Chapter 3
Vertical Integration of EMI Courses in a Medical Curriculum

Mei-Ling Tsai and Paul R. Saunders

Specific Area of Interest: Vertical Integration into Program Curricula

From the institutional viewpoint, especially in countries where English is spoken as a foreign language, one primary goal of implementing EMI courses is to transform traditional universities into world-class institutes through recruitment of more international students and scholars. In such an internationalized learning environment, the global competency of local students can be enhanced through increases in their intercultural awareness and their ability to communicate professionally in English (Byun et al., 2011; Hunter, White, & Godbey, 2006). However, many local university students feel unduly burdened in EMI courses, largely because they feel that what they perceive to be their poor English proficiency, and their associated learning anxiety, seem to have been ignored (Chang, 2010; Cho, 2012; Tsui, 2004). These students feel a big gap between the education goals of the university authorities and their own experience of taking EMI courses and do not see any positive impact on their career opportunities from taking EMI courses. Therefore, simply implementing EMI courses creates a gap between the institutional goals and students' perceptions in many universities.

Interestingly, Taiwan students consider improving English proficiency to be an admirable goal, primarily because it helps students become global citizens and increases their global competitiveness (Chu, 2015). But many are not motivated to specifically partake in EMI courses. If possible, it would be better to align EMI classes with their learning goal of being globally competitive citizens (Chang, 2010). Coyle's model "Content Learning Integrated Learning (CLIL)" identifies four "C" principles to educate students to become globally competent citizens (2002):

M.-L. Tsai (✉) • P.R. Saunders
National Cheng Kung University, Tainan, Taiwan
e-mail: mltsai@mail.ncku.edu.tw

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Content in curriculum:	focusing on subject-specific knowledge
Communication:	application of foreign language as a medium for both learning and communicating
Cognition:	development of critical thinking and learning skills
Culture:	implementation of pluricultural issues or elements in learning

In addition to the four "C" principles in CLIL, Reimers (2009) proposed a framework of global-competence education that characterized global competence into three dimensions: (1) a positive disposition, including a strong sense of an individual's own cultural self and empathy toward others; (2) the ability to speak, think in, and understand foreign languages; and (3) a "deep knowledge and understanding" of the world's history and an ability to think critically about global complexities. Both Reimers' framework and Coyle's four "C" principles provide brand-new concepts of implementing global-competence education in EMI-embedded programs.

Instillation of global-competence education into current EMI courses may highlight global competence as an important outcome in medical programs and provide a clear justification of using CLIL for pedagogical modification in EMI courses. Right now, various versions of CLIL have been proposed to address different levels of integration between language and content (Ball, 2009). Current transformation of medical education also addresses different levels of integration between basic and clinical sciences from junior to senior years in a vertical manner. The focus of medical education has been shifted from objective-based (i.e., knowledge acquisition) to outcome-based (i.e., competence) learning (Atwa & Gouda, 2014). Students in vertically integrated programs share a vision as competent medical professionals. The clear learning goals throughout the program determine their actual performance in clinical settings, empower their preparedness for general practice in hospitals, and sustain long-term attachments to discipline-specific clinical practice (Wijnen-Meijer et al., 2015). The concept of vertical integration in medical education provides a framework of implementing various versions of CLIL to a series of EMI courses in the outcome-based curricula. When global competency becomes the major outcome throughout the program, students in EMI courses are able to exercise metacognitive skills by applying their discipline knowledge of basic science to clinical medicine and thereby generate new concepts. All learning activities are designed to increase students' communication ability in English and their confidence for effective engagement with fellow professionals and the public in an international setting.

Background of the Case

Following Japanese occupation, Taiwan's medical education shifted first from a Japanese system to an American-based system and then reformed to a 7-year medical program. As part of this process, major revisions to the curricula included

changing the language of the textbooks used from Japanese to English. English became an important language to acquire medicine-related knowledge. Afterwards, the improvements to Taiwan's healthcare system instilled a great sense of pride, which dramatically influenced students' intention of learning Medicine in English and advancing their studies abroad. The improved healthcare system in the late 1960s attracted most medical students to develop their careers in Taiwan. Because of Taiwan's relatively homogeneous population, English speaking and listening skills typically are not used in local clinics. To accelerate local communication, more of the medicine-related textbooks were translated into Chinese. An increasing number of students preferred to use Chinese textbooks. Both historic changes and societal circumstances lowered the motivation of most all of medical students in the late twentieth century to learn medicine in English. The voice of connecting their medical professionals with the world had been fading out.

