

Qualitative review of Australian Medical School Curriculum Guidelines based on UDL (Universal Design for Learning) Criteria

Taewan Kim

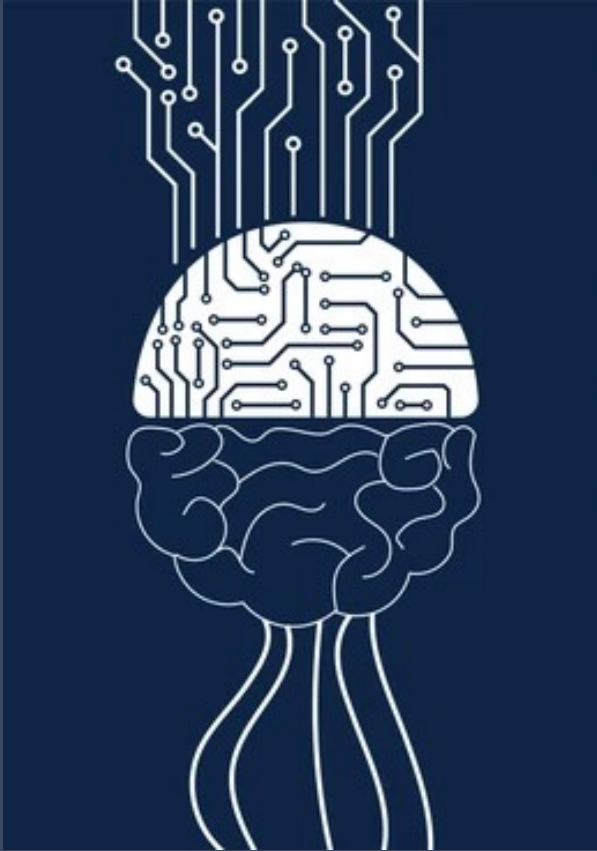
University of Queensland
Student, MD program

Prof. Alison Ledger

University of Queensland



Motivation



Personal background

- Studied fine arts and science
- Tutored science for students with learning disabilities
- Designed an art activity program for child psychiatry department.

Research interests

- Diversity of intelligence
- Diversity of learning styles

Medical education

- Interdisciplinary - Engages diverse types of intelligence
- Growing diversity in medical student cohort
- Expansion to neuroscience and A.I.

UQ MD 2023 curriculum

Faculty of Medicine | MD2025 Stage 1 | Project Launch Briefing



MD2025 Stage 1: Project Overview

Context and Background

Changing population needs and models of care

The UQ Medical Doctor (MD) Curriculum is in need of a major review to better prepare UQ medical graduates for modern clinical practice in Australia, the United States and elsewhere.

The needs of the populations that our future graduates will serve are changing. Our communities are ageing and a greater proportion are now living with chronic conditions and co-morbidities. There are significant and growing health inequalities across our communities. These are acutely felt by Aboriginal and Torres Strait Island people and those living in regional and remote Australia.

Current models of care need to evolve and shift towards a greater focus on prevention, team-based care, digital healthcare, and community-based practice. Increasing use of technology in both health and education requires doctors of the future to employ a new range of skills.

Our current program has room for improvement

Whilst the MD is recognised as a 'flagship' program for the University of Queensland, available performance data comparing us with our Go8 counterparts has highlighted opportunities for further improvement in the areas of:

- The **diversity of our student cohort** and the extent to which it reflects or represents the populations we serve;
- Our **student and graduate satisfaction**; and
- The **preparedness of our graduates** to undertake all the roles and responsibilities of interns upon graduating from UQ.

