English as a Medium of Instruction for Medical Science

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Outlines

- Internationalization and EMI Taiwanese higher education
- EMI in Taiwanese medical education
- Intended learning outcomes associated with introducing EMI into medical schools
- A strategic plan for implementation of EMI courses

Internationalization and EMI in Taiwanese higher education

- University internationalization
- Taiwan regards EMI as an effective means of driving university internationalization
- global competitiveness
- Internationalized campus environment
- Inevitable impact
- Viewed as an evolutionary process

EMI in Taiwanese medical education

- Today, there are 13 medical schools in Taiwan.
- Four years of undergraduate students: nurse, biotechnology, and so on.
- Six years as undergraduate students: medical doctors, dentists, pharmacists, and physical therapists.
- Program curriculum must be consistent with TMAC (Taiwan Medical Accreditation Council) guidelines
- 1,300 medical professionals find employment in hospitals and health-related institutes every year.

Table 2.1 Students' entry level scores on the General Scholastic Ability Test (GSAT) and mandatory English courses and credit hours

University	*GSAT entry level*	*Mandatory credit hours*	*Mandatory courses*
NU1	7%	6	Fundamental English I and II Advanced English I and II
NU2	7%	6	Fundamental English I and II Advanced English
NU3	7%	4	General English I and II
NU4	7%	6	General English Applying English Medical purpose English Advanced English
PU1	7%	6	Fundamental English I and II Conversational English English reading
PU2	7%	8	General English I and II Advanced English English listening and speaking
PU3	7%	6	Medical English Fundamental English I and II English writing
PU4	7%	6	General English Listening and speaking English
PU5	7%	6	English I and II Reading and writing English
PU6	7%	6	Listening and speaking English Reading English
PU7	7%	6	Fundamental English Advanced English
PU8	7%	4	Fundamental English, Speaking English, English writing

Note: Medical schools located within national universities are coded NU1, NU2, and so on. Medical schools located within private universities or colleges are coded PU1, PU2, and so on.

Medical students

Students' entry level score on GSAT and mandatory courses and credit hours

- 12 medical programs
- 4 public or 8 private universities

Students

- Stringent admission requirement
- Top 7% of test takers
- Better academic performance in English

General English courses

- Six credit hours
- Fundamental and Advanced English

Skill and regression

- General English is skill that can be lost overtime.
- It will regress if student lack adequate opportunities to practice and improve these skill.

Natural starting point

- Completing general English courses is a natural starting point
- The pursuit of specialty and English competence.

