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Title: Exploring the mindset of veterinary educators for intelligence, clinical reasoning, compassion, and morality.

Authors:

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Mindset theory describes whether an individual believes their intelligence is inherent and fixed, or whether it can be honed and improved with effort. These different perceptions are called a growth or a fixed mindset. Previous research has shown that students with growth mindsets embrace challenges, strive for mastery, have better psychological well-being, and are more resilient than students with fixed mindsets. Mindset is contagious, and teachers’ mindset can influence students’ mindset, motivation and feedback-seeking behaviors. This is the first study of veterinary educator mindset. As previous research has shown that mindset can vary by subject or personal attributes, called domains, this study investigated mindset in 4 domains: intelligence, clinical reasoning, compassion, and morality. A survey was developed by combining 2 previously published mindset scales and was distributed electronically to the veterinary teaching faculty at St. George’s University, Grenada. The survey participants (n=38, response rate 56%) showed predominantly growth mindsets, with some variation by domain: for intelligence, 84.2% growth, 5.3% intermediate, 10.5% fixed mindset; for clinical reasoning, 92.1% growth, 5.3% intermediate, 2.6% fixed mindset; for compassion, 63.2% growth, 2.6% intermediate, 34.2% fixed; and for morality, 60.5% growth, 13.2% intermediate, and 26.3% fixed mindset. Fifteen participants (39.5%) had fixed mindsets in one or more domain. Twenty participants (52.6%) had growth mindsets in all 4 domains. There were no associations found between demographic variables and mindset. This study found that the majority of the veterinary teaching faculty at this university had growth mindsets in all domains investigated.

Key words: veterinary medical education, psychology, professional development, student health and wellbeing.
INTRODUCTION

Carol Dweck’s mindset theory describes different perceptions of intelligence, either as a trait that can be honed or one that is intrinsic and fixed.¹ These different perceptions are called growth or fixed mindsets, where a person with a growth mindset perceives intelligence as a trait that can be improved with effort, and a person with a fixed mindset perceives that intelligence is set as an inherent part of one’s identity.¹ ² Mindset influences how individuals respond to challenges, where someone with a growth mindset is likely to embrace challenges as opportunities to learn, but someone with a fixed mindset is less likely to take on a challenge for fear of failure.¹ Mindset has been shown to impact students on many levels, including motivation, success, and feedback-seeking behavior.³ ⁵ For medical professionals, growth mindset has been described as a critical framework to face the challenges of the profession, such as confronting medical errors and developing resilience.⁶ ⁸

Mindset has been investigated in primary, secondary, and higher education,¹ ² ⁴ ⁵ ⁹ ¹² but less so in medical education and allied fields.³ ⁶ ¹³ Dweck’s initial research reported that about 40% of the general population has a growth mindset, 40% a fixed mindset, and 20% are classified as intermediate.¹ Growth mindset in veterinary students has been found to be at or above the general population, up to 70% in one study.¹⁴ ¹⁷ Educators tend to have higher growth mindset rates than the general population, up to 80%.¹⁸ ²¹

A person’s mindset can be changed, and one of the key ways in which this occurs is called mindset contagion, meaning, the mindset of people around an individual, such as a student’s classmates and teachers, can affect the individual’s mindset.¹ ² ⁴ ⁵ ⁹ ¹¹ Not only can teachers promote growth mindset, but they can also inadvertently encourage a fixed mindset.¹ In science, technology, engineering, and mathematics (STEM) research, the students’ perception of their teachers’ mindset was correlated with student success more than the students’ own mindset.⁵ In university-level STEM classrooms, the students of teachers with growth mindsets were more motivated and performed better.⁴ In medical education, students tended to avoid seeking feedback from teachers with fixed mindsets.³ ¹³

Mindset can vary within an individual across academic subjects or personal attributes.¹⁰ ¹² ¹⁴ ²² ²³ For example, a person can have a growth mindset about reading but a fixed mindset about mathematics, or differing mindsets about intelligence compared to
This variation in mindset has been called domain specificity. Domain specificity was found in one study of medical supervisors; the majority of participants had a growth mindset regarding clinical reasoning but a fixed mindset about empathy. Domain specificity has also been identified in veterinary students, with the majority of students showing a growth mindset with clinical reasoning and communication, but the majority had a fixed mindset regarding ethics and critical thinking.

