

# Biomedical knowledge acquisition in Traditional Chinese Medicine Education

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## ABSTRACT

In this research project, data was gathered from three separate surveys for 2nd-year acupuncture students, 3rd and 4th-year acupuncture students, and acupuncture graduates. Participants were surveyed on their perceptions of how biomedicine and traditional Chinese medicine (TCM) subjects are integrated into acupuncture/TCM degree courses. Descriptive statistics were used to analyze the data; this information may contribute to how TCM schools can improve their performance in educating TCM practitioners of the future and how practitioners can integrate biomedicine into their practice. Results suggest that the TCM/acupuncture profession is predominantly middle-aged females with English as a second language. The only tertiary TCM institutions accredited by the New Zealand Qualifications Authority are in Auckland, and most practices are in Auckland.

## Keywords

Biomedical education, Acupuncture, Traditional Chinese Medicine, Integrated Medicine

*"A real breakthrough in CAM as a legitimate form of therapy can only occur when the 2 schools of thought learn a common language in which to communicate and consequently begin to truly collaborate." (1)*

## INTRODUCTION

The different views on health taken by Western Medicine (WM) and Traditional Chinese Medicine (TCM) create a complex learning environment for TCM students who are required to learn both as part of their degree course requirements. When either view is presented in isolation with no reference to how these views of health might contribute to the other, many students are left with confusing images in their minds of what health practice is. This research was instigated by a general sense of unease over students' performance in western medicine subjects in a TCM degree, where many students performed at a lower level than their TCM subjects.

For this research project, students at a tertiary institution and practitioners in New Zealand were surveyed (113 responses) about how they experienced learning western medicine and traditional Chinese medicine (TCM) subjects in a TCM degree. In the survey, all but one question was closed, and the closed questions were analyzed with descriptive statistics. A word cloud was used to identify themes emerging from how practitioners should take place through the integration of western medicine and TCM subjects. This research project has enabled a deeper understanding of the effectiveness of biomedical knowledge acquisition in TCM degree courses compared across New Zealand, Australia, the United Kingdom, and Canada.

## LITERATURE REVIEW

In an examination of a selection of the literature on biomedical education since 2016, six themes emerged: biomedical knowledge acquisition concepts, the tension between Traditional Chinese Medicine (TCM) and biomedicine- at education, healthcare system, and research levels, a lack of research on biomedical education in TCM, attitudes to integration from medical professionals, attitudes to integration from medical professionals, Attitudes to TCM from medical/ nurse students, and barriers to integration.

### **Knowledge Acquisition Concepts**

If we consider a student's learning experience within the Community of Inquiry framework (Figure 1), we see that there are three major contributing presences – cognitive presence, teaching presence, and social presence, and three intersecting contributing factors – supporting discourse, selecting content, and setting climate.

