

# **A content analysis of the Twitter hashtag #McrMed: Who is using it and for what reason?**

**EDUC71000 - a dissertation  
submitted to the University of  
Manchester School of  
Environment, Education and  
Development for the Masters  
degree of Digital Technologies,  
Communication and Education**

*28<sup>th</sup> August 2014  
Mr Michael Masterman  
Student ID: 75109211*

*School of Environment, Education and Development*

# Table of contents

<b>Abstract</b>	<i>Page 3</i>
<b>Declaration</b>	<i>Page 4</i>
<b>Intellectual Property Statement</b>	<i>Page 5</i>
<b>List of Figures</b>	<i>Page 6</i>
<b>Acknowledgments</b>	<i>Page 7</i>
<b>The Author</b>	<i>Page 8</i>
<b>Chapter 1   Introduction</b>	<i>Page 9</i>
<b>Chapter 2   Literature Review</b>	
2.1 Why are people using Twitter?	<i>Page 13</i>
2.2 Twitter in an educational context	<i>Page 15</i>
2.3 Twitter in healthcare	<i>Page 18</i>
2.4 The healthcare hashtag community	<i>Page 21</i>
2.5 Twitter in Medical Education	<i>Page 24</i>
<b>Chapter 3   Methodology</b>	
3.1 Research questions	<i>Page 27</i>
3.2 Rationale & Context	<i>Page 27</i>
3.3 Content Analysis	<i>Page 30</i>
3.4 Data analysis and coding	<i>Page 31</i>
3.5 Reflective journal	<i>Page 36</i>
3.6 Ethical considerations	<i>Page 37</i>
<b>Chapter 4   Results &amp; Discussion</b>	<i>Page 38</i>
<b>Chapter 5   Conclusions</b>	<i>Page 47</i>
<b>Chapter 6   Personal Reflection</b>	<i>Page 53</i>
<b>References</b>	<i>Page 56</i>
<b>Appendix</b>	<i>Page 61</i>

**Word count: 14,143**

## Abstract

The #McrMed Twitter hashtag was created by a former student, a content analysis was carried out to discover the type of conversation taking place via the hashtag. The number of interactions with the hashtag in relation to the number of students is very small but there is certainly discussion taking place, most of which is around advertising, sharing information, commentary and experiences. Students, tutors and administrative staff are using the hashtag and this study identifies possibilities as to how hashtags in education, and specifically medical education, can and should be used. The author suggests a clear understanding of how a specific hashtag is developed and furthermore how Twitter can enhance a student community. Twitter hashtags (including educational ones), and specifically healthcare ones, are providing huge amounts of interactive peer led content that should not and cannot be ignored. #McrMed could be one of these...

## Declaration

I Michael Masterman declare that no portion of the work referred to in the dissertation has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

## Intellectual Property Statement

- i. The author of this dissertation (including any appendices and/or schedules to this dissertation) owns certain copyright or related rights in it (the “Copyright”) and s/he has given The University of Manchester certain rights to use such Copyright, including for administrative purposes.
- ii. Copies of this dissertation, either in full or in extracts and whether in hard or electronic copy, may be made only in accordance with the Copyright, Designs and Patents Act 1988 (as amended) and regulations issued under it or, where appropriate, in accordance with licensing agreements which the University has entered into. This page must form part of any such copies made.
- iii. The ownership of certain Copyright, patents, designs, trade marks and other intellectual property (the “Intellectual Property”) and any reproductions of copyright works in the dissertation, for example graphs and tables (“Reproductions”), which may be described in this dissertation, may not be owned by the author and may be owned by third parties. Such Intellectual Property and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property and/or Reproductions.
- iv. Further information on the conditions under which disclosure, publication and commercialisation of this dissertation, the Copyright and any Intellectual Property and/or Reproductions described in it may take place is available in the University IP Policy (see <http://documents.manchester.ac.uk/display.aspx?DocID=487>), in any relevant Dissertation restriction declarations deposited in the University Library, The University Library’s regulations (see <http://www.manchester.ac.uk/library/aboutus/regulations>) and in The University’s Guidance for the Presentation of Dissertations.

## List of Figures

### Chapter 1 | Introduction

<i>Figure 1 - The most popular tweet ever</i>	<i>Page 10</i>
<i>Figure 2 - First tweet containing #McrMed hashtag</i>	<i>Page 11</i>

### Chapter 2 | Literature Review

<i>Figure 3 - Benefits of social media adapted diagram</i>	<i>Page 16</i>
<i>Figure 4 - Tweet activity of #nhssm</i>	<i>Page 22</i>
<i>Figure 5 - Tweet activity of #FOAMed</i>	<i>Page 23</i>
<i>Figure 6 - Tweet activity of #MedEd chat</i>	<i>Page 24</i>

### Chapter 3 | Methodology

<i>Figure 7 - Author coding categories</i>	<i>Page 33</i>
<i>Figure 8 - Type of Tweet coding categories</i>	<i>Page 34</i>

