An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group

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Declaration

By submitting this dissertation electronically, I, Swasthi Singh declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Signature: **Date: December 2017**

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Abbreviations

CDE: Clinically Directed Events, defined as a post originating from a clinical event witnessed in a Cape Town emergency centre by a member of the group themselves.

FOAM: Free Open Access Medical Education

Non-CDE: Non-Clinically Directed Event which was defined as a post of academic content, but not borne of a witnessed clinical event (Non-CDE).

SAMJ: South African Medical Journal.

PART A

LITERATURE REVIEW

INTRODUCTION

Social media is a term that has come into use to describe "software that supports group interaction" [1]. The first incorporation of social media into a Social Network Site existed as early as 1997 in the form of SixDegrees [2]. Since then there has been an exponential growth in social media and Networking sites, with Facebook, Twitter, Flicker etc. becoming household names in many countries [3].

This surge in the incorporation of social media into daily life has transformed large parts of society into an Internet based, interactive global community, transcending geographic and cultural boundaries [1,4,5]. The transformation from the original Web 1.0, in which content generation was the repository of the skilled few, to the community based Web technologies where content is generated by many and shared by all, has been dubbed "Web 2.0" [1,2,4]

Web 2.0 refers to an emerging group of web-based services that allow users to publish, communicate, and engage in social networking anywhere, anytime and, often, on any connected device [6,7]. This constant digital communication maps a new landscape of easily accessible, ever-expanding knowledge in which learners find themselves today.

This new digital reality is being incorporated into medical education at a rapid pace [8,9]. This creates opportunities for greater educational expansion and innovation, [4,10,11] but also raises concerns such as quality assurance [6,8,12]. As the Division of Emergency Medicine of the Western Cape continues to expand and evolve, it is important that it remains current and informed of new and potentially useful trends and innovations.

OBJECTIVE OF LITERATURE REVIEW

The aim of the literature review is to review previous research on the topic of social media and education. Where possible research that focused on the use of Facebook in education was reviewed. Social media educational strategies in Emergency Medicine are specifically reviewed. Both international and South African research is discussed.

SEARCH STRATEGY

The Health Sciences Library at the University of Stellenbosch was used to access print and online academic publications. Google Scholar was also used. The search primarily focussed on articles referring to social media, educational theory, open content, Emergency Medicine, and medical professionalism.

SEARCH STRATEGY: INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria

Multiple search strings were used to identify articles using the resources outlined in the previous section:

Articles on social media

Articles on social media and education

Articles on social media and emergency medicine education

Articles on challenges to education using social media

Articles on social media and medical professionalism

Articles published within the past 10 years

Articles published in English

Exclusion criteria

Non-English articles

Articles older than 10 years

QUALITY CRITERIA:

1. PREVELANCE OF SOCIAL MEDIA IN GENERAL

According to a survey conducted by Princeton Survey Research Associates International from August 7 to September 16 2013 [3], 73% of online American adults are using a social networking platform of some kind, 42% of which are using multiple social platforms. Facebook is by far the most commonly used site, at 71% of the Western adult online population, with high levels of engagement, as evidenced by 63% of Facebook users visiting the site daily and 40% visiting the site multiple times a day [3].

Facebook has a staggering 1.04 billion daily active users globally [13].

Facebook itself has been referred to as the largest country in the world, with more monthly active users than the purported population of China[14]. 83.6% of daily active users reside out of the USA and Canada[13].

In South Africa, a recent study indicates fast uptake of Internet use from fifteen percent of the population in 2008 to 34 per cent in 2012 [15]. The majority of these Internet users are "young, black and live on less than R1500 a month" [15]. Most new Internet users do not own personal

computers, and use mobile phones to access the Internet, although only a minority of users are limited to this, using public access and Internet cafes to gain online access [15].

In the report, the top five reasons for using the Internet are:

- To get information
- To socialize
- For study
- For work or business
- To look for a job[15]

- De Laneroll, 2012

Although South Africans are seeing the socio-economic benefit from using the Internet, there are significant obstacles facing the 66 per cent of non-users. Awareness is one problem: half of these non-users do not know what the Internet is [15]. English literacy is the largest stumbling block to Internet use in South Africa [15]. Only three percent of the one in five South Africans who are not literate in English, use the Internet. Even though the "New Wave" of Internet users may be low income, they are English-literate, pointing to a need for a more multi-lingual South African Internet [15].

With regards to usage patterns within the medical profession, as of 2008, 45% of medical trainees, 64% of medical students and 13% of registrars had Facebook accounts [12]. No more recent data could be identified. It is possible that uptake could have increased significantly over the last 8 years, in line with international trends.

2. SOCIAL MEDIA: TOOLS AND USES

The essence of social media is communication via a virtual platform with varying degrees of access and privacy. Social media also provides a variety of services via a large repertoire of supporting tools [1]. Social media allows for the delivery of communication on a one-to-many, and many-to-many basis. This allows for users to electronically coalesce into interest groups and virtual communities, wherein peer review and synergistic learning is made possible [16].

Social media allows for communication between wide spectra of people.[7]. This communication allows for subject matter -experts and -novices to connect on an equal platform [7]. Authors and other data producers have the ability to promote or make their work freely available online, This sharing of information progresses on a continuum, such that

users may commentate on a project in progress and provide synchronous and asynchronous feedback [7].

By providing the tools for the gathering and sharing of resources, social media provides for the ability to collate and index information for easy user-driven categorization and summation into what has been named 'folksonomies' [17]. Folksonomies can be defined as a user-generated system of classifying and organizing online content into different categories by the use of metadata such as electronic tags. Folksonomies have succeeded taxonomies for the indexing of information, giving users insights into how others categorize information [17].

Sharing information using social media lets the user search and retrieve information that is specific to them either actively or passively[16]. The social media platform therefore permits the enhanced ability to aggregate and create new knowledge. This personalizes curricula that were previously didactic, as well as the delivery of information across a number of social platforms [16].

2.1 Open Content

In April 2004, the Massachusetts Institute of Technology (MIT) announced that it would avail most of its educational content to the world on a free online basis[18]. Known as the MIT Open Courseware program [18], it sparked a shift to what has now come to be known as open content education [18].

Open content can be described as that content which promotes social good by allowing content to be copied, distributed and performed without necessitating permission to do so [19]. The degree to which access and rights are granted varies and is usually specified by the author or owner of the resource. Examples include the free usage of resources as long as the author is recognized, strict conditions that no money or other rewards may be charged for access to the work by down-stream users, and that all work that derives from the resource must also be openly made available. [19].

The trend toward open educational content marks a shift away from traditional academic notions of simply conveying course information, to a process based view of learning:

"*Information is everywhere; the challenge is to make effective use of it*" [6]

- Johnson,   L., Smith, R., Levine, A., & Haywood, 2010

Open content is now actively changing the resources used in, and the manner of education [19]. Beyond the benefits of wider access, the primary purpose of open content is to capitalize on the Internet as a collaborative knowledge platform, and to optimize the educational uses thereof [20]. The conceptualization of open content recognizes that not only information can be shared, but insight and experience can be assimilated and shared too [6].

The benefits to open content education are many. It is a cost-effective alternative to the increasing costs of traditionally published resources. It provides educational resources in regions that are otherwise lacking[19]. Learners themselves actively engage with open content by discovering, evaluating and repurposing it for personal use. This self-discovery enables learners to skill themselves with maintaining currency in any discipline, bringing forth life-long learner-ship[6,21].

3. SOCIAL MEDIA AND EDUCATION

3.1 General Education

Recent academic literature shows a need to foster greater learner control over the entire learning process [7]. In the current digital age, students prefer a learning experience that is active, socially involved, collaborative, participatory, and supported by rich media [4].

With correct application, social media technologies are able to support formal and informal communication, collaborative content generation and review, and knowledge-dissemination. This offers greater autonomy to learners and the opportunity to engage actively in both local and global learning communities [10,22].

It has long been a goal of educators to make learning a more self-directed process[4]. Characteristics of self-regulated learning include:

- The ability to make provision for one's own learning
- Learning itself
- Self-audit of one's learning
- Maintaining one's intrinsic motivation to learn
- A self-regulated learner can function independently to create content, comprehend and process higher-order learning [23]

- Stubbé & Theunissen, n.d.

Of great significance to achieving the aim of student centred learning, is to realize the importance of incorporating informal methods of learning into the entire learning experience,

and that the requirements of learners are not fixed, but mutable[4]. This must be addressed by providing suitable scaffolding for the learning process that can change with needs of learners:

"*Educators need to revisit socially based, conversationally driven designs for self-directed learning and be prepared to accept and face the reality that learners' needs, preferences, perceptions and mental models will contribute significantly to the dynamic process that is learning design. This implies that pedagogic change and greater personalization of learning are both necessary for student centered, self-regulated and independent learning.*" [4]

- Mcloughlin & Lee, 2010

In an article published in 2010, Ala-Mutka purports that informal learning via social media applications makes for efficient and simple access to information and resources.[11]. These social media applications can also enhance skills in collaboration with peers and experts [11]. The skills learnt during this process are entrenched in real life contexts, transferring holistic learning practices to the learner that may persist through life [11]. Further research suggests that informal online learning provides learners with acquisition of 21st century key competencies, keeping abreast with the fast-pace of this modern age [11].

Education using social media technology has been dubbed "Learning 2.0". It gives rise to new educational innovation by:

- Making provisions for new formats of information management, dissemination and acquisition
- Encouraging the invention of dynamic learning environments
- Entrenching learning in more engaging multimedia models
- Allowing for learning at an individual's own pace
- Versatility that reaches beyond a classroom model of face-to-face interaction [11]

- K. Ala-Mutka & Punie, 2010

Tertiary learner profiles point to a sizeable number of students who both work and study, as well as, anticipate continuous Internet connectivity with web based services and social networking being fundamental to their lives [24]. As students delve into social and participatory collaboration in their daily lives, there is an increasing divide between their personal experiences and the learning experience offered by formalized educational institutions[24].

Most tertiary institutions still rely on established learning management systems, also called virtual learning environments, that do not fully realize the potential of social media[25]. These

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course management systems tend to reproduce conservative models of learning on an Internet based forum, duplicating a traditional classroom concept of education. This may limit self-directed learning to didactic resources and educator prescribed courseware [25,26].

Authors concur that there is an imperative to re-assess the focus of learning, to shift focus from the content of an educational program to the process of learning, as well as personal skills development [27]. With open educational resources rapidly gaining global popularity [19,20], and online content being shared, there is a growing recognition of content produced by learners themselves. There exists an urgency to revisit our ideas of pedagogy such that learners are seen as active in the process, and co-creators of content instead of inactive consumers of knowledge [4].

Educational institutions are more and more becoming aware that the ethos inherent in the social networking environment contrasts greatly with 'control culture' of education, where educator-prescribed content and curricula predominate [4]. A number of different studies support the idea that the addition of social media into educational design can make a qualitative improvement to empowering students with a sense of control over their own learning process and career development [1,28,29].

