the two previous years.

MEDICAL EDUCATION CASE STUDY

Is it Learning or is it a Prelude to Cheating?

Case Writers

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As I (Associate Dean, Curriculum Development) was sitting in my office pouring through hundreds of e-mails, a faculty member stopped in to express concerns over the students copying material from the tests. "You've got to do something about this!" he exclaimed. I sighed, and casually walked to the rear of the classroom to observe what was going on. Sure, enough, several students had their head buried in the test papers, busily typing away on their computers in what looked very much like: Question stem, response option A, response option B, etc. They were not engaged in any of the discussions going on around them – just typing. I came up behind one student who quickly put a piece of paper over his screen. Hmm, I thought, that seem a bit suspicious. As I neared another student, I reminded the class loudly – "Only key points not the full questions." The faculty member and I walked out again, and I was reminded that I had talked to the class once before. What was I going to do now, he asked?

Duke-National University of Singapore Graduate Medical School (Duke-NUS) is a new medical school in Singapore, based on the Duke University Medical School curriculum. One major difference between Duke-NUS and Duke in Durham, North Carolina, is that the first year of basic science instruction is delivered almost exclusively using team-based learning (TBL). [1,2] Our first class began in August 2007. This was the first time that we (faculty and administration) had used TBL in such a comprehensive way; we all had much to learn surrounding the development, implementation, and impact of our decisions on the design and execution of TBL – but that is another story. The story I would like to relate to you in this case presentation is about student note-taking surrounding the test questions from TBL sessions. I will relay what happened, how we handled it and pose several questions for the reviewers and readers to ponder and if possible to respond to.

TBL Model

Our implementation of TBL is comprised of the typical components (Figure 1).

1) Pre-preparation by students: they study the faculty guided information needed to participate fully in the TBL session.
2) Individual Readiness Assurance Test (IRAT): holding students accountable for their preparation.
3) Group Readiness Assurance Test (GRAT): Students repeat the IRAT as a team.
4) Following GRAT, the faculty briefly review the IRAT/GRAT results and plan their discussion points, while students use this time to discuss the GRAT questions with their group with open resources.
5) Following the closure to the IRAT/GRAT session, we distribute the application questions – where the students need to apply the information they have just discussed.
6) After the application debate/discussions, the teams usually begin to work on their appeals, if any.

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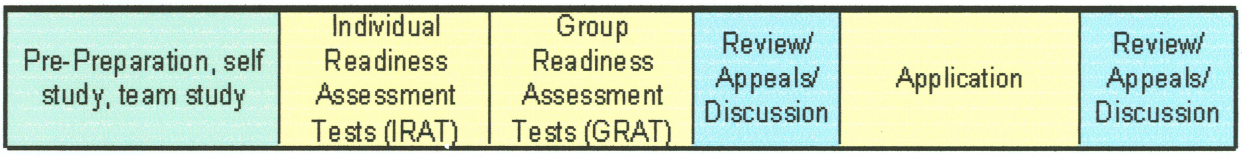
Figure 1. Typical Team-Based Learning (TBL) Structure.



The yellow sections (IRAT/GRAT/Application) are where students receive and discuss questions within their teams. The blue sections (Review/Appeals/Discussion) are where students have time to review with teams with open resources after answers are available, write their appeals, and discuss further. It is this time that is often used to make notes about the core concepts discussed during the TBL session.

Writing Test Questions

As anyone who has developed a test knows, it requires significant effort to create quality multiple choice questions (MCQ). It is just as important for TBL session. In addition, since students work with each question quite closely (individually and in group) to analyze and collectively choose answers, ample opportunity exists for students to copy questions. Plus, the learning/study culture for students the world over is to obtain and memorize old test questions. "Is it on the test?" is the universal question. So, having such unfettered access to test questions is a novelty and temptation. When we tried to collect the material at the end of each session, they wanted more time to take notes from the questions to use to study for the summative tests that would follow later in the course.

The concern from the faculty was "Would these notes on the TBL questions be shared with future classes and would that impact on students' learning?" If future classes knew the questions ahead of time, would they just memorize those answers to get points, and not have done the work to really understand the information? Plus, re-writing questions every year can be an onerous task given the number needed for TBL. For example, the first 6-week course had 13 TBL sessions. Each session had approximately 18 IRAT/GRAT questions, 10 Application questions, for close to 340 questions. In addition, there were 3 summative exams with 80 questions each. That is over 580 questions to re-write for one course.

The challenge and actions taken

As the first block progressed, faculty reported that students were using the extra time available to copy questions rather than participate in group discussion. After much debate among the faculty, we told the class:

- No copying of test items.
- Use extra time for group discussions surrounding questions for enhanced learning
- If you must take notes about the items – focus on key concepts, not typing what looks like stem and 4 response items.
- We believed copying of the questions verbatim would NOT help them understand the core concepts nor assist them with preparation for future tests.
- And, lastly, we strongly believed that the process each individual and group goes through to study the preparatory material, struggle to answer the questions, and collaborate and learn with their group was part of the power of this learning experience. The learning experience during the group discussions would be greatly diminished if students spent the time copying questions. It also would give rise to the ability of upper classmates to give the questions to the next class, thus robbing them of similar learning opportunities. We acknowledged taking notes about the concepts to assist future study was understandable, but copying the questions verbatim was not appropriate and would be considered a violation of the honor code if seen.

Our mandate to the students was hindered by the "appeals" process within TBL. Teams are permitted to write an appeal on questions if they felt they could make a cogent argument as to why they chose the answer they did. However, in order to write the appeal the students felt they needed to copy down the questions to get the exact syntax and nuances of the response options. This of course, went against our request to not copy questions. We thought we solved that problem by having teams write the question on the back of the appeal form, and turn in the appeal and question together, if necessary.

During the next module, the faculty noted again that several students appeared to be copying questions. Feeling as though our point was not made strong enough, we told the class that we were disappointed and felt that this was *possibly* an honor code violation. We would set up an

honor code panel to discuss the situation and implications. The student leaders of the class provided a compassionate response, suggesting that what might have looked like copying might have been just note-taking. They wanted guidance on how to take notes, as perhaps the message was not clear to everyone. As a class they promised not to share their notes to the new classes, and if anyone did so, they recommended that person should be expelled.

Moved by their plea, the dean felt that the students were genuinely trying to learn the best they knew how, and recommended that a task force be set up instead to look at the student's response and to better understand the learning environment that created such a need to copy test questions verbatim. We learned some very interesting things at the task force meeting:

- We found that the student body was hurt and perhaps even wounded that we had attacked their integrity.
- Some students felt that because of our stance on copying, many of them stopped taking any notes during the team activities – for fear they would be viewed as breaking the honor code. (Ironically, there appeared to be no decline in performance even without any note-taking.)
- They also wanted to let us know their intent was honorable and that they were just trying to take notes and learn in the best manner possible.
- Some of the faculty, who had been initially so concerned about the copying, began to see the value of learning the best one can, and became less concerned about the actual copying within the class as long as the student body, as a whole, agreed that they would not share specific content information from the team sessions.
- The students wanted some more explicit guidance on what they could and could not copy and how to communicate with the subsequent classes how to best prepare for the TBL sessions.

The recommendations from the taskforce were that:

- We wanted to establish a culture in our school that allowed for a trusting relationship between our students and our faculty.
- Students could take notes in any fashion they desired.
- Students were to think of their role as teachers for the subsequent classes, thus just as a faculty member might, they can work with the under-classmates on learning/understanding concepts but not sharing specific questions.
- An honor code statement has been put on all test materials that states that any notes taken from this material are for the individual student only. It would become an honor code violation if the individual should share this test information with another student, or if they knew of anyone else sharing/receiving test information and failed to report it.
- Faculty were encouraged to prepare key summary points from the sessions to ensure students knew what is important to take from the session.
- In addition, faculty were encouraged to make minor modifications to some of the test items each year. (We now recognize this occurs naturally during the discussion phases; the faculty see how questions could be improved and enhanced.)

Our Questions and Concerns

Our subsequent classes and new faculty will no doubt have similar issues, and questions, about our culture of learning. How do we avoid this becoming an issue each year? Or will we have to go through this painful process each year with both faculty and staff to emphasize the values and the core issues?

Does it really matter if questions are passed down from class to class as long as the sessions are well facilitated? Part of the dynamic nature of the TBL process is that students are expected to defend their choices – not just show the answer. If that is done well, and the students use their groups to help them understand why the answers are correct – would it really matter if they had the questions (and answers) ahead of time? We do expect our faculty to make minor changes to items each year and believe the team-based learning process engages the students sufficiently that learning is enhanced – with or without them knowing the "specific" answer.

