Commentary

Advancing Systems Citizenship in Colleges and Schools of Pharmacy

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\textbf{A R T I C L E I N F O}

\textbf{Keywords:}
Citizenship
Systems citizen
Citizen scientist
Systems thinking

\textbf{A B S T R A C T}

The pharmacy academy works collectively to serve the educational needs of diverse stakeholders by promulgating expectations for professional programs to achieve standards for both practice and professional development. Building systems thinking into the learning process, with its associative benefits to postgraduate preparation and lifelong practice, offers a pathway to achieve this educational mission. The concept of systems citizenship has been suggested as a process for helping health professional students incorporate a meaningful professional identity and responsibly seek out an understanding of the connections between patients, communities, and the larger institutions and environments that affect each. Drawing on the discipline of systems thinking, the student and pharmacist learn to be effective locally by thinking globally. Systems thinking, a basis for effective citizenship, is a proactive and shared approach to problem-solving that integrates professional identity with the goal of closing gaps in care. Pharmacy colleges/schools provide an opportunity for students to develop and practice as systems citizens.

1. Introduction

Building on its long history, the pharmacy academy has worked collectively to provide the educational foundation needed by schools, faculty, and preceptors to educate the next generation of pharmacists. By applying and further developing this knowledge and skills base, pharmacists continue to play a vital and expanding role in the care of patients and in promoting public health. Pharmacists are also assuming advocacy roles as informed citizens by advancing policies that promote the greater good of communities, such as reducing health disparities, expanding opioid treatment services, and improving access of vulnerable populations to affordable medications and healthcare services. The pharmacy academy has addressed such diverse roles through expectations for professional programs to achieve standards for both practice and professional development. Included among these standards are the knowledge, skills, and attitudes essential for advocacy, self-awareness, leadership, innovation, entrepreneurship, and professionalism. Competencies for practitioners, as outlined in the Pharmacist Patient Care Process and the core Entrustable Professional Activities, also include terms such as advocacy, communication, integrity, patient-centered care, defined populations, problem-solving, and respect.\textsuperscript{2,3} Although all these documents utilize terms that might suggest a role for pharmacists as citizens or attributes associated with citizenship, the specific responsibilities of pharmacists as citizens serving larger communities are not explicitly addressed.

The notion of professionals as citizens has been discussed in the health professions literature. Examples include: developing leadership and advocacy skills for pharmacy faculty and students, applying social justice, health policy, and citizenship skills in an international pharmacy elective course, and understanding social justice, connectiveness, and advocacy as concepts for nurses acting as citizens.\textsuperscript{4–6} Explicit framing of the concept of citizenship, as it relates to pharmacy education, warrants further consideration. The need for this change is evident. For example, state and national pharmacy associations have struggled with attracting new members, retaining current ones, and getting pharmacists involved in legislative agendas essential to the practice of pharmacy and aspects of patient care. Pharmacists need to engage as effective citizens who perform activities that sustain and advance the pharmacy profession and pharmaceutical sciences and optimize the health of individual patients and populations. This commentary discusses the foundation and concepts of systems citizenship and why this should be central to the educational mission of our doctor of pharmacy and postgraduate programs. We also explore the related notion of citizen scientists.
1.1. Foundations of Citizens and Systems Citizens

Daniels and colleagues\(^7\) in *What Universities Owe Democracies*, emphasizes the unique place universities hold in contributing to liberal democracy’s twin promises of equality and liberty. Universities frame and promote an educational environment that supports students in their role as a citizen in a democratic society. A citizen is one who meets the legal requirements of a national, state, province, or local government and is afforded the privilege to serve as a participatory member of a community or organization to the extent that they choose.