## Community of Inquiry

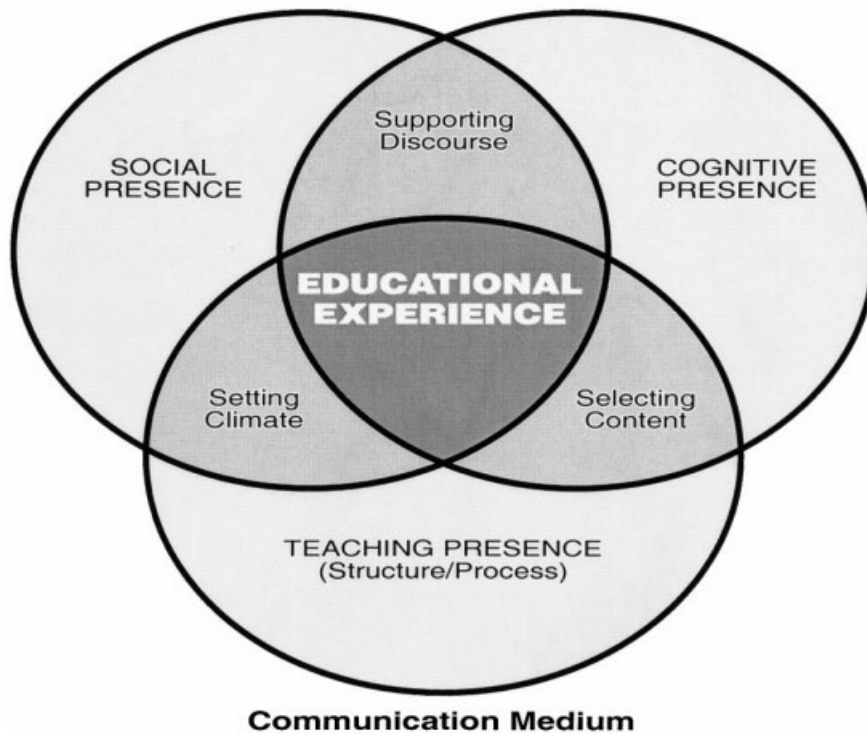


Figure 1. Elements of an Educational Experience

Table 1. Community of Inquiry Coding Template

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
Cognitive Presence	Triggering Event	Sense of puzzlement
	Exploration	Information exchange
	Integration	Connecting ideas
Social Presence	Resolution	Apply new ideas
	Emotional Expression	Emotions
	Open Communication	Risk-free expression
Teaching Presence	Group Cohesion	Encouraging collaboration
	Instructional Management	Defining and initiating discussion topics
	Building Understanding	Sharing personal meaning
	Direct Instruction	Focusing discussion

(2)

From Table 1, we can see that a sense of puzzlement, information exchange, connecting ideas, or applying new ideas may indicate cognitive presence. Social presence is indicated by expressing emotions, open communication, and group cohesion. Teaching presence is indicated by selecting and focussing on discussion topics and building understanding through shared personal meaning. When this is overlaid with the health landscape shown in Table 3 below, we can see that teacher presence may influence the way in which TCM and biomedical subjects are presented. This, in turn, may affect the way in which students in a TCM course integrate or accommodate biomedical knowledge into a TCM degree. An assumption may be made that quality health professions education delivery is

influenced by the purpose of education, the nature of knowledge, /the contents of the curriculum, methods of learning, and assessment (Baker et al., 2021). A further assumption that may be made is that educators will adopt a pluralistic approach to education that incorporates both a western view and a TCM view. Suppose educators lack awareness and fail to be aligned. In that case, they may not only promote sub-optimal education but may also be unable to evaluate educational efforts or demonstrate meaningful impacts where they exist appropriately (3). Informed pluralism could offer a hedge against slipping into dogmatic or unthoughtful approaches to education in the health professions (Baker et al., 2021).

### **The tension between TCM and Biomedicine at education, healthcare system, and research levels**

In many ways, when acupuncture in the TCM tradition entered mainstream western tertiary education, challenges emerged for acupuncture educators. In contrast, attempting to legitimize bi-marginality and being open to greater scrutiny exposure leads to a feeling of academic and mainstreaming disillusionment (4).

Givati and Berlinsky (2021) suggest that the attempts to align acupuncture into the biomedical paradigm in mainstream western institutions have increased the tensions between western medicine and eastern traditions and also questions whether TCM knowledge has been integrated, hybridized or domesticated in higher education institutions (5).

### **Lack of research on biomedical education in TCM**

Despite the high rates of TCM used worldwide and growing interest in TCM education, only a sporadic and underdeveloped body of original research has examined relevant issues. There is a need for growth in research activity and a clear, coordinated research agenda in this important topic area. The significance of growing such a research program around the broad topic of TCM education is essential to ensuring an adequately trained and educated TCM workforce capable of realizing an important role in the broader, coordinated, and inter-professional healthcare system care workforce (6).

### **Integrating Barriers**

Introducing knowledge, evidence, and the philosophy underlying TCM to undergraduates in different health professions might be the first important step to its integration. TCM adopts an individualized holistic approach to health provision, a radically different approach to biomedicine. Because western medicine is the dominant health system, barriers exist in attitudes held by western medicine practitioners. Measurement standards are also different

between the two systems regarding the efficacy of TCM and may be fuelled by a lack of knowledge by western medicine practitioners (7).

Baker et al. (2021) suggest that there are multiple views on how biomedical knowledge acquisition is acquired and valued and how it is included in the curriculum.

The literature also suggests that there is tension between biomedicine and TCM courses (in which acupuncture is taught) (5, 8) and that there is a dearth of research on this area for the integration of knowledge acquisition in TCM degrees. There also appear to be barriers to integrating biomedical knowledge from mainstream health providers caused by attitudes towards TCM, what holistic medicine is, how results are measured in holistic systems, and a general lack of knowledge about TCM and the practice of acupuncture.