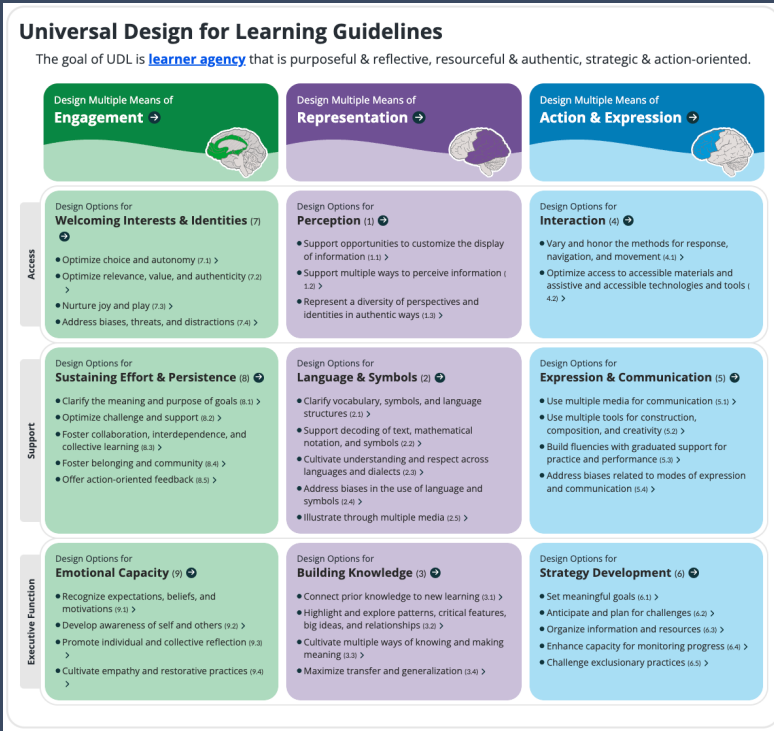
Building on what has come before

What prompted its genesis?

- **Diversity of our student cohort₁**
 - ▶ *diversity in learning styles and intelligence?*
- Student graduate satisfaction₁
- Preparedness of our graduates for internship₁

Universal Design for Learning (UDL)

A **neuroscience-based** educational framework developed to improve and optimize teaching and learning for all people




- It has been incorporated in:
 - **Apple** softwares
 - **Harvard** University curricula
 - **Johns Hopkins** University curricula
 - **McGill** University curricula
- The Guideline 3.0 addresses 3 domains of learning:
 - **Engagement** – *why they learn*
 - what sparks the motivation?
 - **Representation** – *how they process information*
 - In what ways the learners perceive and make meaning of information?
 - **Action & Expression** – *how they express what they know*
 - In what ways the learners navigate a learning environment, approach the learning process, and express what they know?

UDL and Universal Design

Universal Design for Learning originates from Universal Design principles, which we experience every day. **It helps all people, not only those with disabilities.**



Postsecondary physics curricula and Universal Design for Learning: Planning for diverse learnersErin Scanlon,¹ Jillian Schreffler,² Westley James,¹ Eleazar Vasquez,² and Jacquelyn J. Chini^{1,*}¹*Physics Department, University of Central Florida, Orlando, Florida 32816, USA*²*Department of Child, Family, and Community Science, University of Central Florida, Orlando, Florida 32816, USA* (Received 16 January 2018; published 2 July 2018)

Federal legislation specifies equitable access to education for all students at all levels of education, including postsecondary. To explore how well the physics education research (PER) community is currently serving students who inherently vary in needs, abilities, and interests, four research-based curricula (Tutorials in Introductory Physics, Open Source Tutorials in Physics Sensemaking, Physics by Inquiry, and Next Generation Physical Science and Everyday Thinking) were compared with the Universal Design for Learning (UDL) framework. This framework originates in the education literature base and is composed of 3 guiding principles (1. Provide multiple means of representation, 2. provide multiple means of action and expression, and 3. provide multiple means for engagement) further described by 9 principles and 31 checkpoints. The UDL guidelines provide a framework for designing courses to be supportive of and accessible to all learners, taking into account variations among learners during curriculum development. Activities in these four curricula were analyzed for alignment between the in-class curricular elements and the UDL guidelines. Overall, all of the curricula aligned with two of the checkpoints: foster collaboration and community and support planning and strategy development. However, the curricula were unaligned with many of the checkpoints, specifically with regards to providing multiple means of engagement. Who we are prepared to teach indicates who we expect to participate in the physics community. We propose suggestions for modifications to existing curricula and for future curricula to better support all learners. We also argue that, if these research-based curricula do not meet federal legislative guidelines about accessibility for all students, the burden of creating an accessible environment and complying with these federal laws falls on the instructors, which could deter them from using the curricula. If we as a community want instructors to use high quality, research-based curricula, curriculum developers should prioritize supporting all learners.