3.2 Social Media and Medical Education

The traditional medical education system is not optimally equipped to interface with modern digital learners and the rapidly growing repository of medical knowledge. A new approach may be needed for this new era [8].

In a 2013 study, Prober and Khan [9] used a method of teaching in which medical students learned material through a series of educational videos that were accessed online at the learner's own pace [9]. Face to face sessions with faculty were held to facilitate learning and answer directed questions [9]. This model in which content is learned at home, and then evaluated in the class, has been called the "flipped classroom" model[9].

The results were positive, in that 82% of students preferred this model to the traditionally based lecture format [9]. Other studies have compared the effectiveness of the flipped classroom model to the traditional model, and have found positive results in improving learning outcomes and creativity[30–33].

There are many possible advantages to the use of social media in continuing medical education and development for medical professionals [9,34–37]. Social media provides benefit by establishing collaboration and connection within virtual communities of medical

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professionals where knowledge and skills may be more easily shared [8,37]. This allows for progressive learning in which medical professionals keep each other up to date in the fast paced world of growing medical education [34][37]. Such may be done via a variety of media, and to geographically disparate individuals. This has the potential to significantly improve access to education for doctors working in more isolated, rural settings, and even those in extremely busy urban settings where time is a barrier. [37].

3.2.1 Free Open Access "Meducation" (FOAM)

It has been postulated that the best possible application of 'e-health' would be one the combination of the collaborative nature of Wikipedia with the quality-controlled safety culture needed in health care [38].

Social media tools such as wikis, blogs and podcasting are increasing in use and popularity in the medical field [8,39]. They are often easy to use and free to access, making uptake rapid and comprehensive [40]. However the ease of accessibility inherent in these open content sources also presents a problem of credibility. As users are able to edit and add information at will, the accuracy and quality of content is put into question [8,38].

It has been debated that the process of collaboration itself lends to what has been termed a 'Darwinian' style 'survival of the fittest' in terms of information [38]. This concept relates to the rapidity in which information is shared and edited on such open content software. This rapid turnover of information leads to an evolutionary style 'natural selection' of information. Information which is not up to standard or not useful, is efficiently edited or deleted [38]. This is based on concepts of self-policing and community watchfulness [38].

This constitutes a robust post-publication peer review process, rather than the more traditional pre-publication peer review; which may be considered both a strength and a weakness in equal measure. It is clear that there still needs to be careful evaluation of information, and moderation of resources [8,38]. The optimal way of incorporating such quality control measures remains unsolved, with different models being used by a range of providers.

There are also concerns with open content regarding copyright and intellectual property [6]. Further concerns include the credibility of information and peer review processes, as well as new ways to cite and critically appraise these new forms of content [6].

With the effective and appropriate use of wikis, blogs and podcasts, the learning experience of clinicians and students can be enhanced with deeper learner engagement [8,38,41]. It has been suggested that strategies to incorporate these learning 2.0 tools into current virtual learning environments for learners should be researched [8,38].

3.3 Emergency Medicine and Medical Education

A recent survey revealed that 98% of 226 emergency medicine residents at 12 North American residency programs, use a social media platform for learning purposes, for at least one hour per week [8]. However, despite strong use of social media in emergency medicine education, there is a lack of evidence regarding educational outcomes and implementation [8].

Several platforms and strategies exist that have been used to integrate social media in emergency medicine education:

Blogs

Blogs allow for quick and dependable dissemination of information to trainees, which provide succinct and referenced works. They may provide on-shift guidance, and help source appropriate primary literature [8]. Experiential teaching is more possible than on traditional textbook formats, enabling the experience of more practiced clinicians to filter to trainees [8].

Podcasts and Videocasts

A podcast is typically a digitally recorded audio file, which may be downloaded or streamed by users [8]. A videocast is much the same, but available in video format. Podcasts are used to transmit traditional lecture format information. Videocasts are especially useful in teaching skills that may rarely be used, or in visually cued educational concepts such as ECG's or Radio-imaging [8]. Videocasts have been used to import the skills of geographically disparate lecturers, and have been shown to achieve superior results in procedural education [8].

Push Technology

An Internet-based communication in which the platform provides or "pushes" information as it is available, without the user having to "pull" or refresh information [8]. Twitter (and depending on notification settings, Facebook) can provide information to time-strapped learners on the go [8].

Flipped Classroom

The flipped classroom used in undergraduate learning [9], has been used in emergency medicine registrar programs with the hope that it may also improve engagement and higher-level cognitive learning than traditional classroom didactics [8].

Real-time Feedback

Continued academic discussion and feedback is made possible with social media, allowing quick turnover and response to clinical questions and comments [8].

It is clear that use of social media is gaining rapid popularity in the field of emergency medicine and is a widely accepted means of education[8,36,42]:

"use of social media among emergency physicians is unusually strong . . . emergency physicians have embraced the healthcare side of social media in a way not seen among other specialists" [42]

- Pillow, Malford T, Hopson et al., 2014

3.4 South African Relevance

Very few South African studies relating to the use of social media and open access information in education have been published [21,43,44].

A study by Bosch was conducted at the University of Cape Town [44]. The study focused on the relative benefits and preferences in using the University Learning Management System versus those of open social platforms [44]. Students preferred using Facebook to the learning management system 'Vula' [44]. This is of particular relevance as Vula is the learning management system used by the Division of Emergency Medicine, Western Cape.

In another South African study, significant for its focus on a distance learning institution (the University of South Africa), it was found that students also preferred to use Facebook to the institutional learning management system [43].

Despite Vula having the capability of synchronous and asynchronous discussion forums, learners rarely utilized these features, and logged on to Facebook even during vacation periods, which they did not do with Vula [44]. South African students premise this preference for Facebook on the ability to meet global users, peers and experts in a field of study leading to greater academic networking both on and off campus [43,44].

Having noted the preference for using Facebook, limitations to its use exist in the South African setting, which relate to bandwidth, language barriers and access [44]. With bandwidth restrictions in place, most audio-visual streaming is not possible on campus computers. Accessing social media sites is discouraged and sometimes blocked on campus computers [44]. Despite this, most students connect to Facebook on campus computers [44]. Most posts on Facebook were posted in English, and although translation of pages are available in other South African official languages, most students, including non-native speakers, choose English as the language of choice for posting on Facebook [44].

These South African articles tend to mirror the findings in international research, which purport that Learning Management Systems are based on traditional lecture review and test-pedagogy [26]. Institutions have adopted these Learning Management Systems without sufficient data supporting their use [25]. They have been marketed to campus administrators and technologists as resource management tools of static content, class enrolments and grade administration [25,26].

Whilst they may provide administrative ease for educators, they do not encourage the constructivist pedagogy that is central to learner-oriented approaches [26]. Innovative pedagogy is possible but difficult with Learning Management Systems and requires an in-depth knowledge of the workings of these "mouse-heavy" systems [26]. Learning Management Systems that are open source, with greater inter-operability and that support easier use of constructivist pedagogy can now be found (eg. Moodle, Joomla, Drupal) [26]. However, Faculty are rarely able to play a role in the choice of which Learning Management System to purchase [25,26].

The University of the Western Cape (UWC) is considered an early-adopter of the concept of free open educational resources [19]. The Free Content and Free and Open Courseware Implementation Strategy was approved as early as 2005 [19]. Numerous papers, written by University of Western Cape faculty also exist that predate the launch of Wikipedia and the formal open courseware movement [19]. The strategy itself outlines a vision that upholds the underpinning concepts of digital freedom that open courseware embodies[19]:

"In Africa, where the scale of available academic specialisations in any single institution is limited, this kind of explicit and implicit collaboration will prove vital if we are to achieve the potential of higher education on the continent. At the UWC, we are an early-adopter at the strategic level, and we hope that through our collaborative activities we will inspire other African institutions, and indeed other institutions in other countries, to take similar steps and

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establish strategies to implement and promote F/ OER (Free/Open Educational Resources) in a way that is sustainable within their means."[19]

- Keats, 2009

4. BARRIERS TO THE USE OF SOCIAL SOFTWARE

4.1. Privacy and Professionalism in the Medical Field

A key consideration in the usage of social software is privacy. Private or closed groups (such as the Facebook closed group of Emergency Medicine Cape Town) are becoming more popular as it allows for the setting of privacy and security within which users can post and discuss information [45]. While free sharing within private groups occurs, discussions are still managed in accordance with group rules by group administration [45].

Waters and Ackerman (2011) adapts Petronio (2002)'s Communication Privacy Management Theory principles to delineate privacy requirements applicable to social software [46]. The principles are:

- Private information – The revealing of private information equates to public disclosure, particularly on a public platform such as a social software tool[46].

- Privacy boundaries – Boundaries around privacy are set according to both the individual and a particular group. With a social software environment, privacy boundaries can be set by either the individual or group administration in accordance with the social software privacy policies[46].

- Control and ownership – Ownership and control of information lies in the hands of the individual poster and is revealed on groups at the discretion of group administration[46].

- Rule-based management system – Management of privacy is regulated in accordance with policies that are clearly stipulated and communicated[46].

- Privacy management conflicts – The decision around the definition of private information versus public information is the responsibility of the author.[46]

- Waters & Ackerman, 2011

Maintaining privacy and professionalism online and on social media platforms has become a new challenge facing medical professionals. Medical institutions, professionals, and students are trying to keep abreast of the possible effects of social software to their reputations and patients confidentiality [42]. In an address to students and faculty, a Dean of Harvard Medical School, wrote: "Caution is recommended . . . in using social networking sites such as Facebook or MySpace, they can learn about candidates."[47]

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The concerns regarding the use of social networks are not unique or even new to the Medical profession. In a sense, these issues have existed for years within communities where these professionals practice, balancing their social and professional personas [12,42]. Professional distance, although taught at an undergraduate level, can be compromised by the shared space inherent in social networks [12,47]. Social networks amplify the potential discord between these personas by the sheer scale in which distasteful behaviour may be observed by the public, presenting significant challenges to medical professionalism [42,48]. The short and static format of many social media tools also lends itself to misinterpretation, particularly when users interact in a second or third language.

Cain has coined a new term in this era of social networks and medical professionalism - 'e-professionalism' - more and more becoming a relevant term in the modern age [49].

Professionalism can be defined as 'sustaining the public's trust in the medical profession' [49]. Components of this can be considered to be maintenance of an appropriate demeanour, of professional boundaries, and respect for patients[12,49]. However, there is consensus that the concepts of professionalism are modified by societal changes, and that recent societal changes such as social networks and social software, have endangered current notions of professionalism [12,42,49].

"the digital intersection of ... personal and professional lives can be blurred in light of the medical profession's accountability to society" [50]

- (Farnan et al., 2009)

There have been a number of cases relating to inappropriate behaviour on social networks that have exposed medical staff and students to disciplinary action, and even dismissal [12,49]. In a study by MacDonald et al, despite changes to Facebook's privacy settings (2008, and 2009), a quarter of young doctors have profiles open to others[49]. However, only a minority of these doctors was seen engaging in behaviour or belonging to groups that the researchers regarded as being unprofessional. Equally as many doctors, were seen as being positive role models to others. Many users also had personal information available, such as relationship status, religious affiliation, and sexual orientation [49].