Research shows that mindset impacts how students approach learning: a student with a fixed mindset approaches learning with a perfectionist approach, fearing failure, avoiding challenges, and tending to give up when facing obstacles, whereas a student with a growth mindset tends to approach learning with a focus on true mastery, embracing challenges, and viewing obstacles positively and as necessary for success. Student well-being and resilience are impacted by their mindset. Veterinary students with growth mindsets had better resiliency scores, and students with fixed mindset scored lower on a psychological well-being survey.

For educators, a growth mindset means believing that students’ intelligence, empathy, and other traits, are learnable and can be improved over time, whereas an educator with a fixed mindset thinks that students are born with certain traits and cannot improve them. Mindset has therefore been referred to as a threshold concept for educators, meaning, one that is transformative, leading to new perspectives and permanent changes in educators’ approaches to teaching. In a paper discussing the importance of a growth mindset for pharmacy educators, the authors emphasize that honing a growth mindset is critical in medical fields due to continuing education requirements, making this concept vital not just for students, but for educators. A recent systematic review by Wolcott, et al., of mindset in health professions education identified and analyzed 14 research articles and 13 commentaries on the subject, with only 3 of the studies focusing on the mindset of educators (2 of licensed practitioners and 1 of faculty).

The mindset of veterinary educators has not been investigated, and previous research in related fields has shown that educator mindset influences student mindset and achievement. The purpose of this study was to examine veterinary educator mindsets.
at St. George’s University (SGU) School of Veterinary Medicine along 4 domains: intelligence, clinical reasoning, compassion, and morality. The research questions were:

- What is the mindset of veterinary educators at SGU?
- Are there any differences in mindset by domain?

**METHODS**

*Survey design, delivery and distribution*

The study population was the teaching faculty at St. George’s University School of Veterinary Medicine in Grenada, West Indies. The survey was composed of 3 sections: demographics, mindset questions, and 2 follow-up questions, all developed following a thorough literature review. Demographic questions included the following categories: gender, age, nationality, academic rank, years teaching, veterinarian or not, clinical practice experience (veterinarians only), and academic discipline (basic, diagnostic, or clinical sciences).

The mindset portion of the survey (17 questions) was developed by combining two published scales, Carol Dweck’s 8-item implicit theories of intelligence scale,\(^{27}\) and Pal et al.’s scale for mindset in medical educators.\(^{13}\) The 3 intelligence items in Pal et al.’s scale were duplicates of the intelligence scale and were not repeated, resulting in a mindset survey of 4 domains: intelligence (8 questions), clinical reasoning (3 questions), compassion (3 questions), and morality (3 questions). Pal et al. developed their compassion and morality questions from Dweck and adjusted the wording to fit the medical profession.\(^{13,22-23}\) These domains were chosen as examples of traditional clinical skills (intelligence and clinical reasoning) and professional skills (compassion and morality), as was done in a similar study of mindset in medical supervisors.\(^{13}\) Dweck’s scale is available open source for use in research, and Pal et al.’s scale was used with permission.\(^{27}\) Table 1 contains the mindset scale items. All mindset responses were provided on a 6-point Likert scale with no neutral option, as described by Dweck and related studies.\(^{3,13-15,17,27}\) The survey concluded with two yes/no follow-up questions, one regarding voluntary participation in faculty development and one regarding voluntary teaching in the newly integrated professionalism courses at the
university. All survey items were tested for clarity with a pilot group of 5 adults at the same institution who were not members of the study population. (Place Table 1 here)

Participation was voluntary and anonymous. The study was approved by the University’s Institutional Review Board (SGU IRB #20018) and the survey was approved by the University Survey Committee. The survey was delivered online using Qualtrics software. Faculty were invited to participate via an email that explained the purpose of the study and provided the link to the survey. The consent form was embedded on the first page of the survey, and consent was granted by progressing to the survey. Three weekly reminder emails followed the initial invitation, and the survey was open for 1 month. All responses and data were stored securely using the Qualtrics software.