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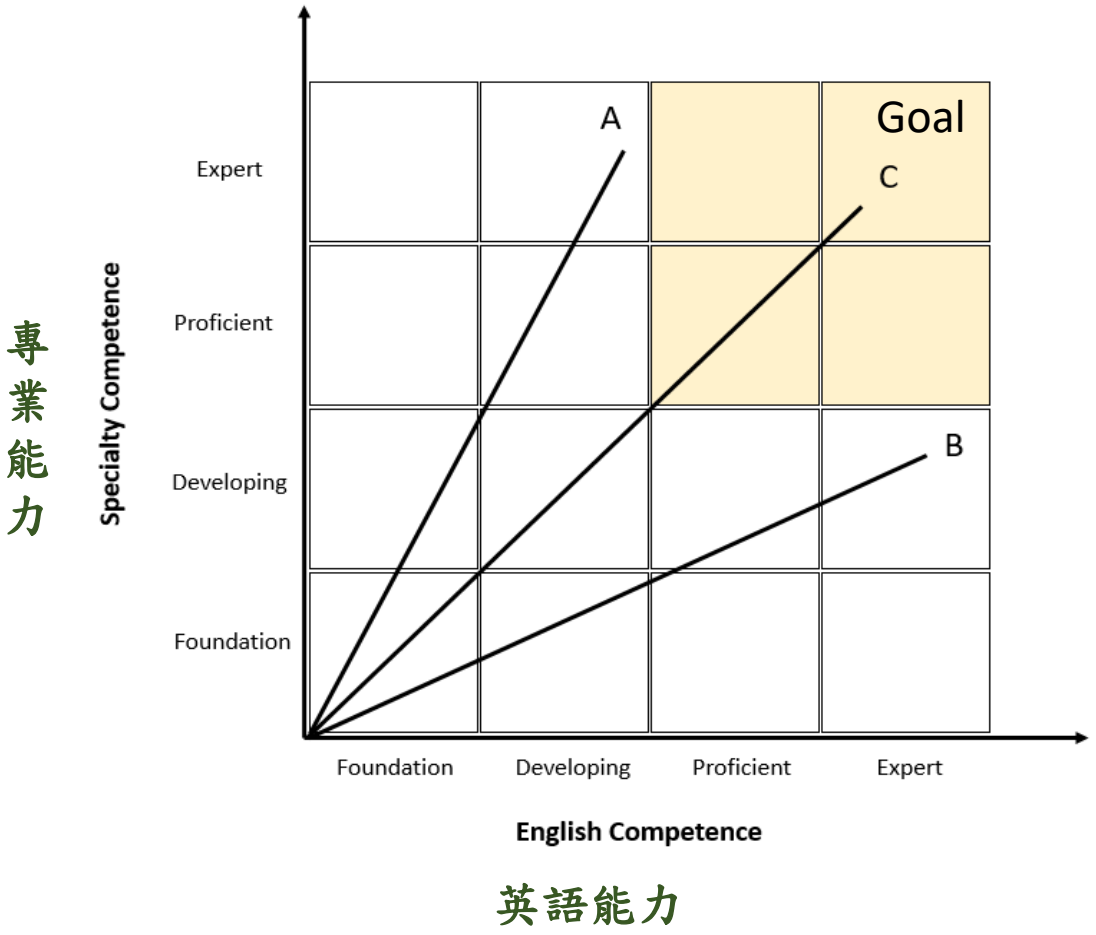
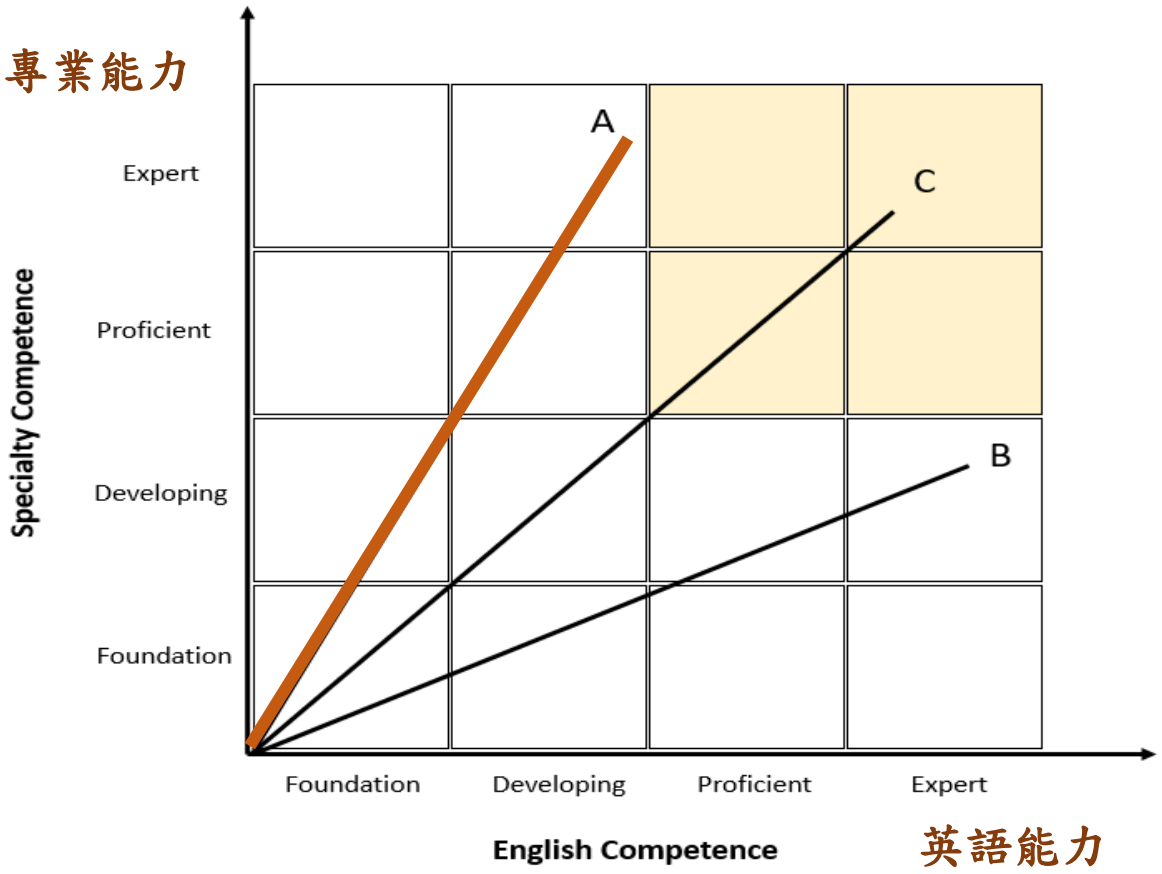
The goal, intended outcome, and possible outcomes



