The effect of an intercalated BSc in subsequent medical school performance depends on prior academic performance

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Background: Many institutions offer intercalated BScs for medical students, though their effect on subsequent performance is unclear. An analysis of the performance of students before and after undertaking an optional, one year, project-based BMedSc is reported.

Summary of Work: The class ranks (Rank) of students before and after undertaking a BMedSc after their 3rd or 4th year (YrPrior) were compared. The prior ranks of students were also classified (RankCat) as High (0-33.3 %ile), Mid (33.4-66.6 %ile) or Low (66.7-100 %ile). A repeated measures ANOVA was conducted with Rank as the repeated measure, and RankCat and YrPrior as between subjects’ factors.

Summary of Results: The ranking of students improved (P<0.01) after undertaking a BMedSc (prior 48.0 %ile, after 42.5 %ile). RankCat had a highly significant (P<10^-6) interaction with Rank as the repeated measure, and RankCat and YrPrior as between subjects’ factors.

Discussion and Conclusions: Prior performance of a student has a marked effect on the performance in the medical course after undertaking a BMedSc. The reasons for these differences probably involve a complex interplay between the prior attributes of students, skills and attitudes acquired during the BMedSc and the demands of returning to medical studies. The selection and support of students should involve a consideration of the prior performance of students.

Take-home messages: Undertaking a BMedSc has an overall positive effect on subsequent performance, though the effects depend on the prior performance of the student.
The rationales medical students used to determine their student-selected components

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Background: Student-selected components (SSCs) are the innovative educational strategy which has been promoted for more than 20 years. Since 2002, the Faculty of Medicine, Chulalongkorn University has added its SSCs to 34 credits: 18 credits in Year 1, 4 credits in Year 3 and 12 credits in Year 6. This research is to explain the rationale behind the study of SSCs for first-year and third-year medical students.

Summary of Work: The target population was 300 first-year students and 321 third-year students in 2014. An iterative approach to data collection was used. Qualitative inquiry was employed in the first stage to identify all possible reasons for SSCs selection. The outputs were grouped into 22 items under 5 categories and arranged into the questionnaire for Stage 2 data collection.

Summary of Results: First-year students tended to choose their SSCs based on opportunities to get good grades (22%), enjoyment in learning (14%) and their desires to try new subjects (13%). On the contrary, the reasons for Year 3 SSCs selection were diverse. The three most apparent reasons were: subject preference (17%), their desires to try new subjects (11%) and an attempt to make improvements (10%).

Discussion and Conclusions: Year 1 students viewed the SSCs differently from the curriculum planners. The SSCs should thus be reallocated to the later years of the curriculum when students can apply the SSCs to maximise their potential and shape their future.

Take-home messages: The curriculum: student’s perspective can be different from the planned curriculum. Curriculum monitoring is fundamental.

Electives for undergraduate medical education: a medical student’s perspective

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Background: Electives are a part of the medical curriculum which allows medical students to observe practices and gain experiences in different locations outside of the medical schools. It also provides opportunities for strengthening their knowledge and clinical skills.

Summary of Work: Introspective questionnaires were distributed to medical students who have graduated asking for their evaluation regarding electives they had done during their clinical years.

Summary of Results: The total numbers of respondents were at 72.7% of 128 medical student graduates of Srinakharinwirot University. Most of them (97%) have agreed that electives can provide extra higher-standard of medical competency in knowledge and extra-curriculum experiences. Enhancing clinical skills and self-directed learning competencies were selected by 95% of the responders while providing an effective time use for knowledge were at 94%. They indicated that places that are chosen for electives should not be limited to only other medical schools or healthcare workplaces (70.0%) here but should provide opportunities for overseas electives (64.0%). However, in regard to self-reflection in elective courses, only 30.0% of the graduate medical students have shown agreement. Electives have also been shown to affect the decision-making for choosing the students preferred working place for the future (97.0%). Further analysis has shown that their choice of a future career is congruent with their choosing of an elective in the fourth, fifth and sixth year for the medical students at the rates of 25.8%, 44.1% and 68.8%, respectively.

Discussion and Conclusions: The results indicate that medical students have an optimistic attitude toward electives while electives can provide better opportunities in enhancing their clinical skills.