Chretien and Kind (2014) have developed a hierarchy of social media exploration for the medical professional, similar to Maslow's Hierarchy of needs [51]. It provides rough guidance in maintaining the public trust, whilst balancing the medical professionals need to discover

and explore on social media sites [48]. Pillow et al. (2014) have gone a step further by developing guidelines and best practices with reference to social media and emergency medicine residency programs. These are intended to co-exist with institutional policy, and it is recommended that each specialist training program develop social media policy and a social media educational effort [42].

A designated content manager should monitor the appropriateness of content with regards to privacy, copyright, and consent. The policy should clearly delineate the target audience, educational objectives, level of privacy and a plan to deal with negative or inappropriate comments [42]. At the individual level, each doctor should be familiar with published guidelines on online medical professionalism, such as those of the American Medial Associations' Professionalism in the Use of Social Media guidelines [52] or those of the American College of Physicians [53].

4.2. Social software challenges for educational use

There are many studies that report positive effects in academic achievement with the addition of social software in educational programs [28,54–61]. There are also studies specific to social media and education in Emergency Medicine, which show benefit. [8,36,39,40].

Despite these advantages, there are many challenges to implementation and progression [6,8,12]. These challenges should be carefully considered when incorporating social media into an Emergency Medicine educational program.

A portion of these challenges relate to barriers to general integration of social media and education, some to the concern for privacy and professionalism within the medical profession, and others to issues particular to Emergency Medicine:

4.2.1 Challenges to integration of social media with general education and the concept of e-learning:

- *Access* to computers with online connectivity, and the skills to use them are not universal, which may result in exclusion and inequity[6]. Educators themselves may lack these skills, or the confidence to trial educational uses of social software[6].
- *Sophisticated technical ability*: to advance the use of social software in education, there needs to be a discerning and learned approach to its use[6]. Learners may lack this critical approach, and educators must facilitate this by providing

adequate educational scaffolding to safely explore the world of social software in education[6].

- *Special needs*: although learning using social software allows learners to learn at their own pace, it may also disadvantage learners with special needs or cognitive and physical difficulties[6]. For example, learners with dyslexia may find text-dense wikis and blogs hard to navigate, but the tools of social software are such, that alternative audio-visual educational content can be selected in order to mitigate this problem. Thus careful selection of social software tools may enable the inclusion of learners with different needs[6].
- *Pedagogical skills*: using social software for educational purposes calls for a change in pedagogical models, in which the educator's role changes form didactic information dissemination to facilitation of the learning process[6]. This requires new methodology, policies and training for educators themselves to be trained to effectively use social software tools[6].
- *Uncertainty* regarding the rapidly changing world of social software exists, and brings in to question consistency and sustainability with regards to its use in education.[6]

-Johnson,L., Smith, R., Levine, A., & Haywood, 2010

4.2.2. *Challenges to social media use and privacy and professionalism in the field of medicine:*

- Dealing with *patient information* gleaned from a social media environment – how should the treating physician manage patient disclosures that may alter current management[12]?
- Ensuring *patient confidentiality* – even anonymous posts may contain enough identifying information to compromise confidentiality[12].
- The *online relationship* of a patient and physician may be a source of third party misunderstanding and speculation, memorializing and casting in an unethical light the nature of such a relationship [12].
- *Self-revelation* by a physician in a social media environment should maintain professionalism[12]. This may be difficult to judge for younger physicians who have been inculcated into the social media ethos of the "hyper-personal", and may damage public trust in the physician or profession[12].
- *Maintaining transparency* by disclosing financial or other interests in medical products or information within a social media environment[12].

- *Physician-regulated online behaviour* depends on the observing physician's willingness to address unprofessional behaviour[12]. All physicians have an ethical obligation to address such matters in order to maintain public trust in the profession[12].

- *Maintaining public trust* in the medical profession whilst allowing physicians the freedom to explore social media and maintain individuality.[12]

<div align="right">- Gholami-kordkheili et al., 2013</div>

4.2.3. Challenges to social media use in Emergency Medicine education:

- *Generational differences* – the younger generation of trainees has been raised immersed in technology and social media; using it in medical education is a natural transition[8]. For the generation unfamiliar with such technology, engagement with social media education may be poor[8].

- *Distraction* – the ubiquitous nature of online connectivity and social media, may allow its use to become distracting, for example whilst on a clinical shift at the detriment of patient care[8].

- *Core Knowledge* – not all topics in Emergency Medicine are given equal weight when discussed in social media[8]. The topics that are considered current and provocative are addressed frequently, while other worthy but less controversial topics are less discussed. This underlines the continued relevance of traditional texts, and shows social media to be an adjunct, not replacement to traditional text formats[8]. Some educators have addressed this concern by using social media platforms to showcase the more "boring" aspects of the curriculum[8].

- *Over-reliance* on social media may lead to a reduction of the ability to critical appraise primary information[8]. It should be stressed that the ability to independently appraise and learn from primary literature sources remains paramount.

- *Quality Assurance* – critics of open source information raise the issue of a lack of the peer review process. Proponents for open source information rebut that this process occurs post-publication instead of pre-publication, as it usually does in traditional peer reviewed literature[8]. No clear evidence exists that proves one method of peer review superior to the other[8].

- *Information Overload* – the sheer quantity of information now available may be daunting and over-whelming[8]. The use of filtering technologies and syndication tools may alleviate this. Faculty may also recommend a few open source media to be of high quality to its trainees[8].

- *Lack of Measurable Outputs* – it is difficult to measure actual engagement and provide measurable outcomes to institutional or other review boards in the use of social media and emergency medicine education[8]. Thus, it becomes difficult to promote the idea of the educational effectiveness of social media. More research needs to be conducted into this area of education [8].

- Scott et al., 2014

5. CONCLUSION

Recently a global discussion forum was held regarding an article published on social media in the emergency medicine curriculum [8,36]. It was made possible by using various social media platforms. It was hosted by Academic Life in Emergency Medicine, which is itself an educational social media organisation [36]. It attracted 1,222 readers from 32 countries to debate in real-time or asynchronously, on a controversial topic [36]. That this was even possible speaks to the power of the social media platform. The online community so gathered, agreed that social media is changing the landscape of education, and that efforts must be made to prepare and keep abreast of the progress [36].

Many American Emergency Medicine programs are moving toward a more integrated social media educational approach [8,36,39,42]. It has been approved by the relevant over-seeing committee that emergency medicine residency programs may fulfil a part of their didactic conference requirement with "individualized interactive instruction" [36]. This has allowed for greater inclusion of online asynchronous and interactive educational resources [36].

This progressive approach to social media in Emergency Medicine education begs the question of whether South Africa will fall in the wake of its international counterparts if it does not make inroads into the world of social media.

The use of social media is extremely common, and its use in medical education is becoming more so[8,34–36,40,62]. There are clear benefits to this, such as increased access and collaboration, but also clear challenges such as quality control and concerns regarding privacy and professionalism[12,42,47,49]. Finding the best way to utilise social media is an important task for education programs everywhere. Being part of this process and shaping it in a way relevant to our context is critically important for South African educators and institutions.

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To sum up, in the words of Joe Lex:

"If you want to know how we practised medicine 5 years ago, read a textbook.

If you want to know how we practised medicine 2 years ago, read a journal.

If you want to know how we practise medicine now, go to a (good) conference.

If you want to know how we will practise medicine in the future, listen in the hallways and use FOAM."[63]

- Joe Lex, International EM education efforts & e-learning, Free Emergency Medicine Talks

GAPS AND NEED FOR FURTHER RESEARCH

There is a paucity of evidence regarding social media in medical education [8]. Although it is agreed upon that social media offers opportunity for medical education, it is difficult to measure outcomes in this field [8]. Most articles on social media and medical education deal with issues of privacy and professionalism [12,49,50,52,62].

There are only a few research articles available that specifically deal with social media and education in the field of emergency medicine [8,36,39,40].

In South Africa, few articles on social media in the field of education could be found [19,43,44]. No articles could be found relating to social media in the field of medical education or more specifically, Emergency Medicine. More South African research in this field is needed to keep abreast with the changing methodologies of medical education.

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PART B

ARTICLE ACCORDING TO SAMJ CRITERIA

An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group

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<u>Declaration of conflict of interest</u>

None

<u>Ethics approval</u>

Approval for this research was obtained at University of Stellenbosch Health Research Ethics Committee on the 5th of June 2015 (ref. no. S14/11/261).

ABSTRACT

BACKGROUND:

In 2012, a closed Facebook group, "Cape Town Emergency Medicine", was created by the Division of Emergency Medicine of the Western Cape. It was created to provide an educational platform and virtual community for the Division's dispersed registrars and faculty. Until now, no attempts have been made to describe the usage patterns of the group.

OBJECTIVE:

To describe the usage patterns of the Facebook group "Cape Town Emergency Medicine".

METHODOLOGY:

An observational, retrospective, descriptive study was performed to analyse the posts and usage patterns of the Facebook group "Cape Town Emergency medicine". Two sampling windows of three months each were taken one year apart.

Posts were divided into 4 types and sub-types: Academic Clinically Directed Events (CDE's), Academic Non-Clinically Directed Events (NCDE's), Divisional posts and Social posts.

The originator of the posts (consultants or registrars), as well as the engagement each post type generated (number of 'likes', 'comments' or 'shares') were analysed. Academic online sources, where referenced, were included.

RESULTS:

A total of 241 posts were reviewed. There was an 11.4% increase in total posts in the sample windows from 2013 (114 posts) to 2014 (127 posts).

Most posts were originated by faculty members (79.3%).

NCDE's accounted for the majority of posts at 41.1%.

Academic CDE posts generated the most engagement with 36.1% of all comments. No original posts were shared.

CONCLUSION:

Results show that the closed Facebook group, Cape Town Emergency Medicine is fulfilling its mission statement of "a closed forum for real time sharing of information and experiences aimed at Emergency Medicine registrars and faculty in Cape Town, South Africa".

Although clinically directed posts accounted for the least number of total posts, they generated the largest percentage of comments (36.1%), suggesting that they generate greater engagement.

INTRODUCTION

Social media is a term that has come into use to describe "software that supports group interaction" [1]. The first incorporation of social media into a Social Network Site existed as early as 1997 in the form of SixDegrees [2]. Since then there has been an exponential growth in social media and Networking sites, with Facebook, Twitter, Flicker etc. becoming household names in many countries [3]

This surge in the incorporation of social software into daily life has transformed large parts of society into an Internet based, interactive global community, transcending geographic and cultural boundaries [3–5]. The transformation from the original Web 1.0, in which content generation was the repository of the skilled few, to the community based Web technologies where content is generated by many and shared by all, has been dubbed "Web 2.0" [1,2,6]

Web 2.0 refers to an emerging group of web-based services that allow users to publish, communicate, and engage in social networking anywhere, anytime and, often, on any connected device [7,8]. This constant digital communication maps a new landscape of easily accessible, ever-expanding knowledge in which learners find themselves today.