- Students' learning outcomes can be evaluated by two categories:
  - Specialty competence
  - English competence
- The yellow zone indicates that both competencies reach proficient or expert level.
- There are three possible outcomes when introducing EMI courses
- Three possible outcomes: A, B, and C.

Hypothetic outcome A

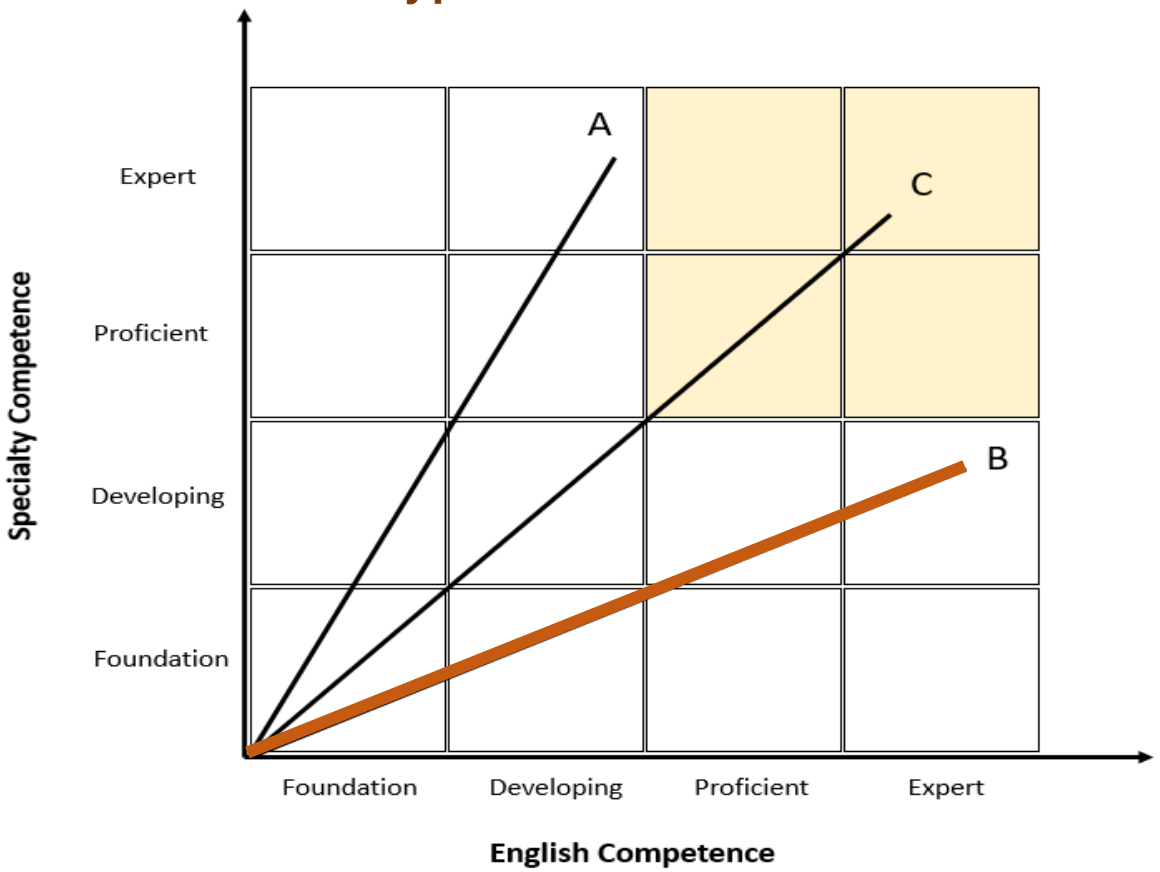


Students' specialty competence reaches an expert level, but their English competence is at a developing level.

Possible reasons:

- Students are not constantly engaged in learning English during six years of medical education.
- Insufficient EMI resources
  - A lack of qualified EMI teachers
  - Inadequate English activities such as workshops, symposiums, and speeches
  - Supportive EAP and ESP courses
- Curriculum design has no strategy