Take-home messages: Electives have a role in the students’ clinical years in maximizing learning opportunities for medical students.
Enhancing dental electives through participatory research

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Background: Completion of an elective project at the University of Glasgow Dental School is a progression requirement and entails a period of self-directed and enquiry-led learning during year four. This study sought to uncover what students hoped to gain and would value from their elective experience. The outcomes would inform the redesign of the dental elective study programme and the associated quality assurance process.

Summary of Work: This qualitative study is situated in a constructionist epistemology and utilises a participatory research methodology. Three student co-researchers analysed data collected from their peers via electronic questionnaire and focus group meetings.

Summary of Results: The findings support maintaining autonomous, enquiry-led independent learning that the School presumed students wanted to experience during their electives, and also highlighted aspects of the elective which students particularly valued.

Discussion and Conclusions: This has allowed a deeper understanding of students' perceptions of, and motivations for, particular elective projects, enabling the elective programme to respond to changing environments in education and global health. The conclusions are 14 recommendations to enhance our students' elective experience, including levels of guidance tailored to students' specific requirements and additional opportunities for wider dissemination of their studies.

Take-home messages: The widest possible range of elective projects should be supported. The independence and autonomy of the elective student should be protected. Institutional links with organisations both within and outwith the UK should be established.

Factors affecting medical students' choice of elective attachment

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Background: Medical students are expected to go on an elective attachment in their final year. The aim for this in the curriculum is to expose the future doctor to different health systems so they can appreciate the weaknesses and strengths of the system they operate in.

Summary of Work: A retrospective electronic survey was carried out to determine what factors really influenced the students in choosing their destination.

Summary of Results: 101 students were surveyed. 61 responses were received, 58% Female and 42% male. Most influential factors were affordability, safety and reputation of destination as a holiday resort.

Discussion and Conclusions: Students are influenced more by economic and leisure factors rather than educational factors. A different approach may be needed to educate students on the real purpose of the elective attachment, or maybe to even short list destinations which they can choose from.

Take-home messages: The role of the elective attachment needs to be emphasised to medical students.
Preparing medical students for field experiences in low-resource settings: development and evaluation of a trigger video of medical students’ experiences and large group discussion module

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Background: Medical students increasingly seek field experience in medically underserved settings. However, programs infrequently provide anticipatory guidance that meaningfully engages students in preparing for predictable challenges.

Summary of Work: Development and evaluation of a 30-minute trigger video and discussion guide for first-year medical students planning field experiences in low-resource settings, in international and domestic settings. The trigger tape features medical students describing unexpected dilemmas they experienced in their field experiences in projects intended to ameliorate health care disparities. Faculty-facilitated discussion followed each student-narrated dilemma. Intended learning outcomes focused on students’ intent to identify strategies for dealing with defined challenges. Students also rated the relevance and impact of the session.

Summary of Results: Of the 93 participating students, most (over 90%) characterized themselves as “very likely” to: anticipate and plan strategies for dealing with potential risks to their personal safety, exposure to infectious diseases. and challenges to cross-cultural communication. Almost all (98%) of students characterized the session as helpful and would recommend it to other students. Students who disagreed characterized the session as “making them uncomfortable” or indicated the information could have been condensed into an e-mail summarizing key points.

Discussion and Conclusions: A focused, engaging educational intervention featuring medical students’ challenges in working in medically underserved populations can promote students’ preparation.

Take-home messages: An exploration of the provision of Global Health Education in Scottish medical schools

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Background: The UK General Medical Council’s document Tomorrow’s Doctors (2009) states that all students studying medicine in the UK should receive Global Health Education (GHE). This study aims to explore how this recommendation is being met in Scottish medical schools, through surveying students and staff members.

Summary of Work: An electronic survey was distributed via a student organisation, Medsin UK, to students and interested faculty members at all (n=5) Scottish medical schools. The survey included questions about the core curriculum, additional GHE opportunities and elective preparation. Senior students with an interest in GHE and staff members with a senior position or an interest in GHE were invited to participate. Staff and students from 4 universities responded. Qualitative framework analysis was conducted and data were independently coded by two individuals and compared to reach consensus on results.

Summary of Results: Respondents were from Glasgow (n=2), St Andrews (n=3), Aberdeen (n=1), and Dundee (n=1). All respondents reported that their institution delivered GHE, however there was considerable variation in the amount, methods and quality of content and delivery. GHE is evolving in all Scottish medical schools.