World Health Organization (WHO) (2010) benchmarks for biomedicine content in TCM state that there should be 110 hours of anatomy, 90 hours of biochemistry and physiology, 90 hours of diagnostics and pathology, 290 hours of Clinical Medicine, 30 hours of Medical Psychology-in a basic acupuncture course totalling 700 hours (28.45%).

**Table 2 Indicative programme structure and teaching schedule**

Subject Name	Theory	Practical	Total
Principles of TCM	140	20	160
Chinese Materia Medica	90	20	110
TCM Formulae	90	20	110
Internal Medicine of TCM	140	60	200
Gynaecology of TCM	70	30	100
Introduction to Acupuncture	20	10	30
Dietary Therapy of TCM	30	30	60
Anatomy	80	30	110
Biochemistry and Physiology	70	20	90
Pharmacology and Toxicology	70	20	90
Pathology and Diagnosis	60	30	90
Clinical Medicine	240	50	290
Medical Ethics and Introduction to Research	50	10	60
Health Regulations	25	5	30
Medical Psychology	25	5	30
<b>Supervised clinical training</b>		<b>900 hours</b>	
<b>Total</b>		<b>2460 hours</b>	

TOTAL Biomedicine hours: 700 (28.45%)

(WHO, (2010))

Table 3 2021WHO indicative structure (WHO, 2021)

Learning modules	Key subjects	Basic level (hours)	Advanced level (hours)
Acupuncture	Introduction to acupuncture	16	32
	Meridians and acupoints	128	144
	Acupuncture skills and techniques	128	144
	Acupuncture therapeutics	208	256
	Microsystems acupuncture	–	48
	Special acupuncture techniques	–	96
	Specialized acupuncture treatment	–	144
<i>Subtotal</i>		<i>480</i>	<i>864</i>
Traditional Chinese medicine	Basic theory of traditional Chinese medicine	96	128
	Traditional Chinese medicine diagnostics	96	128
	Clinical essentials of traditional Chinese medicine	–	176
<i>Subtotal</i>		<i>192</i>	<i>432</i>
Conventional medical knowledge	Anatomy	128	144
	Physiology	64	64
	Pathology	64	64
	Biochemistry	64	64
	Diagnostics	96	96
	Clinical essentials	–	64
	First aid	–	32
<i>Subtotal</i>		<i>416</i>	<i>528</i>
Other relevant areas	Medical laws and regulations	48	48
	Medical ethics	32	32
	Evidence-based medicine	–	32
	Research methodology	–	32
<i>Subtotal</i>		<i>80</i>	<i>144</i>
Supervised clinical practice		400	500
<i>Total</i>		<i>1568</i>	<i>2468</i>

Total Biomedicine hours:	416 h (26.5%)	528h (21.4%)
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The Latest World Health Organization (WHO, 2021) benchmarks for biomedicine content in TCM training is more comprehensive and have different categories and levels of training. The Recommendations in TCM training came with the aim that individual practices and practitioners can be compared, evaluated and accredited, and career pathways can be clear. Conventional Medical knowledge is a module presented with 416 h (26.5%) in the Basic level of training and 528h (21.4%) in the Advanced level of training. Key subjects are Anatomy, Physiology, Pathology, Biochemistry, Diagnostics, Clinical Essentials and First

Aid).

**Table 4. Comparison of Biomed in TCM courses**

Country	Institution	Years	% Total
<b>Australia</b>	Endeavour College	3	21%
	RMIT	4.5	22%
	Torrens University	5	55%
	Western Sydney University	4	16%
	Sydney Institute of TCM	4	25%
<b>United Kingdom</b>	Lincoln College UK	3	18%
	International College of Oriental Medicine	3	17%
<b>Canada</b>	Ontario College of TCM	3, 4.5, 6	22%, 19%, 19%
	Alberta College of acupuncture and TCM	3, 4	30%, 28%
	Canadian college of acupuncture and TCM	2, 3	25%, 20%
	Toronto school of TCM	3, 4, 5	16%, 12%, 9%

In Table 4 above, the total hours of biomedicine subjects ranged from 12% (Alberta College of acupuncture and TCM) to 55% (Torrens University), with courses ranging from 2 – 6 years. Generally, a 3-year Bachelor of Acupuncture has a higher percentage of Biomedicine subjects. In contrast, 4- and 5-year Bachelor of TCM degrees have slightly lower % of Biomedicine components due to adding more specialized TCM courses and practicums.

