Making the case for the evolving role of social media in health professions education and a literature review on the application of some in ophthalmology

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Background and Objective: Social media (SoMe) has emerged as a tool in health professions education (HPE), particularly amidst the challenges posed by the coronavirus disease 2019 (COVID-19) pandemic. Despite the academia's initial skepticism SoMe has been gaining traction in supporting learning communities, and offering opportunities for innovation in HPE. Our study aims to explore the integration of SoMe in HPE. Four key components were outlined as necessary for a successful integration, and include designing learning experiences, defining educator roles, selecting appropriate platforms, and establishing educational objectives.

Methods: This article stemmed from the online Teaching Skills Series module on SoMe in education from the Ophthalmology Foundation, and drew upon evidence supporting learning theories relevant to SoMe integration and models of education. Additionally, we conducted a literature review considering English-language articles on the application of SoMe in ophthalmology from PubMed over the past decade.

Key Content and Findings: Early adopters of SoMe platforms in HPE have leveraged these tools to enhance learning experiences through interaction, dialogue, content sharing, and active learning strategies. By integrating SoMe into educational programs, both online and in-person, educators can overcome time and geographical constraints, fostering more diverse and inclusive learning communities. Careful consideration is, however, necessary to address potential limitations within HPE.

Conclusions: This article lays groundwork for expanding SoMe integration in HPE design, emphasizing the supportive scaffold of various learning theories, and the need of furthering robust research on examining its advantages over traditional educational formats. Our literature review underscores an ongoing multifaceted, random application of SoMe platforms in ophthalmology education. We advocate for an effective incorporation of SoMe in HPE education, with the need to comply with good educational practice.

Keywords: Social media (SoMe); health professions education (HPE); active learning; social learning; technology enhanced learning

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Introduction

Technology has enabled learners to become content creators and use their content in online learning environments for collaboration, interaction, and engagement. Social media (SoMe), in particular, can help us to connect with content, information, and people to meet ongoing lifelong learning needs. It is widely embedded in our daily lives, used for practicalities, and is easily accessible and user-friendly. SoMe can be defined as Internet-based applications on which people create and share content, and build social networks (1).

SoMe can be used as a resourceful platform offering networking and learning opportunities whereby communities of learning may organically emerge, enabling their members' professional identity development while engaging collaboratively in their mutual field of practice. SoMe may be embedded in traditional online or in-person educational programs and scale the learning experience beyond time and geographical constraints involving a wider and more diverse learning community. In SoMe, people create online personal profiles, which become tagged to their virtual creations and interests, blend with content, and enable networking with other digital objects and people sharing mutual goals. People can express themselves and interact by sharing, liking, and commenting using diverse ways of communication such as text, images, sound, and videos (2).

Research confirming the applicability and effectiveness of SoMe in Health Professions Education (HPE) is scarce. A review of 14 selected studies by Cheston *et al.* (3) in 2013 shows that SoMe may enable competency improvement and provide opportunities for learner engagement (71%), feedback (57%), collaboration, and professional development (36%). Technical issues (43%), variable learner participation (43%), and privacy/security concerns (29%) were noted as challenges. Based on 698 papers, Chan *et al.* (4) acknowledged a ubiquitous and steady increase in the use of SoMe in HPE. SoMe strategies were categorized as (I) push-based, with occasional engagement opportunities such as blogs, podcasts, and organizations' SoMe accounts; (II) interaction-based such as Twitter journal clubs/chats, Facebook groups, WhatsApp-based teaching/discussions, and online virtual community of practice (CoP); and (III) blended by combining both, such as live tweeting conferences and virtual networking and mentorship. Online social networking engagement of learners with peers and educators helps elevate self-esteem, motivation, and academic success (5).

Sterling *et al.* (6) underscored the importance of conducting more comprehensive research to better understand the impact of SoMe on postgraduate medical education, recruitment, and professionalism as the quality of existing studies is modest at best.

Guckian *et al.* (7) emphasized the positive impact of SoMe on medical students associated with communication improvement with educators and with both objective and self-reported learning improvement. On the other hand, they noted a lack of clear evidence regarding long-term retention of knowledge and occasionally negative impacts on mental and physical health.