Do we trust the classes on their honor – or are we just being naïve that students will not share given the intense pressure to score high on all exams and the local cultural beliefs associated with failure? (It should be noted that we had a small, intimate inaugural class of 26 students; they had no upper classmates who could advise them of what works and what did not, what struggles they had experienced and survived; and the cost of "dishonor" is very high in this Asian culture and close-knit small society. Losing the ability to complete their MD degree would be costly here, as there are no other viable options). Does having a reminder about the policy on all test materials make a difference?

Student Response

As a second year medical student, I feel that the issue of trust between students and faculty is of utmost importance. When a school decides to accept a student into its medical training program, the admissions committee should actively seek out students whose past records and reference letters indicate a history of trustworthiness. The practice of medicine requires individuals whom patients and colleagues alike can trust and I feel that this personality trait is present in most medical students. In order to facilitate positive relationships between faculty and students, faculty members need to give the benefit of

the doubt to their students in matters of trust until a particular student proves that he or she is not able to be trusted. I think a simple introduction to the course that outlines expectations as well as what is and is not appropriate, perhaps including examples of situations that came up during the inaugural year, would go a long way in acquainting new classes and faculty with the values and core issues at stake during TBL.

If students in the TBL setting agree not to share test material with subsequent classes, faculty members need to trust their word. I do believe that having an honor statement which students must sign on every test serves as a reminder to students of their previous pledges. That being said, I completely understand the view of the faculty in not wanting to let one bad apple ruin the whole bunch. If just one student fails to maintain the trust relationship, the entire incoming class could receive the questions and answers ahead of time and faculty would be stuck in the position of having to rework the course and write a vast amount of new questions.

I participated in a similar TBL course during my first year of medical school and enjoyed the opportunity to discuss problems with my peers in a dynamic setting. The chance to listen to another student's thought process from start to finish was invaluable and helped me to expand the methods I use to approach problems. I think that coming up with a solution as a group and having to defend that solution is the most beneficial aspect of TBL and could possibly be harmed from students having concrete answers ahead of time. If students know what the answer should be, they may be less likely to explore why other answers are wrong and more inclined to focus only on why the right answer is correct. On the other hand, I do not believe that allowing students to take notes in order to learn in a personally efficient manner necessarily equates with passing the information along to subsequent classes, especially if directly cautioned against. As a medical student, I have never felt compelled, in any course, to give my juniors information about specific test questions nor have I asked members of the class above me for that type of data. Rather, the most frequently discussed questions among students from different classes revolve around which topics are most important to know and which seem to be less so.

If the faculty are truly concerned about students not adhering to the honor policy, then proactive steps, such as faculty preparing key summary points for the students as suggested by the task force in the article, should be taken whenever possible rather than automatically assuming students will cheat if given the opportunity. In conclusion, medical students should be trusted on their honor and should be called upon to uphold their end of the trust relationship; simultaneously, faculty should safeguard their own time and energy invested in the TBL course and its questions by removing any obvious temptation to cheat.

Faculty Response

My first impression was that once you decided on a policy of no copying of the test questions, that any copying would be an honor code violation.

Your recommendations from the task force seem very reasonable. However, I would still be concerned that the summative test at the end of the course work is just too strong an inducement to copy test questions. How much is that test worth? Is the RAT worth much less? If so, there is an incentive for the students to copy. On the other hand, if the RAT is worth an equal or greater part of the course grade as the summative exam at the end, there is less incentive to copy those questions. It seems that the process should be reviewed each year and made a part of the discussions on professionalism that should be held at the start of medical education.

I think that it does matter that questions get passed down from class to class. Of course, if your faculty don't mind tweaking them, I suppose it would be ok. I've used the same or very similar questions for a few years and I don't think that the students are copying. But, I don't have a high stakes summative exam. If your goal on the RATs is readiness assurance, they ought to be secure or behind the honor code (as mine are).

Administrator Response

First of all: The Duke/NUS program leadership is to be commended for embarking upon several uncharted waters of starting a medical school with a learning strategy for its curriculum that is novel. We all await their continued publication of what they have done.

One of the great things about starting a 'new' school is that the students and faculty can forge a culture that supports active learning, inquiry, and an a code of honor and integrity that endures through successive classes and transitions of faculty. Dr. Cook wonders if they must go through a process every year with students about the protection of questions. I don't think so, if they instill a value system that begins with a discussion about honor and integrity right from the admissions process; students, as they progress through the four years will take on this value system and insure that subsequent classes maintain the tradition. An Honor Code and signing of an Oath of Honor becomes the shining milestone in the transition from 'regular person' to a physician-in-training. It will not even be a question – Can students pass on questions to the next class?

From my and our experience, it is best for our questions in TBL to be fresh for students in a module. Familiarity with detailed objectives is fine, but the most powerful learning occurs with good questions and having to make judgments and choices. It may work that a class of students 'keeps' questions for outside class study, but they must value them so highly that they are not transmitted to subsequent

classes. It is way too much to ask faculty to craft new and thought-provoking questions every year. Yes, every year they need to come up with new ones, better ones based on student feedback. But, the culture for a curriculum with TBL needs to treasure each module. Student will benefit greatly from both the process of defining a tradition of honor and then practicing it daily.

Respondents

1. Student Respondent – Emily Krennerich, MS2, University of Texas Medical School at Houston, Houston, TX
2. Faculty Respondent – Dan Mayer, M.D., Professor of Emergency Medicine, Albany Medical College
3. Dean Respondent – Dean Parmelee, M.D., Associate Dean for Academic Affairs, Wright State University Boonshoft School of Medicine, Dayton, OH

REFERENCES

1. Michealsen, L.K, Knight, A.P and Fink, L.D. Team based learning: A transformative use of the small groups in college teaching, *Sterling, VA: Stylus Publishing*, 2004.
2. Michaelsen, L.K, Parmelee, D.X, McMahon, K.K and Levine, R.E. Team-based learning for health professions education: A guide to using small groups for improving learning. *Sterling, VA: Stylus Publishing*, 2007.

SHORT COMMUNICATION

Evaluating the Teaching-Learning Methodology of the Gross Anatomy Course at San Juan Bautista School of Medicine

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ABSTRACT

This is the first time that assessment tests were applied at the San Juan Bautista School of Medicine in the Gross Anatomy course. The results showed that our teaching/learning methodology was adequate, effective in enhancing performance by the students, and helped to analyze their outcomes at the individual course level.

Assessment is an important and useful tool to examine and enhance the effectiveness of teaching and learning by medical students.[1, 2] This tool has also been developed to assure quality in training programs in other Medical Schools.[3] In the United States, a unique examination, the United States Medical Licensing Examination (USMLE), is used to assess the ability of the medical student to apply knowledge and concepts to patient care.[4] The Anatomy Department of the San Juan Bautista School of Medicine, conscious of the importance of preparing the students in the core courses, to assure that their performance as physicians should be in concordance with their performance in the USMLE examinations, has added assessment, consisting of 40 multiple choice questions and case studies, in the Gross Anatomy course. The purpose of this assessment process is to determine how students are learning and then use this information to bring beneficial changes, if necessary, into the teaching and learning processes.[4, 5] The Gross Anatomy course is offered during the first semester to the first year medical students. The learning objectives are stated in the corresponding syllabus, and include: 1) gross anatomy of the upper/lower extremities, back, head/neck, thorax/ abdomen, pelvis/perineum ; 2) developmental anatomy ; 3) clinical case presentations ; 4) radiological anatomy throughout the course ; 5) and dissection of human cadavers. Teaching strategies include; lectures, conferences, clinical correlations, quizzes, written and practical exams, portfolios, discussion of radiological images, and laboratory dissection of the cadavers (for which students are grouped 8-9 students/group). After the lecture periods, the students work in the laboratory dissecting cadavers. The dissection groups are heterogeneous with many of the students possessing professional degrees while others are direct graduates from undergraduate college. This diversity presents challenges to working harmoniously in the anatomy laboratory. The faculty participates with the students in the dissection, an activity which permits the professor to observe and analyze student work and which also helps the students to overcome challenges presented by the group diversity. It is the faculty responsibility to assure that the students receive the correct instruction and to evaluate if the department was using the correct teaching methodology to help them acquire the requisite knowledge.