Data analysis

The reliability of the responses of the study population to the scale as a whole, each subscale (intelligence, clinical reasoning, compassion, and morality), and inter-item correlations were analyzed. Each subscale was evaluated using Cronbach’s α, since items within each subscale ask similar questions. The responses to the scale as a whole were evaluated for reliability using McDonald’s ω, since the subscales ask about different topics. Demographics data and the 2 follow-up questions were analyzed using descriptive statistics and frequencies. Dweck’s mindset items (8 intelligence questions) were scored according to Dweck’s published methodology, with 1= strongly disagree to 6= strongly agree, and reverse scoring for 4 items. Pal et al.’s mindset items were scored in the same way, as described by the authors. Average mindset scores were calculated for each domain, and growth mindset was defined by an average score >4.0, a fixed mindset was defined by an average score <3.0, and scores between 3.1-3.9 as intermediate, according to published methodology. Pearson’s chi-square, Fisher’s exact, and phi coefficients were calculated to examine the associations between demographic information, mindset scores, and responses to the 2 follow-up questions. Effect size was calculated from Fisher’s exact to understand the strength of associations. Analyses were not performed on data with fewer than 5 observations per cell. Data management and statistical analysis were conducted via Qualtrics, IBM SPSS statistics software (version 27), and Campbell’s Effect Calculator.
RESULTS

Of the 68 teaching faculty members at St. George’s University in the fall semester, 2020, 47 responses to the survey were recorded (response rate 69%). Out of these, 9 surveys were missing partial or all mindset data, and were excluded, leaving 38 complete surveys (56%). There were 34 veterinarians and 4 non-veterinarians. Of the 34 veterinarians, 29 had experience in clinical practice, 4 did not, and 1 person left this field empty. The research population is described in Table 2. (Place Table 2 here)

Analysis of the responses to each of the 4 subscales showed high reliability (intelligence, $\alpha=0.95$; clinical reasoning, $\alpha=0.91$; compassion, $\alpha=0.94$; morality, $\alpha=0.95$). The responses to the scale as a whole show high reliability ($\omega=0.94$). Inter-item correlations suggested that no one item skewed the scale, therefore all items were measuring the same underlying concept. (Place Figure 1 here)

Overall, this population showed predominantly growth mindsets, with some variation by domain: 84.2% for intelligence, 92.1% for clinical reasoning, 63.2% for compassion, and 60.5% for morality. Fixed mindset was uncommon for intelligence (10.5%) and clinical reasoning (2.6%), but more common for the domains of compassion (34.2%) and morality (26.3%) (see Figure 1). For the domains of intelligence, clinical reasoning, and compassion, only 1 or 2 participants had intermediate mindsets, which increased for morality, with 5 participants having intermediate mindsets (13.2%). See Table 3 for descriptive statistics on mindset by domain. (Place Table 3 here)