Hypothetic outcome B

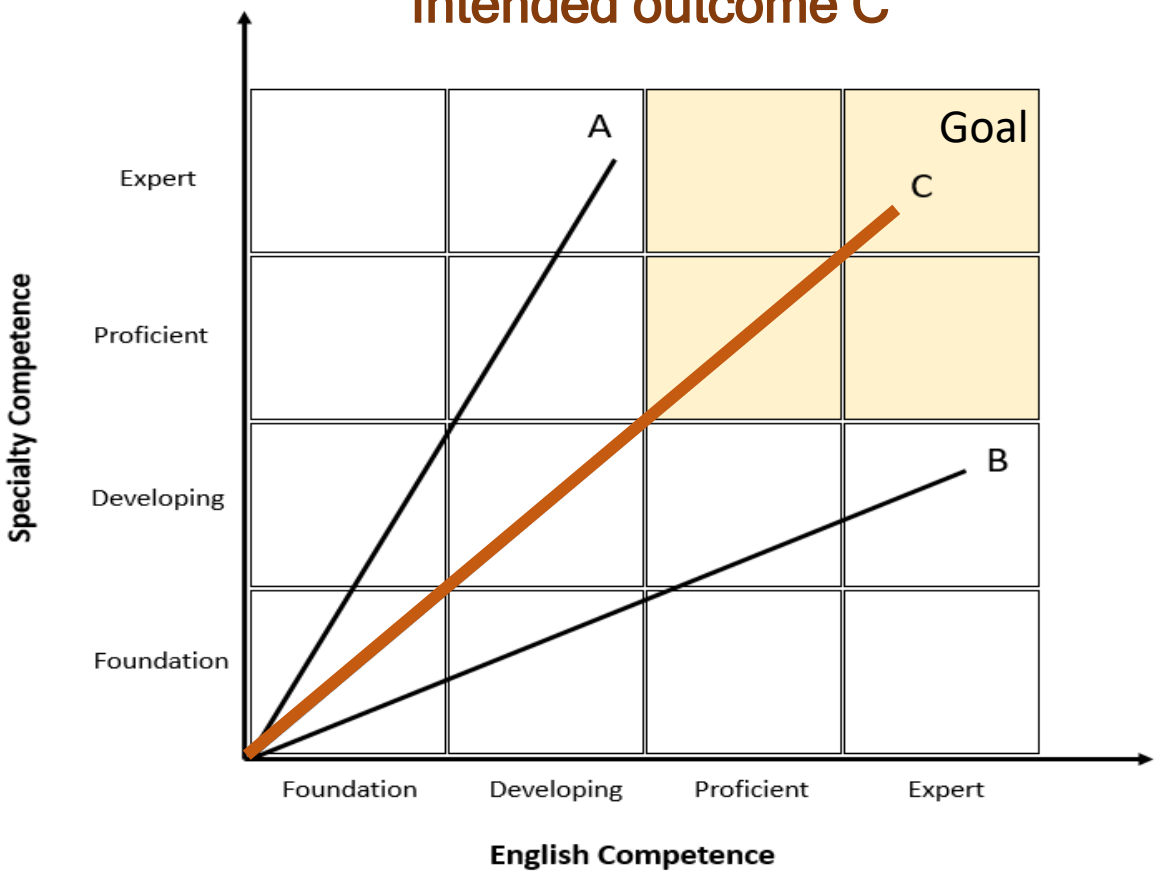


Students' specialty competence reaches an expert level, but their English competence is at a developing level.

Possible reasons:

- Introducing massive EMI courses improves students' English