**Table 5. A Health landscape for Biomedicine (BM) and Traditional Chinese Medicine (TCM) Integration**

	<b>BM dominant</b>	<b>TCM inferior to WM</b>	<b>Integrated</b>	<b>TCM over WM</b>	<b>TCM superior</b>
<b>Position view</b>	BM mono poly	TCM for placebo/psychological	BM & TCM together for individual	TCM superior (implied_BM narrow, limited efficacy)	TCM superior, WM dangerous
	BM approach	Acknowledge psychosocial support	Holistic	Holistic, emphasis on non-physical, maybe spiritual	
<b>Evidence of efficacy</b>	Objective measures, RCTs, external evaluation	RCTs demonstrated some effects of TCM	RCT requirements, <u>product</u> of mainstream		
			Clinical research demonstrating efficacy		
<b>Attitudes</b>	Mainstream knowledge system (BM) only reliable truth		Integrated systems – taking the best of both	BM systems corrupt	
<b>Focus system or individual</b>	Explicit attention to truth boundaries of BM and TCM		Individual/patient based: personal medical landscapes	Separate boundaries between TCM & BM	

Based on Uibu & Koppel (2021)

### Traditional Chinese medicine

*"It is relevant to call it interaction and not integration since, the latter brings with it not only the idea that two subjects can collaborate, but also that one of the two is lacking in something. The term interaction, on the other hand, highlights the reciprocal relationship without one of the two subjects being perceived as missing. In the term integrate there is inherent the concept of assimilation, incorporation, aimed at filling a defect. We should try to overcome the term integration in favour of the term interaction, which on the contrary emphasizes the reciprocal influence between two elements acting on each other.*

*... places them 'alongside one another ... relating them contextually and correlatively" (8).*

Brosnan et al. also suggest that practitioners need to be aware of both western medicine and TCM and be able to shift between the two minds effortlessly and without prejudice.



## METHODS

For this project, data was gathered with an online survey from 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-year undergraduate students and acupuncture practitioners. This project's main research question is: What factors contribute to effective biomedical knowledge acquisition in acupuncture degree courses? This proposed research project aimed to gain a deeper understanding of the effectiveness of biomedical knowledge acquisition in TCM degree courses by examining how biomedical knowledge is presented across degree courses in Australia, Canada, the United Kingdom and New Zealand. Thematic analysis of how biomedical knowledge is integrated within these courses, what aspects of biomedical knowledge are considered important, and how confident acupuncture graduates are in applying biomedical knowledge in their practice. Acupuncture NZ sent the SurveyMonkey link to answer the last question posed to their members.

15 second-year students, 32 third-and fourth-year students, and 66 graduates (113 participants) completed an online survey. There were seven sections in the survey: demographic data (age, gender, study country, years of study, English as a first language (EFL) or English as a second language (ESL), and practice location ( for graduates only); teaching data (how classes were presented and what resources were used); whether participants found learning biomedicine interesting and effective; most useful in practice (overall biomedicine, anatomy and physiology, microbiology, pathology, diagnosis and referral, and pharmacology; what participants found to be ranked as most useful biomedicine subject (diagnostics, biomedical tests, disease pathology, medication knowledge, how to identify red flags, and other); whether biomedicine was referred to in TCM papers and whether TCM was referred to in biomedicine papers. There was one open-ended question for participants to suggest how to integrate biomedicine and TCM. Research ethics approval was granted internally by the institution.

## RESULTS

As shown in Table 6 below, 58.4% of participants were graduates who were members of Acupuncture New Zealand, 28.3% of participants were undergraduate 3<sup>rd</sup> and 4<sup>th</sup>-year students, and 11% were second-year undergraduate students. Participants ages ranged from 18-30 years (19.5%), 31-40 years (26.9%), 41-50 years (27.4%), 51-60 years (15.9%), and

over 60 years (10.6%). Participants studied in different countries, including New Zealand (59.1%), China (30.3%), Korea (4.6%), Japan (1.5%), and other countries (9.1%).

Participants became practising acupuncturists after 2 years (13.3%), 3-4 years (63%), 5 years (13%), more than 5 years (13.9%), and other periods (.9%). 69.9% of participants had English as a second language, and most practices were in Auckland (50%). Only 12.1% of practices were in the South Island.