To enhance evaluation, the assessment tests were administered to 39 first year medical students at three intervals: formative pre-test, on the first day of class; formative mid-term after the topics on upper extremity/ thorax, and abdomen/pelvis were covered; and a summative test towards the end of the semester in which head/neck, lower extremity and perineum were completed. The data obtained from the pre-test was used as the basis for comparison with the other assessment tests. The data was analyzed using one analysis of variance (Sigma Stat 3.1).

After the topics of upper extremity/thorax were covered and tested in class, based on the results , two important

strategies were added: 1) Tutorial Program (a formal peer-driven program established at the institution); and 2) providing laboratory time for dissection after class hours. Following the initiation of these new strategies, the students were tested on the mid-term exam and the results showed significant improvement in all areas, when compared to the pre-test.

The material covered in the Gross Anatomy course especially in the upper extremity area is extensive and difficult for a new student to acquire. The abdomen and pelvis areas were evaluated separately comparing the pre-test and mid-term assessment; and showed an increase of 40% in correct answers. This confirms that the introduced changes to the teaching methodology, i.e. the tutorial program and extension of laboratory hours, as well as the program of assessment optimized the subsequent performance of the students.

Based on the final grades of the course, grades of the assessment tests, and Shelf Examination grades, reported as percentage correct, with a letter grade, and percentile rank (which compares our students to others nationwide), it can be concluded that the teaching/learning methodologies used in the Gross Anatomy course have been effective in the learning process of the students. It also shows that specific classroom assessment is valuable in analyzing the outcomes of the students at the individual course level. Adding the new strategies after the first exam enhanced the performance of the students, and suggested that the course sequence could be successfully modified. There is a limitation in comparing the regional anatomical areas of our assessment test with those seen on the Anatomy shelf examination, because the shelf does not include specific anatomy areas covered.

Based on the results of the present study, the Anatomy Department will modify the course sequence and incorporate the new instructional changes for all classes in the future.

REFERENCES

1. Framework for Outcomes Assessment. *Middle State Commission on Higher Education,* Philadelphia. 2000; 1-18.
2. Case, S., Swanson, D., Constructing Written Test Questions For the Basic and Clinical Sciences. *National Board of Medical Examiners, Philadelphia,* 3rd Edition, 2002; 9-12.
3. Shumway, J., Harden, R. The Assessment of Learning Outcomes. *Education Guide, Association for Medical Education in Europe.2003;* 7-19.
4. Karle, H., Nystrup, J. Evaluation of Medical Specialist Training: Assessment of Individuals and Accreditation of Institutions. *Occasional Paper. Association for Medical Education in Europe.* 2003; 3-7
5. Boston, C. The concept of formative assessment. *Practical Assessment, Research and Evaluation.* 2002; PAREonline.net/getvn.

The Impact of Online Lecture Recordings on Learning Outcomes in Pharmacology

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ABSTRACT

Interactive and/or active approaches to learning are known to be associated with better outcomes for the student. Increasingly, lecture recordings can be accessed online and offer irresistible convenience, particularly to students. In Pharmacology, the use of online lecture recordings via Lectopia was designed to provide an adjunct for revision and clarification. The introduction of Lectopia in second year Pharmacology was associated with a marked decrease in lecture attendance and an apparent increase in the failure rate. Therefore, the impact of Lectopia on learning outcomes was examined using an online, voluntary survey. Of the 295 students enrolled during the course of this study, 86% completed the survey. Students were sorted into three groups, depending on whether they usually attended both, one or no lectures per week. Students who reported they usually did not attend any lectures had a significantly lower mark in continuous summative assessments than students who attended both or one lecture per week ($p<0.03$). Students who usually used Lectopia instead of attending lectures scored significantly lower marks in continuous summative assessments, exam and the final mark compared with students who did not do so ($p<0.05$). The major reasons cited for using Lectopia were revision, clarification, timetable clashes and missed lectures. Interestingly, females performed better than males, provided they usually attended both lectures per week and did not use Lectopia instead of attending lectures. Attendance at lectures appears important for achievement of learning outcomes in second year Pharmacology. The use of online lectures as a replacement for face-to-face lectures may be inappropriate in the biological sciences which require in-depth understanding of mechanistic and fundamental concepts.

INTRODUCTION

Interactive and/or active approaches to learning continue to be associated with better learning outcomes even through this era of e-Learning[1]. Although the unfulfilled early promise of e-Learning is now being challenged in medical education[2] the convenience it offers to students, teachers, and institutional managers is overwhelming. For example, it is tempting to refer students to online recordings of lectures in cases where lecture theatres are overcrowded. Perhaps we should now be more discerning as to the role of online approaches so that they are tailored for student cohort characteristics (for example undergraduate vs graduate), course types (for example science vs medical/dental) as well as individual learner characteristics (including learning styles and cognitive approaches)[3, 4].

Lectopia was developed in the Arts Multimedia Centre, University of Western Australia (UWA) to provide flexibility in teaching and learning[5] and allows students to access lecture recordings online at their convenience. Surveys conducted by the Arts Multimedia Centre report that students use Lectopia to access lecture recordings online for a number of reasons: to revise and clarify lecture material; to manage timetable clashes and missed lectures; to balance work and/or family commitments with study demands; to address difficulties in attending face-to-face lectures due to time taken to travel to and from university or

residing in a regional area. Some students simply preferred to use Lectopia rather than attend face-to-face lectures[6].

Online lecture recordings via Lectopia have been used in second year Pharmacology teaching at UWA since 2005. Thus, audio recordings are made automatically and streamed over the web via an enrolment-limited login access. In fact, Lectopia now supports learning and teaching university-wide including all Pharmacology teaching. From a teaching perspective, the intention in the Pharmacology programme was not to replace face-to-face lectures with Lectopia, but rather to provide an additional tool for students to access lecture material for revision and clarification. However, online lecture recordings might also be used to compensate for large class sizes and timetable clashes. The present study considers the impact of the availability of online lecture recordings on both the educational environment and learning outcomes in second year Pharmacology.

The use of Lectopia and other online lecture services has increased due to overwhelming support from students. Given their age, second year Pharmacology students are likely to embrace Lectopia technology as part of a learning strategy at university, without necessarily considering its potential pitfalls. Historically, no more than 3-4% of students failed these units. Since the introduction of Lectopia, the failure rate has increased, perhaps coincidentally, to approximately 10%. While many reasons might account for this, does the drop in lecture attendance and/or Lectopia availability contribute to poorer learning outcomes in Pharmacology? By choosing not to attend lectures, perhaps students forego networking opportunities, teacher/student engagement and the full face-to-face lecture experience which are an important component of learning and scholarship at university[7].

METHODS

Course structure and assessment

In second year Pharmacology, there are two lectures a week and several laboratory sessions in each semester. Continuous summative assessments are held during the semester and the material covered in these assessments is directly linked to lecture material, which may be accessed online. Attendance at laboratory sessions is compulsory and students submit a report to obtain credit for each session. Laboratory sessions are not recorded using Lectopia. There is, however, some overlap between concepts covered in lectures and laboratories. The exam mainly covers material presented in lectures, although laboratory-based material may also be examined. Thus, assessment in second year Pharmacology includes laboratories, summative assessments, an exam and an aggregate final mark for the semester. With respect to student grades, 50 – 59% corresponds to a pass; 60 – 69% a credit; 70 – 79% a distinction and 80 – 100% a high distinction.

Student survey

Ethical approval for this study was obtained from the Human Research Ethics Committee, University of Western Australia. This project complies with the National Statement on Ethical Conduct in Human Research (2007) by the National Health and Research Council (NHMRC) of Australia[8].

An online, voluntary survey (shown in Table 1) was used to evaluate the impact of Lectopia on learning outcomes among second year Pharmacology students. Students were informed that the survey was not anonymous since student feedback would be linked to their performance in the course. Only the Chief Investigator had access to the database containing student names, numbers and responses to this survey. Hence, the level of confidentiality with respect to this database was greater than that used for student marks where administrative, examination and other university officers also have access to student marks. Student names were removed prior to statistical analysis. Student numbers were linked to learning outcomes for the purpose of analysis. Data obtained in this study was only analysed following ratification of student marks by the Board of Examiners.

Table 2 shows the response rate and gender proportions of the survey population. The survey instrument (Table 1), was designed to capture the student face-to-face attendance, their use of online lecture recordings and the reasons for their declared activity.

Statistical analyses

Assessment outcomes for each semester included laboratory reports, continuous summative assessments, exam and the final mark. Students were categorised into those who attended 0, 1 or 2 lectures per week and assessment outcomes were compared among these groups using one-way analysis of variance and *post-hoc* pairwise comparisons with Bonferroni adjustment. Students were also grouped into those who used Lectopia instead of attending lectures 0, 1 or 2 times per week and assessment outcomes were compared among these three groups (one-way analysis of variance with *post-hoc* Bonferroni-adjusted pairwise comparisons).