He *et al.* (8) investigated how ophthalmologists used SoMe for their personal and professional development at the height of the coronavirus disease 2019 (COVID-19) pandemic. Ninety-four percent reported having a professional SoMe account, most frequently Instagram (25.2%), LinkedIn (22.6%), and Facebook (19.6%). Most participants (64%) declared spending at least 1 hour daily on SoMe to connect with family, promote professional services, educate patients, share clinical cases with colleagues, and find mentorship and networking opportunities.

As learners and educators have been challenged to adopt new technologies, opportunities for innovation in HPE have appeared and SoMe emerged as a field of scholarship, deserving further investigation. Thus, we conducted a review of recent literature on this topic, summarized the most relevant theories of learning underpinning SoMe, described the depths of integration of SoMe in HPE, enumerated best practices to embed SoMe in instructional design, and addressed the role and relevance of SoMe in ophthalmology. We present this article in accordance with the Narrative Review reporting checklist (available at https://aes.amegroups.com/article/view/10.21037/aes-23-74/rc).

Methods

Our article stems from our participation as faculty in the online Teaching Skills Series of the Ophthalmology Foundation (9,10). To draw an overview of SoMe in HPE, we elected four landmark reviews (3,4,6,7). To highlight the role of SoMe in ophthalmology education, we conducted a literature review in PubMed and retrieved 160 articles from which 110 were rejected for not being related to the topic (SoMe and ophthalmology), not English written, or no abstract available (*Table 1*).

Table 1 Summary of the search strategy regarding social media and ophthalmology education

Items	Specification
Date of search	January to February 2024
Databases searched	PubMed
Search terms used	"Social media" AND "Ophthalmology education"
Timeframe	Last 10 years
Inclusion criteria	All articles, regardless of type, in English and with abstracts available
Selection process	H.P.F. and K.G. conducted the search and selection

Learning theories sustaining the role of SoMe in learning

While social learning theory states that behaviors can be acquired through observation, constructivism asserts that knowledge is actively constructed, either individually or socially. Constructivism is a social theory of learning involving observation and an active cognitive constructive process (11). Bandura explained that learning is not a simple process of knowledge translation but a mental process considering the learner's previous experiences and the social context. People learn from one another by observing, experimenting, and modeling in a social context. SoMe creates rich social learning environments and exposes users to various points of view feeding their curiosity and providing new meanings by interacting with others experienced in their selected and/or emerged fields of interest.

Kolb argues that learning occurs through experience and is supported by reflection that generates new knowledge and skills, leading to abstract conceptualization and subsequent active experimentation. Experiential learning theory describes the learning process with concepts that support learning through SoMe. Reflection is critical to learning by observing and experimenting (12). Specific contexts shape an individual's experience differently; past histories, learning strategies, and emotions influence the learning developed through reflection on experience (13,14). SoMe platforms, such as blogs and microblogs like X, former Twitter, can provide such virtual environments enabling individual and collective reflection. When critical reflection involves challenging perspectives beyond measuring pre-set outcomes, learners can engage in reflective problem-solving as part of transformative learning.

Focusing on the importance of the social context and sustained motivation, Vygotsky asserts that meaning is contextualized and created through social collaboration and guidance. A more experienced person, the "knowledgeable other", i.e., an educator or coach, manages the social context and encourages and guides learners to advance experiential learning to the next level of development, designated as the zone of proximal development (ZPD) (15). The socio-cultural environment is understood as a relevant component in enhancing or limiting cognitive development.

Connectivism and heutagogy emphasize technology as the scaffold to connect and build relationships to create knowledge. Connectivism has been labeled the social constructivism of the digital age. Connections support the creation of dynamic social networks that are based on internet profiles of individuals and communities and reflect mutual goals and shared content. Knowledge becomes distributed across digital networks, and learning includes the ability to build and navigate networks, by connecting fields, concepts, and people. The "knowledgeable other" may also be found in peers, online resources, and information. Educators and learners assume interchangeable roles, and decisions about who to connect with and what to learn become a learning process (16).

Compared with pedagogy and andragogy, heutagogy (17) includes the most autonomous and self-efficacious learner (18). Instead of simply completing teacher-assigned tasks, learners are encouraged to seek areas of uncertainty and complexity in the subjects they study. Hase and Kenyon (19) proposed the designation of self-determined learners for those developing self-efficacy, applying their competencies in novel situations, and creating new ideas by actively weaving networks of knowledge and people. Self-determined learners build their own online learning environments. They set outcomes, explore, create, connect, collaborate, and reflect.