**Table 6 Biomedical Education Integration Survey (n=113)**

SQ	Demographics						
	Graduates		Students				
1	58.4% (66)		Years 3 and 4 28.3% (32)		Year 2 (Feb) 8.8% (10)	Year 2 (Jul) 2.2% (5)	
2	Gender	Male 38.9%	Female 60.2%		Not stated .9%		
3	Age	18-30 19.5%	31-40 26.5%		41-50 27.4%	51-60 15.9%	>60 10.6%
4	Country of study (Graduates)	NZ 59.1%	China 30.3%	Korea 4.6%	Japan 1.5%	Other 9.1%	
5	Years of study (Graduates)	2 13.3%	3-4 63%		5 13%	>5 13.9%	Other .9%
6	English first language	Yes (33+1) 30.1%		No (75+4) 69.9%			
7	Practice Location, Grads only (n=66)	Auckland 50%		Other North Island 39.4%	South Island 12.1%	Don't practice 1.5%	

Table 7 below indicates that education patterns have changed for second-year students with a greater reliance on online forums (80%) and quizzes (100%) as presentation and interaction devices, with years 3 and 4 students showing an increased result for the use of videos as a presentation device (66%). Current students also indicate a difference in learning resources used, with all students more reliant on their notes (80%), exam drafts (80%) and teacher feedback (50%). Year 2 students indicate a higher interest in learning biomedicine, with 70% and 80% interested or very interested and 75% of years 3 and 4 students in this category. The preferred learning resource for graduates was textbooks (92%). All participants regarded lectures and textbooks as important learning resources.

60% of year 2 students, 80.64% of years 3 and 4 students, and 72.72% of graduates responded that learning biomedical subjects was either effective or very effective. 90% and 80% of year 2 students, 87.38% of years 3 and 4 students, and 78.79% of graduates

responded that learning biomedical subjects was either useful or very useful. For anatomy and physiology, 80% and 100% of year 2 students, 93.75% of years 3 and 4 students, and 92.42% of graduates responded that learning this topic was useful or very useful. For microbiology, 70% and 60% of year 2 students, 65.65% of years 3 and 4 students, and 68.18% of graduates responded that learning this topic was either useful or very useful. For pathology, 74.38% of years 3 and 4 students and 88.33% of graduates responded that learning this topic was either useful or very useful. For diagnostics and referral, 80% of year 2 students, 93.5% of years 3 and 4 students, and 86.37% of graduates thought that this was important or very important. For pharmacology, 80% of year 2 students, 87.5 of years 3 and 4 students, and 72.72% of graduates thought that this topic was useful or very useful.

**Table 7 Results Biomedical/TCM education integration survey**

Biomed presentation	Lectures	Case studies	Videos	Forums	Quizzes		
Yr2 (July)	<b>100%</b>	80%	60%	<b>80%</b>	<b>100%</b>		
Yr2 (Feb)	<b>100%</b>	50%	50%	<b>70%</b>	<b>70%</b>		
Yr3/4	97%	50%	<b>66%</b>	25%	22%		
Grads	97%	50%	35%	20%	20%		
Learning resources used	Lectures	Textbooks	YouTube	Moodle	Own notes	Exam drafts	Teacher feedback
Yr2 (July)	<b>80%</b>	100%	60%	80%	<b>80%</b>	<b>40%</b>	<b>40%</b>
Yr2 (Feb)	<b>100%</b>	80%	60%	60%	<b>70%</b>	<b>80%</b>	<b>50%</b>
Yr3/4	84%	<b>94%</b>	<b>78%</b>	<b>75%</b>	47%	<b>80%</b>	<b>50%</b>
Grads	76%	92%	35%	32%	59%	0%	0%
Interest in learning Biomed	Not	Somewhat	Neutral	Interesting	Very		
Yr2 (July)	0%	20%	0%	<b>40%</b>	<b>40%</b>		
Yr2 (Feb)	0%	10%	20%	20%	<b>50%</b>		
Yr3/4	6.25%	6.25%	12.5%	<b>37.5%</b>	<b>37.5%</b>		