In order to understand how our specific EMI course in a vertically integrated curriculum was performed, along with its rationale and how it benefitted the NCKU program, first an understanding of the context with which it was implemented is required, both nationally and locally. In response to the key problem of disconnecting with the world, the Taiwan Medical Accreditation Council introduced world standards for medical education in Taiwan to align Taiwan's medical education practices with global standards. The first phase of reforms was initiated with the introduction of problem-based learning (PBL) in many medical schools. The second phase of medical education reform incorporated the idea of vertical integration within the medical education curriculum to break the barriers among the three established program blocks (originally separated into general education in the first 2 years, basic medical sciences in years 3 and 4, clinical training in years 5–7). The brand-new concept of medical professionalism was also incorporated into this second phase of medical education reform. Intercultural communication and global awareness are now included to enhance medical professionalism. This new movement of vertical integration coupled with medical professionalism has brought strong connection of Taiwan's medical education with the world.

Specifically, the NCKU medical program has evolved considerably over the years as stewards of the program have incorporated many reforms in response to the Taiwan Medical Accreditation Council recommendations as well as inspired personal ideas implemented. Of 12 medical schools in Taiwan, the National Cheng Kung University Medical College (NCKUMC) was the first to raise self-awareness of connecting Taiwan's medical education with the world in the late 1990s, even before the council's recommendations. Dr. Kun-Yen Huang (the founding dean of NCKUMC) in the 1990s had highlighted the importance of English in medical education, created a single tailor-made English course (medical English) for Years 1–2 medical students, and offered financial support to a few Year 6 medical students interested in overseas observership opportunities. After Dean Huang retired, his successors continuously endorsed the important mission of improving medical English for medical students and supported the implementation of the first EMI course (Medical Physiology). The second EMI course (PBL Pathophysiology) for Year 4 medical students was implemented in 2004. After first recruitment of international students in 2006, a new English course (Medical Terminology) for Year 2

medical students was created. Taking the opportunity of the second major medical education reform, NCKUMC incorporated the philosophies of vertical integration and global competence to coordinate the existing EMI courses in the modified medical program. This is the inception of the case study reported in this chapter. The guiding principles for the EMI implementation involved incorporating Coyle's four "C" principles and Reimers framework of global competence education. In the vertically integrated program, the courses in the early years were soft CLIL-like with a focus more on particular English language use to understand and appropriately express content concepts. As students progressed through the program, a transition to hard CLIL-like courses focused on the professional content and the cognitive skills, and English language was merely used as a communicating medium to understand this professional material. During this reform, CLIL-like courses from soft to hard forms were vertically integrated into the medical curriculum.

The vertical integration of CLIL-like EMI courses in the NCKUMC Medical Program did not occur in one single step but was an evolutionary process that happened over several years. The effectiveness of the various course implementations along with the revisions to the curricula of those courses was determined by assessing student perceptions measured in surveys. Since 2002, NCKUMC has mandated that student perception surveys be performed at the conclusion of the overall program and later on at the conclusion of each course. This final survey is issued to students upon their graduation to allow for review and revision of program courses. These upon-graduation surveys have been collected from the graduating classes 2009–2014, which cover the overlapping period when four separate EMI courses became six vertically integrated EMI courses. There were approximately a total of 75 students per graduation year, and on average 90% of medical students completed and returned each survey, which used Likert scales of five response options (strongly disagree to strongly agree).

Case Study

Please refer to Table 3.1 for an outline of vertically integrated EMI courses within the NCKUMC's Medical Program. In this 7-year medical program, the EMI courses that are vertically integrated into Years 1–4 were designed to enhance students' use of English, thinking skills, and content knowledge. The overseas observership training, consisting of both the course and the practicum in foreign hospitals, has the specific goal of helping students acquire international learning experience in Years 5 and 6.

Both basic knowledge and skills related to global competence are continuously reinforced in the six EMI courses over a 6-year period:

Year 1: English, Medicine, and Life focuses on the English language skills of listening and speaking about globally relevant and medically related issues.

