1   **Global Leaders in Development (GLIDE): a global leadership module across three international**

2   **pharmacy schools.**

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9   **ABSTRACT**:

10   **Objectives:** The objective of this study is to assess the impact of the Global Leaders in Development

11   (GLIDE) module to determine whether concepts of global mindset, citizenship, and leadership can be

12   effectively taught within a short-term didactic module.

13   **Methods:** Faculty members of PharmAlliance, a partnership between three schools of pharmacy,

14   created a three-week optional, non-credit bearing distance-based global leadership development

15   module. Material and assignments focused on concepts of global mindset, global citizenship, and global

16   leadership as applied to the global health issues of non-communicable diseases, universal health

17   coverage, and primary care. Student self-rated growth was measured with an adapted fifteen question

18   pre-post survey that also included open-ended questions.

19   **Key Findings:** Most statements showed growth on the pre-post survey with seven being statistically

20   significant ($p < 0.05$). The largest growth involved students' perceived potential to be a global leader in

21   pharmacy (global leadership category), the students' connectedness to the pharmacy profession

22   worldwide (global citizenship category), and the students' awareness of global challenges faced in the

23   pharmacy profession (global mindset category). Qualitative analysis identified several themes for each

24   of the open-ended questions. Student expectations focused on the desire to expand their global

25   mindset, better understand global pharmacy practice, develop teamwork skills, and understand global

26   pharmacy challenges and strategies for engagement.

27   **Conclusions:** The concepts of global mindset, global citizenship, and global leadership may help promote

28   awareness of global health challenges, opportunities to make a global difference in a local context, and

29   connectivity to the profession on a global scale.

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

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33   **INTRODUCTION**

34   Leadership is a key component of pharmacy education for several countries, including Australia, Canada,

35   the United Kingdom, and the United States, and is needed to achieve the standards put forth by the

36   International Pharmaceutical Federation (FIP) Global Competency Framework.[1] Despite its presence in

37   the curricula for several countries, it is unknown how it may be best used or taught to address some of

38   the world' largest health problems. Noncommunicable diseases (NCDs) cause over 70% of deaths

39   worldwide, yet at least half of the world's population does not have full coverage for basic, essential

40   health services.[2,3] Exacerbating these problems, it is expected that there will be a shortage of 15 million

41   health care workers worldwide by 2030.[4] Global challenges including NCDs, universal health coverage,

42   and access to primary care services will require both organizational and individual leadership to achieve

43   the World Health Organization's Sustainable Development Goals by 2030. As these challenges continue

44   to transcend country borders, the pharmacy profession may need to consider how to develop our

45   students and the future workforce into global leaders.

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47   While the concept of global leadership for the profession is not defined, it may require a global mindset

48   and sense of citizenship to effectively address global health challenges. The concept of a global mindset

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49 has been identified in the business literature as a key characteristic for global leadership.[5,6] A global

50 mindset has been broadly defined by Gupta et al. as an openness to and awareness of diversity across

51 cultures with the ability to act on that insight to influence others.[7] While cultivating a global mindset is

52 at the forefront of business school programs and many companies, the literature is sparse with its

53 impact in health education and professional curricula, including that of pharmacy.

54

55 Another concept that should be explored further in health professional curricula is that of global

56 citizenship, which in the corporate context has evolved beyond the idea of corporate social

57 responsibility. While there is no universally agreed definition for global citizenship, most focus on the

58 central themes of social responsibility, global competence, and global civic engagement.[8] As a concept,

59 global citizenship refers to a sense of belonging to a broader community and promoting linkages

60 between global and local contexts for a more peaceful, tolerant, secure, and sustainable society.[9] The

61 United Nations Education, Scientific, and Cultural Organization (UNESCO) emphasizes that global

62 citizenship is key to achieving the Sustainable Development goals by 2030 and that it is a lifelong

63 learning concept that is applicable to learners of all ages.[9]

64

65 To assume a global leadership role, students may need to learn about and be exposed to concepts not

66 traditionally found in the pharmacy curricula. Limited information is available as to whether schools

67 have introduced global mindset and citizenship concepts into pharmacy or health education curricula.