This new digital reality is being incorporated into medical education at a rapid pace [9,5]. This creates opportunities for greater educational expansion and innovation, [6,10,11] but also raises concerns such as quality assurance[7,9,12]. As the Division of Emergency Medicine of the Western Cape continues to expand and evolve, it is important that it remains current and informed of new and potentially useful trends and innovations.

The closed Facebook group, "Cape Town Emergency Medicine", was created in 2012 by the Division of Emergency Medicine of the Western Cape. Its information statement reads as follows: "This is a closed forum for real time sharing of information and experiences aimed at Emergency Medicine registrars and faculty in Cape Town, South Africa". Access to the group is restricted to faculty and registrars affiliated to the Division of Emergency Medicine of the Western Cape.

Usage on the group has not been prescribed or policed (other than to protect patient-confidentiality), and until now, no attempt has been made to discover if it is being used as intended, or if usage has changed over time.

This study aimed to analyse the primary aspects of usage on the closed Facebook group by determining the origins of each post, the type of post, and the engagement that each post generates. The online sources referenced in posts have also been noted.

It is hoped that with this information, the Division of Emergency Medicine in Cape Town may be able to better understand the characteristics of the posts in its closed Facebook group. With this knowledge, it may be possible to discover which academic posts encourage the most engagement, and use this to bolster the educational potential of the group.

AIMS AND OBJECTIVES

PRIMARY AIM

The primary aim of this study is to describe the usage patterns of the closed Facebook group 'Cape Town Emergency Medicine'.

SECONDARY AIM

The secondary aim of this study is to compare the usage patterns on the Facebook group for the periods of 1st January - 31st March 2013 to 1st January - 31st March 2014, to determine whether usage patterns have changed over time.

OBJECTIVES

The objectives:

- To describe the usage patterns of the closed Facebook Emergency Medicine group of Cape Town as it relates to three major categories:
    - The originators of the posts – consultants vs. registrars
    - The nature of the posts – academic (clinically directed vs. non-clinically directed posts) or or non-academic (divisional vs. social) posts
    - The engagement that each post generates, in terms of 'comments', 'likes' or 'shares'
- To compare these for the first three months of 2013 to the first three months of 2014
- To further categorize the academic posts into clinically directed posts and non-clinically directed posts, and determine which online sources were used for each.
- To ascertain which type of academic posts, from which source, garners the most engagement.
- To determine whether this information can be used to make recommendations regarding future educational posts

METHODOLOGY

This was an observational, retrospective, descriptive study. The Principal Investigator manually reviewed posts on the closed Facebook group Cape Town Emergency Medicine over two sampling windows: the first three months of 2013, and the first three months of 2014.

The posts were categorised into types of posts:
- Academic posts (posts with educational/ academic content), with the subtypes of:
  - Clinically directed events (CDE's): educational content borne of a clinical event witnessed in a Cape Town emergency centre by a member of the group themselves
  - Non-clinically directed events (non-CDE's): educational content not borne of a witnessed clinical event
- Non-academic posts (posts without educational content), with the sub-types of:
  - Divisional posts: non-educational posts relating to the operational concerns of the Division of Emergency Medicine in Cape Town.
  - Social posts: non-educational posts NOT relating to the divisional concerns of the Division of Emergency Medicine in the Western Cape.

The originator of the posts (consultants or registrars), and the engagement each post-type generated (number of 'likes', comments, or 'shares'), were noted.

If the post contained references to online sources, these were noted. With posts of dual or ambiguous content, co-authors were called upon to finalise the categorisation of a post based on the primary intent of the post.

RESULTS

Number of posts per originator

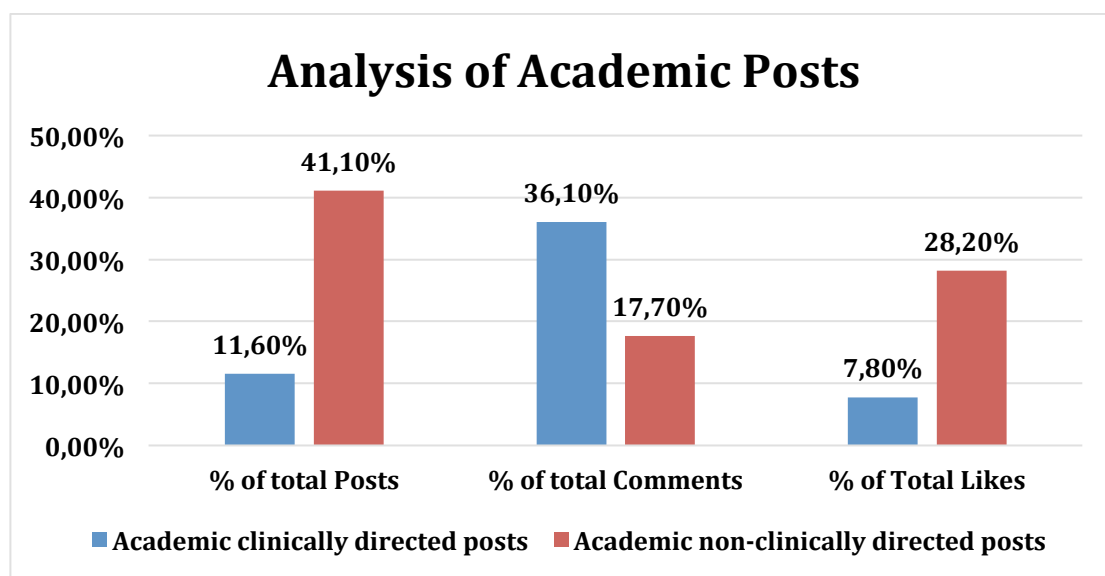■ Faculty posts ■ Registrar posts
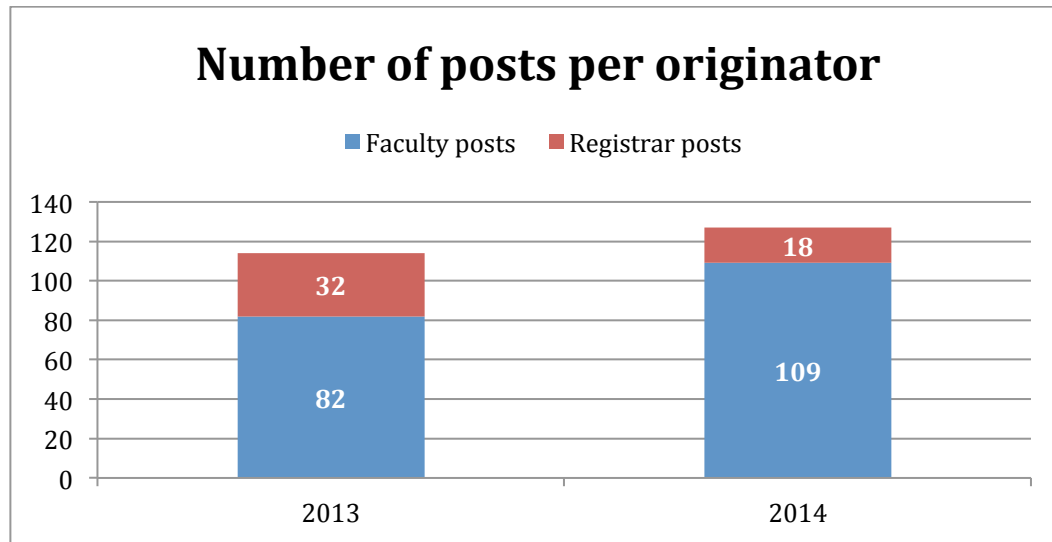
Graph 1

Graph 1 depicts the total posts of the Cape Town Emergency Medicine group by year, and the originators of the posts.

There is a growth in total posts between the sample windows from 2013 to 2014 of 11.4%, showing a positive upward trend in the number of posts.

Members of faculty initiated the majority of posts in both 2013 (71.9%) and 2014 (85.8%), showing a decrease in registrar-initiated posts in the latter year.

Analysis of Academic Posts

■ Academic clinically directed posts ■ Academic non-clinically directed posts
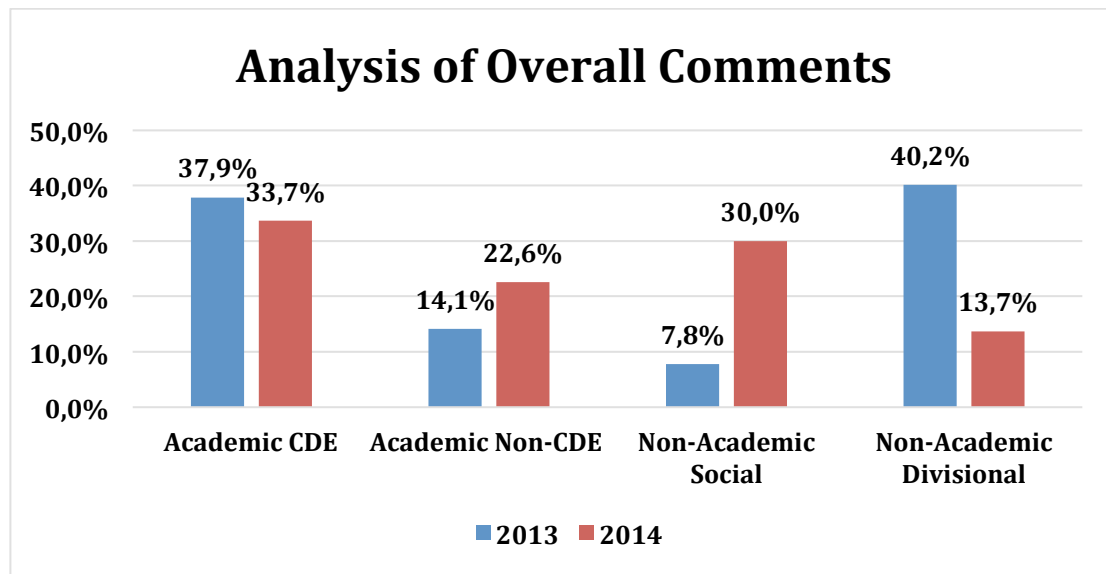
Graph 2

36

Graph 2 presents an analysis of all academic posts, and the engagement generated by each category. Of the total posts, 11.6% were categorised as academic clinically directed posts. Though this is a small percentage of total posts, it generated a disproportionately large percentage of all total comments (36.1%).