Twenty participants (52.6%) had a growth mindset in all 4 domains. No one had a fixed mindset in all 4 domains. Fifteen participants (39.5%) had a fixed mindset in at least one domain: 2 had a fixed mindset in 3/4 domains, 8 had a fixed mindset in 2/4 domains, and 5 had a fixed mindset in 1/4 domain. When a participant had a fixed mindset in 2 or more domains (n=8), the most common domains represented were compassion and morality (6/8). No associations or effects were found between mindsets and the demographic variables of gender, academic rank, or academic discipline. The group sizes were too small to make comparisons with the variables of veterinarian or not, and experience in clinical practice.
Thirty-four of the 38 (89.5%) participants had been involved in voluntary faculty development offered at St. George’s University. With such a high rate of involvement, no comparisons could be made with this variable. Twenty-two participants (57.9%) volunteered to teach in the professionalism courses and 16 (42.1%) did not. Ten of the 16 people that do not teach in the professionalism courses (62.5%) had a fixed mindset in 1 or more domain. Five of the 22 people who teach in the professionalism courses (22.7%) had a fixed mindset in 1 or more domain. The effect of having a fixed mindset in any domain on volunteering to teach in the professionalism courses was $r=0.402$ (95% CI= 0.089-0.646), equating to a medium to large effect (for reference: small effect, $r=0.1$; medium effect, $r=0.3$; large effect, $r=-.5$).30

**DISCUSSION**

This is the first study to survey veterinary educators about their mindset. We investigated mindset in veterinary educators across 4 domains: intelligence, clinical reasoning, compassion, and morality. Overall, the majority of veterinary educators at this university demonstrated a growth mindset.

The results of our study (n=38) are directly comparable to the medical clinical supervisor study (n=40), as we used the same scale and had comparable sample sizes.13 Similar domains have been probed in a study of mindset in veterinary students, however, a different scale was used, so results are not directly comparable.14 Comparisons to the general population are also made, since our survey included Dweck’s widely used 8-item implicit theories of intelligence scale.27

The majority of the surveyed faculty showed a growth mindset in all 4 domains investigated, which correlates with what is previously known about teacher mindsets; teachers from primary school to higher education have higher proportions of growth mindset than the general population.18-21 In a comparison by domain to the medical supervisor study, more of our faculty showed growth mindset for intelligence than the medical supervisors (82.4% and 43%, respectively).13 General population averages are about 40%.1 For the domain of clinical reasoning, our study and the medical supervisor study had similarly high proportions of growth mindset (92.1% and 88%, respectively). For the domain
of compassion, our population showed nearly twice the proportion of growth mindset than medical clinical supervisors (63.2% to 35%), where population averages are around 40%.13,22 For morality, we found more than twice the proportion of growth mindset than medical clinical supervisors (60.5% to 25%, respectively), yet similar to the general population (56%).13,23 A study of mindset in veterinary students investigating similar domains showed that most veterinary students had growth mindset for clinical reasoning, communication, and reflection, but more fixed mindset for a category called professional reasoning, which included ethics and critical thinking.14

The high proportions of growth mindset found in our surveyed population may be attributed to specific population characteristics. The surveyed educators have chosen a career in academia at a teaching-focused university. With few exceptions, a large proportion of the teaching faculty’s time is devoted to didactic teaching. This veterinary school does not have a large teaching hospital and works on a distributive model, where students are at the Grenada campus for years 1–3, and then attend their clinical year at affiliated universities. The difference in populations may explain the difference between our findings and the medical clinical supervisor study results, as their population were supervisors in a clinical setting, but further investigations with larger sample sizes are needed.13 Other considerations are self-selection bias of participants, the university’s culture and influence on teacher mindset, or the small sample size.18,31

In our study, no correlation or effect was found between mindset and demographic variables, consistent with the previously mentioned medical supervisor report.13 However, previous research has found higher rates of fixed mindset in females and in the youngest and oldest faculty.1,10 The different findings could be due to the small sample size and the composition of our study population.

The presence of a fixed mindset in any domain showed a moderate effect on volunteering to teach in the new professionalism courses, but due to the small sample size, this should be interpreted with caution. Effect does not imply causality. Other factors that could contribute that were not explored are the impact of teaching load, incentives, and the likelihood to volunteer in general, rather than the fact these classes are about professionalism. A growth mindset in veterinary students has been associated with
improved well-being and resilience,\textsuperscript{16-17} therefore, exploring the impact of educator mindset on student mindset in these domains is an important next step in research.