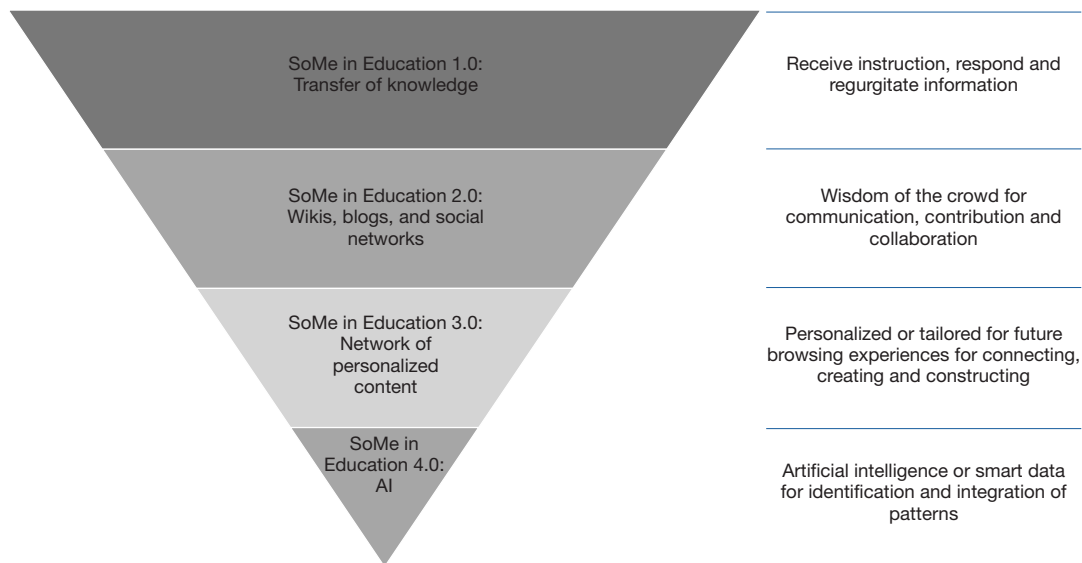Co-constructing knowledge can stem from casual exchanges of ideas while networking, which may produce

Figure 1 Progression of integration of SoMe and education relative to the evolving worldwide web and the diversity of corresponding pedagogical approaches. SoMe, social media; AI, artificial intelligence.

partnerships and problem-solving (20). A CoP has been conceptualized as a group of people with common interests who share their unique experiences and contributions to deepen knowledge and expertise through ongoing interactions (21). SoMe links people and information together, and supports ongoing interactions and virtual CoPs (22,23).

Learning by creative problem-solving can, also, be supported by the theory of diffusion of innovation. SoMe-based peer networking may lead to a critical mass of adopters through the influence of innovators driving novel educational strategies. Implementing a new educational idea can be explored following this theory: communicate it widely, encourage interest, review the strategy, try it, and adopt it to meet learning needs (24).

Integration of SoMe in learning and teaching

SoMe can be integrated into education across its several stages of evolution. Gerstein model (25) and the four developmental stages of the web match the evolution of technology to meet the evolving philosophies of education (*Figure 1*).

They are described as follows:
- ❖ In Education 1.0, learners are treated equally, regardless of their interests or previous experiences. Knowledge is transferred unidirectionally from

instructor to learners as depicted by the 3 Rs—learners receive by listening and responding by taking notes and regurgitating the information previously instilled. The learning experience is educator-centered in all interactions. In this context, SoMe serves as a platform for available information.
- ❖ In Education 2.0, learners become knowledge builders within a constructivist and andragogical approach to learning. Learners interact with peers, educators, and didactics by communicating, connecting, and collaborating (3Cs). They re-use content in different contexts for additional purposes. The foundations of andragogy relate to Web 2.0, and the definition of Education 2.0 lies in humanistic roots emphasizing the importance of prior experience and social context. Social networks, wikis, and blogs epitomize Web 2.0 tools (26). Educators are learning facilitators, "guides on the side", as opposed to "sages on the stage" (27).
- ❖ Education 3.0 embodies a heutagogical philosophy defined by significant learner autonomy and a connectivism approach that relies on building knowledge and weaving networks supported by technology. Capable, and self-efficacious, learners master their learning pathway and generate content adding value to the field of study. Web 3.0, or the semantic Web, links with the conceptualization