Academic non-clinically directed events represent the majority of total posts at 41.1%, but achieved only 17.7% of total comments and 28.2% of total likes.
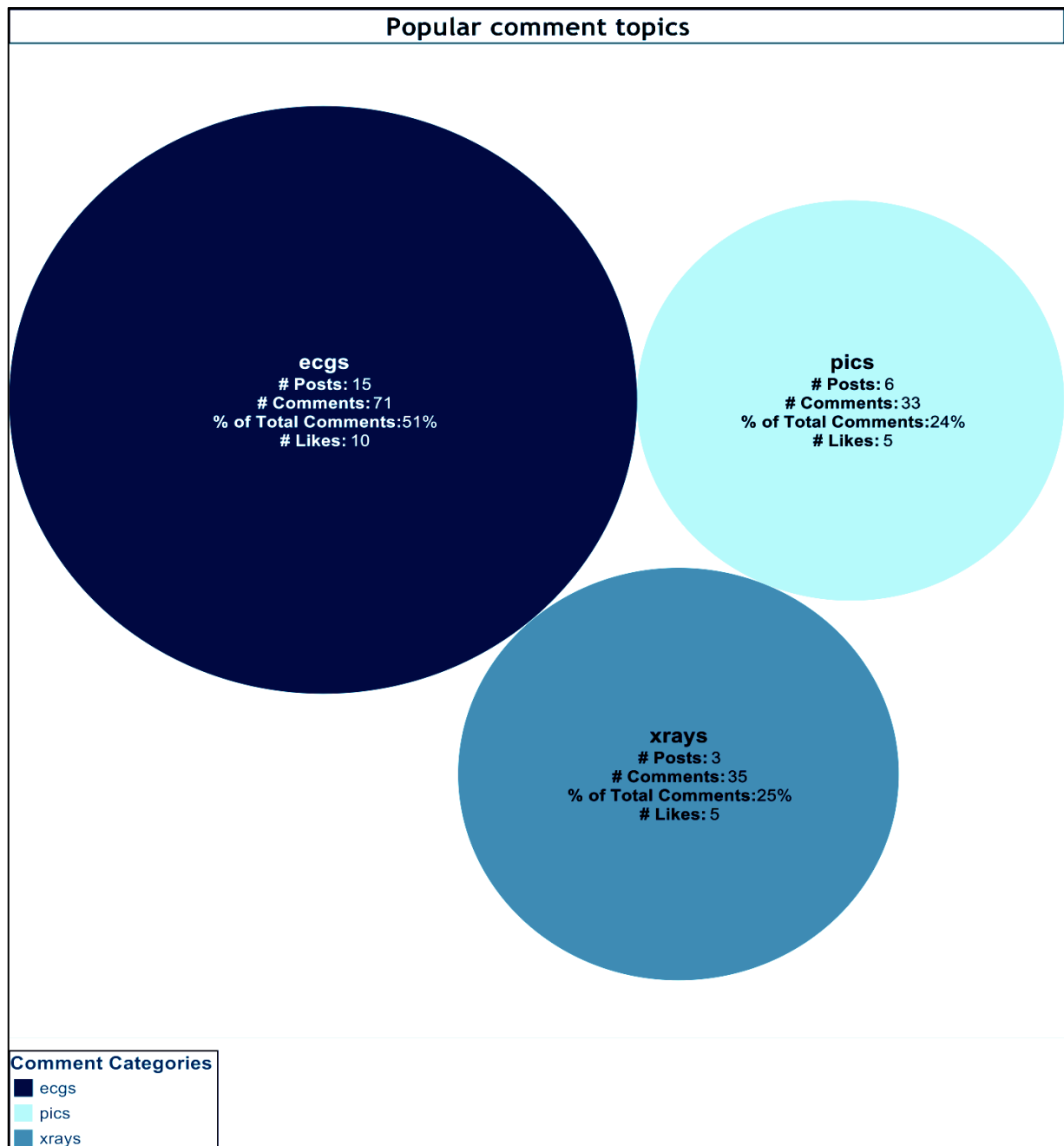
Analysis of Non-Academic Posts
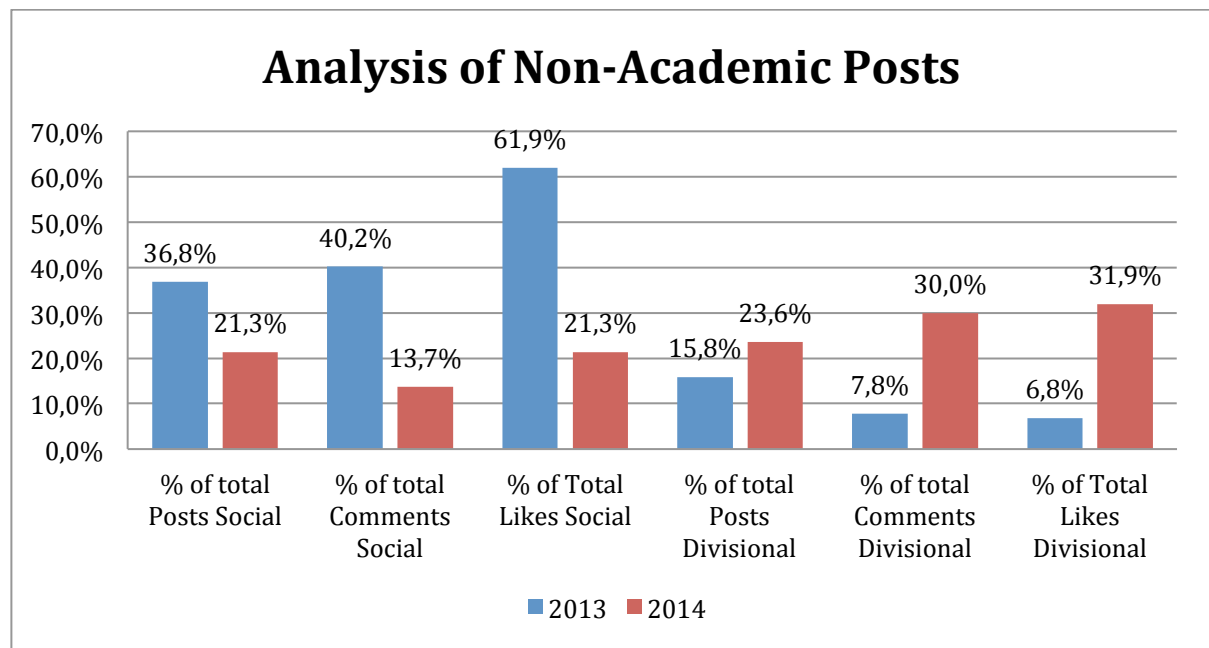
Graph 3

Graph 3 represents the divisional and social postings for the two sampling windows. Annual analysis of the two posting types shows a sharp increase in divisional postings (and generated engagement) from 2013 to 2014, as well as a decrease in the social postings and their response across the sampling windows.

Analysis of Overall Comments

Graph 4

Graph 4 shows the analysis of comments generated by post types overall and on a yearly basis. 'Comments' were viewed as a more participatory form of engagement as compared to the more passive 'Likes'. No original posts were shared during the two sampling windows. Divisional posts see a large increase in comment generation from 2013 to 2014 (from 7.8% to 30.0%), and academic CDE's show a large and sustained percentage of all comments generated (37.9% and 33.7%).

Although not represented, yearly analysis shows a sharp decline from 2013 to 2014 in 'likes' for social posts (61.9% to 29.3%). Academic CDE 'likes' also decrease from 11.9% to 5.2%. There is an increase in Academic non-CDE 'likes' (from 19.5% to 33.5%) and Divisional 'likes' (from 6.8% to 31.9%). Overall, 'likes' increased from 118 total 'likes' in the 2013 sample window to 191 total 'likes' in the 2014 sample window, suggesting a greater engagement in the 2014 sample window.

Popular comment topics

ecgs
 # Posts: 15
 # Comments: 71
% of Total Comments:51%
 # Likes: 10

pics
 # Posts: 6
 # Comments: 33
% of Total Comments:24%
 # Likes: 5

xrays
 # Posts: 3
 # Comments: 35
% of Total Comments:25%
 # Likes: 5

Comment Categories
ecgs
pics
xrays

Graph 5

Graph 5 shows the type of Academic CDE posts that proved to be popular comment topics. ECG's were seen to generate 51% of academic CDE comments, followed by pictures of X-rays (25%) and pictures of clinical events (24%). This suggests that of the academic CDE's, which as a category generated the majority of overall comments, ECG's created the greatest engagement.

Reference Popularity
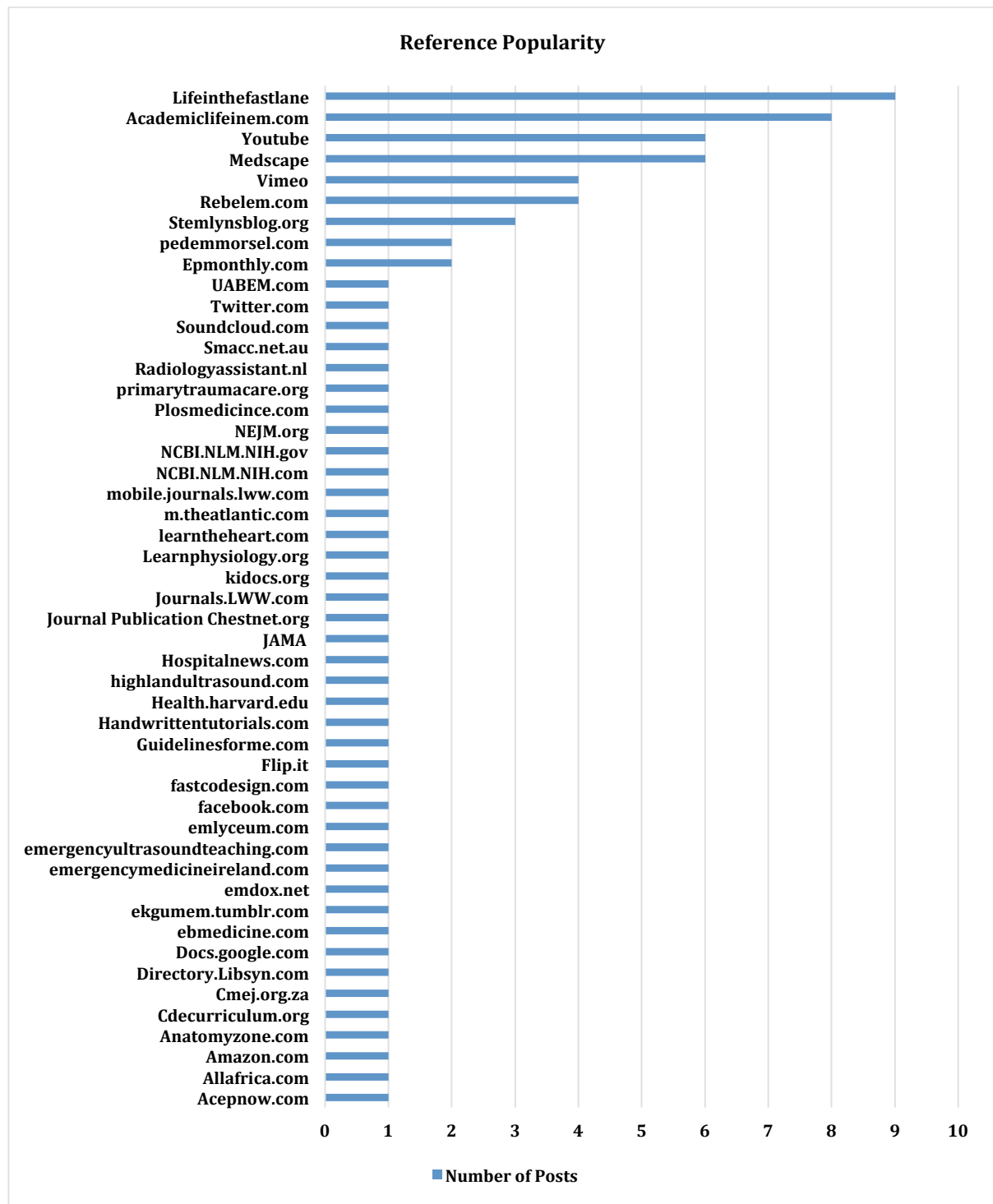
Graph 6

Graph 6 shows a breakdown of all quoted sources of information in the original posts. Academic blogs proved to be most popular, with sources such as "Life in the Fast Lane" and "Academic Life in EM", which are particular to emergency medicine. Widely used general social media platforms such as "YouTube" also proved to be popular.