### Chapter 4 | Results & Discussion

<i>Figure 9 - Number of tweets by author category</i>	<i>Page 38</i>
<i>Figure 10 - Number of tweets by author category comparison</i>	<i>Page 39</i>
<i>Figure 11 - Number of tweets by type of tweet category</i>	<i>Page 40</i>
<i>Figure 12 - Number of tweets by authors and type</i>	<i>Page 41</i>
<i>Figure 13 - Number of re-tweets by type of tweet category</i>	<i>Page 42</i>
<i>Figure 14 - Link to resource by type of tweet category</i>	<i>Page 43</i>
<i>Figure 15 - #McrMed TweetReach data (8th-14th Aug 14)</i>	<i>Page 44</i>
<i>Figure 16 - The tone of the #McrMed tweets</i>	<i>Page 45</i>
<i>Figure 17 - The tone of tweets by author category</i>	<i>Page 45</i>
<i>Figure 18 - Number of replies by type of tweet category</i>	<i>Page 46</i>

## Acknowledgments

Firstly I would like to thank the only constant I have had in my life and my inspiration, my Grandparents Jack and Miki Masterman. If it weren't for their support, encouragement and sometimes strong words, I would have never achieved what I have today.

My colleagues and friends at the Undergraduate Medical Education department at Central Manchester Foundation Trust, more specifically my previous manager Judy Hadfield who gave me the opportunity to study the masters degree whilst in full-time employment. Allison Booth for the time spent proof-reading my assignments, this dissertation and with data input. Hopefully you have seen an improvement over the past two years, I owe you lunch!

My supervisor Drew Whitworth for his guidance and teaching throughout the time of my studies, alongside Mike O'Donoghue and Gary Motteram who have taught me numerous things and given me the confidence that I 'hold my own' in the world of academia.

I'd also like to acknowledge class mates over the two years who have provided me with valuable interactions both online and within the classroom and this has been both rewarding and challenging, the opportunity to interact with an incredibly intelligent group of students has been a real pleasure, and good luck in your future careers.

Finally I'd like to thank my Mum, Sally Elizabeth Masterman, who essentially made me the person I am today. I just wish you were here to see me do this, I miss you. 31<sup>st</sup> July 2007.

## The Author

The author has a BSc in business information systems from the University of Liverpool. There is no previous experience in large-scale academic research; the author has co-authored a number of small research projects that have been presented as posters at medical education conferences.



## Chapter 1 | Introduction

Social media, web2.0 technologies are becoming a huge part of our daily lives and without a doubt they have reshaped the way we communicate with each other, companies and establishments. The first wave of microblogging sites arrived in around 2005, whereas today there are a range of sites spread across the world. Some examples include: Twitter, Tumblr, FriendFeed, Cif2.net, Plurk, Jaiku and identi.ca.

For this dissertation I will be concentrating on the most popular microblogging site, Twitter. The first Twitter 'tweet' was sent on 21<sup>st</sup> March 2006, with the invention of the hashtag (#) arriving on 23 August 2007. (Twitter, About Twitter, 2014)

Statistic brain suggests that there are now 675,750,000 active registered users on Twitter, with an average of 58 million tweets per day (Statistic brain, 2014). Twitter is a user-generated site that allows users to post messages up to the maximum length of 140 characters, which by default are all posted publically and can be viewed by anyone. Users can however, protect who can see their tweets by making their account private, which in turn only allows the followers of that user to view their tweets.

Twitter describes a tweet as follows:

*“A Tweet is an expression of a moment or idea. It can contain text, photos, and videos. Millions of Tweets are shared in real time, every day”* (Twitter, About Twitter, 2014)

Registered users can reply to a tweet and join in on the conversation. A re-tweet (RT) will share a tweet to another user's followers, whilst also allowing them to add on extra thoughts - this is sometimes known as a modified tweet or MT. One can also favorite a tweet, which is a way of showing the author that one likes it.

A hashtag (#) is a way of assigning a tweet to a topic and/or a way of organising a whole range of tweets. The most popular tweet in the history of Twitter was written by the celebrity Ellen DeGeneres (@TheEllenShow). The tweet contained the hashtag #oscars. The tweet was re-tweeted (RT) by 3,405,789 and favoured by 2,029,551 users as of 3<sup>rd</sup> March 2014. See figure 1.



Figure 1 - The most popular tweet ever

and more specifically, Undergraduate Medical Education within the University of Manchester Medical School (MMS).

MMS is the largest medical school in the country with 2,162 undergraduates, 29 academic (full-time) staff, 1 research staff (full-time) and 73 support staff during the 2012/13 academic year. “The undergraduate course is internationally recognised for innovation and quality. It was the first medical school in the UK to introduce a problem-based curriculum and was one of only four UK schools to achieve the highest rating at the last teaching quality review.” (Manchester Medical School, 2014).

