ABSTRACT:

Objectives: The objective of this study is to assess the impact of the Global Leaders in Development (GLIDE) module to determine whether concepts of global mindset, citizenship, and leadership can be effectively taught within a short-term didactic module.

Methods: Faculty members of PharmAlliance, a partnership between three schools of pharmacy, created a three-week optional, non-credit bearing distance-based global leadership development module. Material and assignments focused on concepts of global mindset, global citizenship, and global leadership as applied to the global health issues of non-communicable diseases, universal health coverage, and primary care. Student self-rated growth was measured with an adapted fifteen question pre-post survey that also included open-ended questions.

Key Findings: Most statements showed growth on the pre-post survey with seven being statistically significant (p<0.05). The largest growth involved students’ perceived potential to be a global leader in pharmacy (global leadership category), the students’ connectedness to the pharmacy profession worldwide (global citizenship category), and the students’ awareness of global challenges faced in the pharmacy profession (global mindset category). Qualitative analysis identified several themes for each of the open-ended questions. Student expectations focused on the desire to expand their global
mindset, better understand global pharmacy practice, develop teamwork skills, and understand global pharmacy challenges and strategies for engagement.

Conclusions: The concepts of global mindset, global citizenship, and global leadership may help promote awareness of global health challenges, opportunities to make a global difference in a local context, and connectivity to the profession on a global scale.

Keywords: global mindset, global citizenship, global leadership, pharmacy education

INTRODUCTION

Leadership is a key component of pharmacy education for several countries, including Australia, Canada, the United Kingdom, and the United States, and is needed to achieve the standards put forth by the International Pharmaceutical Federation (FIP) Global Competency Framework.\(^1\) Despite its presence in the curricula for several countries, it is unknown how it may be best used or taught to address some of the world’s largest health problems. Noncommunicable diseases (NCDs) cause over 70% of deaths worldwide, yet at least half of the world’s population does not have full coverage for basic, essential health services.\(^2\,3\) Exacerbating these problems, it is expected that there will be a shortage of 15 million health care workers worldwide by 2030.\(^4\) Global challenges including NCDs, universal health coverage, and access to primary care services will require both organizational and individual leadership to achieve the World Health Organization’s Sustainable Development Goals by 2030. As these challenges continue to transcend country borders, the pharmacy profession may need to consider how to develop our students and the future workforce into global leaders.

While the concept of global leadership for the profession is not defined, it may require a global mindset and sense of citizenship to effectively address global health challenges. The concept of a global mindset
has been identified in the business literature as a key characteristic for global leadership. A global mindset has been broadly defined by Gupta et al. as an openness to and awareness of diversity across cultures with the ability to act on that insight to influence others. While cultivating a global mindset is at the forefront of business school programs and many companies, the literature is sparse with its impact in health education and professional curricula, including that of pharmacy.

Another concept that should be explored further in health professional curricula is that of global citizenship, which in the corporate context has evolved beyond the idea of corporate social responsibility. While there is no universally agreed definition for global citizenship, most focus on the central themes of social responsibility, global competence, and global civic engagement. As a concept, global citizenship refers to a sense of belonging to a broader community and promoting linkages between global and local contexts for a more peaceful, tolerant, secure, and sustainable society. The United Nations Education, Scientific, and Cultural Organization (UNESCO) emphasizes that global citizenship is key to achieving the Sustainable Development goals by 2030 and that it is a lifelong learning concept that is applicable to learners of all ages.

To assume a global leadership role, students may need to learn about and be exposed to concepts not traditionally found in the pharmacy curricula. Limited information is available as to whether schools have introduced global mindset and citizenship concepts into pharmacy or health education curricula. To prepare students to become global agents of change, faculty members across three pharmacy schools came together to develop a three-week module, Global Leaders in Development (GLIDE), that featured concepts of global mindset, global citizenship, and global leadership. The module utilized learning lessons from a global citizenship extracurricular summer course at University College London (UCL) as well as suggestions by UNESCO to inform its content and delivery. The objective of this study is...
to assess the impact of the GLIDE module to determine whether the concepts of global mindset, global citizenship, and global leadership can be effectively be taught within a short-term didactic module across three international pharmacy schools.