ANALYSIS

The majority of posts originated from faculty (79.3%). Registrar-initiated posts decreased by almost half from 28.1% in the 2013 sample window to 14.2% in the 2014 sample window. The study was not designed to describe reasons for reduced registrar participation. Further study may reveal useful ways to increase participation by registrars in the future.

The majority of posts were of an academic non-clinically directed nature (41.1%), followed by those of a social nature (28.6%), then by posts of a divisional nature (19.9%) and lastly those of an academic clinically directed nature (11.6%).

Despite accounting for only 11.6% of total posts, the clinically directed academic posts generated a disproportionately large percentage of total comments (36.1%). This suggests that although clinically directed posts were small in number, they generate greater active response from the group, and may be an effective way to engage learners and faculty.

There is a notable difference in the 2013 and 2014 sample windows regarding the frequency and engagement of the divisional and social posts. Comparing the two sample windows, the 2014 sample window shows a decrease in the frequency of social posts (36.8% to 21.3%), as well as a sharp decline in the engagement these posts generated ('likes' fell from 61.9% to 29.3%, and comments from 40.2% to 13.7%).

Conversely, the divisional posts rose from 15.8% to 23.6%, and generated significantly more engagement ('likes' from 6.8% to 31.9%; comments from 7.8% to 30.0%). This may reflect a change in the ethos of the group, from a more social platform, to one that puts greater emphasis on using the group for divisional information sharing.

The difference between the sample windows in terms of the academic posts was less significant. The clinically directed posts occurred at a similar frequency 13.2% in 2013, and 10.2% in 2014. Engagement remained fairly consistent in terms of comments (37.9% in 2013 and 33.7% in 2014), although 'likes' decreased from 11.9% to 5.2%.

The non-clinically directed posts increased over the consecutive sample windows (34.2% and 47.2% respectively). The engagement also increased from 2013 and 2014 (14.1% to 22.6% of comments, and likes from 19.5% to 33.5%).

The sources for the academic posts are shown in graphs 5 and 6. The clinically directed posts consisted mainly of ECG's, pictures of clinical conditions and X-rays. Of these, ECG's received the most comments, with learners showing active involvement in interpretation of these.

The non-clinically directed posts were largely sourced from various online sources. Notably, emergency medicine academic blog sites that serve the Free Open Access Medical Education concept, such as "Life in the Fast Lane" and "Academic Life in EM" were quoted frequently. Other free medical sites were also used, such as "Medscape". "YouTube" as a general social media platform was also used frequently. All together a spectrum of online sources was used according to the specific needs of the academic posts.

DISCUSSION

It is clear from the analysis that the Cape Town Emergency Medicine closed Facebook group serves as a platform for education, divisional information-sharing and social networking.

Emphasis is placed on knowledge sharing, as evidenced by the large number of educational posts. There are also a large number of social and divisional posts that together show the group to be a virtual academic community for its members. Together, this shows that the closed Facebook group, Cape Town Emergency Medicine is fulfilling its mission statement of "a closed forum for real time sharing of information and experiences aimed at Emergency Medicine registrars and faculty in Cape Town, South Africa".

The majority of posts are originated by faculty. The faculty seems to serve the function of initiators in this context, and although this is a valued function of educators, registrars themselves perhaps need to become more active as originators of content.

Clinically directed posts, although fewer in total number, often generate long in-depth clinical discussions. The results suggest that more posts that directly involve everyday clinical problems are very popular and get the members of the group engaging well. This may be an area of focus for the Division of Emergency Medicine of Cape Town in future educational strategy.

The results also show wide usage of Free Open Access Medical Educational sources. This is a global movement in which the members of the group show themselves to be immersed.

LIMITATIONS

The study is limited to just one Facebook group, whose members are geographically constrained to Cape Town. It is a descriptive study of a specific population, and thus results may not be generalizable.

The sample windows in which data was collected, was set at one year apart to provide data on change in usage pattern over time, however, this may introduce selection bias and skew outcomes.

Although instant feedback in a closed Facebook group is possible and desirable, attempts to ascertain notification settings of the users in the Cape Town Emergency Medicine group were not made.

This study draws inference between engagement in the educational sense (active participation in the learning process) and engagement with the educational posts analysed ('likes', 'comments' and 'shares'). Many studies into social media education have used 'likes', 'comments' and 'shares' as a proxy of educational engagement, as it requires users to actively engage in content [13,14]. Engagement itself is seen as an integral part of self-directed learning [6]. Although greater engagement would lend itself to a more active learning process, it should be noted that using 'likes', 'comments' and 'shares' is used here as a proxy to active learner driven participation.

CONCLUSION

It is evident from this analysis that the Cape Town Emergency Medicine closed Facebook group serves as an academic, virtual community to its members. It provides a forum for education, social bonding and divisional information sharing. Educational posts make up the majority of content, and clinically directed educational posts generate greater engagement. Further local research and the educational potential of closed group social media should be explored.

COMPETING INTERESTS AND FUNDINGS

The primary supervisor serves as group administrator to the Cape Town Emergency Medicine closed Facebook group.
The study has been privately funded

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PART C: ADDENDA

A. South African Medical Journal Instructions to Authors

B. Waiver of Consent

C. Research Protocol

D. HREC approval letter

<div align="right">**Appendix A**</div>

INSTRUCTIONS FOR AUTHORS : SAMJ

Author Guidelines

Accepted manuscripts that are not in the correct format specified in these guidelines will be returned to the author(s) for correction, and will delay publication.

AUTHORSHIP

Named authors must consent to publication. Authorship should be based on substantial contribution to: (i) conception, design, analysis and interpretation of data; (ii) drafting or critical revision for important intellectual content; and (iii) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to www.icmje.org).

CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute conflict of interest.

RESEARCH ETHICS COMMITTEE APPROVAL

Provide evidence of Research Ethics Committee approval of the research where relevant.

PROTECTION OF PATIENT'S RIGHTS TO PRIVACY

Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to www.icmje.org.

ETHNIC CLASSIFICATION

References to ethnic classification must indicate the rationale for this.

MANUSCRIPTS

Shorter items are more likely to be accepted for publication, owing to space constraints and reader preferences.

Research articles (previously 'Original articles') not exceeding 3 000 words, with up to 6 tables or illustrations, are usually observations or research of relevance to clinical medicine and related fields. References should preferably be limited to no more than 15. Please

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provide a structured abstract not exceeding 250 words, with the following recommended headings: Background, Objectives, Methods, Results, and Conclusion.

Scientific letters will, in future, be incorporated as shorter Research articles.

Editorials, Opinions, etc. should be about 1000 words and are welcome, but unless invited, will be subjected to the SAMJ peer review process.

Review articles are rarely accepted unless invited.

Letters to the editor, for publication, should be about 400 words with only one illustration or table, and must include a correspondence address.

Forum articles must be accompanied by a short description (50 words) of the affiliation details/interests of the author(s). Refer to recent forum articles for guidance. Please provide an accompanying abstract not exceeding 150 words.

Book reviews should be about 400 words and must be accompanied by the publication details of the book.

Obituaries should be about 400 words and may be accompanied by a photograph.

MANUSCRIPT PREPARATION
Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - www.icmje.org.

Manuscripts must be provided in UK English.

Qualification, affiliation and contact details of ALL authors must be provided in the manuscript and in the online submission process.

Abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

Scientific measurements must be expressed in SI units except: blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be preceded by a space (except for %), e.g. '40 kg' and '20 cm' but '50%'. Greater/smaller

than signs (> and <) should be placed immediately preceding the relevant number, i.e. 'women >40 years of age'. The same applies to ± and º, i.e. '35±6' and '19ºC'.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160...

Quotes should be placed in single quotation marks: i.e. The respondent stated: '...'

Round brackets (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

General formatting

The manuscript must be in Microsoft Word or RTF document format. Text must be single-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes, with the exception of Tables).

ILLUSTRATIONS AND TABLES

If tables or illustrations submitted have been published elsewhere, the author(s) should provide consent to republication obtained from the copyright holder.

Tables may be embedded in the manuscript file or provided as 'supplementary files'. They must be numbered in Arabic numerals (1,2,3...) and referred to consecutively in the text (e.g. 'Table 1'). Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged. Tables must be cell-based (i.e. not constructed with text boxes or tabs), and accompanied by a concise title and column headings. Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

Figures must be numbered in Arabic numerals and referred to in the text e.g. '(Fig. 1)'. Figure legends: Fig. 1. 'Title...'

All illustrations/figures/graphs must be of high resolution/quality: 300 dpi or more is preferable, but images must not be resized to increase resolution. Unformatted and uncompressed images must be attached individually as 'supplementary files' upon submission (not solely embedded in the accompanying manuscript). TIFF and PNG formats are preferable; JPEG and PDF formats are accepted, but authors must be wary of image compression. Illustrations and graphs prepared in Microsoft Powerpoint or Excel must be accompanied by the original workbook.

REFERENCES

Authors must verify references from the original sources. Only complete, correctly formatted reference lists will be accepted. Reference lists must be generated manually and not with the use of reference manager software.

Citations should be inserted in the text as superscript numbers between square brackets, e.g. These regulations are endorsed by the World Health Organization,[2] and others.[3,4-6]

All references should be listed at the end of the article in numerical order of appearance in the Vancouver style (not alphabetical order). Approved abbreviations of journal titles must be used; see the List of Journals in Index Medicus.

Names and initials of all authors should be given; if there are more than six authors, the first three names should be given followed by et al. First and last page, volume and issue numbers should be given.

Wherever possible, references must be accompanied by a digital object identifier (DOI) link and PubMed ID (PMID)/PubMed Central ID (PMCID). Authors are encouraged to use the DOI lookup service offered by CrossRef.

Journal references:
Price NC, Jacobs NN, Roberts DA, et al. Importance of asking about glaucoma. Stat Med 1998;289(1):350-355. [http://dx.doi.org/10.1000/hgjr.182] [PMID: 2764753]

Book references:
Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworth, 1975:96-101.

Chapter/section in a book:
Weinstein L, Swartz MN. Pathogenic Properties of Invading Microorganisms. In: Sodeman WA jun, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974:457-472.