68 To prepare students to become global agents of change, faculty members across three pharmacy

69 schools came together to develop a three-week module, Global Leaders in Development (GLIDE), that

70 featured concepts of global mindset, global citizenship, and global leadership. The module utilized

71 learning lessons from a global citizenship extracurricular summer course at University College London

72 (UCL) as well as suggestions by UNESCO to inform its content and delivery. The objective of this study is

73   to assess the impact of the GLIDE module to determine whether the concepts of global mindset, global

74   citizenship, and global leadership can be effectively be taught within a short-term didactic module

75   across three international pharmacy schools.

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77   **METHODS**

78   Faculty members of PharmAlliance, a three-way partnership between the pharmacy schools at the

79   University of North Carolina at Chapel Hill (UNC), Monash University (Monash), and University College

80   London (UCL), created a three-week optional, non-credit bearing distance-based global leadership

81   development module. The first-week material focused on the concepts of global mindset, global

82   citizenship, and global leadership. Students read one journal article associated with each concept and

83   watched a 20-minute recorded PowerPoint presentation video on each concept made by the faculty

84   facilitators. Each video also included an introductory message from one of the Deans at each school

85   explaining the importance of the concept. The second-week material applied the three concepts to the

86   global health issues of non-communicable diseases, universal health coverage, and primary care by

87   having students read one key resource from the World Health Organization on each global health issue

88   as provided by the faculty facilitators. [11-13] Table 1 outlines the format of the module.

89

90   Content material was developed and shared with students using Google Drive. Each school recruited

91   students from the first- and second-year class within their professional pharmacy program. Students

92   were organized into international teams of six to seven students with relatively equal distribution across

93   the programs based on total enrolment. Students were asked to watch videos and read selected articles

94   in advance of team meetings which were one hour each week for two weeks with a faculty facilitator

95   from one of the three schools. During the virtual team meetings, faculty facilitators followed a jointly

96   developed standardized discussion guide with key questions regarding the material for each week.

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98   The concepts and global health issues from the first two weeks formed a matrix framework (Figure 1) for

99   students to use when working together in their team for their final deliverable, a case storyboard. The

100   case storyboard had to highlight the concepts of global mindset, global citizenship, and global leadership

101   as it applied to one of four risk factors associated with the global health issues discussed: 1) pollution

102   and environment, 2) physical and mental wellbeing, 3) life factors, healthy living, and nutrition, and 4)

103   economic factors including country wealth, and poverty. The case storyboard had to outline a specific

104   health issue under one of the risk factors and explain how pharmacy students and the profession could

105   contribute towards addressing the identified issue. Students had the instructions for the case storyboard

106   from the beginning of the module and had time at the end of each team meeting to work on their

107   deliverable. Student teams were then given an additional week (third week) to finalize their case

108   storyboard.

109

110   Students were sent a pre-post survey through Qualtrics asking them to rate themselves on fifteen

111   statements on a 5-point Likert Scale (1= strongly disagree; 5= strongly agree). This survey was adapted

112   from the learning dimensions of the UNESCO global citizenship education framework and the UCL

113   Global Citizenship Programme.[9] These cognitive, socio-emotional, and behavioural dimensions of global

114   citizenship were also utilized when developing the survey statements for global mindset and global

115   leadership. Each concept had five statements for evaluation. Statements were self-developed by the

116   authors. Students completed the pre-survey before the module started and the post-survey within one

117   week after the module concluded. They also answered open-ended questions on each survey. The pre-

118   survey included one question asking about their expectations while the post-survey included questions

119   on what stood out, how they would utilize what they learned, what they need to learn more about

120   moving forward, and how they would improve the module. All quantitative data analyses were