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I. INTRODUCTION

Students with disabilities make up over 10% of the undergraduate student population in the United States [1]. Of the students with disabilities in postsecondary education, 25% enroll in science and engineering fields [2]. Federal law requires postsecondary institutions to provide equal access to students with disabilities. However, multiple universities in the United States have been faced with litigation for failing to provide such access. For example, two students with assistance from the National Federation for the Blind brought suit against Florida State University

for failing to provide reasonable accommodations and accessible technology; specifically, the students stated they did not have equal access to the software used for homework and exams or the clicker response systems used in their mathematics class [3]. Harvard University and the Massachusetts Institute of Technology were sued by the National Association of the Deaf in response to online lectures, courses, and other educational materials that did not have adequate captions [4].

Since one goal of the physics education research (PER) community is to develop curricula and technology that support student learning, and to have those materials adopted by instructors across the country and world, issues of access for all students should be *a priority* in the development process. Not only do inaccessible curricula and technology put instructors and institutions at risk of violating federal laws, they also send the message that we do not anticipate certain students will engage in learning physics. While there have been studies focusing on how to support students with disabilities in physics (for example,

*jchini@ucf.edu

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Literature Review

Studies on UDL in university education settings

ProQuest database

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abstract("universal design for learning" OR "universal design" OR "UD" OR "UDL") AND
abstract("higher education" OR "university:" OR "tertiary education")
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full-text, peer-reviewed, English, published since 2000

• 87 publications in university education

- Harvard
- Johns Hopkins
- McGill

• 3 publications in STEM

- 1 systematic review
- 1 in undergraduate physics
- 1 in undergraduate mathematics

• 0 publications in medical education

Research Question

To what extent do the AMC Standards *align* with UDL principles?

Standards for Assessment and Accreditation of Primary Medical Programs

Universal Design for Learning Guidelines

The goal of UDL is [learner agency](#) that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.



Australian medical ed.

“The AMC standards” is the Australian Medical Council’s **document** that regulates Australia’s **nation-wide medical education**

Standards for
Assessment and
Accreditation of
Primary Medical
Programs

- Graduate outcome statements
 - Clinical practice
 - Professionalism and Leadership
 - Health and Society
 - Science and scholarship
- Accreditation standards
 - Purpose, context
 - **Curriculum**
 - Assessment
 - Students
 - Learning Environment
 - Evaluation and continuous improvement

Analysis

Curriculum

2.1 Medical program outcomes and structure

2.1.1 The medical program outcomes for graduates are consistent with:

- the Australian Medical Council (AMC) graduate outcome statements
- a safe transition to supervised practice in internship in Australia and Aotearoa New Zealand
- the needs of the communities that the medical education provider serves, including community groups who experience health inequities and Aboriginal and/or Torres Strait Islander and Māori communities.

2.1.2 Students achieve assessment outcomes, supported by equitable access to learning and supervisory experiences of comparable quality, regardless of learning context. These outcomes are supported by appropriate resources in each learning environment.

2.2 Curriculum design

2.2.1 There is purposeful curriculum design based on a coherent set of educational principles and the nature of clinical practice.

2.2.2 Aboriginal and/or Torres Strait Islander and Māori health content is integrated throughout the curriculum, including clinical aspects related to Aboriginal and/or Torres Strait Islander and Māori health across all disciplines of medicine.

2.2.3 The Aboriginal and/or Torres Strait Islander and Māori health curriculum has an evidence-based design in a strengths-based framework and is led and authored by Aboriginal and/or Torres Strait Islander and Māori health experts.