Table 3.1 The status of an EMI course in each academic year

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Course name	English, Medicine, and Life	Medical Terminology	Human Physiology	PBL Pathophysiology	English Case Study of Overseas Observership	Summer Overseas Observership Program
Credits	4	2	6	4	1	1
Course status	Required	Elective	Required	Required	Elective	Elective
Students per group	16–20	20–25	8–10	8–10	4–5	4–5

Table 3.2 Students in each graduating class received EMI courses in their 7-year study

Graduating class	English, Medicine, and Life	Medical Terminology	Human Physiology	PBL Patho-physiology	English Case Study of Overseas Observership	Summer Overseas Observership program
2009	✓		✓	✓		✓
2010	✓		✓	✓		✓
2011	✓	✓	✓	✓	✓	✓
2012	✓	✓	✓	✓	✓	✓
2013	✓	✓	✓	✓	✓	✓
2014	✓	✓	✓	✓	✓	✓

Year 2: Medical Terminology focuses on medical terms and the application of medical terms in clinically related simple cases which require guided discussion and brief answers in English.

Year 3: Human Physiology focuses on theories of physiological functions and the application of physiological theories in advanced clinical cases. In this course guided English discussion in a big class is followed by detailed Chinese discussions in small groups of 8–10 students and short presentations in English.

Year 4: PBL Pathophysiology focuses on critical thinking and clinical reasoning with respect to the pathogenesis of a chronic disease. Only 2–3 tutorial groups converse in English and the remaining 5–6 groups operate in Chinese. All groups give short presentations in English.

Year 5: English Case Study for Overseas Observership focuses on intercultural communication in patient-doctor interviews and professional presentations for morning rounds.

Year 6: Summer Overseas Observership Program focuses on hands-on practical experiences in foreign clinical settings.

Table 3.2 indicates the EMI course availability for the different graduating classes, 2009–2014, during their medical education. The graduating classes of 2009 and 2010 only had four separate EMI courses available to them and did not have a chance to participate in the two newly designed courses (Medical Terminology and English Case Study of Overseas Observership). Those in the graduating classes from 2011–2014 had the opportunity to take the six integrated EMI courses and to give short presentations in English during their 7-year study. They were clearly informed that the goals of these courses included a conscious effort to vertically integrate key ideas throughout the program in each individual course's curriculum.

Students in the graduating classes of 2009–2010 experienced both lecture and PBL with no presentations in English, but those in the classes of 2011–2014 experienced more learning activities (Johnson, Saunders, & Tsai, 2013; Tsai, 2013). Case-based and problem-based learning were followed by formal and short presentations in English.

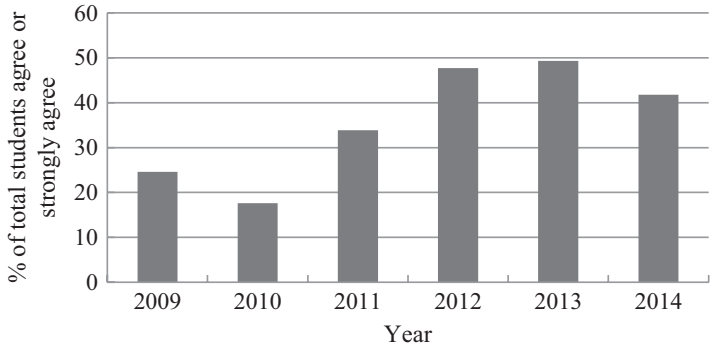

Fig. 3.1 The percentage of medical students in graduating classes from 2009 to 2014 who agree or strongly agree that EMI is an effective learning approach

From the upon-graduation survey of medical students across the graduating classes of 2009–2014, it is important to note that only 25% of students in 2009 and about 18% students in 2010 (before the structured EMI-embedded program was implemented) considered EMI to be an effective learning approach. After the six EMI courses were vertically integrated into the medical program, more self-directed learning activities (including presentations in English) were introduced. More than 30% of students in 2011 considered EMI to be an effective learning approach, and this percentage increased to more than 40% in subsequent graduating classes (Fig. 3.1).