121   conducted using Microsoft Excel 2018. Paired t-tests were used to evaluate differences in the pre-post

122   scores. Qualitative data were coded and analysed using a one cycle open coding process with

123   conventional content analysis.[14] Dispersion screening of results revealed four cases with consistently

124   'extreme' recorded values in the post-test variable set (all had values *less than* the dispersion interval

125   given by $[Mdn - 2(Q_3 - Q_1)]$) .   These four extreme cases were excluded from subsequent comparative

126   analysis. This study and analysis was approved by the University of North Carolina at Chapel Hill

127   Institutional Review Board. This research received no specific grant from any funding agency in the

128   public, commercial, or not-for-profit sectors

129   **RESULTS**

130   In total, 71 students enrolled and completed the module with 65 students completing the pre-survey

131   and 51 students completing the post-survey. Students who only completed the pre-survey (n=15) or

132   only completed the post-survey (n=1) were removed for quantitative analysis. Additionally, the cases

133   with consistently extreme values on post-survey responses were excluded (n=4). Of the 46 students

134   (65%) included for final analysis, 21 were from UNC, 15 from UCL, and 10 from Monash. Most students

135   were in their second year (70%). Table 2 shows pre-post results for each statement as well as each

136   concept.

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138   Most statements showed growth from the pre-survey to the post-survey, with seven having a

139   statistically significant increase (p<0.05). The largest growth was seen in the statements about the

140   students' perceived potential to be a global leader in pharmacy (global leadership category), the

141   students' connectedness to the pharmacy profession worldwide (global citizenship category), and the

142   students' awareness of global challenges faced in the pharmacy profession (global mindset category). A

143   decrease was seen in four statements however none of the results were statistically significant. All

144   three concepts (global mindset, global citizenship, and global leadership) showed significant total

145   growth ($p<0.001$).

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147   Qualitative analysis identified several themes for each of the open-ended questions. Student

148   expectations focused on the desire to expand their global mindset, better understanding global

149   pharmacy practice, develop teamwork skills in working with international students, and understand

150   global pharmacy challenges as well as strategies to get engaged. When asked what was remarkable from

151   the module, students predominantly commented on global awareness and collaboration. In particular,

152   students often commented on their newfound appreciation for non-communicable diseases (NCDs) and

153   how these are global health issues that have substantial local implications. Many students described

154   how their preconceived notions of global health were challenged revealing their own implicit bias as to

155   what defines and constitutes global health. These self-realizations appeared to be associated with the

156   weekly readings and the facilitated team meeting discussion. As seen below, several students indicated

157   how the local connectivity of global health challenged their thinking.

158

159   "The concept of acting "Glocal," a notion that promotes thinking globally but acting locally. This module

160   really emphasized this idea, and helped us to realise that this is very achievable if we have a global

161   mindset, see ourselves as global citizens, and act as global leaders." – Monash student

162

163   Global engagement and advocacy were the predominant themes for how students saw themselves

164   putting into action what they have learned. Students voiced the need for future advocacy and creating

165   awareness for global challenges and issues, whether pharmacy is directly implicated or not. In moving

166   forward, there was also recognition that small actions can lead to substantial impacts. As indicated in

167   the quote below, students are interested in future global pharmacy opportunities and wanted to instill

168   within themselves a better awareness of the issues impacting the profession on a global and local scale.

169

170   "It has given me a perspective on how important my role is as a pharmacist. I no longer see myself

171   behind a counter, but I see myself fighting for things that matter. I feel like this is one of the best things

172   that I have done this year. . . it involves a lot of communication and discussion and it allows you to see

173   things from a different perspective." – UCL student

174

175 To move forward, students stated that they need to learn more about opportunities to get involved as

176   well as what is going on in other parts of the world. From resources for tackling global issues to more

177   examples about ways pharmacists have made an impact, students want to further explore global

178   pharmacy practice and education in other countries. Some students want to specifically influence policy

179   and government on issues of health and the role of pharmacy in helping address global health

180   challenges. Students would comment on how increased knowledge of the profession worldwide could

181   position countries to better work with and learn from one another.