Lecture attendance and the use of Lectopia instead of attending lectures were compared between genders using the Pearson Chi-square test of equal frequencies. Student marks obtained in various assessments were compared between genders using Students' t-test.

Statistical analyses were conducted using SPSS 15.0.0 for Windows (SPSS Incorporated, Chicago, IL). The criterion for significance was $p<0.05$ and comparisons yielding $p<0.1$ are reported here as trends.

Table 1. Survey instrument

Please indicate your gender	Male	Female	
As regards your weekly frequency of attending lectures or using Lectopia instead of attending lectures, please check the appropriate value: 1. I usually attend Pharmacology lectures per week 2. I usually use Lectopia **INSTEAD OF** attending Pharmacology lectures per week	None None	Once Once	Twice Twice
Please type your responses to the following question. Do you use Lectopia? If so, what are the main reasons you use Lectopia?			

Table 2. Response rate and gender proportions of the survey population

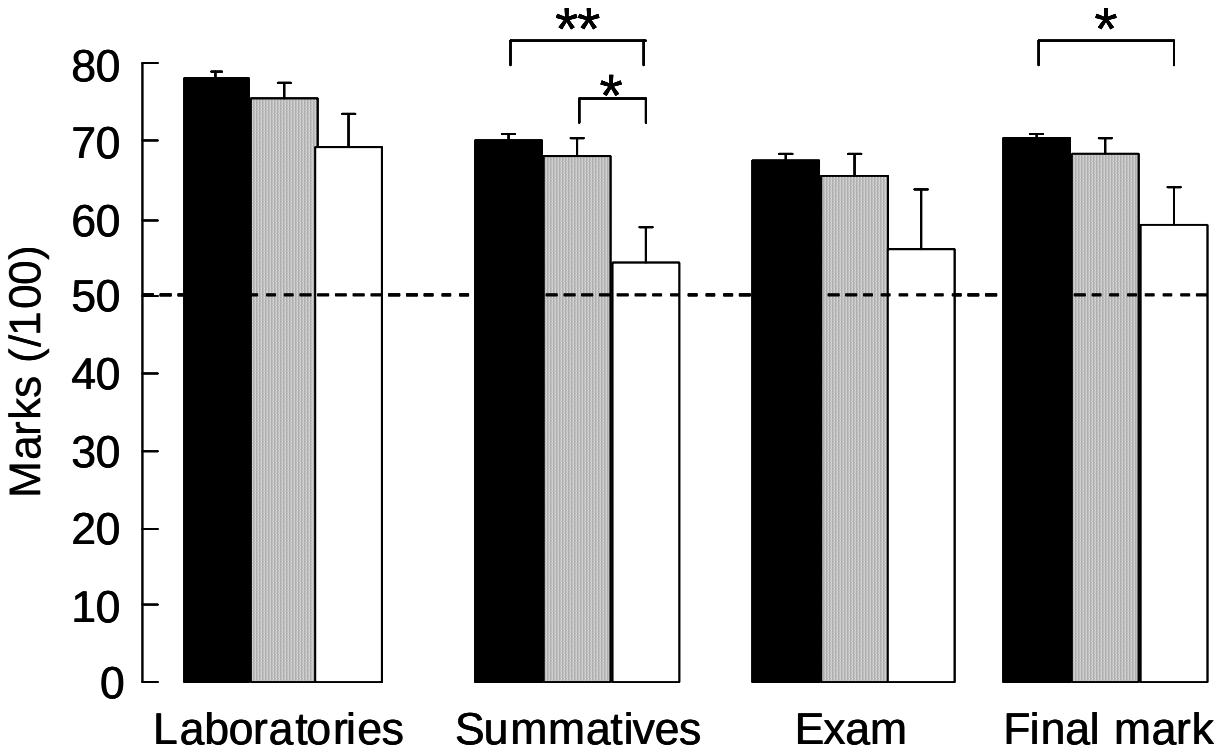
	Number and (proportion)	**Females (%)**	**Males (%)**
Enrolled students	295 (100%)	59	41
Survey respondents	254 (86%)	60	40

RESULTS

Impact of lecture attendance

Students were sorted into three groups, depending on whether they reported that they usually attended two, one or no lectures per week (Figure 1). The general trend observed for marks from laboratories, summative assessments, exam and the final mark was that the more lectures the student attended each week, the higher the mark. There was no significant difference between marks obtained in laboratories by the three groups of students. However, the trend seen with laboratory marks suggests that weaker-performing students might be less likely to attend lectures ($p<0.1$). Non-attendance at lectures was associated with lower marks in continuous summative assessments held during the semester. Students who reported that they usually did not attend lectures had a significantly lower mark than students who attended both lectures (no lectures: 54.1 $\pm$ 4.5%, both lectures: 69.8 $\pm$ 0.9%; $p<0.003$, Figure 1). There was also a significant difference between marks obtained by students who did not attend any lectures and those who usually attended one lecture per week (no lectures: 54.1 $\pm$ 4.5%, one lecture: 68 $\pm$ 2.1%; $p<0.03$, Figure 1). Indeed, on average, students who attended both or one lecture(s) per week obtained a credit mark (69.8 $\pm$ 0.9% and 68.0 $\pm$ 2.1%, respectively), while students who did not attend lectures obtained a pass mark (54.1 $\pm$ 4.5%) with respect to summative assessments. While there tended to be a trend for lower exam marks in the group who usually did not attend lectures, this failed to achieve significance (no lectures: 56 $\pm$ 7.6%, both lectures: 67.3 $\pm$ 1.0%; $p<0.1$). Non-attendance at

Figure 1. Effect of lecture attendance on student marks



Effect of lecture attendance of student marks. Data for students who usually attended two (■), one (▨) or no (□) lectures per week are indicated. The dashed line indicates the pass mark (50%). Data are expressed as mean ± standard error of the mean, n = 8 - 190. * indicates $p<0.03$ and ** indicates $p<0.003$.

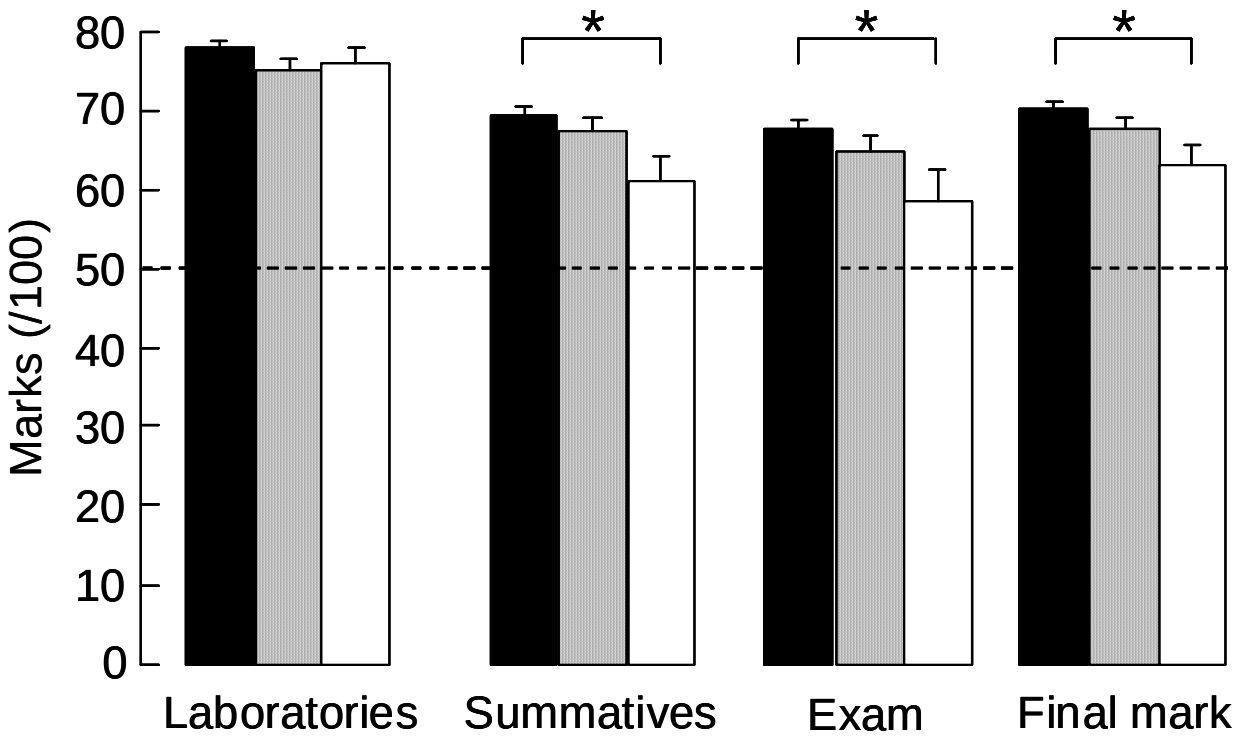
lectures was associated with a significantly lower final mark compared with the group who attended both lectures per week (58.9 ± 4.8%; 70.1 ± 0.8% respectively; $p<0.03$). Thus, on average, students who attended both lectures obtained an overall distinction while students who did not attend lectures obtained a pass mark in the unit.