METHODS

Faculty members of PharmAlliance, a three-way partnership between the pharmacy schools at the University of North Carolina at Chapel Hill (UNC), Monash University (Monash), and University College London (UCL), created a three-week optional, non-credit bearing distance-based global leadership development module. The first-week material focused on the concepts of global mindset, global citizenship, and global leadership. Students read one journal article associated with each concept and watched a 20-minute recorded PowerPoint presentation video on each concept made by the faculty facilitators. Each video also included an introductory message from one of the Deans at each school explaining the importance of the concept. The second-week material applied the three concepts to the global health issues of non-communicable diseases, universal health coverage, and primary care by having students read one key resource from the World Health Organization on each global health issue as provided by the faculty facilitators. Table 1 outlines the format of the module.

Content material was developed and shared with students using Google Drive. Each school recruited students from the first- and second-year class within their professional pharmacy program. Students were organized into international teams of six to seven students with relatively equal distribution across the programs based on total enrolment. Students were asked to watch videos and read selected articles in advance of team meetings which were one hour each week for two weeks with a faculty facilitator from one of the three schools. During the virtual team meetings, faculty facilitators followed a jointly developed standardized discussion guide with key questions regarding the material for each week.
The concepts and global health issues from the first two weeks formed a matrix framework (Figure 1) for students to use when working together in their team for their final deliverable, a case storyboard. The case storyboard had to highlight the concepts of global mindset, global citizenship, and global leadership as it applied to one of four risk factors associated with the global health issues discussed: 1) pollution and environment, 2) physical and mental wellbeing, 3) life factors, healthy living, and nutrition, and 4) economic factors including country wealth, and poverty. The case storyboard had to outline a specific health issue under one of the risk factors and explain how pharmacy students and the profession could contribute towards addressing the identified issue. Students had the instructions for the case storyboard from the beginning of the module and had time at the end of each team meeting to work on their deliverable. Student teams were then given an additional week (third week) to finalize their case storyboard.

Students were sent a pre-post survey through Qualtrics asking them to rate themselves on fifteen statements on a 5-point Likert Scale (1= strongly disagree; 5= strongly agree). This survey was adapted from the learning dimensions of the UNESCO global citizenship education framework and the UCL Global Citizenship Programme. These cognitive, socio-emotional, and behavioural dimensions of global citizenship were also utilized when developing the survey statements for global mindset and global leadership. Each concept had five statements for evaluation. Statements were self-developed by the authors. Students completed the pre-survey before the module started and the post-survey within one week after the module concluded. They also answered open-ended questions on each survey. The pre-survey included one question asking about their expectations while the post-survey included questions on what stood out, how they would utilize what they learned, what they need to learn more about moving forward, and how they would improve the module. All quantitative data analyses were
conducted using Microsoft Excel 2018. Paired t-tests were used to evaluate differences in the pre-post scores. Qualitative data were coded and analysed using a one cycle open coding process with conventional content analysis. Dispersion screening of results revealed four cases with consistently ‘extreme’ recorded values in the post-test variable set (all had values less than the dispersion interval given by \( \text{Mdn} - 2(Q_3 - Q_1) \)). These four extreme cases were excluded from subsequent comparative analysis. This study and analysis was approved by the University of North Carolina at Chapel Hill Institutional Review Board. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

**RESULTS**

In total, 71 students enrolled and completed the module with 65 students completing the pre-survey and 51 students completing the post-survey. Students who only completed the pre-survey (n=15) or only completed the post-survey (n=1) were removed for quantitative analysis. Additionally, the cases with consistently extreme values on post-survey responses were excluded (n=4). Of the 46 students (65%) included for final analysis, 21 were from UNC, 15 from UCL, and 10 from Monash. Most students were in their second year (70%). Table 2 shows pre-post results for each statement as well as each concept.

Most statements showed growth from the pre-survey to the post-survey, with seven having a statistically significant increase (p<0.05). The largest growth was seen in the statements about the students’ perceived potential to be a global leader in pharmacy (global leadership category), the students’ connectedness to the pharmacy profession worldwide (global citizenship category), and the students’ awareness of global challenges faced in the pharmacy profession (global mindset category). A decrease was seen in four statements however none of the results were statistically significant. All
three concepts (global mindset, global citizenship, and global leadership) showed significant total
growth (p<0.001).