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183   "I need to learn more about the pharmacy profession in other countries, and how we can use our

184   differences to learn from each other and empower each other." – UNC student

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186 Overall, both qualitative and quantitative growth was demonstrated by this analysis as evidenced by the

187   students' reflections and the pre-post survey data. The largest growth seen across both the quantitative

188   and the qualitative data was in the cognitive domain as students acquired new knowledge and

189   perspective after taking the course. Students also exhibited growth in the socio-emotional domain of

190   learning as they developed an appreciation for how different communities can be connected through

191   shared opportunities and challenges.[9]

192

193   Finally, although student comments indicated their satisfaction with the module, students indicated that

194   there should be more time and instruction on the concepts and global health challenges presented.

195   Students stated that three weeks was not sufficient to go into depth regarding content material. It was

196   also not sufficient for adequate teamwork and engagement with their international peers.

197

198   **DISCUSSION**

199   This collaborative, international education study explored the concepts of global mindset, global

200   citizenship, and global leadership across students from three schools of pharmacy. The global concepts

201   taught in the module are often not a focus in pharmacy or general higher education curricula, yet are

202   being discussed as those that should be integrated into student learning.[15] Findings of this study suggest

203   a short-term didactic course does create a positive impact on students' understanding and value of

204   global mindset, global citizenship, and global leadership. This is also the first study to assess the

205   instruction of these concepts in pharmacy across multiple international institutions.

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207   A key strength of this study includes analysing global citizenship, global mindset, and global leadership

208   across three international pharmacy programs in a mixed-methods capacity. Instruction of these

209   concepts are predominantly taught within one institution and limited data exists regarding its

210   instruction in health profession education. The study had several limitations though, of which the timing

211   and delivery of the module seemed to be the most influential. The module had to be designed to fit a

212   three-week window of overlapping schedules to allow for synchronous team discussions. As indicated by

213   student comments, as well as verbal discussions instructors had with students after the module ended,

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214   three weeks was perceived as an inadequate amount of time to fully explore the concepts and work

215   with their international teams on a deliverable. Another limitation lies in the possibility of self-selection

216   bias as those students who were likely more interested in global initiatives at baseline signed up for the

217   module. Further, the survey was not piloted before implementation and only utilized expert content

218   validity by the authors which could impact how it was understood across the three countries. More

219   research is needed to further validate the survey instrument before assessing the long term impact of

220   the module into practice.

221

222   Analysis of post-survey comments revealed that students enjoyed working with their peers from other

223   countries towards a shared goal. While most international collaborative opportunities utilize online

224   platforms for text-based asynchronous learning, virtual face-to-face meetings with faculty facilitation

225   appeared to further instill a sense of connectedness among the team.[16] This could be one contributing

226   factor as to why students had significant growth in feeling connected to the profession on a global scale.

227   The literature indicates that most students prefer interactive, synchronous learning platforms over text-

228   based asynchronous lectures.[16] Programs can facilitate their own international student networks by

229   starting small and offering co-curricular opportunities, such as case study discussions, book clubs, and

230   periodic virtual seminars that feature synchronous discussion and collaboration. With teamwork and

231   collaboration serving as foundational principles in many pharmacy curricula worldwide[17, 18],

232   international student collaboration could help reinforce collaborative practice which takes into

233   consideration differing perspectives.

234

235   Student comments also revealed a sense of initiative and desire to take local action in different

236   capacities. As students became more aware of global health issues and challenges, they indicated a

237   stronger appreciation as to what could be done within a local context to impact global change.

238   Increasingly, educators are trying to utilize the "think global, act local" mantra to help students better

239   understand what can be done in their local setting that has global implications.[99] Local action can be a

240   conduit for further developing global leadership skills as students work to increase awareness of global

241   issues not only for themselves, but also for those around them. Professional advocacy is another

242   characteristic often embedded within pharmacy curricula with global leadership providing a unique

243   platform to exercise and achieve this skill.