Impact of using Lectopia instead of attending lectures

Students were divided into three groups depending on how many times per week they usually used Lectopia instead of attending lectures (Figure 2). Whether or not Lectopia was used instead of attending lectures was not associated with any significant change in laboratory marks. Since laboratory sessions were not recorded using Lectopia, this suggests that these groups were similar with respect to their ability to write laboratory reports. However, there was a general trend observed for marks obtained in summative assessments, exam and the final mark such that the more often Lectopia was used instead of attending lectures, the lower the marks obtained. Importantly, using Lectopia instead of attending both lectures per week was associated with significantly lower marks in summative assessments, exam and the final mark compared with not using Lectopia instead of attending lectures (using Lectopia instead of attending both lectures: 61.4 ± 2.7%, 58.6 ± 3.9% and 63.0 ± 2.7%, not using Lectopia instead of attending lectures: 69.5 ± 1.1%, 67.7 ± 1.2% and 70.3 ± 0.9% respectively; $p<0.05$, Figure 2).

Student comments regarding Lectopia use

Figure 2. Effect on student marks of using Lectopia instead of attending lectures

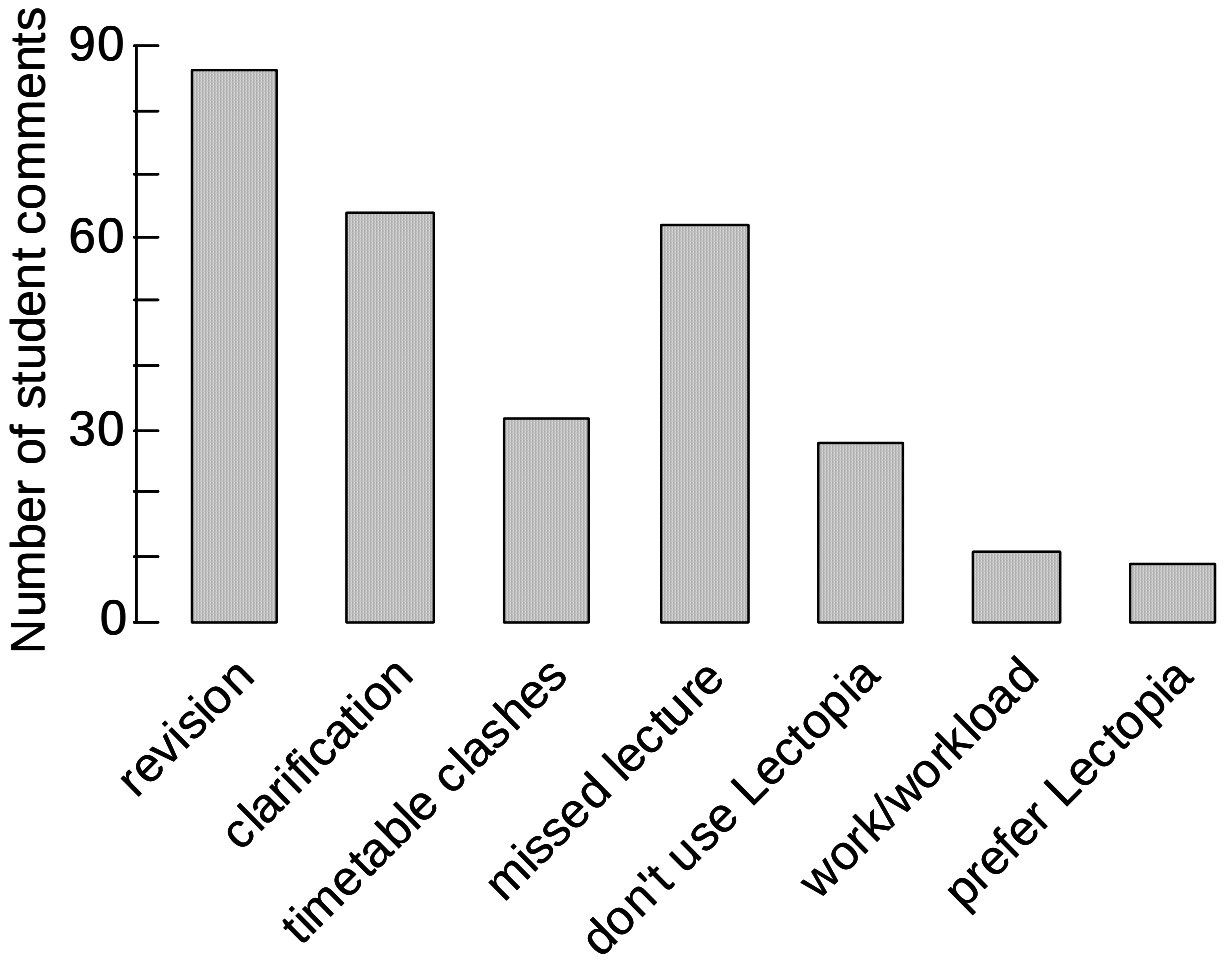


Effect on student marks of using Lectopia instead of attending lectures. Data for students who did not use Lectopia instead of attending lectures are indicated (■). Data for students who usually used Lectopia instead of attending one (▨) or both (□) lectures per week are also indicated. The dashed line indicates the pass mark (50%). Data are expressed as mean ± standard error of the mean, n = 18 - 141. * indicates $p<0.05$.

Student comments regarding their use of Lectopia were categorised into: revision; clarification; timetable clashes; missed lecture; don't use Lectopia; work/workload; prefer Lectopia (Figure 3). Some students listed more than one reason for using Lectopia, providing a total of 292 items. The major reasons reported for using Lectopia were for revision and clarification of lecture material. As expected, timetable clashes were an issue and often cited as a reason for using Lectopia. The issue of timetable clashes is currently a significant one at this university. Students who enrol in combined degrees as well as units of study at different year levels often have timetable clashes. The number and proportion of students who reported timetable clashes as an issue varied from one semester to another. Since recordings of their Pharmacology lecture were available online, students may therefore have been implicitly encouraged not to attend their conflicting Pharmacology lectures. Furthermore, where another unit had repeat lectures or practical sessions such that it would be possible to avoid timetable clashes, students may have selected time slots that clashed with Pharmacology lectures. Since Pharmacology lectures were recorded on Lectopia, there appears to have been a perception by such students that this would save time. Students also used Lectopia if they missed a lecture for other reasons. During the course of this study there seemed to be an increase in the proportion of students who reported using Lectopia for this reason. Students who may have become more familiar with and reliant on Lectopia may have been inclined to miss lectures and depend on Lectopia instead. Thus, Lectopia appears to have provided a convenient contingency such that missing a lecture was seen as less of an issue by students than if this service was

unavailable. Some students reported that they did not use Lectopia. A small number of students reported using Lectopia due to work or workload issues or because they simply preferred Lectopia to attending face-to-face lectures.

Figure 3. Main reasons for using Lectopia



Main reasons for using Lectopia. The number of comments for each category ranged between 9 and 86.

Effect of Age and Gender

The majority of students who enroll at the University of Western Australia do so directly after completing high school in this state. For example, approximately half of the entire cohort of undergraduate students were 19 years and under as at December 31, 2006[9]. As such, most second year Pharmacology students are between 18 and 19 years of age.

Taken as a whole, females achieved significantly higher mean scores in laboratories, summative assessments, exam and the final mark (Table 3, $p<0.02$). Indeed, females obtained a grade higher than males in all assessment modes, regardless of lecture attendance and Lectopia use.