It is of interest to note that the implementation of Medical Terminology in Year 2, and English Case Study of Overseas Observership in Year 5, along with the revision of Human Physiology in Year 3, led to dramatic improvements in the perceptions of some students in the class of 2011. Many of these students agreed that EMI Medical Terminology plays an important role in enhancing the awareness of professional English use in medical education. The implementation of different learning activities in Human Physiology allowed students to experience the beauty of self-directed learning and to practice formal presentations in English. The English Case Study of Overseas Observership highlighted the concept of global-competence education and active learning. Various learning activities in these three courses consolidated vertical integration of the six EMI courses into the existing medical program and greatly improved most students' perceptions on self-directed learning in EMI courses.

The practice of self-directed learning skills in the case-based and problem-based courses changed student perceptions about the overseas observership. Only about 40% of students in 2009 and 30% of students in 2010 considered the overseas observership to be an effective learning approach. After implementing six coordinated EMI courses in the medical program, about 50–60% of medical students in the 2011–2014 years considered the overseas observership to be an effective learning approach (Fig. 3.2), and we did see a small increase in the number of students actually participating in the overseas practicum (Fig. 3.3).

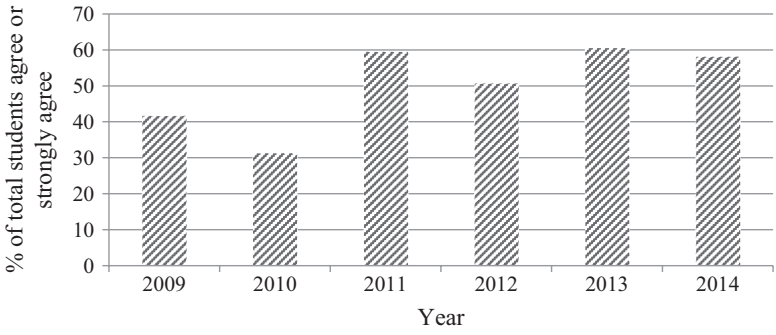

Fig. 3.2 The percentage of medical students in the graduating classes from 2009 to 2014 who agree or strongly agree that overseas observership is an effective learning approach

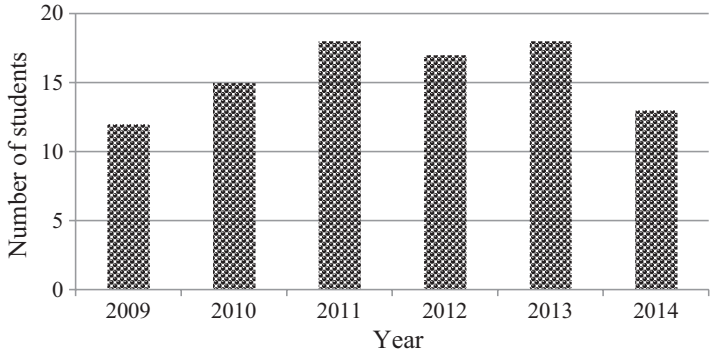

Fig. 3.3 Numbers of medical students in the graduating classes from 2009 to 2014 who received the summer overseas observership training in our international partner hospitals (Note: Three students in the class of 2014 withdrew from the program due to various personal issues)

The improvement in attitudes toward the EMI-based courses just shown is important, but it reflects opinions which are retrospective. Motivation is an important element for learning to occur (Deci, Vallerand, Pelletier, & Ryan, 1991), but it must be present at the time of learning and not afterward. For the next part of this case review, we will address changes to student perceptions within the vertically integrated program. Medical students from the graduating class of 2013 were selected to analyze their perceptions of the EMI courses that they took in their Years 2 and 3 based on excerpts from the end of year surveys for each course with a focus on the following three issues:

1. Difficulties within the EMI course
2. Attitudes regarding EMI courses
3. Attitudes regarding the pedagogical practices used in the EMI courses

As shown in Table 3.3, more than 70% of students from the graduating class of 2013 took Medical Terminology in their Year 2. Of the students who took the course

Table 3.3 The difficulties of the graduating class 2013 in EMI courses

	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
Year 2 – Medical Terminology percent respondents (total 58)					
Unfamiliar with English pronunciation	12	51	22	12	2
English reading	14	62	16	9	0
English listening	14	59	19	9	0
Slowing down my comprehension	10	32	29	24	3
Year 3 – Medical Physiology percent respondents (total 73)					
Unfamiliar with English pronunciation	12	41	26	18	3
English reading	3	3	42	36	16
English listening	4	24	47	19	5
Slowing down my comprehension	4	41	40	7	8

(58 students), about 60% agreed or strongly agreed that they had difficulties in medical term pronunciation, reading English textbooks, and listening to English in the course after 2 years' experience in EMI courses. In their Year 3, all students (78 students) took the required course in Human Physiology. Of these, 73 students returned the end-semester survey. About 53% of these student responses reported agreement or strong agreement regarding their difficulty in medical term pronunciation.