The study population showed high levels of voluntary participation in faculty development. Growth mindset in educators has been proposed as a factor in willingness to participate in faculty development.\textsuperscript{32} However, other factors not explored in this study could also explain high levels of participation, such as the culture of the university or incentives for attending. Faculty development programs have been postulated to influence mindset at an organizational level, and further research in the veterinary context is warranted.\textsuperscript{25,31}

At this veterinary school, the implications of having a faculty with predominantly growth mindsets could be profound. Previous research informs us that educators’ growth mindsets improve students’ feedback-seeking behaviors and promote motivation and growth mindset in students.\textsuperscript{1,3-4} Mindset has been postulated to impact the choices educators make in their course design, from educational approaches to assessment practices.\textsuperscript{25} Educators with growth mindsets tend to prefer active learning that promotes deeper understandings over a content focus.\textsuperscript{25} Influencing student mindset towards growth, course design that emphasizes active learning, and assessments that support and enhance student learning are all important in the delivery of a modern curriculum. Further research is needed to see what and if there is an effect in the veterinary education context, but based on evidence in other fields, faculty development programs should include informing educators about mindset and its impact on course design, assessment, student learning, professional development, and continuing education.

\textit{Limitations}

One limitation of this study is that this is only the second report utilizing the scale items for the domains of clinical reasoning, compassion, and morality, and both studies (the present study, and Pal et al.’s study) had small sample sizes.\textsuperscript{13} However, the scale included Dweck’s well-published mindset of intelligence scale, which has been used in educational and psychological literature for over 25 years.\textsuperscript{1,27} Additionally, the scale items developed by Pal et al. for the domains of clinical reasoning, compassion, and morality were based on Dweck’s published compassion and morality scales, and designed for the medical educator
This study provides further supporting validity evidence, as responses to the scale were found to be reliable in this population and similar results to the medical educator study, but further studies with larger sample sizes are needed in order to make stronger comparisons and generalizations.

Sample size is one limitation of this study. Due to this university’s small faculty size (n= 68), even the reasonable response rate of 56% (average response rates 24-33%) did not provide a large sample size. Response rates were encouraged by survey best practices, including mobile-friendly as well as desktop user interfaces, email reminders, minimal text box responses, and an overall short survey. No financial or other incentive was provided for participation, and perhaps this could have increased the response rates. Comparison of demographic data of the participants to the faculty as a whole showed that the participant population was representative of the faculty at this veterinary school.

The small sample size was addressed in part by a conservative statistical approach. Some of the statistical analyses were not conducted due to small sample size, such as the associations between mindset and 2 of the demographic variables (being a veterinarian and clinical practice experience). Similarly, the effect of a fixed mindset on professionalism teaching must be interpreted with caution due to the small sample size.

Another potential limitation is whether these results are applicable to other veterinary schools, considering the university’s curriculum design and faculty attributes. The population demographics are described to allow readers to draw their own conclusions about transferability, but ultimately, further research is warranted.

**Future Directions**

Research on mindset in veterinary education is still in early stages. There are 4 studies on student mindset to date, and this is the first study on educator mindset. Replicating this study across other veterinary schools is indicated and larger sample sizes would help determine whether these findings are applicable to a broader context. Beyond characterizing mindset in veterinary education, future research is needed to establish the impact of educator mindset on students. Research on mindset in medical education and allied health fields, including a recent systematic review, have identified the following areas...
of opportunity: research on educator mindset and the impact on student learning, how
assessment methodology can affect student mindset, how a university’s culture and mindset
shapes its faculty’s mindset, and potential mindset interventions on all levels.\textsuperscript{6-7,31,36-37}