competence but sacrifices the demand for medical professional training.
- The curriculum design has no strategy.

Intended outcome C



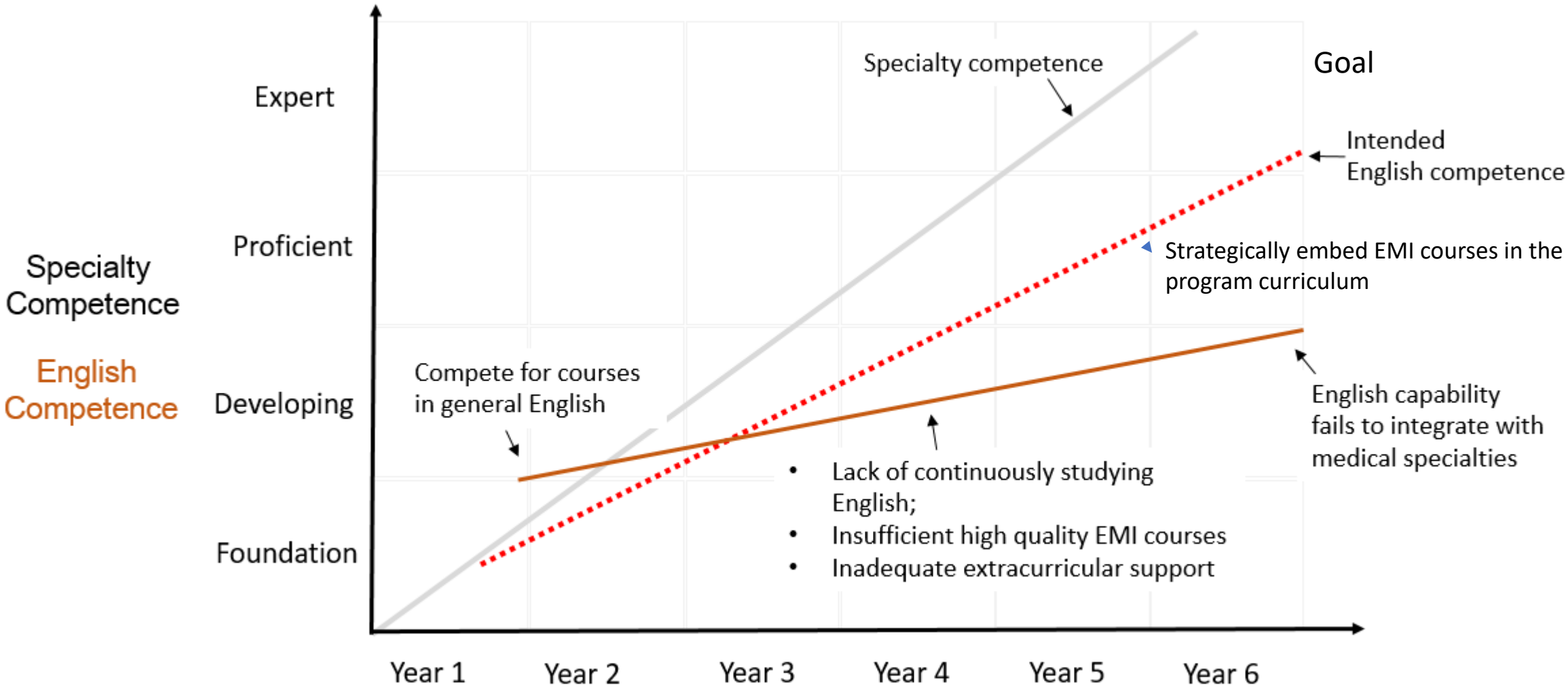
Students' both specialty and English competence reach expert levels