Surprisingly, only 6% of students indicated they experienced or strongly experienced difficulty reading English textbooks, and 28% still had difficulty in listening to English within an EMI course. It is clear that after 3 years of study in this vertically integrated medical program, students show increased confidence in their abilities in English listening and reading and moderate improvements in their ability to pronounce medical terms, but this does not extend to comprehension ability. About 42% of students in Year 2 and 45% of students in Year 3 felt a negative impact from EMI on their comprehension, while only 27% of students in Year 2 and 15% of students in Year 3 did not experience difficulties (Table 3.3). As mentioned previously, Medical Terminology focuses on medical terms and their application in clinical cases, but Human Physiology is more theoretical, covering theories of physiological functions and the application of physiological theories in various conditions. It is likely that the increased depth of the content from Years 2 to 3 may have impacted students' confidence in what they comprehended within this third year EMI course.

With respect to student acceptance of EMI-based courses, there was still an overwhelmingly negative view, with 72% of students in Year 2 and 61% of students in Year 3 not accepting EMI courses (Table 3.4). The vertical integration of courses was an evolutionary process whereby courses (content and practice) were reviewed

Table 3.4 The attitude of graduating class 2013 to EMI courses

	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
Year 2 – Medical Terminology percent respondents (total 58)					
Accept medicine-related EMI courses	2	5	24	50	19
Unaccept medicine-related EMI courses	17	55	22	5	0
Year 3 – Medical Physiology percent respondents (total 73)					
Accept medicine-related EMI courses	11	5	27	30	26
Unaccept medicine-related EMI courses	24	37	24	5	8

Table 3.5 Percent response Year 2 students, graduating class of 2016, to EMI courses (total 69)

	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
Year 2 – Medical Terminology percent respondents (total 58)					
Student English reports related to term-related scenario	12	41	38	9	0
Illustration-related homework	10	38	39	10	2
Good proportion of lectures in terminology and professional content	17	53	26	3	0
Combination with problem-based or clinical cases	20	45	26	5	3
Year 3 – Medical Physiology percent respondents (total 73)					
Case-based learning	32	47	14	8	0
Clinical case-based lecture	10	37	44	10	0
Problem-based learning	5	38	36	16	4
Lectures on content and clinical application	3	19	48	19	10
Review and discussion	12	39	24	18	5

and revised every year based on the feedback given by students. There is still considerably more work to be done, but the modifications appear to have been effective. Using the same measure for the Year 2016 graduating class as was used at the conclusion of the Year 2 Medical Terminology course, the number of students who did not accept EMI-based courses dropped by half to 36%.

The majority of the modifications made to the courses involved revising the pedagogical practices in the EMI courses from teacher-centered learning to student-centered learning. This involved transitioning students from teacher-centered lectures to student-centered PBL (Johnson, Saunders, & Tsai, 2013; Tsai, 2013). Despite the poor perception of EMI, overall student perceptions of the teaching practices and how these improved their comprehension of material were quite favorable (Table 3.5). Students from the graduating class of 2016 in their Year 2, when Medical Terminology was taught, indicated that their most favorable learning for-

Table 3.6 Percent response Year 2 students, graduating class of 2016, to EMI courses (total 69)

