

# Cross-cultural Comparison of an American and a Taiwanese Medical School with Longstanding Institutional Ties

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## ABSTRACT

Cross-cultural medical education has been suggested to train students to care for diverse patient populations and reform medical education systems. In this article, the authors conduct a cross-cultural comparison between two medical schools with a long-standing relationship – the Warren Alpert Medical School of Brown University in the United States and the School of Medicine of National Cheng Kung University in Taiwan – focusing on history, admissions, and curriculum.

**KEYWORDS:** Cross-cultural medical education, medical schools, Taiwan, United States

## INTRODUCTION

Cross-cultural medical education has been proposed as a means of training students to care for diverse patient populations and recognizing and addressing cultural biases in healthcare.<sup>1,2</sup> Understanding the process of adapting medical education across cultures can also help physicians and medical educators by promoting research collaborations and welcoming exchange students.

The Warren Alpert Medical School (AMS) of Brown University was selected by the College of Medicine of National Cheng Kung University (NCKU) in Taiwan as one of their models.<sup>3</sup> This article provides a cross-cultural comparison between the two medical schools, focusing on history, admissions, and curriculum.

## FOUNDATIONS OF RELATIONSHIP

Both universities have long histories, although their medical schools were more recently established. Brown University was founded in 1764 as the seventh college in Colonial America.<sup>4</sup> Brown became the third university in the United States (US) to create a medical school in 1811, although the school was closed 16 years later.<sup>5</sup> In 1972, Brown's medical school was relaunched with new specialists, laboratories, and clinical services.<sup>5</sup> NCKU was created in 1931 as "Tainan District School for Higher Education" and given its current name in 1971.<sup>6</sup> In 1981, the governmental executive branch approved the creation of the NCKU College of Medicine,

which formally began admitting students in 1983.<sup>6</sup>

Brown and NCKU have shared several exchange programs at the undergraduate and graduate level since 2008.<sup>3,7</sup> AMS students may take a clinical elective at NCKU for 1-2 months, and AMS students and college students in Brown's combined baccalaureate-MD Program in Liberal Medical Education (PLME) may also take a two-week summer course on Chinese Medicine and cross-cultural biomedical ethics at NCKU.<sup>8</sup> All tuition, room, and board costs for clinical electives and summer courses are covered by NCKU. Likewise, NCKU students are allowed to complete clinical rotations at Brown free of charge. The Luke Charitable Foundation (US) and Ministry of Education (Taiwan) both provide a stipend/scholarship to the participants of this exchange program. In the past decade, 84 Brown and 56 NCKU students have participated in these cross-cultural linkages.

## SIMILARITIES AND DIFFERENCES

**Table 1** shows a comparison of admissions policies at Brown University and NCKU. Both schools have admission pathways for high school students. For NCKU, this is standard practice; all Taiwanese medical schools primarily admit high school students.<sup>9</sup> However, most American medical schools primarily admit students who will soon or have already completed an undergraduate education.<sup>10</sup> Fifty-eight percent of Brown medical students were admitted through the traditional route as college students and graduates, 37% were admitted through the PLME during high school, and 5% were admitted through the Early Identification Program (EIP) or Postbaccalaureate Linkage Program.<sup>11</sup>

Interviewing has traditionally been a very common admissions tool for medical schools in the US, including Brown.<sup>12</sup> Historically, Taiwanese medical students were only recruited through the national college admissions exam – a process shared with other East Asian countries and derived from a long history of exam-based meritocracy.<sup>13,14</sup> To this day, the Examination Yuan that conducts civil service exams is one of Taiwan's five branches of government. However, criticism by the US National Committee on Foreign Medical Education and Accreditation (NCFMEA) has pushed Taiwanese medical schools like NCKU to integrate personal applications and interviews into their admissions process, following Brown's model.<sup>13</sup>