More recently, the concept of citizenship has been expanded to consider global problems. Global citizens recognize their responsibilities to make our planet sustainable, equitable, and peaceful. The COVID-19 global pandemic is a profound example where pharmacists, in collaboration with other healthcare and public health professionals, have acted locally in promoting safe practices and disease prevention. When considered in the context of pharmacists in several countries now providing immunization services (eg, United States, United Kingdom, Canada, Switzerland), this had the added benefit of helping curb the further spread of the virus around the globe. Pharmacists have often played key roles in working locally, but producing important global benefits by ensuring adequate medicines and medical supplies, overcoming supply chain breakdowns through their work, and volunteering in organizations to support emergency relief efforts.

The transition to an ever-expanding, more complex, knowledge-based economy creates greater opportunities for informed citizenship. Such citizens are not limited to recognizing the individual and collective decisions may positively or negatively impact others locally, regionally, or beyond. Success as a citizen will require systems intelligence, the ability to create partnerships across boundaries, and openness of mind, heart, and will.\(^8\)

A systems citizen, who can be supported by larger “civic cultures,” is considered by some as a critical and necessary mindset for a health professional to effectively advance patient safety and care.\(^9\) In medical education, Gonzalo and Singh\(^10\) defined systems citizenship as when health care providers think about their role to learn from and with team members focusing on everyday patient care through a systems thinking lens. A systems citizen recognizes, as an obligatory part of professional identity, how to approach gaps in patient care.\(^11\) Borkan and colleagues\(^12\) examine the emergence of health systems science as a curricular innovation in medical education, one which promotes intentionally embedding learning activities to foster graduates who are systems citizens. Systems citizens continue to learn and unlearn behaviors and develop skills and abilities that enable teams and organizations to change workplace cultures in the journey toward achieving crucial goals, such as Healthy People 2030.\(^13,14,15\)

1.2. Actions of Systems Citizens and Systems Thinking

What should a pharmacy student or graduate do in their role as a systems citizen? Using the lens of a systems citizen who acts locally but thinks globally, Table 1 lists examples of common actions of a systems citizen. It is not surprising that many (although not all) of these actions can be found when describing the current knowledge, skills, behaviors, and attitudes necessary for effective professional practice and continuing development.

Two concepts that relate to systems citizenship include its foundation in the field of *systems thinking*, which we describe here, and an adjacent notion, given pharmacy’s roots in science, of *citizen scientists* (discussed below). Particularly useful for solving challenging situations and problems, the role of systems thinking has been described for the health sciences and medical education.\(^16,17\) Systems thinking involves an approach where a larger complex system is considered, rather than the simple analysis of the individual components. In healthcare, this extends well beyond traditional biological systems, such as organ systems, physiological processes, and disease classifications to actually include many disparate “actors” (eg, health insurers, public health agencies, government regulators, professional/industry associations, patient advocacy groups) and factors, such as patient health behaviors, social determinants of health, race/ethnicity, culture, the economy and labor supply of health professionals, among many others. One works to understand the patterns and interrelationships of relevant actors and factors using a broad nonlinear perspective. Pharmacy education itself is a system, containing many actors, such as students, faculty, administrators, practice sites, employers, regulators, accreditors, and federal agencies. It also has many influencing factors: applicant readiness, student enrollment and progression, faculty job satisfaction, board passage rates, student debt, and job markets, among many others.

Complex systems often undermine the intent of straightforward solutions. One example would be attempting to prevent the readmission of a patient recently discharged after congestive heart failure exacerbation. The acute care pharmacist might have performed a medication reconciliation upon admission. At discharge, the same pharmacist could recommend appropriate therapy, personally counsel the patient on adherence, and communicate the recommended therapy regimen to both the patient’s primary care physician and cardiologist. However, despite performing best practices, this same patient might be readmitted with another exacerbation. The reason is unclear. Perhaps the natural progression of the disease is to blame. Alternatively, the pharmacist might have not considered other connected factors, such as the patient’s lack of family support, poor insurance coverage, low health literacy, poor transportation availability, and distrust of health professionals. All these influences could and often do, work to negate a pharmacist’s otherwise effective, but single-dimensional pharmacotherapeutic solution. Not all of these considerations are within the purview of the pharmacist, however, necessitating the pharmacist to work collaboratively with other healthcare professionals to achieve positive outcomes via an interprofessional approach to care.