Internet references:
World Health Organization. The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization, 2002. http://www.who.int/whr/2002 (accessed 16 January 2010).

Other references (e.g. reports) should follow the same format:
Author(s). Title. Publisher place: publisher name, year; pages.

Cited manuscripts that have been accepted but not yet published can be included as references followed by '(in press)'.

Unpublished observations and personal communications in the text must not appear in the reference list. The full name of the source person must be provided for personal communications e.g. '...(Prof. Michael Jones, personal communication)'.

PROOFS
A PDF proof of an article may be sent to the corresponding author before publication to resolve remaining queries. At that stage, only typographical changes are permitted; the corresponding author is required, having conferred with his/her co-authors, to reply within 2 working days in order for the article to be published in the issue for which it has been scheduled.

CHANGES OF ADDRESS
Please notify the Editorial Department of any contact detail changes, including email, to facilitate communication.

CPD POINTS
Authors can earn up to 15 CPD CEUs for published articles. Certificates may be requested after publication of the article.

CHARGES
There is no charge for the publication of manuscripts.

Submission Preparation Checklist
As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

Named authors consent to publication and meet the requirements of authorship as set out by the journal.

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The submission has not been previously published, nor is it before another journal for consideration.

The text complies with the stylistic and bibliographic requirements in Author Guidelines.

The manuscript is in Microsoft Word or RTF document format. The text is single-spaced, in 12-point Times New Roman font, and contains no unnecessary formatting.

Illustrations/figures are high resolution/quality (not compressed) and in an acceptable format (preferably TIFF or PNG). These must be submitted individually as 'supplementary files' (not solely embedded in the manuscript).

For illustrations/figures or tables that have been published elsewhere, the author has obtained written consent to republication from the copyright holder.

Where possible, references are accompanied by a digital object identifier (DOI) and PubMed ID (PMID)/PubMed Central ID (PMCID).

An abstract has been included where applicable.

The research was approved by a Research Ethics Committee (if applicable)

Any conflict of interest (or competing interests) is indicated by the author(s).

Appendix B

WAIVER OF INFORMED CONSENT

1. Protocol Title: *An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group*

2. Principal Investigator: <u>**Dr Swasthi Singh**</u>

        <u>**University of Stellenbosch (Student no. 16705793)**</u>

3. Reasons for waiver of consent

There will be no contact between the researcher and participants at any point during the study. The only demographic information needed from participants will be current job status, i.e. faculty or registrar.

The study is a descriptive, observational study and is merely an audit of activity on a semi-public Facebook group. It should be emphasised that the study will not report the individual comments, nor code the responses. Instead comments will only be anonymously categorised and aggregated. Anonymous use of categorical data also does not transgress Protection of the Personal Information Act. Thus a request to waiver consent is based on the study being minimal risk.

However, all members of the group shall be informed of the study, assured of the confidentiality of their posts and identities, and given recourse to voice concerns anonymously via a representative or directly to the principal investigator, and will at all times have the option to withdraw their posts from the study.

Anonymity will be retained throughout the duration of the study and afterward. The results will not affect the rights and welfare of subjects.

No additional pertinent information is expected to arise during the study.

By signing this request for waiver of informed consent, I certify the information included in it.

                                                            <u>12/10/2014</u>

_____

Principal Investigator's Signature   Date

Appendix C

RESEARCH PROTOCOL

An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group

STUDENT:

Dr. Swasthi Singh

Division of Emergency Medicine

University of Stellenbosch

Student Number: 16705793

Email: Swasthi.singh@gmail.com

Telephone: 0828102900

This study is in partial fulfilment of the degree MMED Emergency Medicine

PRIMARY SUPERVISOR:
Dr. Almero Oosthuizen
Consultant Specialist, Karl Bremer Hospital
Division of Emergency Medicine

CO-SUPERVISOR:
Dr. Melanie Stander
Consultant Specialist, Tygerberg Hospital
Division of Emergecny Medicine

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ABSTRACT

Introduction

In 2012, the Division of Emergency Medicine in the Western Cape created a closed Facebook group. Access to the group is restricted to students and staff affiliated to Emergency Medicine in Cape Town. It was created to foster a virtual community in which academic, operational and social discussion takes place.

Usage on the group has not been prescribed or policed, and is monitored only to ensure patient confidentiality and rules of conduct are not breached. Until now, no attempt has been made to discover if it is being used as intended, or if usage has changed over time. The principal investigator aims to analyse the usage patterns of the above Facebook group. Three primary aspects of usage will be analysed: the origins of each post, the type of post, and the engagement that each post generates.

It is hoped that with this information, the Division of Emergency Medicine in Cape Town may be able to better understand the characteristics of the posts in its closed Facebook group. With this knowledge, it may be possible to discover which academic posts encourage the most engagement, and use this to bolster the educational content of the group.

Methodology

This will be a retrospective, observational, and descriptive study that covers two periods: the first three months of 2013 and 2014 respectively.

The posts shall be described as they relate to three major categories:

1) *The originator of the posts*

   The originator is defined as the person who first places the primary post on the Facebook group. Each post shall be categorised as being originated by either consultant or registrar. This will reveal whom the majority of posts are created by, and whether the majority of content on the group is driven by faculty or by the registrars themselves.

2) *The type of posts*

   'Academic' posts will be defined as posts with educational content pertaining to the field of Emergency Medicine. The source of the academic posts are to be further examined: does it arise from a Clinically Directed Event (a clinical event witnessed in

a Cape Town emergency centre by a member of the group themselves)? Or are posts related to educational content not borne of a witnessed clinical event? In this case, if a link to an educational website is mentioned, the website name shall be recorded to determine which websites are most being used in medical education in Cape Town Emergency Medicine.

'Divisional' posts will be defined as those relating to the operational needs of the Division of Emergency Medicine in Cape Town.

'Social' posts will be defined as those not relating to the divisional or academic concerns of the Division of Emergency Medicine in the Western Cape.

3) *The engagement a post generates*
    The engagement of a post is a measure of the response that it generates in terms of the number of its 'comments', 'likes', and 'shares'. The posts with the most collective responses shall be noted and analysed. The engagement generated by the academic posts may provide an insight into which type of academic post fosters greater interaction amongst group members.

There shall be a formal request to waiver each memebers individual signed consent, and information on the study will be posted on the site itself. No individual will be personally named, nor will the content of a particular post be made public, as these shall be generalised into broad categories. Concerns regarding privacy or participation in the study, may be addressed via the registrar representive, if anonymity is needed, or directly to the principal investigator.
Data will be captured by using an electronic spreadsheet on a password protected laptop in a locked office, and analysed using descriptive statistics.

Conclusions
The results from this study will inform the Western Cape Division of Emergency Medicine of the usage patterns of its closed Facebook group. It will provide information as to the origins, type and engagement of posts. By analysing these, it is hoped that characteristics of highly engaging educational posts may be identified, so that these characteristics may utilised in the future.

INTRODUCTION

1.1.   Background and literature review

The Closed Facebook group, "Cape Town Emergency Medicine", was created in 2012 by the Division of Emergency Medicine of the Western Cape. Its information statement reads as follows: "This is a closed forum for real time sharing of information and experiences aimed at Emergency Medicine registrars and faculty in Cape Town, South Africa". Access to the group is restricted to faculty and registrars affiliated to the Division of Emergency Medicine of the Western Cape.

Traditionally, South African registrar training programs use a single-centre training model. This results in trainees sharing a physical community, with all the resultant benefits. Their physical proximity provides for a community in which experiences and knowledge may be shared. Emergency Medicine, offers a decentralised approach during registrar training. Emergency Medicine registrars work in many different departments in various hospitals throughout Cape Town and its surrounding areas. ('The Roadmap', Emergency Medicine Registrar Resources, Vula). The closed Facebook group was created to provide a virtual forum wherein academic knowledge and experiences unique to this field may be shared. As yet, no analysis has been undertaken to ascertain if the above mission statement is being realised, or how and how much the forum is being used.

Facebook is defined as a Social Network Site[1], and a 'closed' or 'secret' group limits access to posts and members, on an invitation-only basis[2].

Social network sites are gaining popularity globally[1]. Social Network Sites are defined as "as web-based services that allow individuals to:

(1) construct a public or semi-public profile within a bounded system,
(2) articulate a list of other users with whom they share a connection, and
(3) view and traverse their list of connections and those made by others within the system"[1].

The first of these sites, SixDegrees was established as early as 1997, and thus, a new means of internet based communication was born [3]. It marked a change from the norm, in that it allowed users to add and subtract content by creating their own profile pages, and to send messages to other users [4]. A string of other Social Network Sites followed, but in 2004 Facebook was created, and it has since come to dominate the world of Social Network Sites amidst the rise of the so called Web 2.0 of internet applications [5].

Web 2.0 refers to "the second incarnation of the web", as content is more readily generated by users themselves, and offers more democratic use of collective intelligence thus created. This marks a departure from the previous Web 1.0 in which content was controlled solely by administrators with superior computer programming knowledge. [6]. Applications such as wikis, blogs, social network sites and podcasts have emerged from this revolution as the backbone of this so-called 'social web' with users themselves creating and sharing knowledge.

Facebook, as of December 2015, held 1.04 billion *daily* active users[7], which is a staggering proportion of the world's population. As such, Facebook has begun to pique the imagination of educators and students worldwide, as a tool to bring the classroom to the learners. The concept of 'the flipped classroom model' has evolved from such a re-imagining of education, wherein content is learned at the learner's own pace. Consultants thus act as facilitators to learning, and not solely as didactic providers of knowledge [8–11]. Although there has been growing research internationally regarding the use of social network sites for educational purposes [12–17], there is consensus that more research needs to be done in this field [1,18].

This is especially true in the South African context. Two published studies in South Africa apply to the use of Social Network Sites holding educational value [11,19]. However, no published research exists in the South African context with specific regard to medical education and social network sites.
Despite the paucity of published research in the South African context, many international researchers point to a positive effect on student education with the use of Social Network Sites [4,20,21]. The positive effects range from increased engagement with lecturers, greater enthusiasm for using Facebook for educational purposes, a sense of community, individual paced learning, and educational links and information on offer [22].

The closed Facebook group "Cape Town Emergency Medicine", offers a unique opportunity to explore the educational uses of Social Network Sites peculiar to South Africa. It is known that in South Africa, cultural differences are notable, and disparity to Internet access still exists [11]. The members of the 'Cape Town Emergency Facebook Group' have relatively uniform access to the Internet. This provides the opportunity to study a sub-population within South Africa, unhindered by the problem of Internet access.

Furthermore, an analysis of such a group may provide insights into new methods of how to adequately engage members on a Social Network Site. By understanding which educational

posts engage the most members, the educational potential of the site may be enhanced, thus staying abreast with the expanding world of Web 2.0 technology.

1.2 Motivation

As previously mentioned, the mission statement of the Cape Town Emergency Medicine closed group is, "This is a closed forum for real time sharing of information and experiences aimed at Emergency Medicine registrars and faculty in Cape Town, South Africa". Since its creation in 2012, an analysis of its usage patterns has not yet been attempted. The degree to which it is achieving its mission statement is to be determined by this study.