	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
My attitude to EMI courses					
I accept EMI courses	10	14	29	33	13
I do not accept EMI courses	14	22	30	25	9
I am aware of the importance of overseas obsevership programs in medical professionalism	22	45	19	7	7
Factor influences my decision to join an overseas observership program					
Future medicine in multicultural community	25	41	23	3	9
Senior's suggestions	16	43	25	12	4
Future development of international medicine	25	45	22	1	7
Cross-cultural communication in clinical practice	30	43	17	4	4
Peer pressure	14	29	41	9	7
About English Proficiency in EMI courses					
I am aware of the important impact of English on professional training in medicine	58	29	9	1	3
I will take English Proficiency Test to ensure English Proficiency	13	28	26	19	14
I wish school offer more training courses to prepare students for EMI courses	22	35	23	13	7

mat was a lecture format, which combined medical terms and professional content (70%). Their second preference were formats that combined lectures with problem-based or clinical cases (65%). At the end of Year 3, when Human Physiology was taught, the most favorable learning format, which 79% of students liked, was case-based learning. Their second best pedagogical choice was review and discussion. These responses, which showed that the least favorable choice was the pure lecture class with only 22% of the students preferring, were very different from the Year 2 responses.

Another critical aspect of this vertically integrated program is that it is biased to promote forward thinking and outcome-based learning (as opposed to the traditional passive thinking of objective-based learning). The premise is if students understand the purpose of what, why, and how they are learning, they are likely to remain motivated to keep learning as lifelong learners. Only more recently have we been able to evaluate how effectively the program is instilling this idea in the students. Now included as part of the end of Year 2 survey, the same year that the Medical Terminology course is included, are questions about whether students are thinking about future participation (three full years away) in the overseas observership program, what factors are motivating them to join the program, and how they intend to prepare themselves (Table 3.6).

A large proportion of Year 2 students from the graduating class of 2016 (67%,) was aware of the importance of overseas observership in cultivating medical professionalism. An increased acceptance of EMI courses may be partially due to students understanding that these courses could provide the chance to practice self-directed learning skills and prepare them for an overseas internship. This understanding may come from senior student advice, as 59% of these students in the class of 2016 agreed or strongly agreed with the influence of a senior's suggestion on their decision to join an overseas observership program. In addition to external motivators (such as seniors' suggestions), internal motivators were also important to change student mindsets. More than 60% of students agreed or strongly agreed with the importance of the following three factors related to global-competence education in making their decision: the future development of international medicine, the change of local communities from homogenous to multicultural, and the impact of cross-cultural communication in clinical practice. Many of these medical students indicated being interested in participating in the overseas observership program, and 87% of medical students considered English to be important in professional training. With regard to how they expected to improve their English proficiency, more than 50% of students preferred to have EMI courses in addition to self-preparation (41%). Results from this survey suggest that global-competence education is an important outcome goal of learning content knowledge in EMI courses.

Vertical Integration Framework in Program Curricula

The theoretical underpinnings of a vertically integrated program encompass five important elements: raised educational stakes, local ownership, a broad university role, longer attachments, and shared workforce vision (Rosenthal, Worley, Mugford, & Stagg, 2004). A clear educational vision increases learner ownership in vertical integration and shifts the paradigm from discovery to purpose-driven learning. The long-term practice of self-directed learning skills allows learners to feel self-empowered, engaged with the material, and to feel that their efforts contribute to their desired learning objectives (O'Donnell, Reeve, & Smith, 2012). Therefore, learners' motivation driven by autonomy, competence, and relatedness to their professional development is a critical determinant of the success in a vertically integrated curriculum (Deci et al., 1991).

The practical realization of vertically integrating EMI-embedded courses in a medical program first required the identification of global-competence in education as a learning goal. Secondly, key elements in global-competence education were identified and aligned with both content and language instruction each year. At the same time, content knowledge and language skills were coupled with self-directed learning activities, including cases or tasks each academic year in the EMI courses (guided by the notion of creating an appropriate transition in order to minimize student anxiety with regard to alien pedagogical practices). This vertical integration of various forms of CLIL in the EMI courses allowed the students to enhance their

Table 3.7 Possible vertical integration of EMI courses into a 4-year undergraduate program