**Table 1.** Comparison of Admissions Policies at Brown University and NCKU

	Brown University	NCKU
<b>Admissions: Categories of Students</b>	(1) Fourth-year high school students applying for the PLME (2) Third-year undergraduate students at University of Rhode Island, Providence College, Rhode Island College, and Tougaloo College applying for the EIP (3) Traditional applicants who have completed or will complete college before matriculating to medical school (4) College graduates who enroll in selected post-baccalaureate programs	(1) Third-year high school students in the top 1% of their high school with qualified national GSAT applying for the Stars Program (2) Third-year high school students and university-degree holders who have taken the GSAT personally applying for NCKU (3) High school students who have completed their third year and taken the Advanced Subjects Test
<b>Application Process</b>	(1) PLME applicants submit their ACT or SAT scores and application essays to Brown University and the PLME; interviews changed to a video portfolio due to the COVID-19 pandemic. (2) EIP applicants apply and are nominated by their institutions after a review process and may be selected for a virtual interview by Brown; no standardized exam scores are necessary. (3) Traditional applicants submit their MCAT score, grades, and application essays to AMS and may be selected for a virtual interview by Brown. (4) Postbaccalaureate applicants are nominated by their institutions and may be selected for a virtual interview by Brown; no standardized exam scores are necessary.	(1) Applicants who scored in the top 1% on the GSAT and are recommended by their high schools can apply through the Stars program; they will attend an MMI-formatted interview. (2) Applicants can submit their GSAT score and portfolio to NCKU and will attend an MMI-formatted interview. (3) Applicants submit a 'University and Department preference list' and are matched to an institution, including NCKU, based on their AST score.
<b>Diversity</b>	Brown EIP's mission is to recruit students from groups historically UiM, first-generation college students, and low-income backgrounds. Brown has created an Office of Diversity and Multicultural Affairs and organized a Task Force on UiM Admissions to attract and retain more UiM students.	A major goal of the Stars Program is to encourage rural students to enroll in Taiwanese colleges and medical schools.
<b>International Students</b>	No limit; international medical students must complete one year of education in the US or Canada	Maximum of 7 non-Taiwanese students; quota is determined by Ministry of Education

Abbreviations: AMS, Warren Alpert Medical School of Brown University; AST, Advanced Subjects Test; EIP, Early Identification Program; GSAT, General Scholastic Ability Test; MCAT, Medical College Admission Test; MMI, multiple mini-interview; NCKU, National Cheng Kung University; PLME, Program in Liberal Medical Education; UiM, underrepresented in medicine.

Medical school curricula at Brown and NCKU also show major similarities (Table 2). Required and recommended pre-medical coursework overlap at both institutions, including biology, chemistry, physics, writing, and social sciences. Likewise, the medical science curriculum is notably similar at Brown and NCKU, with detailed instruction in pathology, histology, pharmacology, and health systems. In addition, medical licensing exams in the US and Taiwan both cover basic science, clinical knowledge, and skills.

A major reason AMS was selected as a model for NCKU was because of its curricular focus on liberal arts and medical humanities – primary areas of interest for Taiwanese medical educators since the reforms in the early 2000s.<sup>13</sup> The aim of the Brown PLME is to promote student exploration in the liberal arts and sciences,<sup>15</sup> and Brown's 'Open Curriculum' gives PLME students academic flexibility by prohibiting institutional course requirements. AMS offers scholarly concentrations in 'Caring for Underserved Communities', 'Medical Education Medical Humanities and Ethics', and 'Physician as Communicator', among others.<sup>16</sup> The Clinical Arts and Humanities Program at Brown also hosts the Bray Fellowship in Medical Humanities and the Bray Visiting Scholar/Creative Artists Fellowship to integrate the humanities into medicine. NCKU integrated this academic flexibility into its curriculum by providing six elective weeks

where medical students may choose to spend their time on any approved task (e.g., conferences, research, workshops).