Grads	1.52%	16.67%	13.64%	30.30%	<b>37.88%</b>
<b>Effectiveness</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Effective</b>	<b>Very</b>
Yr2 (July)	0%	0%	<b>40%</b>	20%	<b>40%</b>
Yr2 (Feb)	0%	10%	30%	10%	<b>50%</b>
Yr3/4	0%	6.45%	12.9%	29.03%	<b>51.61%</b>
Grads	1.52%	4.55%	21.21%	<b>39.39%</b>	33.33%
<b>Usefulness Biomed</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	0%	20%	0%	0%	<b>80%</b>
Yr2 (Feb)	0%	0%	10%	10%	<b>80%</b>
Yr3/4	0%	0%	12.5%	3%	<b>84.38%</b>
Grads	1.52%	3.03%	16.67%	28.79%	<b>50%</b>
<b>Usefulness A&amp;P</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	0%	0%	20%	20%	<b>80%</b>
Yr2 (Feb)	0%	10%	10%	20%	<b>60%</b>
Yr3/4	0%	3.13%	3.13%	6.25%	<b>87.50%</b>
Grads	0%	0%	7.58%	18.18%	<b>74.24%</b>
<b>Usefulness Microbiology</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	0%	0%	40%	20%	<b>40%</b>
Yr2 (Feb)	0%	10%	20%	20%	<b>50%</b>
Yr3/4	0%	6.25%	28.13%	28.13%	<b>37.50%</b>
Grads	4.55%	4.55%	22.73%	<b>36.36%</b>	31.82%
<b>Usefulness pathology</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	<i>Year 2 students do not learn pathology</i>				
Yr2 (Feb)	<i>Year 2 students do not learn pathology</i>				
Yr3/4	0%	6.5%	9.38%	21.88%	<b>62.5%</b>
Grads	0%	3.03%	13.64%	33.33%	<b>50%</b>
<b>Diagnostics &amp; Referral</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	0%	0%	20%	20%	<b>60%</b>
Yr2 (Feb)	0%	0%	20%	0%	<b>80%</b>
Yr3/4	0%	0%	6.25%	18.5%	<b>75%</b>
Grads	0%	1.52%	12.12%	25.76%	<b>60.61%</b>
<b>Pharmacology</b>	<b>Not</b>	<b>Somewhat</b>	<b>Neutral</b>	<b>Useful</b>	<b>Very</b>
Yr2 (July)	0%	0%	20%	20%	<b>60%</b>
Yr2 (Feb)	0%	0%	20%	0%	<b>80%</b>
Yr3/4	0%	3.13%	9.38%	31.25%	<b>56.25%</b>
Grads	0%	3.03%	24.24%	<b>36.36%</b>	<b>36.36%</b>
<b>Most important for clinic</b>	<b>Diagnostics</b>	<b>Red Flags</b>	<b>Disease pathology</b>	<b>Biomed tests</b>	<b>Medication knowledge</b>
Yr2 (July)	<i>Years 2, 3, and 4 were not asked this question</i>				
Yr2 (Feb)					
Yr3/4					
Grads	<b>51%</b>	<b>26%</b>	<b>12%</b>	<b>9%</b>	<b>2%</b>
<b>Learn Biomed in TCM</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Usually</b>	<b>Always</b>
Yr2 (July)	0%	<b>40%</b>	<b>40%</b>	0%	20%
Yr2 (Feb)	0%	<b>50%</b>	<b>50%</b>	0%	0%
Yr3/4	0%	<b>31.25%</b>	<b>31.25%</b>	21.88%	15.65%

Grads	3.03%	18.18%	<b>40.91%</b>	28.79%	9.09%
Learn TCM in Biomed	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Usually</b>	<b>Always</b>
Yr2 (July)	0%	<b>60%</b>	40%	0%	0%
Yr2 (Feb)	0%	40%	<b>50%</b>	10%	0%
Yr3/4	9.68%	35.48%	<b>38.71%</b>	6.45%	9.68%
Grads	19.70%	<b>34.85%</b>	18.18%	19.70%	7.58%

Graduates rated diagnostics highest (51%), followed by identifying red flags second (26%) and disease pathology third (12%). Biomedical knowledge was rated fifth, with only 2% of graduates selecting this option.

All year 2 students stated that they either rarely or sometimes learned about biomedicine in TCM classes; years 3 and 4 students had a range of responses, with 62.5% of students stating that they either rarely or sometimes learned about biomedicine in TCM classes and only 38% of years 3 and 4 students stating that they usually or always learned about biomedicine in TCM classes. 78% of graduates said they sometimes, usually, or always learned about biomedicine in TCM classes. 90% and 100% of year 2 students said they rarely or sometimes learned about TCM in biomedicine classes, and only 10% stated that they usually learned about TCM in biomedicine classes. There was a mixed response from years 3 and 4 students, with 74% stating that they rarely or sometimes learned about TCM in biomedicine classes. There was also a mixed response from graduates, with 73% stating they never, rarely, or sometimes learned about TCM in biomedicine classes.