Why should a systems citizen employ a systems thinking approach? For one, systems thinking has been shown to be beneficial in organizations that address complex problems, such as health administration and leadership; clinician education, leadership, and practice; and public and global health.\(^18\) Systems thinking is a proactive, open, and circular linking approach for problem-solving.\(^19,20\) It reframes conversations to see the entire system, rather than simply the silos that comprise it, thus, allowing systemic assessment of stakeholder viewpoints. It transforms one’s ability to comprehend and approach

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Table 1

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<th>Actions of an Effective Systems Citizen.(^a)</th>
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<tr>
<td>Stays maximally informed using critical thinking skills to continuously evaluate information on complex professional and personal issues</td>
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<td>Engages and effectively communicates with various communities, both public and private, to meet or advance the needs of others and to promote scientific and evidence-based knowledge</td>
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<td>Assumes responsibility and takes the initiative in commitments and problem-solving for the benefit of individuals and their broader communities</td>
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<td>Recognizes the importance of giving back time and financial support to other individuals and groups</td>
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<td>Works to ensure that government, at all levels, takes care of and promotes the benefits of family, friends, and community in supporting the well-being of individuals</td>
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<td>Strives intentionally and deliberately to improve sustainability locally, nationally, and globally</td>
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<td>Works to promote equity, diversity, and inclusion in personal and professional activities</td>
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<td>Examines data, issues, and challenges with a skeptical perspective as to soundness, accuracy, and validity while at the same time avoiding being cynical in interactions with other individuals and groups</td>
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<tr>
<td>Develops and continually enhances skills to be an effective advocate and champion for ideas and issues</td>
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<td>Contributes and leads using systems thinking</td>
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<td>Serves and promotes the concept of the citizen scientist</td>
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\(^a\) To the best of our knowledge, the specific actions included in this list each represent an amalgam of ideas not directly attributable to a particular source.
broad community, organizational, and societal-based challenges. Systems tools and methods consider key connections between individuals, groups (teams, departments, organizations, agencies), communities of all sizes, and governments at all levels.19

As Table 1 illustrates, successful systems citizens lead others through action regarding their current systems, workflows, interpersonal relationships, and by following best practices. They explore connected patterns and structures within organizations that are frequently overlooked when only considering individual events. They are effective communicators who can speak and listen to others at all levels of an organization. They can conceptualize and illustrate the entire system for others. Systems thinkers share the vision of what a successful system would look like following improvements. They demonstrate courage and expend the energy needed to challenge the status quo and navigate through current boundary systems.19 Successful systems citizens also work to promote and protect psychological safety by allowing individuals and organizations to learn, unlearn, and challenge current systems, as needed for innovation.20

1.3. Systems Citizen as Citizen Scientist

Pharmacists, working as systems citizens, could also lead others in citizen science initiatives. This is an idea adopted from roots in ornithology where thousands of volunteers helped to study the migratory patterns of birds.21 Citizen scientists, as a concept for fields like pharmacy, can include both professional and amateur (community volunteer) scientists among their ranks. Roles could include: assistants who help with data collection only; collaborators who help analyze data, refine, or modify projects or support the dissemination of findings; or co-creators who are full partners in the design of studies and dissemination of findings.22-24 Citizen science seems to only have been recently proposed as a means to advance other fields of science, education, and learning.25 One advantage of citizen scientist initiatives is that these attract a wider public understanding of, and recruit support for, ambitious scholarly endeavors. Systems citizens, particularly in the areas of the health sciences, can and should take a leadership role in promoting and educating others to become citizen scientists. Our graduate and health professional students can serve as important contributors, especially within their specialized fields or in areas where they have personal passions and interests.