Possible reasons:

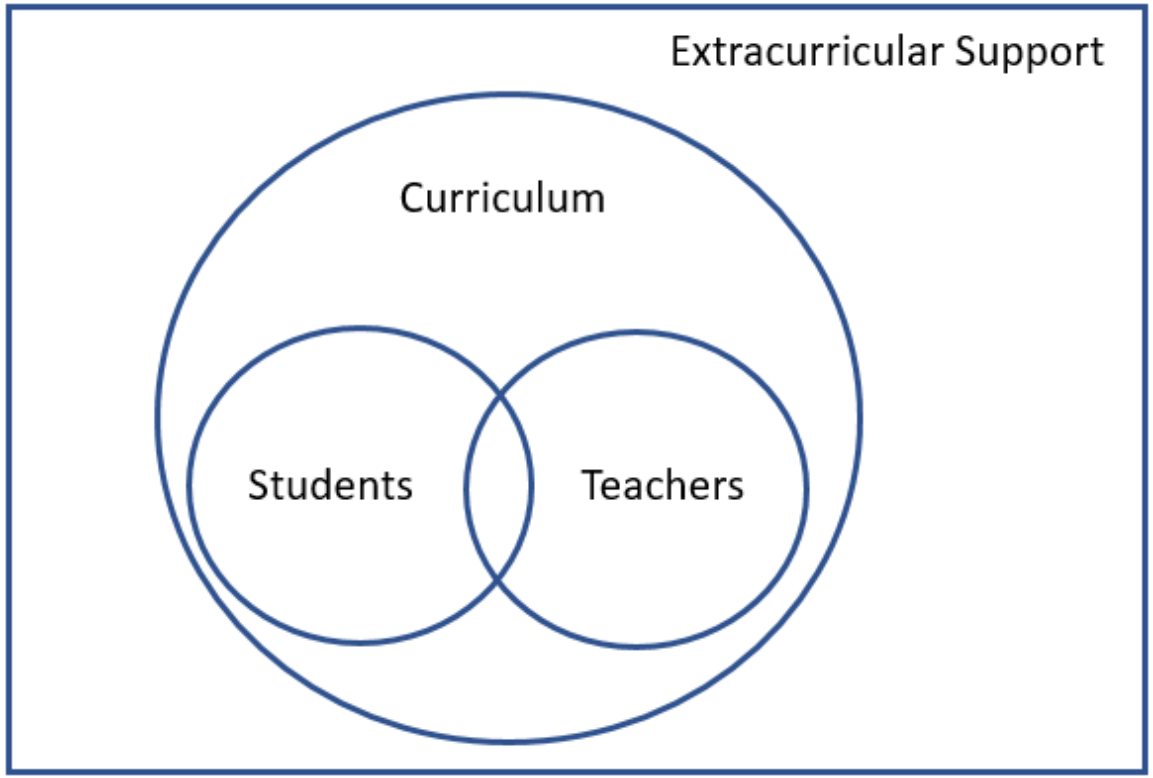
- EMI courses are strategically integrated into the program curriculum
- The program curriculum shape students to be bilingual.

This is an ideal outcome that students become medical specialists capable of using English to acquire updated knowledge and communicate with international peers.