## DISCUSSION

Participant perceptions varied on the knowledge crossover between TCM and biomedicine. From the literature, there is a lack of research in this domain, with just a few researchers (7-9) who are aware of the problems that exist in bridging the knowledge, attitudes, and culture between TCM and western medicine. Brosnan et al. (2016) suggest that we should consider interaction, not integration, to overcome the perception that one approach to health care is dominant over the other. Uuibi and Koppel, in mapping the western medicine/TCM health scape, have provided opportunities to explore this contentious domain. There also appears to be a misfit between the gold standard of health research and clinical practice and TCM education.

There are also wide differences in the times allocated to biomedicine within TCM degrees,

with western-style university acupuncture courses having a greater percentage (for instance, Torrens University 11% per year and Endeavour College 7% per year).

One response to the open-ended question in the survey was:

*"We live in a biomedical world, so we need to understand how our patients who are coming from biomedicine into our clinic, are talking to us so we can determine red flags, understand their SSX and then apply this to our TCM training so we best benefit the patient. Make students understand both Biomed and TCM".* Practitioner response from the survey.,

This was echoed by other participants who saw the need for Western medicine and TCM. Survey findings indicate a greater technology adoption among current students for learning resources. This has been influenced by many courses being online because of the pandemic. Important to note that this is a female-dominated profession, with the majority of participants having English as a second language.

In November 2021, TCM became a designated health service in New Zealand under the Health Practitioners Competence Act (2003). In May 2022, the Chinese Medicine Council was formed to establish the qualifications and competency standards that need to be met to be registered as a Chinese medicine practitioner. The pressure is on TCM education providers in New Zealand to meet legal requirements and current international benchmarks for best practice may mean changes in degree structures.

## LIMITATIONS

Limitations include a small sample size (113) and the use of descriptive statistics.

## RECOMMENDATIONS

Perhaps a community of practice for cross-fertilization ideas between Biomedicine and TCM teachers would be a good starting point to promote the interaction and acceptance of the health principles between two very different approaches to teaching subjects from such different philosophies.

## CONCLUSION

Findings from this research support the need for further research on how to present biomedicine and TCM topics in the same degree program in an integrated or interactional manner. Students and graduates highlight the need to apply both sets of knowledge. In the

next stage of this research project, experts in the field from both TCM and western medicine will be interviewed to derive a path forward in TCM degrees.

**REFERENCES**

1. Caspi O, Bell IR, Rychener D, Gaudet TW, Weil AT. The Tower of Babel: communication and medicine: An essay on medical education and complementary-alternative medicine. *Archives of Internal Medicine*. 2000;160(21):3193-5.
2. Garrison DR, Anderson T, Archer W. Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*. 2000;2:87-105.
3. Baker LR, Phelan S, Woods NN, Boyd VA, Rowland P, Ng SL. Re-envisioning paradigms of education: towards awareness, alignment, and pluralism. *Advances in Health Sciences Education*. 2021;26(3):1045-58.
4. Stumpf SH, Kendall D, Hardy ML. Mainstreaming acupuncture: barriers and solutions. *Complementary health practice review*. 2010;15(1):3-13.
5. Givati A, Berlinsky S. The 'disenchantment' of traditional acupuncturists in higher education. *Health*. 2021:1-21.
6. Gray AC, Steel A, Adams J. A critical integrative review of complementary medicine education research: key issues and empirical gaps. *BMC Complementary and Alternative Medicine*. 2019;19(1):73.
7. Zhang NM, Vesty G, Zheng Z. Healthcare professionals' attitudes to integration of acupuncture in Western Medicine: A mixed-method systematic review. *Pain Management Nursing*. 2021;22(6):684-93.
8. Brosnan C, Chung VC, Zhang AL, Adams J. Regional influences on Chinese Medicine Education: Comparing Australia and Hong Kong. *Evid Based Complement Alternat Med*. 2016;2016:6960207.
9. Uibu M, Koppel K. Beyond Medical Pluralism: Communicative Positioning of Biomedicine and CAM in Estonia. *European Journal of Health Communication*. 2021;2(3):85-109.