The Brown-NCKU exchange has impacted medical education at Brown as well. Two years before the Brown-NCKU exchange agreement was signed, Brown established an elective course in Medical Chinese to educate preclinical medical students on communicating with Mandarin-speaking patients. This course has provided an important pipeline for AMS students in the Brown-NCKU exchange. Developing an international exchange program with NCKU reinforced Brown's curricular reforms to teach medical students to care for patients from diverse cultures and backgrounds.

The US and Taiwan both require that physicians pass medical licensing exams, although both countries have been moving away from exam-based curricula. The US Medical Licensing Examination (USMLE) Step 1 transitioned to a pass/fail grading system as of January 26, 2022.<sup>17</sup> Taiwan changed their medical licensing Stage 2 exam to incorporate Objective Structured Clinical Examinations (OSCEs) and improve patient care.<sup>18</sup> Notably, OSCEs were used in both countries, despite low reliability.<sup>19,20</sup>

Brown has more flexible grading policies than NCKU, reflecting cultural attitudes towards exams. For example, the USMLE has higher pass rates for first-time takers (92–96%) than Taiwanese national licensing exams (61–91%).<sup>21</sup>

**Table 2.** Comparison of Curriculum Policies at Brown University and NCKU

	Brown University	NCKU
<b>Duration</b>	8 years	6 years
<b>Annual Cost of Attendance<sup>a</sup> (Tuition + others)</b>	<i>Undergraduate:</i> USD \$82670 / NTD 2314760 <i>Medical:</i> USD \$93970 / NTD 2631160	<i>Locals:</i> USD \$2825 / NTD 79100 <i>International students:</i> USD \$5135.07 / NTD 143782
<b>Premedical Curriculum</b>	<i>Required:</i> 4 chemistry/ biochemistry courses; 2 biology and physics courses; 1 math course <i>Recommended:</i> Writing and social science coursework	3 general education courses; 2 physical education, service learning, sociology, and biology courses; 1 Chinese, English, organic chemistry, and medical physics course
<b>Preclinical/ Translational Curriculum</b>	Pathology, Histology, Pharmacology, Health Systems, Anatomy, Physiology	Anatomy, Histology, Physiology, Pathology, Pharmacology, Global Health System, Block Curriculum (11 sub-blocks) including at least 8 credits of medical humanities electives
<b>Clinical Curriculum</b>	2-week clinical skills clerkship, doctoring program	2-week 'clinical skills for clerkship' workshop, 'On Doctoring' program
<b>Grading</b>	Premedical students can choose to be graded on the A(90+)/B(80–89)/C(70–79)/NC(<70) or S(70+)/NC scales. Preclinical years are graded on the S/NC scale. Clinical years are graded on the Honors (top 30% of class)/S/NC scale. The minimum passing grade is a 70.	All students are graded on the following scale: A+ (90–100), A (85–89), A– (80–84), B+ (77–79), B (73–76), B– (70–72), C+ (67–69), C (63–66), C– (60–62), F (<59), and X (0). The minimum passing grade is a 70.
<b>Clinical Evaluation</b>	Student evaluations by preceptors across nine competencies, OSCEs, national standardized subject-based exams, assignments, and presentations	Written exams, PBL and small-group assessments, OSCEs, national standardized subject-based exams, and research performance evaluations by preceptors
<b>Class Rank</b>	No class rank; undergraduate students in the top 20% are designated as "Magna Cum Laude"	Students were numerically ranked prior to 2016; now, transcripts display rank percentiles for top 5%, 10%, 20%, 30%, 50%, and 75% instead of numerical-order class ranking indicators.
<b>Licensing Exams in Medical School</b>	United States Medical Licensing Examinations (Steps 1 and 2)	Medical Licensing Examinations (Stages 1 and 2)
<b>Licensing Authority</b>	Federation of State Medical Boards and National Board of Medical Examiners	Ministry of Examination (governed by Examination Yuan)

Abbreviations: NC, no credit; NCKU, National Cheng Kung University; OSCE, Objective Structured Clinical Examination; PBL, problem-based learning; S, satisfactory.

<sup>a</sup> An exchange rate of 1 USD:28 NTD was used for currency calculations.