Qualitative analysis identified several themes for each of the open-ended questions. Student
expectations focused on the desire to expand their global mindset, better understanding global
pharmacy practice, develop teamwork skills in working with international students, and understand
global pharmacy challenges as well as strategies to get engaged. When asked what was remarkable from
the module, students predominantly commented on global awareness and collaboration. In particular,
students often commented on their newfound appreciation for non-communicable diseases (NCDs) and
how these are global health issues that have substantial local implications. Many students described
how their preconceived notions of global health were challenged revealing their own implicit bias as to
what defines and constitutes global health. These self-realizations appeared to be associated with the
weekly readings and the facilitated team meeting discussion. As seen below, several students indicated
how the local connectivity of global health challenged their thinking.

“The concept of acting “Glocal,” a notion that promotes thinking globally but acting locally. This module
really emphasized this idea, and helped us to realise that this is very achievable if we have a global
mindset, see ourselves as global citizens, and act as global leaders.” – Monash student

Global engagement and advocacy were the predominant themes for how students saw themselves
putting into action what they have learned. Students voiced the need for future advocacy and creating
awareness for global challenges and issues, whether pharmacy is directly implicated or not. In moving
forward, there was also recognition that small actions can lead to substantial impacts. As indicated in
the quote below, students are interested in future global pharmacy opportunities and wanted to instill within themselves a better awareness of the issues impacting the profession on a global and local scale.

“It has given me a perspective on how important my role is as a pharmacist. I no longer see myself behind a counter, but I see myself fighting for things that matter. I feel like this is one of the best things that I have done this year... it involves a lot of communication and discussion and it allows you to see things from a different perspective.” – UCL student

To move forward, students stated that they need to learn more about opportunities to get involved as well as what is going on in other parts of the world. From resources for tackling global issues to more examples about ways pharmacists have made an impact, students want to further explore global pharmacy practice and education in other countries. Some students want to specifically influence policy and government on issues of health and the role of pharmacy in helping address global health challenges. Students would comment on how increased knowledge of the profession worldwide could position countries to better work with and learn from one another.

“I need to learn more about the pharmacy profession in other countries, and how we can use our differences to learn from each other and empower each other.” – UNC student

Overall, both qualitative and quantitative growth was demonstrated by this analysis as evidenced by the students’ reflections and the pre-post survey data. The largest growth seen across both the quantitative and the qualitative data was in the cognitive domain as students acquired new knowledge and perspective after taking the course. Students also exhibited growth in the socio-emotional domain of
learning as they developed an appreciation for how different communities can be connected through shared opportunities and challenges.  

Finally, although student comments indicated their satisfaction with the module, students indicated that there should be more time and instruction on the concepts and global health challenges presented. Students stated that three weeks was not sufficient to go into depth regarding content material. It was also not sufficient for adequate teamwork and engagement with their international peers.

**DISCUSSION**

This collaborative, international education study explored the concepts of global mindset, global citizenship, and global leadership across students from three schools of pharmacy. The global concepts taught in the module are often not a focus in pharmacy or general higher education curricula, yet are being discussed as those that should be integrated into student learning. Findings of this study suggest a short-term didactic course does create a positive impact on students’ understanding and value of global mindset, global citizenship, and global leadership. This is also the first study to assess the instruction of these concepts in pharmacy across multiple international institutions.

A key strength of this study includes analysing global citizenship, global mindset, and global leadership across three international pharmacy programs in a mixed-methods capacity. Instruction of these concepts are predominantly taught within one institution and limited data exists regarding its instruction in health profession education. The study had several limitations though, of which the timing and delivery of the module seemed to be the most influential. The module had to be designed to fit a three-week window of overlapping schedules to allow for synchronous team discussions. As indicated by student comments, as well as verbal discussions instructors had with students after the module ended,
three weeks was perceived as an inadequate amount of time to fully explore the concepts and work
with their international teams on a deliverable. Another limitation lies in the possibility of self-selection
bias as those students who were likely more interested in global initiatives at baseline signed up for the
module. Further, the survey was not piloted before implementation and only utilized expert content
validity by the authors which could impact how it was understood across the three countries. More
research is needed to further validate the survey instrument before assessing the long term impact of
the module into practice.