Overall, 78.5% of students reported that they attended both lectures each week, with the proportion of females (77.2%) and males (80.4%) not being significantly different ($\chi^2=0.346$, $p>0.05$). Among the group who attended both lectures each week, females scored significantly higher than males on laboratories, exam and the final mark (Table 4, $p<0.01$). Indeed, females obtained a mean higher grade than males in laboratories and the final mark (high distinction and distinction versus distinction and credit, respectively). However, among those attending less than two lectures per week, there were no gender differences in any of the

performance indicators. This may have been due to the small size of this sub-sample.

Furthermore, 36.4% of the sample used Lectopia rather than attending lectures at least once per week. The proportion of females (38.7%) and males (33.3%) who used Lectopia instead of attending lectures at least once a week, was not significantly different (χ^2=0.507, p>0.05). Among those that did not use Lectopia instead of attending lectures, females scored higher than males in laboratories, summatives, exam and the final mark (Table 5, p<0.05). Again, females obtained a higher grade than males in these assessments (high distinctions and distinctions versus distinctions and credits, respectively). However, among those that used Lectopia instead of attending one or two lectures a week, there were no gender differences in any of the performance indicators.

Table 3. Effect of gender on student marks

	Females	Males	p value
Laboratories	80.7 ± 1.0	73.7 ± 1.4	<0.001
Summatives	71.4 ± 1.1	66.9 ± 1.3	0.011
Exam	71.3 ± 1.2	64.8 ± 1.5	0.001
Final mark	73.2 ± 1.1	67.1 ± 1.2	<0.001

Data are expressed as mean ± standard error of the mean.

Table 4. Effect of gender on performance among students who reported attending both lectures each week

	Females	Males	p value
Laboratories	80.2 ± 0.9	75.5 ± 1.3	0.003
Summatives	70.9 ± 1.2	68.7 ± 1.2	n.s.
Exam	69.7 ± 1.3	64.4 ± 1.4	0.006
Final mark	72.3 ± 1.0	67.5 ± 1.1	0.002

Data are expressed as mean ± standard error of the mean. n.s. indicates not significant

DISCUSSION

As reported in Hamdi[10], we have demonstrated that attending face-to-face lectures is important with respect to learning outcomes in Pharmacology. Similarly, Gatherer and Manning[11] reported that lecture attendance correlated well with examination performance in the biological sciences. In any science where explanations of mechanisms, using diagrams and figures and experiential engagement

between teacher and student forms an important part of learning, simple online audio recordings may not be adequate. Indeed, we have shown that regular non-attendance at lectures was associated with lower marks in summative assessments and the final mark. These data also show a benefit of attending at least one lecture a week, perhaps by helping the student to keep in touch with curriculum content, teachers and peers through networking opportunities. This also allows students to gain the benefit of attending at least half the lectures delivered in Pharmacology. Similarly, the findings suggest that the regular use of Lectopia in lieu of attending lectures adversely affects learning. Using Lectopia to replace no more than one lecture a week appeared less damaging than replacing both lectures. In the present study, there was no evidence of a relationship between student ability (as measured by their weighted average mark) and lecture attendance (data not shown). This suggests that student ability may not be used to predict lecture attendance in Pharmacology. While the relationship between lecture attendance and student performance is still unclear, missed networking opportunities, diminished teacher/student engagement and the difference between online audio recordings and a face-to-face lecture experience offer possible contributing factors.

Online lecture recordings can play an important adjunct role for revision and clarification. If certain concepts are unclear, students can revisit and replay material over and over again until they "get it". However in this study, students also reported using Lectopia due to timetable clashes which denied them the primary experiential "live" session.

That females performed better than males, when they usually attended both lectures per week and did not use Lectopia in replacement was intriguing. That this advantage was lost once Lectopia was used instead of attending lectures would support the engagement benefit of face-to-face lectures, although sample size may also contribute to the lost effect.

Here, students completed an online survey to report their own usual lecture attendance and use of Lectopia to replace lectures. Some students tended to over-estimate their lecture attendance, for example, students who were observed to be absent from lectures reported regular attendance in the survey. There was also a disparity between the number of students who reported usually missing both lectures (n=8) and those who used Lectopia instead of attending both lectures per week (n=18). Clearly, these discrepancies represent limitations of using self-reported data in the present study. It is possible that if lecture attendance had been independently logged, the differences between students who regularly attended lectures and those that did not might have been more marked, since non-attending students tended to perform poorly in assessments overall.

Attendance at laboratories is compulsory and almost all students comply with this. Lecture attendance in units of study within Business, Arts and Humanities is often compulsory and may be associated with course credit or penalty for non-attendance at a majority of lectures. In contrast, scientific disciplines at this university do not enforce lecture attendance due to potential equity issues such as timetable clashes and student disability. There are also practical considerations which make the collection of quality and accurate data on student attendance at each lecture potentially costly and time-consuming where large numbers of students are involved. While tempting, enforcing attendance at lectures in a university environment may even be problematic and counter-productive, with decreased student enrolment in Pharmacology as a result of these restrictions. An alternative might be to encourage attendance at lectures by making them more attractive to students. For example, a change from a didactic lecturing

Table 5. Effect of gender on performance among students who reported not using Lectopia instead of attending lectures

	Females	**Males**	**p value**
Laboratories	80.7 $\pm$ 1.1	74.8 $\pm$ 1.6	0.002
Summatives	71.7 $\pm$ 1.4	67.4 $\pm$ 1.4	0.036
Exam	71.6 $\pm$ 1.2	63.9 $\pm$ 1.6	<0.001
Final mark	73.7 $\pm$ 1.2	66.8 $\pm$ 1.2	<0.001

Data are expressed as mean $\pm$ standard error of the mean.

style to one that is more interactive and invites student participation has recently been shown to dramatically increase attendance at Pharmacology lectures. Indeed, one of the goals of a university education in the 21st century is to encourage critical and independent thinking, mastery of the subject, questioning and problem-solving[7]. In removing choice with respect to lecture attendance, we might deprive students of achieving these higher goals of a university education. Instead, Pharmacology students will be strongly encouraged to attend lectures, by providing them with the compelling data obtained in this study in support of face-to-face lectures.

REFERENCES

1. Romanov, K., and Nevgi A. Do medical students watch video clips in eLearning and do these facilitate learning? *Medical Teacher*. 2007; 29:490-494.
2. Harden, R.M. E-learning-caged bird or soaring eagle? *Medical Teacher*. 2008; 30:1-4.
3. Carbonaro, M., King, S., Taylor, E., Satzinger, F., Snart, F., and Drummond, J. Integration of e-learning technologies in an interprofessional health science course. *Medical Teacher*. 2008; 30:25-33
4. Maley, M.A.L., Harvey, J.R., de Boer, W.B., Scott, N.W., Arena, GE. Addressing current problems in teaching pathology to medical students: blended learning. *Medical Teacher*. 2008; 30:e1-e9.
5. Australia. Lectopia: http://www.lectopia.com.au [Access date: April 29, 2008]
6. Arts Multimedia Centre. The iLecture system: guidelines and useful information. Crawley WA: The University of Western Australia; 2003.
7. Markwell, D. A large and liberal education: higher education for the 21st century. North Melbourne, VIC: Australian Scholarly Publishing. 2007.
8. National Health and Medical Research Council of Australia. National Statement on Ethical Conduct in Human Research (2007): http://www.nhmrc.gov.au/publications/synopses/e72syn.htm [Access date: 19 September, 2008]
9. The University of Western Australia Statistics Office. Unistats. 2007: http://www.stats.uwa.edu.au/StatsOffice/unistats/2007 [Access date: April 3, 2008]
10. Hamdi A. Effects of lecture absenteeism on Pharmacology course in medical students. *Journal of the International Association of Medical Science Educators*. 2006; 16:27-30.
11. Gatherer D., and Manning F.C.R. Correlation of examination performance with lecture attendance: a comparative study of first-year biological sciences undergraduates. *Biochemical Education*. 1998; 26:121-123.