2.2.4 The medical education provider is active in research and scholarship, including in medical education and Aboriginal and/or Torres Strait Islander and Māori health learning and teaching, and this research and scholarship informs learning, teaching and assessment.

2.2.5 There is alignment between the medical program outcomes, learning and teaching methods and assessments.

2.2.6 The curriculum enables students to apply and integrate knowledge, skills and professional behaviours to ensure a safe transition to subsequent stages of training.

2.2.7 The curriculum enables students to evaluate and take responsibility for their own learning, and prepares them for lifelong learning.

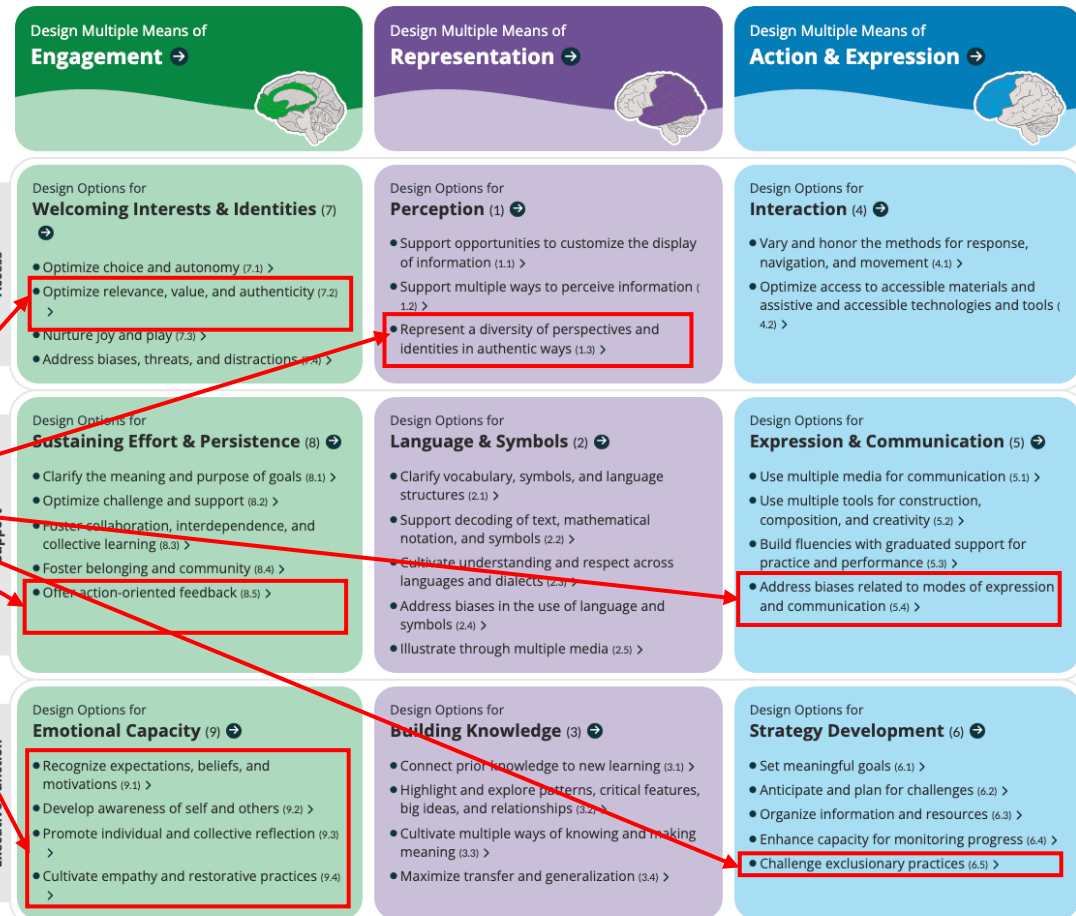
2.2.8 The curriculum design and duration enable graduates to demonstrate achievement of all medical program outcomes and AMC graduate outcome statements.