		Outcome of discipline-specific content	Outcome of global competence
Year 1	Term 1 (2 credits)	EAP/ESP courses focus on professional terms and basic discipline knowledge	Application of discipline-related vocabulary and basic English communication in intercultural cases
	Term 2 (2 credits)		
Year 2	Term 1 (2 credits)	Discipline-specific course at the entry level lecture coupled with intercultural elements using case-based instruction	Initial discipline-related critical thinking and discussion in multicultural settings
	Term 2 (2 credits)		
Year 3	Term 1 (2 credits)	Case-based discipline related professional ethics	Making aware global context/ cross-cultural perspectives in speaking
	Term 2 (2 credits)	FULL problem-based learning case study – discipline related	Advanced discipline-related critical thinking on global issues in writing
Year 4	Terms 1–2 (4 credits)	International experience preparation followed by international experience: international internship/observership;	Cross-cultural negotiation skills and professional communication in presentation and writing

global competency by progressively improving the depth of discipline-relevant content with communication skills, cognitive learning, and cultural awareness. Repeated reinforcement, throughout the program, of both language and content knowledge happened by requiring students to think critically about basic and discipline-specific concepts raised in intercultural cases. All this raised their cross-cultural awareness and strengthened their confidence over time to actively participate in an overseas observership opportunity near the conclusion of the program and to cultivate their global competency through action.

The progression began in the first 2 years (Years 1–2) of the program when those courses focused on helping students integrate professional medical terms with English language usage and encouraged the use of textbooks in English – a considerable language focus through understanding how to communicate concepts via English. In the middle years (Years 3–4), as students became more fluent with their professional English, the focus moved to students acquiring a deeper understanding of advanced medical science-specific knowledge – focus on developing communication skills for medical content that uses English. This culminated in Year 5 and the summer afterwards that helped students develop newly learned clinical and professional skills as they were applied in international settings – focus on the professional content, English merely the medium to communicate this content.

We believe that the principles we adhered to can be equally effective when applied to vertically integrating EMI courses in the established curricula of typical 4-year undergraduate programs – as we propose in the framework shown in Table 3.7.

Highlights and Challenges

The overall highlight of our efforts to more effectively incorporate EMI courses into an established medical program was the vertical integration of EMI courses, which had a positive impact on most students, as can be seen in their learning attitudes about EMI and the way in which this vertical integration helped medical students enhance their global competency. More students were willing to explore the world and exercise their intercultural communication skills in our international partner hospitals. In addition to these English features, the whole medical program had a better balance in cultivating skill development instead of the direct instruction which they received in needed medical knowledge. Particularly important was the focus on critical thinking skill development early on in the medical program. The success of this effort was largely due to the progressive manner in which specific teaching practices were incorporated into the various vertically integrated EMI courses – practices which helped mitigate student anxiety about taking on the demands of a new way of learning. All this was realized by introducing only 8% of the total 217 credits as EMI-embedded medical curricula. With only 18 credits across six vertically integrated EMI courses (some being elective), in a context where the rest of the content courses were still offered in Chinese, more than 50% of the students indicated that they had a positive perception about the effectiveness of EMI courses and about the overseas observership.

Typically, challenges in this type of endeavor require the involvement of administrative authority and the enlistment of a core faculty team who can teach the EMI courses. Before the process of transformation can start, the administrative authority should develop an incentive plan to persistently raise the awareness of global-competence education and self-directed learning in all programs. During the transformation period, practical support (such as the systemic implementation of faculty development programs) should be planned ahead to effectively recruit more teachers who are willing to learn the skills necessary to convert their pedagogies from teacher-oriented lectures to student-centered learning in their EMI courses.

After the transformation is in place, the greatest challenge to this kind of EMI-embedded program is sustainability. In Taiwan's national academic institutions, term limits for key administrative positions, and the requirement that faculty assume new roles, mean a constant flux of personnel in key positions responsible for executing various aspects of any reformed program. If the next generation of faculty have not been properly inculcated about the value of the many reforms made, and the hard lessons that have been learned, and do not have the same passion as the original implementation team, then this new group may not be able to adequately advocate for maintaining the complete EMI-embedded curriculum, including the overseas observership program, and will not be able to explain the necessity of each detailed reform so as to counter the types of institutional resistance which always persist. If the program is not continually defended, then some of the gains made with the reforms will erode. Current challenges to the success of this reformed medical program accentuate the need for vigilance to maintain the benefits of the reforms

that have thus far been made and to heighten an appreciation that reform is a never ending process. Sometimes there are major changes and sometimes minor changes, but the program is always evolving.