Medical students and Development of professional English language skills



A strategy plan for Implementing EMI



Four essential components in the development of EMI courses

Curriculum design

TMAC guidelines

Year 1 and 2

Liberal arts (Year 1 and year 2)	***Basic training*** (Year 3 and Year 4)	***Specialized training*** (Year 5 and Year 6)
▪ Philosophy ▪ Ethics ▪ History and civilization ▪ Social science and economics ▪ Art and culture ▪ Science and technology ▪ Social Sustainability	▪ General English writing ▪ Scientific reading ▪ Information technology and medicine ▪ Biostatistics ▪ Data science ▪ Computer programming ▪ Biostatistics ▪ Experimental design	▪ The guidelines of writing patient record notes ▪ Academic presentation ▪ Scientific writing ▪ Health care policy ▪ Insurance and health policy ▪ Environmental health ▪ Law and medicine ▪ Evidence-based medicine ▪ Medical ethics

- Policymakers should select courses that can be developed into EMI courses without negatively impacting the program curriculum.
- Some courses associated with liberal art and social science in the first and second years could be embedded into the program curriculum because they can lay a foundation for students to thrive in their EMI courses in upcoming years.

Curriculum design

TMAC guideline

Year 3 and 4

Liberal arts (Year 1 and year 2)	***Basic training*** (Year 3 and Year 4)	***Specialized training*** (Year 5 and Year 6)
▪ Philosophy	▪ General English writing	▪ The guidelines of writing patient record notes
▪ Ethics	▪ Scientific reading	▪ Academic presentation
▪ History and civilization	▪ Information technology and medicine	▪ Scientific writing
▪ Social science and economics	▪ Biostatistics	▪ Health care policy
▪ Art and culture	▪ Data science	▪ Insurance and health policy
▪ Science and technology	▪ Computer programming	▪ Environmental health
▪ Social Sustainability	▪ Biostatistics	▪ Law and medicine
	▪ Experimental design	▪ Evidence-based medicine
		▪ Medical ethics

- Courses in the years three and four are basic science.
- Several EAP and ESP courses could be offered alongside EMI courses to equip students for ongoing EMI courses. For example, general English writing and scientific reading.
- Several basic science and technology courses unrelated to abstract and challenging content could also be good candidates for developing EMI courses, for example, Information technology and medicine, Biostatistics, data science, experimental design, etc.

Curriculum design

Year 5 and 6

Liberal arts (Year 1 and year 2)	***Basic training*** (Year 3 and Year 4)	***Specialized training*** (Year 5 and Year 6)
▪ Philosophy ▪ Ethics ▪ History and civilization ▪ Social science and economics ▪ Art and culture ▪ Science and technology ▪ Social Sustainability	▪ General English writing ▪ Scientific reading ▪ Information technology and medicine ▪ Biostatistics ▪ Data science ▪ Computer programming ▪ Biostatistics ▪ Experimental design	▪ The guidelines of writing patient record notes ▪ Academic presentation ▪ Scientific writing ▪ Health care policy ▪ Insurance and health policy ▪ Environmental health ▪ Law and medicine ▪ Evidence-based medicine ▪ Medical ethics

- Courses in years five and six are hospital-based clinical training, so-called clerkship.
- Many courses can be developed as EMI courses because those courses are universal knowledge.
- Students taking those EMI courses help them become international medical specialists. They are health care policy, environmental health, evidence-based medicine, medical ethics, etc.
- However, school educators may consider developing EAP or ESP courses in scientific writing and academic presentation because these courses are crucial for medical professionals.

EMI Teachers

Table 2.5 Estimation of qualified EMI teachers in medical schools in Taiwan

University	*% (M/N)*
NU1	Not available
NU2	16.1% (16/99)
NU3	Not available
NU4	4.2% (5/118)
PU1	3.7% (14/370)
PU2	7.6% (9/118)
PU3	17.8% (27/151)
PU4	Not available
PU5	7.6% (11/144)
PU6	10.6% (10/94)
PU7	6.2% (9/143)
PU8	12.8% (10/78)

Note: *M* represents the number of faculty members in the department of medicine who were awarded degrees from English-speaking countries. *N* represents the total number of faculty members in the department of medicine. Medical schools located within national universities are coded NU1, NU2, and so on. Medical schools located within private universities or colleges are coded PU1, PU2, and so on. These data were collected from the official websites of the medical schools, which were accessed in April 2020.