5

Maximizing Your Leadership Potential: A Two-part IAMSE Webcast Audio Seminar Series

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Academic health centers are increasingly faced with persistent forces of change. Implementing the change process frequently involves unique skills and strategies by effective leaders willing to transform individuals, organizations and cultures. Many of us in contemporary medical science recognize the importance of influencing change to align both individual and organizational goals. Each of us must develop many leadership roles throughout our careers. Understanding the conceptual and practical aspects of what makes a leader effective helps us maximize opportunities, operations and outcomes. Educational leadership requires attitudes and skills: perspectives, strategies, interpersonal interactions and clear communications. Effective leadership boosts productivity, career success and morale whether in the research, clinical or academic environment. The IAMSE webcast audio seminar is a well-established format for faculty development. This webcast series was organized and conducted in two six-part series (2007) to explore the dynamic interactions of organizations, individuals, behaviors, strategies, cultures and contexts required to develop leadership strategies in academic healthcare

settings. Part I (Spring 2007) addressed how we are influenced by the leadership behaviors and styles of those with whom we interact. Likewise, we are affected by the leadership styles we use in turn. Part II (Fall 2007) expanded upon the previous strategies and factors that enhance career development. Concepts in the continuing series included recognizing elements in curriculum change, leading meetings effectively, negotiating for consensus and collaboration, leading multi-disciplinary teams, inspiring a vision and aspiring to positions of leadership in academic health centers. With this in mind, an experienced and dynamic cadre of academic leaders shared their insights and abilities in the realization that everyone can maximize their leadership potential. Part I of the series commenced with:

A Practical Approach to Build Leadership Effectiveness

The webcast series began with Dr. Jeffrey A. Morzinski who presented an organizational framework using metaphors to help us understand complex organizations. Dr. Morzinski initiated the seminar by sharing his academic and administrative background in educational leadership at the Medical College of Wisconsin. He claimed that "leadership is a key skill set in academic medical settings". From early in their careers faculty are expected to perform successfully in leadership roles, such as those encountered on research teams, curriculum planning projects or new initiatives on quality or safety. These expectations exist in highly complex environments where the future can be uncertain. Stakes are high in many leadership situations, with outcomes associated with funding, efficiency, productivity and morale. He offered a practical and well-accepted perspective to best understand the complex role that educational leaders may apply when reframing organizations. Using an organizational framework (Bolman and Deal: 1997), he articulated how each frame guides our thinking and vision to improve administrative performance. The four-part framework (e.g., Structural, Human Resource, Political and Symbolic) provides a lens for diagnosing leadership gaps and for planning leadership actions. He went on to apply the framework to a case example, as participants used a template worksheet to address each of the four frames for action. The session concluded with "lessons from the field" along with selected resources for improving future leadership effectiveness. Several questions and comments reinforced how these frames may help us better understand highly complex organizations, such as academic health centers. To better interpret the organizational frames and their application, view Jeff's presentation at:
www.iamse.org/development/2007/was-2007-spring.htm

Everyone Can be (must be) an Influential (and effective) Leader

Dr. Lynn Curry, a presenter in an earlier webcast series and proprietor of the CurryCorp, Inc., specified that organizational health and success fundamentally depends on the quality of shared leadership. That means regardless of the title we bear, we have a responsibility to our organization and to our colleagues in that organization to help it be a healthy place to work and to succeed in its organizational mission. Dr. Curry further emphasized that this shared obligation for leadership is particularly acute in the academic health care centers where all faculty members have a permanent responsibility as role models for students and junior faculty. Therefore, we all need to learn to optimize our day-to-day formal and informal leadership opportunities. An important aspect of that skill is to understand the contribution of cognitive style to interpersonal relationships and leadership in general. She provided an overview of the role of cognitive style in formal and informal leadership. A particular example was offered using the Myers Briggs Type Indicator (MBTI) as a reference point for analyzing our unique leadership roles, however many cognitive style formulations have compatible and obvious connections with various leadership roles (e.g., organizers, doers, intuitives, reflectives, etc.). An individual with a Myers-Briggs Type ISTJ (introvert, sensing, thinking, judging attitude) cognitive style for example, would likely excel at leadership tasks that require in-depth advance planning, but not so much in generating the interpersonal enthusiasm to engage participants. In conclusion, Lynn highlighted the need to learn skills at different stages of our academic career in order to perform our evolving leadership roles based upon our cognitive style strengths. To achieve added insight into the relationship between shared leadership and cognitive style, please view Lynn's in-depth presentation at:
www.iamse.org/development/2007/was-2007-spring.htm

The Impact of Effective Leadership on Faculty Productivity and Career Success

The series continued with Dr. Patricia S. O'Sullivan from the University of California, San Francisco who signified that "leaders have an essential role to enhance productivity and career success". Most faculty members have stress about their productivity and what it takes to be successful in their institution. Many define academic success solely in terms of publications and of course they are an important element. However, success as an educator may be related not only to research, but also to other roles, such as curriculum development, assessment, mentoring/advising and administration. Dr. O'Sullivan affirms that leadership must be vigilant in providing opportunities for faculty members to be successful in all of these roles. For those faculty in leadership, having a faculty member develop a strategic plan considering these five roles helps leadership in planning for individual success. Creating a community of educators encourages educational scholarship as typified by applying Kotter's leadership steps, a framework for implementing change (Kotter. Leading Change: 1996). The presumptive leadership steps involve: creating a sense of urgency; creating a guiding coalition;

developing a vision and strategy; communicating the vision for change; empowering broad based action; generating short term wins; consolidating gains and producing more change; and anchoring new approaches in the institution. A key feature of this model is a team approach, whereby leaders formulate a research team with tasks and targets to help sustain productivity. By the conclusion of the seminar, Pat was able to describe the elements of a personal strategic plan to help with research productivity and career success. Participant questions and comments reinforced many of these elements in the remaining time. Pat's suggestions for creating an environment that encourages productivity is available in greater detail by reviewing her presentation at:

www.iamse.org/development/2007/was-2007-spring.htm

Leading People within Organizations: Communicating for Performance

Paula Bartholome presented a concise presentation of organizational communications from her background as an organization development consultant with her firm Parallax. Ms. Bartholome started this one-hour webcast by discussing what defines a leader and characteristics of effective leader communication. "The greatest problem with communication is the illusion it has been accomplished". This quote from George Bernard Shaw illustrates how many organizational leaders are expected to set an organizational vision, chart a course toward it, and coordinate with and through others to get there. Communication is crucial to achieve alignment and movement toward organizational or individual goals and how communication is done is as important – or perhaps more important – than its specific content. She reinforced the leader role from the previous seminar by emphasizing how effective communication supports organizational performance while building and maintaining necessary interpersonal relationships and open environments. Effective communications enhances teamwork, collaboration and mutual respect to support quality performance. She further asserted that effective communications achieves commitment and offers constructive feedback for individual, team and organizational achievement. Lastly, she revealed how storytelling inspires meaning for emotional and rational connections based on the unique qualities of each organization. Paula's specific suggested tips and communication strategies for performance are available by viewing her presentation at:

www.iamse.org/development/2007/was-2007-spring.htm

Coaching and Mentoring

Dr. Tom Viggiano, Associate Dean for Faculty Affairs at Mayo Medical School and Director of the Office of Education Scholarship in the Mayo Clinic College of Medicine, characterized one aspect of leadership as "a process that ordinary people use when they are bringing forth the best from themselves and others" (Kouzes and Pozner: 2003). The common developmental relationships that comprise academic leadership are advising, mentoring and coaching. Advising, mentoring and coaching involve goal setting, analysis and reflection, providing feedback and directing actions to achieve goals. Advising usually occurs over a limited period of time and the advisor serves as a guide to help the advisee achieve a specified goal. Mentoring involves a sustained and committed relationship from which the mentor and protégé obtain reciprocal benefits. Coaching is a process that facilitates learning and development of specific skills for the purpose of improving one's performance. Dr Viggiano described the characteristics of effective mentoring relationships and the situations in which coaching is most effective. Dr Viggiano summarized the individual, institutional and leadership characteristics of a productive research organization (Bland. Acad Med. 80: 225-237, 2005) and discussed how these characteristics apply to the education enterprise. He then presented a method for documenting advising and mentoring relationships that is recommended by the Association of American Medical Colleges Group on Educational Affairs Scholarship Project. Participants were invited to share their comments, questions and challenges concerning developmental relationships as a leadership activity. This presentation on Coaching and Mentoring may be viewed at:
www.iamse.org/development/2007/was-2007-spring.htm

Leading Effectively at the Department or Program Level: People, Priorities, and Politics

Part I of the seminar series concluded with a departmental leader perspective, as expressed by Dr. Michael Lumpkin from Georgetown University. Dr. Lumpkin started with a practical approach to leadership at the medical science departmental level. At the onset he pointed out that formal and informal leaders need to balance the importance of people, priorities and political influences within their respective academic departments or programs. Effective departments and programs need to recognize and promote faculty members who contribute to the creative and innovative purposes of the organization. He provided a practical focus on performing effectively in the department or program leadership position – abbreviated version of the faculty development course. Specific applications were offered for managing change appropriate for program or departmental basic scientist leadership. Insights were drawn from his experiences including an example of curriculum change led by a Dean who applied many of the salient leadership aspects delineated in the previous series presentations. Most notably, he recommended treating staff with respect, including them in routine communications, advocating for their success and publicly

acknowledging their work. He concluded with an assertion to treat everyone equitably and avoid favoritism. Finally, the leader needs to be the first to step forward finding a solution to problems. Problems are often discrepancies between what ought to be and what is. The leader's ability to solve problems contributes to satisfying individual and team needs. Please go to this link and listen Michael's presentation and review its content for practical tips on leading at the departmental level:
www.iamse.org/development/2007/was-2007-spring.htm