Summary

Our past experience indicates that the simple implementation of EMI courses in a local university program may create great resistance from several fronts. The coordinated transformation of the existing program, which was primarily taught through Chinese instruction in a teacher-centered approach, now provides greater balance to the program through vertical integration, by being based on global-competence outcomes and by including a little more English instruction that incorporates modern student-centered pedagogical practices. The acceptance of the idea of the need for global-competence education coupled with self-directed learning and student feedback determined the goals and specific elements of this EMI-embedded program. The success of vertically integrating six EMI courses in a coordinated fashion across the program's curricula illustrates the value in identifying students' true needs, rather than just exchanging the instruction medium from Chinese to English. Instead, efforts were made to revise the learning paradigm from the teacher-oriented lecture mode of instruction, which is most familiar for Asian students in EFL settings, to a student-centered approach. The vertical integration of global competence into an EMI-embedded program, culminating in overseas observership opportunities, is not only an innovative curricular design, but, more importantly, is transformative for students. When we as teachers succeed in providing the learning opportunities our students need, they will be able to confidently face the challenges of a modern globalized world.

References

Atwa, H. S., & Gouda, E. M. (2014). Curriculum integration in medical education: A theoretical review. *Intellectual Property Rights, 2*(2), 113. doi:10.4172/ipr.1000113.

Ball, P. (2009). Does CLIL work? In D. Hill & P. Alan (Eds.), *The best of both worlds? International perspectives on CLIL* (pp. 32–43). Norwich, UK: Norwich Institute for Language Education.

Byun, K., Chu, H., Kim, M., Park, I., Kim, S., & Jung, J. (2011). English-medium teaching in Korean higher education: Policy debates and reality. *Higher Education, 62*(4), 431–449. doi:10.1007/s10734-010-9397-4.

Chang, Y.-Y. (2010). English-medium instruction for subject courses in tertiary education: Reactions from Taiwanese undergraduate students. *Taiwan International ESP Journal, 2*(1), 55–84.

Cho, D. W. (2012). English-medium instruction *in* the university context of Korea: Trade off between teaching outcomes and media-initiated university ranking. *The Journal of Asia TEFL, 9*(4), 135–163.

Chu, M.-P. (2015). Taiwanese college students' perceptions of L2 motivation and identity in a globalized context. *Hwa Kang English Journal, 21*, 1–33. doi:10.3966/221880882015122101001.

Coyle, D. (2002). From little acorns. In D. So & G. Jones (Eds.), *Education and society in plurilingual contexts*. Brussels, Belgium: Brussels University Press.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation in education: The self-determination perspective. *The Educational Psychologist, 26*, 352–346. doi:10.1080/00461520.1991.9653137.

Hunter, B., White, G. P., & Godbey, G. C. (2006). What does it mean to be globally competent? *Journal of Studies in International Education, 10*(3), 267–285. doi:10.1177/1028315306286930.

Johnson, C., Saunders, P. R., & Tsai, M.-L. (2013). Implementing the CBL$^+$ model allows scaffolded introduction to medical students unfamiliar with features of PBL structured learning. *Journal of Medical Education, 17*(3), 27–36. doi:10.6145/jme201313.

O'Donnell, A., Reeve, J., & Smith, J. (2012). *Educational psychology: Reflection for action* (3rd ed.). Hoboken, NJ: Wiley.

Reimers, F. M. (2009). Global competency: Educating the world. *Harvard International Review, 30*(4), 24–27.

Rosenthal, D., Worley, P. S., Mugford, B., & Stagg, P. (2004). Vertical integration of medical education: Riverland experience, South Australia. *Rural and Remote Health, 4*(1), 228.

Tsai, M. L. (2013). Implementation of explicit scaffolding with key features of critical thinking changes medical students' perceptions of PBL in a hybrid curriculum. *Journal of Medical Education, 17*(4), 146–155. doi:10.6145/jme201316.

Tsui, A. B. M. (2004). Language policies in Asian countries: Issues and tensions. *The Journal of Asia TEFL, 1*(2), 1–25.

Wijnen-Meijer, M., ten Cate, O., van der Schaaf, M., Burgers, C., Borleffs, J., & Harendza, S. (2015). Vertically integrated medical education and the readiness for practice of graduates. *BMC Medical Education, 15*, 229. doi:10.1186/s12909-015-0514-z.