2.2.9 The curriculum outlines the specific learning outcomes expected of students at each stage of the medical program, and these are effectively communicated to staff and students.

2.2.10 There are opportunities for students to pursue studies of choice that promote breadth and variety of experience.

Universal Design for Learning Guidelines

The goal of UDL is [learner agency](#) that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.



Analysis

2.3.3 Students work with and learn from and about other health professionals, including through experience of **interprofessional learning** to foster **collaborative practice**.

- | | |
|------------------------------|--|
| 2. Sustaining Effort | Foster collaboration, Interdependence and collective learning
Represent a Diversity of Perspectives and Identities in Authentic Ways <ul style="list-style-type: none"> Facilitate listening to diverse perspectives. |
| 3. Perception | |
| 4. Building Knowledge | |
| 5. Building Knowledge | Highlight patterns, critical features, big ideas, and relationships <ul style="list-style-type: none"> Highlight previously learned skills that can be used to solve unfamiliar problems. |
| | Maximize transfer and generalization <ul style="list-style-type: none"> Incorporate explicit opportunities for the review and practice of new concepts or skills, including social skills. Incorporate explicit, supported opportunities to generalize learning to new situations Offer opportunities over time to revisit key ideas and linkages between ideas. |
| 6. Exp. & Comm. | Build Fluencies with graduated support for practice and performance <ul style="list-style-type: none"> Use differentiated mentors (e.g., teachers/tutors who use different approaches to motivate, guide, feedback, or inform). Use differentiated models to emulate (e.g., models that demonstrate the same outcomes but use differing approaches, strategies, skills, etc.). Use differentiated feedback (e.g., feedback that is accessible because it can be customized to individual learners). Use multiple examples of novel solutions to authentic problems. |

Universal Design for Learning Guidelines

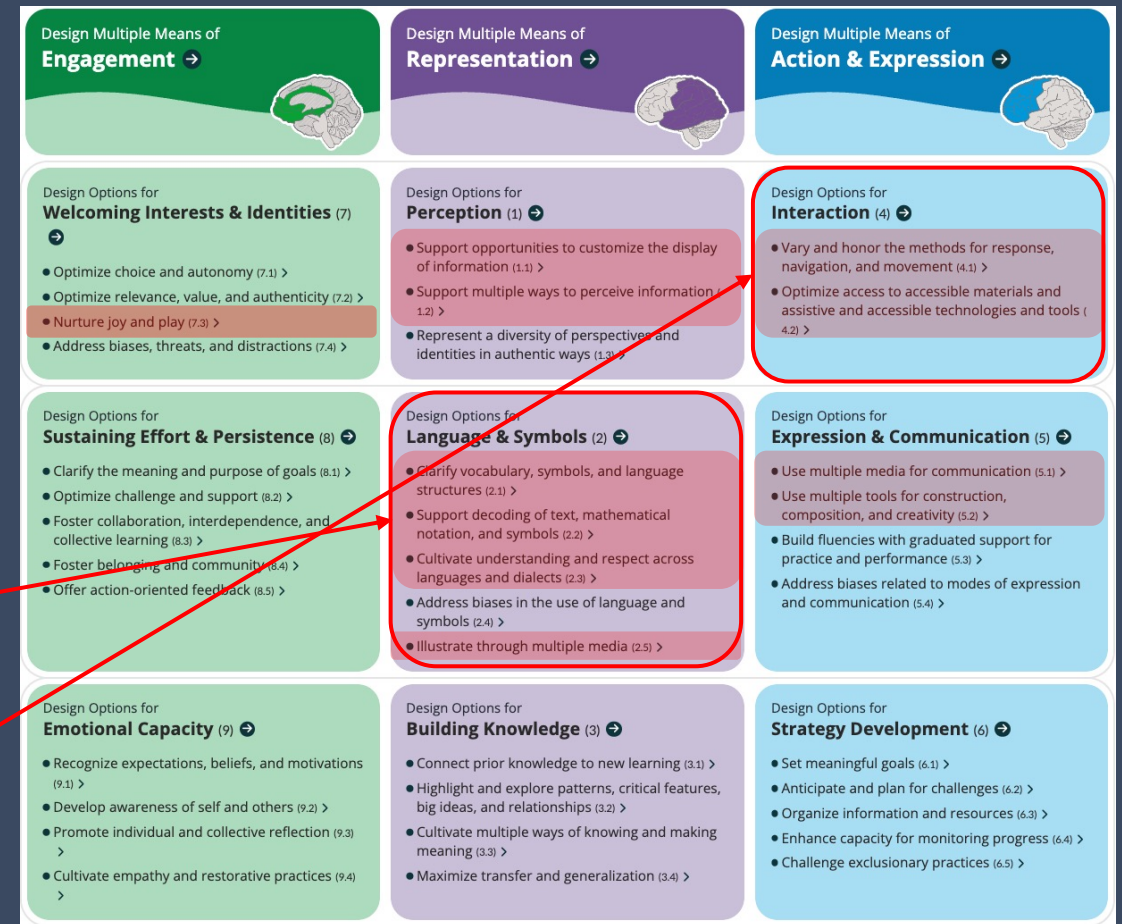
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Results