- This table illustrates the estimation of qualified EMI teachers in medical schools in Taiwan.
- The information collected from the websites of medical schools in Taiwan, faculty members who have either a master's degree or doctorate from an English-speaking country, on average, account for less than 10% of the faculty.
- The result suggests that qualified teachers who are highly skilled in both English and medical specialties may be difficult to find in Taiwan.

Possible solutions to the shortage of qualified EMI teachers

- To offer courses that are co-taught by medical professionals and English expert
- To offer more opportunities for professional development of EMI teachers
- To work with faculty outside the medical school to implement EMI courses within the medical school curriculum

Extracurricular support

To cultivate a positive environment, schools may consider holding various academic activities using English, such as international conferences, workshops, and forums. These activities help students and faculty to implement English in the university environment naturally.

- Establish a writing center and language center
- Award or recognize EMI teachers
- Respect CMI teachers
- Transform academic culture

EAP and ESP courses alongside EMI courses
scientific reading, presentation, and writing

- General English courses at the fundamental and advanced levels may not be sufficient for students thriving in EMI courses.
- ESP and EAP courses associated with medicine-related reading, presentation, and writing could be alongside EMI courses
- They help students sharpen their skills in medical specialties.

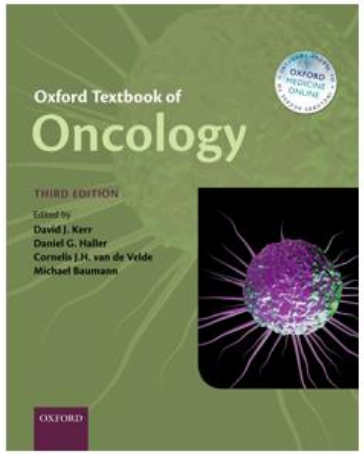
Academic reading

Many medical students read Chinese-translated textbooks or references instead of English-language ones. Some students only focus their studies on medical specialty's board certification examination.

- This not only hampers students' development of English reading comprehension it also adversely affects their development as medical specialists.
- Poor-quality and outdated translated textbooks will resist students from acquiring or constructing updated and completed medical knowledge.

Academic reading

Reading original English textbooks helps students develop their general use of English in the realm of medicine.



In Taiwan, students have few opportunities to experience environments where English is the main language. However, reading English texts is a good opportunity for students to engage themselves in an English language context.

Acquiring scientific knowledge by reading original English texts provides students with several advantages

- To build up their professional vocabularies,
- to apply this vocabulary, and
- To develop their general use of English in the realm of medicine.

Designing EAP and ESP courses in reading for academic and medical purposes will help students develop reading competence.

English for academic presentation

Today's rapid development of medical science and technology has caused scientists to largely adopt English for oral presentations so as to communicate with global peers at **international conferences, workshops, symposiums, and meetings**.

- Policymakers in higher education should consider implementing EAP and ESP courses to teach academic presentation skills.
- It offers students a valuable opportunity to learn how to use English **to acquire scientific knowledge**, **articulate arguments, and interact with listeners.**

Academic writing

Medical writing is a viral means of communicating scientific information. It includes the writing of documents such as disease- or drug related education, promotional literature, journal articles, healthcare websites, and so on.

- Arguably, many students are still at the development level of English medical writing before graduation, though data are needed to substantiate this claim.
- Educators in higher education may consider implementing EAP and ESP courses to teach academic writing to medical students.
- School administrators may also consider establishing writing centers on campus to help students overcome barriers to English writing.

Conclusion

- Miss out EMI benefits if medical students discontinue developing their English skills with specialty training.
- Room to implement EMI without disrupting the existing curriculum.
- Consider four factors: teacher, student, curriculum design, and extracurricular support when introducing EMI courses
- Strategically Identify courses to develop EMI courses
- Alongside EAP and ESP courses.
- Consistently offering high-quality EMI courses every semester