To do this, an attempt must be made to describe its usage patterns, and by whom and how the group is largely used. High-yield educational posts with greater engagement will be identified to guide future educational posts. Links to educational sites that prove popular and offer greater engagement will also be earmarked. This information may be used to guide future educational purposes on the Facebook group.

1.3 RESEARCH QUESTIONS

Hypothesis: The hypothesis for this study is that the closed Facebook group 'Cape Town Emergency Medicine' provides an academic platform and a virtual community in which to share non-academic information for dispersed registrars and faculty of the Division of Emergency Medicine Cape Town.

1.4 PRIMARY AIM

The primary aim of this study is to describe the usage patterns of the closed Facebook group 'Cape Town Emergency Medicine'. It is hoped that this information may maximise the educational potential of the Facebook group in the future.

SECONDARY AIM

The secondary aim for this study is to compare the usage patterns on the Facebook group for the periods of 1st January - 31st March 2013 to 1st January - 31st March 2014, to determine whether usage patterns have changed over time.

1.5 OBJECTIVES

The objectives:

- To describe the usage patterns of the closed Facebook Emergency Medicine group of Cape Town as it relates to three major categories:
  - The originators of the posts – consultants versus registrars
  - The nature of the posts – academic (clinically directed versus non-clinically directed posts) or or non-academic (operational versus social) posts
  - The engagement that each post generates, in terms of 'comments', 'likes' or 'shares'
- To compare these for the first three months of 2013 to the first three months of 2014
- To further dileanate the academic posts into clinically directed posts and non-clinically directed posts, and determine the source of each.
- To ascertain which type of academic posts, from which source, garners the most engagement
- To determine whether this information can be used to make recommendations regarding future educational posts

METHODOLOGY

2.1 Study Design

This will be an observational, retrospective, descriptive study analysing the posts of the Facebook group 'Cape Town Emergency Medicine'. This shall be done over two sampling windows for the first three months of 2013, comparing these to the first three months of 2014. The study will describe what the type of posts are (academic, or non-academic), who generated these posts (consultants or registrars), and which posts generated the most engagement (number of 'likes', comments, or 'shares'). The Principal Investigator shall manually review posts on the group to screen for the relevant information necessary to the study.

If a post contains dual content and proves difficult to categorise, a co-supervisor shall be asked to clarify which primary category a particular post may fall under, and if it is still undecided, then the third supervisor may be called upon to make a final decision regarding the nature of the post. In all cases, the post will be categorised based on the initial content and intent.

2.2 Study Setting

This study shall be set on the closed Facebook group 'Cape Town Emergency Medicine' for the first three months of 2013 and 2014 respectively.

2.3 Study Population

The study population will consist of the members of the Facebook group 'Cape Town Emergency Medicine' as they existed for the periods of the first three months of 2013 and 2014 respectively. The members of the group consist of consultants and registrars affiliated to the Division of Emergency Medicine in the Western Cape.

2.4 Sampling

Inclusion criteria:

All posts for the first three months of 2013 and 2014 on the 'Cape Town Emergency Medicine' Facebook group will be included in the study.

Exclusion criteria

Posts that fall outside of the timeline abovementioned will be excluded.
Posts generated by members who decline to participate in the study, shall be manually removed from the data set, and declared as such.

2.5 Data collection and management

Data will be captured using an electronic data sheet (Microsoft Excel, Microsoft Corporation, Redmond, WA). Data integrity shall be ensured by password protection.
A formal request to waiver consent shall be submitted. Members on the group shall be informed of the study, and assured that each post shall be generalised into categories and that no participant shall be mentioned by name. Recourse for concerns regarding the study shall be provided for members via their registrar representative if confidentiality is required, or directly to the principal investigator. Requests not to participate with the study shall be heeded, and posts of members who are unwilling to participate shall be manually removed from the data set.

2.6 Statistical Analysis

With the aid of a statistician, descriptive statistics will be calculated using histograms, and frequency tables.

2.7 Timeline

- Submission to Stellenbosch University Human Research Ethics Committee – November 2014
- Data collection – March to April 2015
- Data analysis and write up of dissertation – April to May 2015
- Submission to research committee of Stellenbosch University – June 2015

3 Ethical and legal considerations

Approval will be sought from Stellenbosch University Human Research Ethics Committee prior to data collection.

Data will at all times be password protected, and available to senior researchers only.

Only registrars and faculty affiliated to the Division of Emergency Medicine of the Western Cape have access to the group.

A request to waiver formal informed consent shall be submitted.

It should be emphasised that the study will not report the individual comments, nor code the responses. Instead comments will only be anonymously categorised and aggregated.

Anonymous use of categorical data also does not transgress Protection of the Personal Information Act.

Thus a request to waiver consent is based on the study being minimal risk.

However, all members of the group shall be informed of the study, assured of the confidentiality of their posts and identities, and given recourse to voice concerns anonymously via a representative or directly to the principal investigator, and will at all times have the option to withdraw their posts from the study. The notice of proposed research that will be posted on the Facebook group can be found in appendix three. This message will be posted at different times of the day, weekly, over a period of a month, in order that the message be seen by the most members possible. The notice shall also be posted on the university communication platform, Vula, and via the divisional email listing.

Posts that suggest that the sharing of patient data was not accomplished on ethical grounds, may be uncovered during the course of the study. If informed consent was not gained, poor professionalism shown or the anonymity of patients was not preserved, these posts shall be reported for review by group administration. Group administration may then decide to remove

an offensive post and report this to senior faculty. A reminder to share sensitive data appropriately may be issued to the originator of such a post.

4 Strengths and limitations of study

This study is a descriptive study, and thus results may not be generalizable.

The study is limited to just one Facebook group, whose members are geographically constrained to Cape Town. Although this may appear as a limitation, it may also prove to be a strength. This is true in the sense that the study is unique to the intricacies pertinent to the Division of Emergency Medicine of the Western Cape, and thus may prove to be especially useful to the Division itself.

The two sampling windows of three months each, are seperated by a period of a year (as at the start of each sampling window). This may allow an insight into how the group postings have evolved over time, and how, if at all, the academic postings have differed from year to year.

Another possible limitation of the study is the inference it draws between engagement in the educational sense (active participation in the learning process) and engagement with the educational posts analysed ('likes", "comments" and "posts") in the study. Many studies into social networking sites have used "likes", "comments" and "posts" as a proxy of engagement, as it requires users to actively engage in content [13,23]. Engagement itself is seen as an integral part of self-directed learning [24]. Although greater engagement would lend itself to a more active learning process, it should be noted that using "likes", "comments" and "posts" is used here as a proxy to active leaner driven participation.

5 Reporting and implementation of results

Results shall be published in a peer-reviewed journal. The Emergency Medicine Division of the Western Cape will receive feedback regarding all key findings from the study.

6 Resources

6.1 Available Resources

This study is to be self-funded.

6.2 Budget and Budget motivation

The budget for this study is R3400. A detailed budget is available in appendix one

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Appendix one

Detailed Budget

PERSONAL COMPENSATION		R0
Principal investigator	R0	
CONSULTING SERVICES		R700
Statistical services @R175 per hour	R700	
TRAVEL		R400
Travel	R1,07 per km as per SARS specifications	
Accommodation	R0	
Meals and incidentals	R0	
OTHER DIRECT COSTS		R2000
Telephone, cell phone, fax	R200	
Internet, email	R500	
Paper, printing and copying	R1300	
Ethics committee fee	R0	
TOTAL DIRECT COSTS		R3100
TOTAL INDIRECT COSTS(12%)		R300
TOTAL COSTS		R3400

Appendix two

WAIVER OF INFORMED CONSENT

1. Protocol Title: *An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group*

2. Principal Investigator: <u>**Dr Swasthi Singh**</u>

<u>**University of Stellenbosch (Student no. 16705793)**</u>

3. **Reasons for waiver of consent**

There will be no contact between the researcher and participants at any point during the study. The only demographic information needed from participants will be current job status, i.e. faculty or registrar.

The study is a descriptive, observational study and is merely an audit of activity on a semi-public Facebook group. It should be emphasised that the study will not report the individual comments, nor code the responses. Instead comments will only be anonymously categorised and aggregated. Anonymous use of categorical data also does not transgress Protection of the Personal Information Act. Thus a request to waiver consent is based on the study being minimal risk.

However, all members of the group shall be informed of the study, assured of the confidentiality of their posts and identities, and given recourse to voice concerns anonymously via a representative or directly to the principal investigator, and will at all times have the option to withdraw their posts from the study.

Anonymity will be retained throughout the duration of the study and afterward. The results will not affect the rights and welfare of subjects.

No additional pertinent information is expected to arise during the study.

By signing this request for waiver of informed consent, I certify the information included in it.

12/10/2014

_____

Principal Investigator's Signature   Date

Appendix three

Notice of Proposed Research

Dear Members,

It is my pleasure to announce my proposed research on our closed Facebook group 'Cape Town Emergency Medicine'. The study entails analysing posts made on this group during the periods of 1st January to 31st March 2013, and 1st January to 31st March 2014.

Although the study entails analysing these posts, it will not include any personal information on the originator of the posts, and will not contain any direct quotes from the posts. The information will be broadly categorised and anonymity of all members shall be preserved. (for example, a post will be categorised as educational, inspired by a clinical event one of us may have witnessed, and said to be posted by either faculty or a registrar)

Participation will be entirely voluntary, and if anyone would like to omit certain posts they made from the study, they may contact myself, or group administration (Almero Oosthuizen), or the registrar representative. Absolutely no penalties shall befall any person who wishes to omit posts from the study.

Thank you for taking the time to read this message, and if you have any queries regarding the study, please do not hesitate to contact me.

Dr. Swasthi Singh
0828102900
swasthi.singh@gmail.com

HREC Approval Letter

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jou kennisvennoot · your knowledge partner

Approval Notice
Response to Modifications- (New Application)

05-Jun-2015
SINGH, Swasthi

Ethics Reference #: S14/11/261

Title: An analysis of the usage patterns of the 'Cape Town Emergency Medicine' closed Facebook group

Dear Dr Swasthi SINGH,

The **Response to Modifications** - *(New Application)* received on **28-Apr-2015**, was reviewed by members of **Health Research Ethics Committee 1** via Expedited review procedures on **05-Jun-2015** and was approved.
Please note the following information about your approved research protocol:

Protocol Approval Period: **05-Jun-2015 -05-Jun-2016**

Please remember to use your **protocol number** (S14/11/261) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:
Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.
Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.
For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at 0219399657.

Included Documents:
MOD_Protocol
MOD_Cover letter_Response to modifications
CV M Stander

CV S Singh
Protocol Synopsis
Declaration M stander
Application Form
Research Protocol
Declaration S Singh
Request to Fast-Track
HREC General checklist
Declaration A Oosthuizen
CV AH Oosthuizen

Sincerely,

Franklin Weber
HREC Coordinator
Health Research Ethics Committee 1