# of times each principle was supported by the AMC Standards	
Engagement:	30
Representation	20
Action & Expression:	26

Areas lacking support	
Engagement	7.3 Nurture joy and play
Perception	1.1 Support opportunities to customize the display of information 1.2 Support multiple ways to perceive information
Language & Symbol	2.1 Clarify vocabulary, symbols, and language structures 2.2 Support decoding of text, mathematical notation, and symbols 2.3 Cultivate understanding and respect across languages and dialects 2.5 Illustrate through multiple media
Interaction	4.1 Vary and honor the methods for response, navigation, and movement 4.2 Optimize access to accessible materials and assistive and accessible technologies and tools
Expression & Communication	5.1 Use multiple media for communication 5.2 Use multiple tools for construction, composition, and creativity



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Sensory functions

- Font, size of text
- Speed or timing of video
- Written transcripts
- Auditory clips
- Visual diagrams

Language skills

- Support linguistic diversity
- Pre-teach key terminologies
- Closed captioning in more than one language
- Support sign languages

Physical interaction

- Provide alternative to mouse control
- Access to adaptive keyboard

Discussion

Blind spots in AMC Standards		
Inherent variation of intelligence		Language skills
<u>Sensory functions</u> <ul style="list-style-type: none">• Font, size of text• Speed or timing of video• Written transcripts• Auditory clips• Visual diagrams	<u>Physical interaction</u> <ul style="list-style-type: none">• Provide alternative to mouse control• Access to adaptive keyboard	<u>Language skills</u> <ul style="list-style-type: none">• Support linguistic diversity• Pre-teach key terminologies• Closed captioning in more than one language• Support sign languages

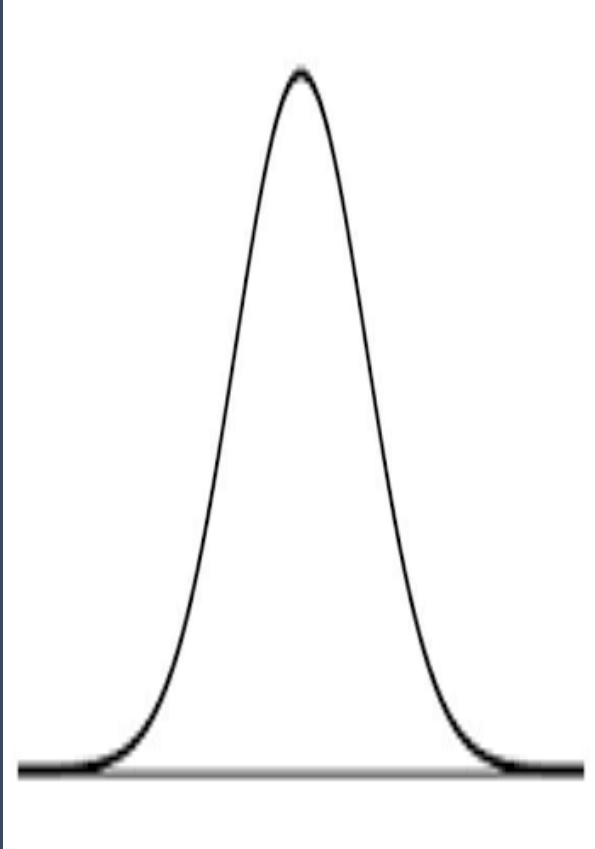
- Rudimentary intelligence is under-addressed, compared to high level skills.
- The admission process assesses acquired skills - Diversity of intelligence in medical cohort could be **masked** by the students' high level skills acquired with rigorous effort
- The blindspots may expose the students with atypical intelligence to barrier throughout their medical education