Part II

Leadership and the Complexity of Change

Part II in the series began in the fall of 2007 with Dr. Nehad El-Sawi (Associate Dean at the KCUMB Institute for Medical Innovation), acknowledging that innovation and change are ever-present in academic health sciences educational environments (e.g., curriculum re-organization, teaching/learning methods, technology, accreditation expectations, etc.). Various models of leadership for change are available and considerable evidence is in the literature regarding specific strategies and practical approaches to facilitating an organizational context that is conducive to change and long-lasting success. Dr. El-Sawi focused on common characteristics of facilitative and proactive-strategic leaders, models of change, and examples of correspondingly practical application and strategies. During this session she focused specifically on impetus, issues, and challenges for curriculum change. A more current version of Kotter's (2006) leadership model exemplified the essential facilitating factors she advocates for transforming organizations. In addition, effective strategies were offered in how to effectively initiate curriculum change, engage stakeholders, and facilitate positive stages of curriculum change. You may educe greater awareness of the facilitating factors described in Nehad's seminar by reviewing her presentation at:
www.iamse.org/development/2007/was_2007_fall.htm

Effective Committees and Meetings

Organizing and managing meetings is an often overlooked skill of effective leaders. Dr. Franklin Medio shared his practical suggestions from his extensive graduate medical education experience. He provided recommendations that augmented Dr. El-Sawi's earlier directive on transformative leadership, namely to facilitate effective communications that build team consensus. His five elements of successful meetings offers guidance to leaders concerned about challenges for balancing valuable time and individual participation. Planning the meeting entails purposeful decisions on specific items worthy of discussion. A well-constructed agenda ranks items by their level of importance and urgency. It is valuable to select participants who are empowered to contribute the most quality. Furthermore, leaders need to design a purposeful agenda with specific, achievable goals, initiate meetings with clearly established ground rules or expectations, manage time to keep everyone on time and on task, and close the meeting by reflecting on what worked and clarity for further actions. Keeping participants actively involved in meeting activities builds consensus and group cohesion while enhancing their accountability. These are important qualities for academic leaders at all levels. In closing, Franklin presented a useful template to plan and conduct meetings. Giving appropriate structure to your meetings improves efficient use of time and models qualities of effective leadership. As is often true in our teaching role, we tend to forget what we do not apply. Opportunities abound to put these ideas into practice – as soon as your next meeting. More specific recommendations for structure and control of your meetings may be found in Franklin's presentation at:
www.iamse.org/development/2007/was_2007_fall.htm

Negotiations and Conflict Management

Dr. Medio was followed by Dr. Elza Mylona, Associate Dean of Educational Development and Evaluation at Stony Brook University. Dr. Mylona's session offered key concepts for listening and meeting individual needs and interests in a mutually satisfying manner. Often it is important to recognize that disagreements or disputes exist, explore functional options or agreeable courses of action to achieve consensus ("win-win") outcomes. Specific negotiation skills were considered in meeting organizational and individual goals. All leaders at all levels encounter the complex features of negotiation and conflict management, especially shaping new curriculum. It is vital to recognize that negotiation is interpersonal communication designed to reach agreement, especially when both parties have some shared interests. She presented several aspects of the negotiation process including 'seeing things from the other point of view while being aware of the consequences if your idea/proposal is not accepted'. Furthermore, Elza proclaimed that "a well thought out BATNA (Best Alternative to a Negotiated Agreement) gives you more power or leverage". We are to focus on interests using objective criteria to make decisions and above all listen actively and reflectively. A truly win-win outcome is a compromise where we close the gap between our wants and are real needs. She concluded with a few pearls to consider, namely that most negotiations are as much about emotions as they are about money or resources and that negotiations with high expectations generally do better. A more in-depth understanding of the negotiation process and models of conflict management in Elza's seminar are available for your review at:
www.iamse.org/development/2007/was_2007_fall.htm

Leadership in a Changing Environment: Inspiring a Shared Vision

Leadership is a dynamic process where leaders inspire and communicate their vision for change. Ms. Lintner, a staff developer at the University of Texas Medical Branch, proclaimed that 'leaders mobilize others with passion to achieve a defined and aspired goal'. Those of us in medical science education may easily recognize an abundance of leadership opportunities such as those involving: curriculum, courses, promotion & tenure, clinical science assessment and research. Our success as leaders is predicated on the unique style we apply in this dynamic process. Alison several leadership styles: coercive, authoritative, affiliative, democratic, pacesetting, and coaching. The qualities of each are described in her presentation along with a self-assessment ranking. She suggests that authoritative, affiliative, democratic and coaching styles have the highest correlations in medical science. In addition, she presented a few case studies to query participants on which style might be most effective in resolving the student progress case or the team-work case. To interject a degree of interactive learning, the series director/moderator acted as a proxy for all participants. Finally, Kotter's (1996) leadership step for developing a vision for change was expounded upon. Alison described the benefits of a vision statement and a template for creating a vision for an educational unit. In this way, participants learned how to create and communicate a vision for change. Details on crafting a vision statement are available at this link
www.iamse.org/development/2007/was_2007_fall.htm

Multi-disciplinary Team Building

This session by Dr. Stephen Bogdewic (Executive Dean for Faculty Affairs and Professional Development; Indiana University, School of Medicine) offered participants a general overview of the team development process; characteristics of effective teams; common challenges at each development stage; and practical applications (e.g., when are teams needed, how to sustain teams when people move on, how to reduce conflict in oral and written communications, etc.). Dr. Bogdewic's long-standing role in academic medicine provides a distinct vantage point to recognize the complex and unique challenges as well as organizational and leadership characteristics that faculty must possess. He placed emphasis upon strategies that overcome dysfunctional aspects of multi-disciplinary teams in academic health centers. Increasingly, patient care 'is not delivered by individuals but by a system'. Inherent in this system are high performing, multi-disciplinary teams often with diverse skills that cross lines of specialization. He demonstrated a set of useful teambuilding stages and strategies often used in developing workplace teams (e.g., forming, storming, norming and performing). In particular, he discussed a set of proactive interventions that facilitate well-managed problem solving groups. Of interest, were the five dysfunctions of a team (e.g., absence of trust, fear of conflict, lack of commitment, avoidance of accountability and inattention to results). He further asserts that 'teams go through predictable stages of development and the role of the leader needs to change as the team evolves'. Leading multi-disciplinary and diverse teams of key stakeholders requires leaders who enhances equity, gains trust and sustains shared authority when achieving specific goals or tasks. Stephen's descriptive models and extensive references on team management are beyond the scope of this report but may be accessed at:
www.iamse.org/development/2007/was_2007_fall.htm

Aspiring to a Leadership Position

The two-part seminar series came to a close with an admonition that we all need to aspire to be effective leaders in academic medicine. Series presentations have given us a variety of concepts and practices that will assist us in this task. In this final session Dr. Tom Schmidt (Assistant Dean at the Carver College of Medicine, University of Iowa) shared his personal insights, experiences and decisions in his academic career that prepared him for his leadership position. As a professor in the Department of Physiology and Biophysics, Dr. Schmidt highlighted significant leadership accomplishments in research, teaching and administration. He humbly declared that "some self-promotion is necessary" and we must seize opportunities to excel (i.e., Harvard Macy Institute, IAMSE involvement, teaching award submissions, etc.). He examined key features for professional development and advancement that associate with evidence of educational scholarship. Among these features are career goal-setting, communicating with key individuals for input and advice regarding strategies, making decisions about where to focus professional efforts, saying no effectively when necessary, seizing opportunities, strategies for monitoring one's progress up the career ladder and how to make mid-course adjustments when needed. His personal reflections and self-awareness offer valuable insights that we can all draw from to help guide our own pathway to career success. In conclusion, he exhorted us to develop our reputation as a dedicated and enthusiastic educator. These features and other perspectives for aspiring to a leadership position are available in Tom's presentation at:
www.iamse.org/development/2007/was_2007_fall.htm

Dr. Scott served as Director and Moderator for the Webcast Audio Seminar series, Part I and Part II that broadcast in the spring and fall of 2007.