Analysis of post-survey comments revealed that students enjoyed working with their peers from other
countries towards a shared goal. While most international collaborative opportunities utilize online
platforms for text-based asynchronous learning, virtual face-to-face meetings with faculty facilitation
appeared to further instill a sense of connectedness among the team. This could be one contributing
factor as to why students had significant growth in feeling connected to the profession on a global scale.
The literature indicates that most students prefer interactive, synchronous learning platforms over text-
based asynchronous lectures. Programs can facilitate their own international student networks by
starting small and offering co-curricular opportunities, such as case study discussions, book clubs, and
periodic virtual seminars that feature synchronous discussion and collaboration. With teamwork and
collaboration serving as foundational principles in many pharmacy curricula worldwide, international student collaboration could help reinforce collaborative practice which takes into
consideration differing perspectives.

Student comments also revealed a sense of initiative and desire to take local action in different
capacities. As students became more aware of global health issues and challenges, they indicated a
stronger appreciation as to what could be done within a local context to impact global change.
Increasingly, educators are trying to utilize the “think global, act local” mantra to help students better understand what can be done in their local setting that has global implications. Local action can be a conduit for further developing global leadership skills as students work to increase awareness of global issues not only for themselves, but also for those around them. Professional advocacy is another characteristic often embedded within pharmacy curricula with global leadership providing a unique platform to exercise and achieve this skill.

The positive comments on the open-ended questions paired with the non-significant decrease in some statement results indicate potential response shift bias as students may have overestimated their self-reported knowledge and abilities on the pre-survey. Student comments indicated that the pre-reading material and team discussions challenged their beliefs and pre-conceived notions around global health. This may explain the lack of statistically significant growth seen on some statements indicating the students’ openness to new ideas from other countries, territories, and cultures. The lack of growth seen in statements about students’ ability to develop leadership skills and work in equal partnership to bring about change is likely due to student realization that they had more room to grow and develop than previously thought. A lack of expertise is a known factor that contributes towards false positive perceptions in student self-assessments. Finally, their lack of growth in curiosity about aspects of pharmacy in other parts of the world may be due to the discovery achieved during this course, thereby decreasing the amount unknown from the students’ perspective. The previously mentioned time constraints of the module could also explain why several statements showed insignificant growth.

Growth in awareness was particularly evident from their comments on a deeper understanding of global challenges, such as noncommunicable diseases, and how these global challenges have local implications. Noncommunicable diseases and chronic disease state management can often be viewed as localized
issues in developed countries despite significant increases of NCDs occurring in developing countries.\textsuperscript{22}

This can result in NCDs not being discussed as a global health issue, which attenuates the opportunity for students to think about how their daily actions and future activities as a pharmacist are making significant contributions to global health. As one of the most accessible and trusted healthcare providers, students may not be thinking at a macro level how pharmacists contribute towards the primary care infrastructure in their local environment and across many countries, which is a key element of ensuring universal health coverage.\textsuperscript{2} Pharmacists have the opportunity to reinforce how local disease states have global implications when working with students and young practitioners.

CONCLUSION

The development of global mindset, global citizenship, and global leadership are continuous, lifelong processes that are not intended to be achieved within a short period of time. However, a brief introduction to these concepts in a limited timeframe could help promote awareness of global health challenges, stimulate curiosity as to what can be done in local contexts to make a global difference, and increase a sense of connectedness to the profession on a global scale. Students are the future workforce and embedding these concepts into the curricula can help further the global impact of the profession.

More research is needed to determine construct validity of the survey as well as what the impact of such a module would be in other geographic areas including low to middle income countries. This study could provide confidence and justification for other schools of pharmacy as they consider the impact and feasibility of including these concepts into didactic learning for a comprehensive pharmacy education that can help transform practice.