Mindset research has been suggested as a vital next step in advancing
professionalism education from the perspective of educators, students, and veterinary
professionals.\textsuperscript{6,26,36} Educator mindset may impact how professionalism is taught, and may
impact student mindset on professionalism topics. Our results show that more individuals
had fixed mindsets for compassion and morality than for intelligence and clinical reasoning.
If these findings are repeatable, further research on the impact of teacher mindset on
professional skills teaching is warranted. For students and veterinary professionals, mindset
has been associated with well-being and resilience.\textsuperscript{16-17,24} Future research on whether a
fixed mindset in a specific domain in linked to well-being or resilience would provide more
information for mindset interventions. Research shows that mindset can be changed, both
by the idea of mindset contagion, and through explicit teaching about mindset.\textsuperscript{1,9,11} At a
time when well-being and professional skills teaching are at the forefront of veterinary
education, exploring the connection between mindset and professional skills teaching may
provide opportunities for improvement in this area, such as faculty development for
educators and student-level mindset interventions.

\textit{Conclusion}

This is the first study of mindset in veterinary educators. The results show that at this
university, a high proportion of the veterinary educators have growth mindsets across all 4
domains investigated. The authors hope that this study will stimulate further similar
research at other veterinary schools and colleges, to add to the breadth of knowledge about
mindset in veterinary educators, explore the impact of educator mindset on students, and
potentially guide faculty development opportunities.

\textbf{ACKNOWLEDGEMENTS}

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Conflict of interest statement:

The authors have no conflicts of interest to disclose.

NOTES


b. IBM SPSS software, Armonk, NY, version 27.


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Tables and Figures:

Table 1: Mindset scale items. This scale was used with permission by Pal et al. (2019), with intelligence domain questions expanded based on Dweck’s original publication (1995), available open source from (NMRC).

<table>
<thead>
<tr>
<th>Intelligence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I don’t think I personally can do much to increase my intelligence.</td>
</tr>
<tr>
<td>2.</td>
<td>I can learn new things, but I don’t have the ability to change my basic intelligence.</td>
</tr>
<tr>
<td>3.</td>
<td>My intelligence is something about me that I personally can’t change very much.</td>
</tr>
<tr>
<td>4.</td>
<td>To be honest, I don’t think I can really change how intelligent I am.</td>
</tr>
<tr>
<td>5.</td>
<td>With enough time and effort, I think I could significantly improve my intelligence level.</td>
</tr>
<tr>
<td>6.</td>
<td>I believe I can always substantially improve on my intelligence.</td>
</tr>
<tr>
<td>7.</td>
<td>Regardless of my current intelligence level, I think I have the capacity to change it quite a bit.</td>
</tr>
<tr>
<td>8.</td>
<td>I believe I have the ability to change my basic intelligence level considerably over time.</td>
</tr>
</tbody>
</table>

Clinical Reasoning

<table>
<thead>
<tr>
<th>Clinical Reasoning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A person has a certain amount of clinical reasoning ability and they really can’t do much to change it.</td>
</tr>
<tr>
<td>2.</td>
<td>A person’s clinical reasoning ability is something about them that they can’t change very much.</td>
</tr>
<tr>
<td>3.</td>
<td>A person can learn new things, but they can’t really change their basic decision-making ability.</td>
</tr>
</tbody>
</table>

Compassion

<table>
<thead>
<tr>
<th>Compassion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A person’s compassion is something very basic about them and it can’t be changed very much.</td>
</tr>
<tr>
<td>2.</td>
<td>Whether a person is warm or not is deeply ingrained in their personality. It cannot be changed very much.</td>
</tr>
<tr>
<td>3.</td>
<td>There is not much that can be done to change a person’s compassion.</td>
</tr>
</tbody>
</table>

Morality

<table>
<thead>
<tr>
<th>Morality</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A person’s moral character is something very basic about them and it can’t be changed very much.</td>
</tr>
<tr>
<td>2.</td>
<td>Whether a person is responsible and sincere or not is deeply ingrained in their personality. It cannot be changed very much.</td>
</tr>
<tr>
<td>3.</td>
<td>There is not much that can be done to change a person’s moral traits (e.g. conscientiousness, uprightness and honesty).</td>
</tr>
</tbody>
</table>