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245   The positive comments on the open-ended questions paired with the non-significant decrease in some

246   statement results indicate potential response shift bias as students may have overestimated their self-

247   reported knowledge and abilities on the pre-survey.[20] Student comments indicated that the pre-reading

248   material and team discussions challenged their beliefs and pre-conceived notions around global health.

249   This may explain the lack of statistically significant growth seen on some statements indicating the

250   students' openness to new ideas from other countries, territories, and cultures. The lack of growth seen

251   in statements about students' ability to develop leadership skills and work in equal partnership to bring

252   about change is likely due to student realization that they had more room to grow and develop than

253   previously thought. A lack of expertise is a known factor that contributes towards false positive

254   perceptions in student self-assessments.[21] Finally, their lack of growth in curiosity about aspects of

255   pharmacy in other parts of the world may be due to the discovery achieved during this course, thereby

256   decreasing the amount unknown from the students' perspective. The previously mentioned time

257   constraints of the module could also explain why several statements showed insignificant growth.

258

259   Growth in awareness was particularly evident from their comments on a deeper understanding of global

260   challenges, such as noncommunicable diseases, and how these global challenges have local implications.

261   Noncommunicable diseases and chronic disease state management can often be viewed as localized

262   issues in developed countries despite significant increases of NCDs occurring in developing countries.[22]

263   This can result in NCDs not being discussed as a global health issue, which attenuates the opportunity

264   for students to think about how their daily actions and future activities as a pharmacist are making

265   significant contributions to global health. As one of the most accessible and trusted healthcare

266   providers, students may not be thinking at a macro level how pharmacists contribute towards the

267   primary care infrastructure in their local environment and across many countries, which is a key element

268   of ensuring universal health coverage.[2] Pharmacists have the opportunity to reinforce how local disease

269   states have global implications when working with students and young practitioners.

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271   **CONCLUSION**

272   The development of global mindset, global citizenship, and global leadership are continuous, lifelong

273   processes that are not intended to be achieved within a short period of time. However, a brief

274   introduction to these concepts in a limited timeframe could help promote awareness of global health

275   challenges, stimulate curiosity as to what can be done in local contexts to make a global difference, and

276   increase a sense of connectedness to the profession on a global scale. Students are the future workforce

277   and embedding these concepts into the curricula can help further the global impact of the profession.

278   More research is needed to determine construct validity of the survey as well as what the impact of

279   such a module would be in other geographic areas including low to middle income countries. This study

280   could provide confidence and justification for other schools of pharmacy as they consider the impact

281   and feasibility of including these concepts into didactic learning for a comprehensive pharmacy

282   education that can help transform practice.

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320   Table 1. Outline of module activities and learning concepts

	Activity	Concepts Covered
Week 1	Online video lectures	− Introduction to the program − Overview of global mindset − Overview of global citizenship − Overview of global leadership
	Readings	− Global pharmacy practice and challenges (case study) − Global health myths − Global leadership competencies
	Facilitated Group Discussion	− Connecting global and local health − Addressing global health misconceptions − Applying leadership qualities to further global health agendas
	Longitudinal Group Assignment	− Build initial relationships − Identify team leader − Identify global health problem for storyboard
Week 2	Readings	− Key issues/agendas in global health (non-communicable diseases, universal health coverage, primary care access)
	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	− Identify risk factors and potential solutions for the identified global health problem (GLIDE framework)
Week 3	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

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327 Table 2. Student (N=46) Pre-post Growth for Statements on Global Mindset, Global Citizenship, and
328 Global Leadership

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

329 Pre-post data self reported by students on a 5-point Likert Scale (1= strongly disagree; 5= strongly agree).
330 before and after taking the GLIDE module. *statistically significant

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