1.4. Pharmacy Education’s Role in Educating Systems Citizens

Pharmacy colleges/schools provide a fertile setting to educate students and postgraduates with the knowledge, skills, and abilities critical to becoming valued systems citizens. These educational outcomes align with the competencies we seek through our didactic and experiential courses, co-curricular activities, and research opportunities. The educational pathway begins with preparing future pharmacists and scientists to understand and embrace the actions of a systems citizen. This moves beyond a construct of advocacy to one of intentional reflection and engagement, whereby students learn, as an integral part of their professional and personal identity, to become an agent of the change they seek to enact. This could be done through integration of systems citizenship actions into didactic and experiential learning, but perhaps this might find a more immediate home in the structured planning of co-curricular activities (Table 2 has examples of each). To encourage this, we propose that systems citizenship be introduced as an element of the next version of the Accreditation Council for Pharmacy Education standards. We would also suggest this as a role for pharmacists that would be integrated within future iterations of the Center for the Advancement of Pharmacy Education outcomes.

Systems thinking is essential to addressing challenges and opportunities. With programs seeking ways to differentiate themselves in an effort to stem enrollment concerns, an emphasis on systems citizenship and systems thinking could provide a unique niche. As we think about the evolution of various curricula in our colleges/schools of pharmacy, we must focus on how we educate future generations of systems citizens, how we help them find and develop their professional interests and passions, and how they can strengthen both the lives of their patients and their defined communities.

Table 2
Examples of Systems Citizenship Activities in Pharmacy Education.

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<tr>
<td>Visiting with state representatives or senators during student legislative events</td>
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<td>Volunteering for health fairs or other community events in economically-deprived areas</td>
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<td>Participating in global travel experiences that permit first-hand exposure to the culture and healthcare services of host countries</td>
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<tr>
<td>Engaging in leadership, fund-raising or other volunteer opportunities with professional societies and community service organizations</td>
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<td>Participating in substance abuse and other education events at local high schools</td>
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<th>Didactic</th>
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<td>Understanding the foundations and applications of systems thinking in healthcare settings</td>
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<td>Studying essentials of health disparities, deprivation, and SDOH</td>
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<td>Engaging in active learning, such as case studies, that embed elements of SDOH or cultural differences that must be addressed by the pharmacist</td>
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<td>Applying geographic mapping tools to quantify SDOH in selected communities</td>
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<tr>
<td>Developing knowledge and skills of health literacy, language barriers, cultural competence, and public and population health</td>
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Building self-awareness skills to assume the role of being both a health professional and a systems citizen

**Experimental**

Selecting rotations at sites that primarily serve areas of social deprivation, including Federally Qualified Health Centers, county hospitals, free clinics, independent pharmacies, Indian Health Service and other practice settings

Spending a significant amount of time engaging with social or community health workers during an ambulatory care rotation

Pursuing an experiential rotation that requires the student to counsel patients whose culture is quite different than one’s own, e.g., country of origin, language, health beliefs, social etiquette.

Selecting nontraditional experiences that center on systems citizenship activities, such as state and national professional associations and public health departments.

Abbreviation: SDOH, social determinants of health.

Author Contributions

Gregory Reardon – Conceptualization, Writing – Original Draft Writing - Review & Editing; Evan T. Robinson – Conceptualization, Writing - Original Draft, Writing – Review & Editing; Sheldon Schuster – Conceptualization, Writing – Review & Editing; Gayle A. Brazeau – Conceptualization, Writing – Original Draft, Writing - Review & Editing

Declaration of Competing Interest

None declared.

Funding/Support

There is no funding/support for this work.

Acknowledgment

The authors would like to thank Dr. David Zgarrick, Professor Emeritus, Department of Pharmacy and Health Systems Sciences, School of Pharmacy at Northeastern University, for reading and providing excellent suggestions for this manuscript.

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