Unlike NCKU, AMS does not rank students and implements exclusive pass/fail grading in the preclinical years, de-emphasizing grades and competition. However, during the clinical years at AMS, at least the top 30% of students in clerkships are awarded Honors grades; students in electives have no limits on Honors grades.

Both universities provide ample opportunities for students to engage in research, especially during the pre-clinical years. AMS provides PLME and medical students with summer research funding, programs to match students with faculty mentors, and course credit for research; AMS also offers a Scholarly Concentration for medical students interested in basic and translational research. NCKU provides summer and year-long research funding, offers a research elective, and helps match medical students with international research projects. Of note, NCKU encourages medical students to conduct research in the summer during their preclinical years.

### LESSONS LEARNED

Medical education is remarkably similar at NCKU in Taiwan and AMS in the US, partly due to recent Taiwanese and NCKU curricular reforms. Culture and history influenced different approaches to medical education at both institutions, demonstrating several important lessons for cross-cultural medical education.

First, education reforms led by the Taiwanese government successfully led to the cross-cultural adoption of the US model with a distinct Taiwanese flavor. Cultural understanding is essential when adapting medical education models across cultures. The US also has much to learn from Taiwan; healthcare services are considerably more expensive in the US despite similar medical education systems and wider accessibility in Taiwan.<sup>22</sup>

Second, medical schools in different cultures with similar curricula are well-suited for international exchange programs that can last over a decade and introduce medical students to patient care in another healthcare system.

American medical students who rotate internationally may improve their care for patients of different cultures.<sup>1,2</sup>

Third, exposure to different systems can inspire reform at partner institutions. NCKU changed its admissions and curricular policies using AMS as a model; AMS and NCKU have taken steps to de-emphasize exams for accreditation and admissions, and both have focused on supporting humanistic-oriented medical education. Areas of curricular change pioneered at NCKU include course requirements in physical education, public service, and environmental medicine courses.

## LOOKING AHEAD

The partnership between Brown and NCKU has been fruitful for students and educators. Looking forward, more can be done to strengthen existing ties and promote the exchange of knowledge. Expanding visiting faculty and student exchange programs can help Brown and NCKU share institutional knowledge and experience. Brown currently has a faculty exchange program with Tougaloo College in Mississippi and a visiting research fellowship program for international graduate students. Visiting professorships<sup>23</sup> are a low-cost mechanism for improving collaboration,<sup>24</sup> mentorship, and professional development for physicians and researchers. Through the Brown-NCKU exchange program, 4 Brown and 3 NCKU faculty members have visited NCKU and Brown, respectively. Given the COVID-19 pandemic, a broader faculty exchange program could be developed and implemented more easily through virtual learning.

Additionally, Brown and NCKU can host joint international conferences on scientific research or medical education. Clinical departments at both institutions frequently hold grand rounds that can be coordinated together, and Brown organizes annual student research conferences. Virtual conference software can be utilized to share novel research findings while eliminating conference travel expenses,<sup>25</sup> reducing logistical costs, and lowering carbon emissions.

Notably, COVID-19 has had a larger impact in the US than Taiwan. Admissions and curricular policies at NCKU have therefore been mostly unaffected by the pandemic. By contrast, Brown has shifted many courses online at the undergraduate and medical school levels and adopted virtual interviewing.<sup>26</sup> As variants of COVID-19 continue to emerge, longstanding institutional linkages can help NCKU remain aware of viral threats and adapt to pandemic changes with the advice and support of its partner, Brown.

## CONCLUSIONS

Curricular reform at NCKU modeled upon that at AMS serves as a prominent example of cross-cultural adaptation of medical education systems. Furthermore, international

linkages between Brown and NCKU medical schools promote cross-cultural understanding of medicine for American and Taiwanese medical students. There are opportunities to further nurture this dynamic partnership by building faculty exchange programs, hosting joint conferences, and conducting collaborative research.

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### Disclosures

No conflicting relationship exists for any author.

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