Discussion and Conclusions: There is not a standard approach to the content and delivery of GHE across Scottish medical schools. Importantly, elective practice are extremely diverse. This small survey highlights differences in staff and student perceptions of the provision of GHE.

Take-home messages: This survey demonstrates areas of good practice and those with room for improvement in the provision of GHE in Scotland. Knowledge sharing between Scottish universities may be on method of improving GHE provision.
**Summary of Work:** During international Tempus ePBLnet project, Karaganda State Medical University modernised its discipline-based curriculum into more student-motivating, competency-based PBL curriculum. It required translation into Russian and adaptation of 54 PBL cases to local healthcare culture, mapping them against the objectives and finding their place in the present curriculum.

**Summary of Results:** Survey of curriculum and case adaptation teams discovered that social and community issues were much harder to integrate into the existing curriculum than pure basic science materials. The clinicians reviewing the cases called them artificial because of medical differences existing between Western and post-Soviet countries. Some cases did not match well the existing objectives and could not be included; other cases had to be moved from one year to another creating problems with unmatched complexity of learning objectives.

**Discussion and Conclusions:** Many complex issues arise in adapting curriculum from one institution to another; very careful measures are needed to overcome them. The teachers could feel lack of ownership of adapted cases and complain of their valuable time being taken away.

**Take-home messages:** Curriculum adaptation is a complex issue and close collaboration of all participating parties is required to overcome the barriers.
Designing of an Innovative Multidisciplinary Clinical Module on Endocrine and Endocrine Surgery for Medical Students in Al-Baha University

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Background: Al-Baha Faculty of Medicine is adopting an integrated system based curriculum. In the basic sciences phase, integration was a straightforward process while very challenging in the clinical phase. In order to develop a fully integrated system based clinical module, it was necessary to recall surgery, internal medicine and paediatrics from their ivory towers to be tailored in one common educational medium.

Summary of Work: To develop, implement and evaluate a module on: Endocrine and Endocrine Surgery (EES), a module committee was assembled including an internist, surgeon, paediatrician and community physician. Intended learning outcomes related to basic sciences as well as clinical sciences were formulated. Content selection and organization were performed depending on the ILOs. Varieties of teaching/learning and assessment strategies were adopted.

Summary of Results: These efforts resulted in construction of students’ study guide. The contributing specialties were: internal medicine, paediatrics, surgery and community medicine. 20% of the content was allocated to basic sciences. The module was introduced for study by the fourth year students. Teaching/learning activities were as follow: Lectures: 28, Clinical presentation: 2, Seminars: 3, PBL sessions: 3, SDL sessions: 3, Skills’ Lab. sessions: 3, day-long hospital-based clinical sessions: 8, basic sciences practical sessions: 1.

Discussion and Conclusions: Validity of integration in the clinical phase indicates loosening the borders between the related disciplines as the case of integration in basic sciences. EES module can be seen as a prototype of integration between clinical sciences. Through this module, medical and surgical problems of the Endocrine system in the different age groups are put together.

Take-home messages: The development of multidisciplinary integrated system-based modules in clinical medicine can be achievable.

Integration of Narrow Band Imaging gastroscopy and histology to teach human gastric pathology in patients with Helicobacter pylori associated gastritis for third year medical students

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Background: Gastroscopy is a standard diagnostic tool for upper gastrointestinal tract diseases especially Helicobacter pylori associated gastritis and used widely in clinical practice. Aim of our study, to evaluate effect of Integration of Narrow Band Imaging gastroscopy and histology to teach human gastric pathology in patients with Helicobacter pylori associated gastritis for third year medical students.

Summary of Work: A total 60 medical students were enrolled in the study from 15 July 2014 to 5 October 2014 at Institute of Medicine, Suranaree University of Technology, Nakonratchasima, Thailand. We use correlation between gastric mucosal morphologic pattern by Narrow Band Imaging gastroscopy and severity of inflammation grading to teach pathological change of gastric mucosa after infected by Helicobacter pylori bacteria. End of the class, we evaluation of 60 returned questionnaires.

Summary of Results: Anonymous evaluation of 60 returned questionnaires (100% response rate) showed that more than 80% of respondents considered the session had stimulated and improved their understanding of Helicobacter pylori associated gastritis. When compared pre and post class, the result show that significant improve their understanding of gastric mucosa pathology after infected by Helicobacter pylori bacteria (p<0.01).