Discussion

Blind spots in AMC Standards	
<p>Inherent variation of intelligence</p> <div><p><u>Sensory functions</u></p><ul style="list-style-type: none">• Font, size of text• Speed or timing of video• Written transcripts• Auditory clips• Visual diagrams</div> <div><p><u>Physical interaction</u></p><ul style="list-style-type: none">• Provide alternative to mouse control• Access to adaptive keyboard</div>	<p>Language skills</p> <div><p><u>Language skills</u></p><ul style="list-style-type: none">• Support linguistic diversity• Pre-teach key terminologies• Closed captioning in more than one language• Support sign languages</div>

- There may be an assumption that medical students' language skills are sufficient, if they pass through the admission process.
- Students with language difficulties could be **masked** by the admission process
- The blindspots may expose the students to barriers throughout medical education

Strengths



- A framework for understanding human brain function that recognizes the **diversity within sensory processing, motor abilities, social comfort, cognition, and focus** as neurobiological differences.
- **students**, who are more likely be in a **lower socioeconomic status**.
- Curricular change can benefit **students who have stigmas** on their learning disabilities or neurodiversity.
- This study may help better understand the learning disabilities and **de-pathologizing some ADHD symptoms** - the over-prescription issue has been raised as

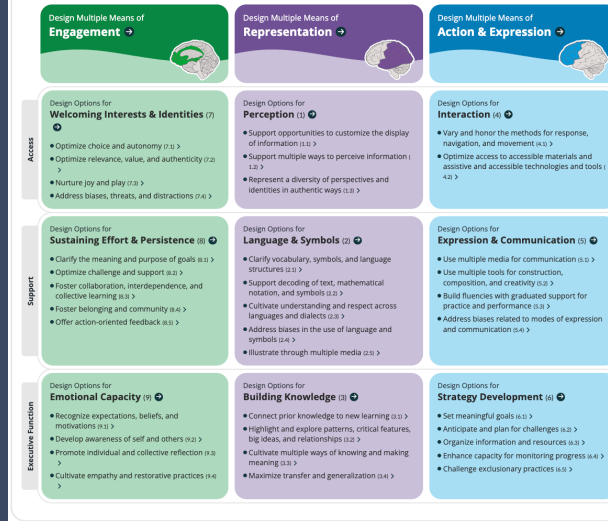
Discussion

Standards for Assessment and Accreditation of Primary Medical Programs

AMC Australian Medical Council Limited

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Suggestion for change:

Adding explicit stipulations that support the variation in language and intelligence in the medical school cohorts

Discussion

Standards for Assessment and Accreditation of Primary Medical Programs

AMC Australian Medical Council Limited

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Suggestion for change:

Adding explicit stipulations that support the variation in language and intelligence in the medical school cohorts

Further research topic

What is the degree of variation in intelligence and language within UQ medical cohort?

- Survey?
- Systemic study (SAP)



References

1. Resources - Project Launch Briefing [Internet]. Uq.edu.au. 2022 [cited 2024 Aug 14]. Available from: <https://medicine.uq.edu.au/md-design/resources>
2. dd