Table 2: Demographic data of study population

<table>
<thead>
<tr>
<th>DEMOGRAPHIC VARIABLE</th>
<th>POPULATION DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td>Female: 24/38 (63.2%)</td>
</tr>
<tr>
<td></td>
<td>Male: 12/38 (31.6%)</td>
</tr>
<tr>
<td></td>
<td>Prefer not to say: 2/38 (5.3%)</td>
</tr>
<tr>
<td>AGE</td>
<td>Range: 30-75 years</td>
</tr>
<tr>
<td></td>
<td>Mean: 46.9 years; Median: 45 years</td>
</tr>
<tr>
<td></td>
<td>Standard deviation: 12.7 years</td>
</tr>
<tr>
<td>NATIONALITY</td>
<td>North American: 17/36 (47.2%)</td>
</tr>
<tr>
<td></td>
<td>South American: 6/36 (16.7%)</td>
</tr>
<tr>
<td></td>
<td>Caribbean: 6/36 (16.7%)</td>
</tr>
<tr>
<td></td>
<td>European: 4/36 (11.1%)</td>
</tr>
<tr>
<td></td>
<td>African: 2/36 (5.6%)</td>
</tr>
<tr>
<td></td>
<td>Indian: 1/36 (2.8%)</td>
</tr>
<tr>
<td>ACADEMIC RANK</td>
<td>Professor: 15/38 (39.5%)</td>
</tr>
<tr>
<td></td>
<td>Associate professor: 10/38 (26.3%)</td>
</tr>
<tr>
<td></td>
<td>Assistant professor: 5/38 (13.2%)</td>
</tr>
<tr>
<td></td>
<td>Instructor/demonstrator: 8/38 (21.1%)</td>
</tr>
<tr>
<td>ACADEMIC DISCIPLINE</td>
<td>Basic sciences: 13/38 (34.2%)</td>
</tr>
<tr>
<td></td>
<td>Diagnostic sciences: 6/38 (15.8%)</td>
</tr>
<tr>
<td></td>
<td>Clinical sciences: 18/38 (47.4%)</td>
</tr>
<tr>
<td></td>
<td>Other: 1/38 (2.6%)</td>
</tr>
</tbody>
</table>
**Table 3**: Descriptive statistics of participants’ mindset by domain. For median and mean scores: fixed mindset=0-3.0; intermediate=3.1-3.9; growth mindset=4.0-6.0.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Median Score</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Fixed Mindset (%)</th>
<th>Intermediate Mindset (%)</th>
<th>Growth Mindset (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence</td>
<td>5.0</td>
<td>4.8</td>
<td>1.1</td>
<td>10.5 (4/38)</td>
<td>5.3 (2/38)</td>
<td>84.2 (32/38)</td>
</tr>
<tr>
<td>Clinical Reasoning</td>
<td>5.2</td>
<td>5.2</td>
<td>0.8</td>
<td>2.6 (1/38)</td>
<td>5.3 (2/38)</td>
<td>92.1 (35/38)</td>
</tr>
<tr>
<td>Compassion</td>
<td>5.0</td>
<td>4.3</td>
<td>1.3</td>
<td>34.2 (13/38)</td>
<td>2.6 (1/38)</td>
<td>63.2 (24/38)</td>
</tr>
<tr>
<td>Morality</td>
<td>4.0</td>
<td>4.0</td>
<td>1.1</td>
<td>26.3 (10/38)</td>
<td>13.2 (5/38)</td>
<td>60.5 (23/38)</td>
</tr>
</tbody>
</table>

**Figure Captions**: (figure attached as separate document)

**Figure 1**: Mindset data by domain, expressed as percent of participant population.