Table 2 Critical factors for embedding SoMe in health professions education

Critical factors	Description
Design of the learning experience	Curricula can be synchronous, asynchronous, hybrid, or blended. Well-designed learning environments enable participants to develop meaningful dialogue and share educational resources (20)
The role of the educator	Educators should act as facilitators, curators of content, amplifiers, role models, mentors, guiding learners and catalysing the learning journey towards the accomplishment of the goal and established objectives
Selection of SoMe platforms	This selection impacts the depth of the educational experience. SoMe platforms and tools should be specifically chosen for social networking, professional networking, media sharing, microblogging, knowledge aggregation, free open access medical education or game learning environments (16,21,24,25)
The purpose of the learning experience	The goal of the learning experience should guide the choice of the SoMe platform and tools that may aim: to create or support CoPs; aid in formation of professional identity; to receive, exchange, seek, create, store and organize content; or to use as a communication channel (11)

SoMe, social media; CoP, community of practice.

sustaining Education 3.0. Learners can create their digital personal learning environments. SoMe may be regarded as a learning partner by pushing contextualized information and linking people with common goals. Learners connect, create, and construct (3 Cs) various intertwined social networks. Learners and educators should embrace the concept that "one can grow, change, and be significant".

❖ SoMe in Education 4.0 poses a novel learning environment where learners interact across networks and lead by influence. Learners need to develop problem-solving skills and critical thinking to interact with artificial intelligence. The challenges require agility and adaptability to showcase initiative and entrepreneurialism. Content developers need to embrace effective oral and written communication. As information develops continuously, educators must access and analyze data with curiosity and imagination (28).

Incorporating SoMe in HPE has benefits to both learners and educators, such as improving communication, knowing learners through their profiles, hosting collaborative and enjoyable learning experiences, enabling behavior modeling and autonomy, nurturing content creation, and taking active roles in CoPs (29,30).

A few challenges remain for SoMe integration into the instructional design of HPE, such as ensuring the quality and accuracy of information, maintaining a significant presence, dedicating time to monitoring SoMe, protecting data privacy, maintaining professional standards to avoid cyberbullying, keeping patient-physician boundaries, and complying with regulation requirements (16-18).

Several strategies to leverage SoMe in instructional design have been proposed. In the planning stage, educators and learners should reflect on their digital identity and goals for using SoMe, and apply evidence-informed techniques, existing guidelines, shared norms, and co-creation approaches to improve HPE quality. SoMe tools and strategies should be aligned to achieve desired outcomes. During SoMe implementation, a team approach is paramount to manage an organizational SoMe presence and protect participants by defining boundaries and privacy settings. Incorporating ongoing learners' SoMe interaction into the classroom conversation is a useful educational tool. Educators can establish SoMe as an informal backchannel where they demonstrate responsible and meaningful use. Personal and professional SoMe accounts should be separated (3,16,31).

Key elements for successful integration of SoMe in HPE

Beyond its original purpose and driven by the recent pandemic, SoMe became a dominant vehicle for discourse, debate, and education (19). Helpful SoMe practices in HPE include four critical factors to improve the educational experience by promoting communication, critical thinking, and independent inquiry (*Table 2*).

When designing the learning experience, we should consider whether the learning will occur synchronously or asynchronously. When designing live learning experiences, educators and curricula designers can start with asynchronous opportunities to interact with didactics, faculty, and peers with ice-breakers, and initiating conversation (32). Optimal synchronous learning environments offer opportunities for dynamic interaction

and SoMe can support dialogue, and resource exchange, and strengthen social interactions. This approach highlights the importance of community, culture, and context in knowledge construction. SoMe may also extend learning engagement with learning reinforcements after the synchronous phase (7).

The educator's role might include additional responsibilities to maximize the effect of embedding SoMe in their educational programs. Educators act as content curators, create tutorials, adjust weekly activities with the course flow, and may amplify their impact by highlighting essential ideas or concepts using blogs or microblogs such as X. They serve as role models by using tools and activities to maintain an online presence by sending regular newsletters and stimulating activity in forums, podcasts, and weekly live sessions in synchronous platforms.

The selection of tools or platforms impacts the quality of the learning experience. Web 2.0 tools (33) can be categorized by function, such as (I) social networking like Facebook, Google Plus, and X, (II) professional networking using LinkedIn, media sharing such as YouTube, Vimeo, Instagram, and, (micro)blogs, and (III) knowledge aggregation through wikis, free open access medical (FOAM) education, and gaming environments (21,24). Each tool has advantages, disadvantages, and intended purposes (25).