<table>
<thead>
<tr>
<th>Week 1</th>
<th><strong>Activity</strong></th>
<th><strong>Concepts Covered</strong></th>
</tr>
</thead>
</table>
| Readings | Online video lectures | – Introduction to the program  
– Overview of global mindset  
– Overview of global citizenship  
– Overview of global leadership |
| Facilitated Group Discussion | Readings | – Global pharmacy practice and challenges (case study)  
– Global health myths  
– Global leadership competencies |
| Longitudinal Group Assignment | Facilitated Group Discussion | – Connecting global and local health  
– Addressing global health misconceptions  
– Applying leadership qualities to further global health agendas |
| Longitudinal Group Assignment | Longitudinal Group Assignment | – Build initial relationships  
– Identify team leader  
– Identify global health problem for storyboard |
| Week 2 | **Activity** | **Concepts Covered** |
| Readings | Readings | – Key issues/agendas in global health  
(non-communicable diseases, universal health coverage, primary care access) |
| Facilitated Group Discussion | Facilitated Group Discussion | – Application of global health agendas to pharmacy practice in high-income and low-to-middle income countries  
– Strategies to motivate action for global health issues  
– Review of longitudinal project progress |
| Longitudinal Group Assignment | Longitudinal Group Assignment | – Identify risk factors and potential solutions for the identified global health problem (GLIDE framework) |
| Week 3 | **Activity** | **Concepts Covered** |
| Longitudinal Group Assignment | Longitudinal Group Assignment | – Create a story board addressing the identified global health problem and associated risk factors, considering topics discussed across global mindset, citizenship, and leadership |
Table 2. Student (N=46) Pre-post Growth for Statements on Global Mindset, Global Citizenship, and Global Leadership

<table>
<thead>
<tr>
<th>Statement</th>
<th>Pre-Survey Mean (SD)</th>
<th>Post-Survey Mean (SD)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Mindset</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I am aware of the global challenges the pharmacy profession faces.</td>
<td>3.59 (0.91)</td>
<td>4.39 (0.65)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>2. I understand how local pharmacy issues have global implications.</td>
<td>3.72 (0.83)</td>
<td>4.394 (0.68)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>3. I am open to new ideas from other countries, territories, and cultures</td>
<td>4.89 (0.38)</td>
<td>4.76 (0.43)</td>
<td>0.057</td>
</tr>
<tr>
<td>4. I appreciate the importance of having a global mindset</td>
<td>4.80 (0.40)</td>
<td>4.85 (0.36)</td>
<td>0.533</td>
</tr>
<tr>
<td>5. I am curious about aspects of pharmacy in other parts of the world.</td>
<td>4.87 (0.34)</td>
<td>4.83 (0.38)</td>
<td>0.598</td>
</tr>
<tr>
<td><strong>Average for Global Mindset</strong></td>
<td>4.37</td>
<td>4.64</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Global Citizenship</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I understand the impact of globalization on health.</td>
<td>4.33 (0.67)</td>
<td>4.63 (0.53)</td>
<td>0.003*</td>
</tr>
<tr>
<td>7. During my time as a student, I plan to be involved in activities that tackle global problems.</td>
<td>4.46 (0.75)</td>
<td>4.48 (0.69)</td>
<td>0.811</td>
</tr>
<tr>
<td>8. I feel a sense of responsibility for how the pharmacy profession advances.</td>
<td>4.39 (0.54)</td>
<td>4.54 (0.55)</td>
<td>0.090</td>
</tr>
<tr>
<td>9. I feel connected to the pharmacy profession worldwide.</td>
<td>3.43 (1.025)</td>
<td>4.24 (0.85)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>10. I can work in equal partnership with individuals, community, and other organizations to bring about social change.</td>
<td>4.43 (0.58)</td>
<td>4.41 (0.62)</td>
<td>0.799</td>
</tr>
<tr>
<td><strong>Average for Global Citizenship</strong></td>
<td>4.21</td>
<td>4.46</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Global leadership</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I believe my actions can make a difference on a global scale.</td>
<td>3.93 (0.85)</td>
<td>4.22 (0.63)</td>
<td>0.011*</td>
</tr>
<tr>
<td>12. I have the potential to be a global leader in pharmacy.</td>
<td>4.20 (0.69)</td>
<td>4.28 (0.62)</td>
<td>0.420</td>
</tr>
<tr>
<td>13. I am able to grow and develop my leadership skills over time.</td>
<td>4.74 (0.44)</td>
<td>4.72 (0.46)</td>
<td>0.799</td>
</tr>
<tr>
<td>14. I am able to communicate the importance of global leadership to my peers.</td>
<td>4.07 (0.74)</td>
<td>4.37 (0.61)</td>
<td>0.033*</td>
</tr>
<tr>
<td>15. I am aware of the organizations and resources available to me that can assist with addressing global pharmacy challenges.</td>
<td>3.57 (0.98)</td>
<td>4.30 (0.63)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td><strong>Average for Global Leadership</strong></td>
<td>4.10</td>
<td>4.38</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Pre-post data self reported by students on a 5-point Likert Scale (1= strongly disagree; 5= strongly agree). *statistically significant