Discussion and Conclusions: Integration of Narrow Band Imaging gastroscopy and histology to teach Human gastric pathology in patients with Helicobacter pylori associated gastritis can improve understanding of Helicobacter pylori associated gastritis pathology for third year medical students.

Take-home messages: Type 1 and 2 represent normal or mild inflammation morphologies, type 3-5 represent moderate to severe inflammation morphologies.
Three Years Experience in Correlated Basic Medical Science and Clinical Science Course

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Background: Faculty of Medicine at Khon Kaen University, Khon Kaen, Thailand started a new curriculum for medical students since 2009. Discipline base curriculum was transformed to systematic base curriculum for preclinical year. However, problem base learning is the core learning process. Correlated basic medical science and clinical science course is performed to improve vertical correlation between basic medical science and clinical science and horizontal correlation between each system. The objective of this course is to integrate basic medical science and common clinical presentation by using the case scenarios and clinical setting. Therefore, most of the topics in this course are common symptomatology for medical students such as jaundice, diarrhea, chest pain, fever etc. Most of teaching staff in each topic consist of clinicians and basic science staff. Students have to study the assignment before each class and have pretest evaluation before class. Moreover, it is interactive learning during teaching by using voting. This course takes place in the 2nd semester of 3rd year of the medical course, which is the last preclinical year.

Summary of Work: Objective of this study was to evaluate the outcome of this course. This study summarized the course evaluation between 2012 and 2014 and analyzed the correlation between final grading of the students and National License Examination score.

Summary of Results: The result of course evaluation showed student satisfaction was higher than 90% in all topics. The students evaluated that this course was important to the profession and can apply to clinical year study. Moreover, final grading of the students significantly related to examination score of National License Examination (part basic medical science).

Discussion and Conclusions: Correlated basic medical science and clinical science course is important to preclinical year students to improve their clinical correlation.
Vertical integration of head, neck and special senses with otolaryngology and ophthalmology in second year of undergraduate medical curriculum – perception and performance

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**Background:** At Alfaisal University, a spiral, system-based integrated curriculum with hybrid learning strategies is divided in three phases. A four-week head, neck and special senses (HNS) block was offered in both phase I and II, with horizontal integration. Phase II block also had vertical integration with clinical sciences like otolaryngology and ophthalmology. Phase III consisted of related clinical rotations. Recently, it was decided to merge various phase I and II blocks, including HNS, to be offered in phase I.

**Summary of Work:** A multidisciplinary team developed new vertically integrated block. At the end of the block feedback was obtained from students and faculty, through structured questionnaire. Students were assessed through the end of block examination.

**Summary of Results:** Out of 114 (67%) responding students, 78% agreed that the learning objectives of the block were clear. Seventy six percent agreed that weekly themes and schedule were matching with the learning objectives. Only 35% liked the idea of vertical integration at this level, 37% were confident that they had achieved clinical learning objectives effectively and 32% agreed that there was adequate time for self-learning; however, 54% agreed that it stimulated learning and 85% passed end of block examination successfully. Eighty-nine percent of the faculty members thought that vertical integration provided context to understand preclinical concepts, while 66% agreed that this vertical integration will improve performance in clinical years.

**Discussion and Conclusions:** Although, students were apprehensive of a vertically integrated HNS block, most of them achieved block objectives successfully. **Take-home messages:** Students’ apprehension about the vertical integration may be addressed through better communication.

Analysis of Students’ Perceptions on Adopting an Integrated Curriculum

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**Background:** Conventionally, the traditional curriculum approach is implemented to teach medicine. It consists of separate preclinical and clinical studies. As medicine develops through the creation of a massive knowledge base, it became impractical for medical undergraduates to master all these sciences. Therefore, the integrated curriculum (IC) approach is being adopted worldwide. This study explores the students’ perspectives on IC, therefore, helps the development of completely IC.

**Summary of Work:** A cross sectional study was conducted. Data was collected via anonymous, online surveys administered to medical students of Alfaisal University. A Chi-square test followed by post-hoc correlation was used to determine association between demographics and the perception on IC.