The purpose of including SoMe can be to support developing CoPs, and enable educators to advance their practice by increasing peer visibility, a sense of belonging, and collective ownership associated with professional identity development (17). Lahiri and Moseley (34) developed a checklist to reflect on the overarching purpose and both social cognitive and constructivist perspectives of including SoMe in educational programs.

SoMe in ophthalmology

SoMe has emerged as a transformative force in ophthalmology, profoundly impacting practice, research, education, training, patient engagement, and enhancing clinical care (35). Its applications span from promoting ophthalmic services, enriching conference experiences, disseminating cutting-edge research literature, serving as a platform for teaching ophthalmology at medical schools, recruiting future ophthalmologists, advocating for eyecare, and facilitating collaborative endeavors (36-42).

SoMe platforms used in medical education can be grouped by function and to maximize their impact selected accordingly based on their main purpose (29). Platforms

like Facebook, X, and WhatsApp serve as dynamic hubs for HPE networking and collaboration, through which ophthalmologists share insights, discuss challenging cases, and access educational resources with professional development. WhatsApp enacts collaboration, problem-solving and networking (43-48). Podcasts, encompass storytelling and trend towards sharing practical advice and new technologies. Instagram has emerged as a potent platform for education and professional visibility as well as platforms for sharing surgical videos such as Youtube and TikTok (45,49-53).

As residency programs increasingly leverage SoMe for recruitment and educational purposes, the presence of ophthalmology trainees on these platforms continues to expand (54).

Patients increasingly turn to SoMe for information about ophthalmology. This highlights the importance of implementing two-way messaging systems to improve patient care. By engaging with patients through SoMe, ophthalmologists can deliver timely postoperative instructions, enhance medication adherence and address concerns with patient outcomes. This leads to increased patient satisfaction (55-57).

SoMe has been used to share information among eye care professionals, the academic community and the public about keratoconus (58), oculoplastic (36,42,59), keratoplasty (60), cataract surgery (61), refractive surgery (62), ptosis (63), intravitreal injections (64), diabetic macular edema, glaucoma (65-67), dry eyes (68), ptosis (63), retina (69,70), strabismus (71), uveitis (72), multifocal intraocular lenses (73), refractive surgery (62), retina (74), retinopathy of prematurity (75), contact lenses (76), pediatric cataract surgery (56), diabetic macular edema (77).

The widespread use of SoMe in ophthalmology also presents challenges, particularly regarding the reliability of medical information (78). As patients and ophthalmology trainees rely more on SoMe medical content, it becomes imperative to ensure accurate information dissemination (79,80). Establishing formalized SoMe policies within training programs is essential to guide responsible usage and uphold professional standards. Regulatory bodies and healthcare organizations can play a crucial role in this effort by collaborating with ophthalmologists to establish guidelines and implement measures to regulate and monitor SoMe content (81,82). While utilizing SoMe in ophthalmology, professionals should consider the required time, the inherently public nature of interactions, and potential misinformation as a challenge for both

ophthalmologists and their patients (35,83). Proactive engagement and vigilant oversight are essential to harness the full potential of SoMe in ophthalmology (84). Measuring ophthalmology trainees' performance improvement and patients health literacy is vital (46,57,77,85-91).

Conclusions

The use of SoMe in HPE is supported by several learning theories; it encourages personal profiling, and learners' knowledge co-creation, nurtures reflective, active, and social learning, and allows self-pace and choice over learning. SoMe widen outreach with mentors and diverse mentoring fields to embrace underrepresented and underserved learner communities. To maximize the beneficial effect and consolidate the role of SoMe in HPE, four critical aspects should be considered: the learning experience design, the role of educators, the selection of SoMe platforms, and the purpose of SoMe incorporation. SoMe can supplement and optimize learning experiences in HPE. Its integration in HPE should be used judiciously and adapted to the purpose intended, and should follow ethical principles. Its application needs to be continuously evaluated to establish its relevance and long-term impact on performance improvement.

In ophthalmology, SoMe has been shown to offer unprecedented opportunities for practice, research, advocacy, education, training, and patient engagement. While challenges such as ensuring reliable content quality and time management persist, proactive engagement, and quality policies with vigilant oversight are essential for maximizing the benefits of SoMe in HPE in general as well as in ophthalmology.

Acknowledgments

Footnote

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