**Summary of Results:** 249 students responded; out of which, ~58% claimed to know what curriculum integration is, however, only ~44% of them were able to identify the correct definition outlining all the major components of IC. Out of the ~44% who understood what is meant by a completely IC, ~83% perceives the IC to be effective, and ~61% believes the most important benefit is that it helps in knowledge retention and induces deeper understanding of concepts, ~44% also believes that an IC should be implemented in all years of medical school. Moreover, those with higher GPAs were more likely to have a correct perception of the IC (p<0.001).

**Discussion and Conclusions:** Only a minority of the students understands what IC is. Majority, of those who understand it correctly, perceive it to be effective and beneficial. **Take-home messages:** More efforts need to be devoted to the development of effective complete trans-disciplinary integration models.
Implementing a longitudinal integrated clerkship for all third year students at an allopathic medical school - lessons learned

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Background: A longitudinal integrated clerkship (LIC) provides continuity of patient and preceptor experiences in core clinical disciplines. At The Commonwealth Medical College (TCMC) all third year medical students complete a yearlong LIC in six core disciplines (family medicine, internal medicine, pediatrics, psychiatry, surgery, and Ob/Gyn).

Summary of Work: Over three years 192 students completed our LIC spending one half-day per week with an ambulatory preceptor in each core discipline. Outcomes were assessed by OSCEs, NBME subject exams, USMLE Step 2 CK/CS, residency directors' and alumni surveys and the AAMC graduation questionnaire (GQ).

Summary of Results: Test scores were comparable with national averages. A majority of residency director respondents reported that the performance of the 2013 graduating cohort was above peers in clinical competence, communication and team skills, clinical reasoning, and professionalism. Students expressed concern about the adequacy of inpatient experiences.

Discussion and Conclusions: The twelve-month LIC was extremely faculty intensive, proving unsustainable in a medically underserved region when class size reached 100. The need for enhanced inpatient experiences also disrupted continuity with patients and preceptors. TCMC is therefore modifying its third year to include a 6 month uninterrupted ambulatory LIC and 6 months of block rotations weighted to inpatient experience. Implementing a large scale LIC is feasible but challenging. The LIC offers benefits in desirable professional attributes among graduates. Take-home messages: Identifying sufficient qualified preceptors is a major barrier to large scale LIC implementation. That and student concerns require flexibility, creativity, and tailored local solutions on the part of LIC leadership teams.
Conclusion: The results indicate that an understanding of anatomy is an important factor in confidence with regard to clinical competency. Contemporary reductions in the time allotted to anatomy teaching are therefore resulting in students feeling less confident about clinical competency.

Take-home messages: We believe therefore, that anatomy is an important part of medical education and that medical schools should be encouraged to provide more teaching, particularly via dissection and lectures, with formal examinations.
Effectiveness of teaching of chest compressions in basic life support courses in a traditional medical curriculum

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Background: Every physician is expected to be proficient in resuscitation and basic life support (BLS). Therefore, most undergraduate curricula strongly emphasize training these skills. However, performance of post-graduate physicians usually does not meet guideline standards. We wanted to evaluate, whether there was already indication for limitation of skills during undergraduate education.

Summary of Work: In the traditional curriculum of Charité – Medical University Berlin resuscitation training was given at three time points (6th, 7th, and 10th semester; 24 hours in total). Directly after the 3rd training 128 medical students were examined. As the main outcome parameter we analyzed chest compression quality, which is by far the most important BLS intervention. Guideline targets (according to ILCOR 2010 guidelines) lie at 5.0-6.0 cm compression depth, 100-120 compressions per min, and minimal leaning between compressions (below 5 mm).

Students performed compression-only CPR for 5 minutes on a manikin, performance was recorded via Laerdal SkillReporter.

Summary of Results: Mean compression depth was 38.8 [37.4-40.3 SD] mm. Average rate over 5 minutes was 120.4 [118.0-122.7 SD] bpm. Of 72'804 compressions only 40.3 % were within target rate and 13.6 % within target depth. Only 17.4 % of participants maintained a medium leaning depth lower than 5 mm.

Discussion and Conclusions: Chest compression quality did not meet guideline targets at the end of an undergraduate curriculum, despite three time points for resuscitation training.

Decay of skills may already be attributed to insufficient teaching during the undergraduate phase.

Take-home messages: Innovative teaching methods should be considered if guideline adherent chest compression quality are aimed at in post-graduate physicians.