The school has a presence on various social media platforms including; You Tube, Twitter, Facebook and also has its own blog. The Twitter account [@MMS\\_UoM](#) was created on 2<sup>nd</sup> September 2013 and the Head of School (Professor Tony Freemont [@ProfFreemont](#)) joined Twitter a year previous to that, on 5<sup>th</sup> September 2012.

As this introduction shows, the technology is incredibly popular and hopefully goes some way to showing why it has become the fastest growing social platform ever. This growth has also seen an increase in research and interest from the academic world, yet the actual specifics of why people tweet and also the affordances of the technology are still unclear.

This dissertation will examine the use of Twitter and hashtags in healthcare, education

The #McrMed hashtag was created following a blog from Dr Colin Lumsden [@DrCJLumsden](#) (Senior Lecturer in Medical Education, Consultant Paediatrician, Lead for eLearning, Lead for iPad Project, Researcher in Mobile Learning) via the MMS learning environment MedLea on the 19<sup>th</sup> October 2012.



Figure 2 - First tweet containing #McrMed hashtag

The learning environment is where all MMS students go to access resources, see their timetables and read blogs from different members of the school. In the main these people are clinical academic staff, whom are seen in high-regard by the students. This extract was taken from part of a lengthier blog post:

*“And really finally ... The boss is Tweeting ... get the news before any of us do! @Proffreemont Also can any of you think of a good hashtag for us at MMS? MMS is used by others! Suggestions welcomed.”(Colin Lumsden, MedLea, 2012)*

On the 21<sup>st</sup> October 2012 the #McrMed hashtag was suggested by a former MMS student Jason Shin (see figure 2). Dr Shin is now a qualified doctor and still uses the hashtag.

Instead of trying to understand if Twitter, or indeed other social networks, can improve connections or enhance student learning, I wanted to take a step back and try and understand what people in a specific community are using Twitter for, and even more specifically what they are using the hashtag for. Given that there are no rules, and to some extent no specific topic, linked to this hashtag I am keen to discover what the actual point of the hashtag is whilst also trying to understand the types of people using the hashtag and potentially understanding how this or other hashtags can be used within education in the future.

The structure of the dissertation will be as follows; my literature review will look at how and why people are using Twitter currently - in a general sense. I will then look into how the technology is being utilised in education, healthcare and more specifically the medical education setting.

The methodology chapter will outline in more detail the research questions I hope to answer (of which there are three specific ones) and I will also explain my rationale and some further context on why and how I plan to answer these questions. I will discuss the content analysis methodology, my data and coding techniques, the role of personal reflection and any ethical considerations.

I will be combining my results and discussion sections into one chapter, fundamentally outlining the data that has been collected and how it may link to the previous and following chapters.

I will draw on this data to present my conclusions and thus bringing all the previous sections together and finish the dissertation with a final section that will summarise my personal reflections on the entire process. This will be mainly linked to my current job role whilst considering more personal reflections too.

The references and an appendix section will complete this work.

## Chapter 2 | Literature Review

A literature search was conducted using a number of databases, including NHS evidence, PubMed, Google Scholar and the University of Manchester library search using the terms Twitter in Medical Education, enhancing communication using Twitter, microblogging in education, microblogging, hashtag & content analysis. A body of literature was found however, there is limited work on the specific area I'm looking at in this study, which is quite understandable given its fairly niche traits.

The aim of the review is to understand why people use Twitter and how it is currently being used in healthcare education. I will also be looking at how other content analysis has been carried out with the aim of understanding the field in a bit more detail. I have narrowed my search in this area using the terms content analysis, hashtag analysis and Twitter content analysis.

### **2.1 Why are people using Twitter?**

The first thing I would like to try and address is why and how people are using Twitter generally. There is a growing body of research that tries to answer this question, some of which I will try to bring together in the first part of this literature review. I hope this can allow me to suggest some of the possible reasons people are using the #McrMed hashtag in my discussion.

From an emotional point of view it is suggested by Zhao & Rosson (2009) that the main reason people use microblogging technologies is to develop another emotional layer, allowing closer connection to friends and the world as a whole. They also conclude that informal communication via microblogging can help colleagues get to know each other better, by understanding each others' personal lives a bit more using the information in the posts they publish.

In comparison to regular blogging, the speed of publishing is also seen as a main advantage by users and by only allowing a shorter number of characters, it allows for the user to take less time thinking and less physical time to generate content (Small, 2011, Java et al, 2007).

Some may say posts like 'I have just had two eggs on toast with some beans for my breakfast' are meaningless and trivial. They are in fact valued by friends and family (Java et al, 2007) and it is widely agreed that people tend to follow an account because they are connected in some way, or at least share the same or similar interests. I think this is particularly relevant in the #McrMed education field and one could suggest that this allows for more and more connections in that area. The term *Homophily* is "a contact between similar people [that] occurs at a higher rate than among dissimilar people" (McPherson, 2001) whilst Kwak et al (2010) summarise that Twitter moves away from the usual activities of social networks and when they investigated reciprocated relationships, some level of *homophily* was exhibited. Their study explored the entirety of Twitter including 41.7 million user profiles and 106 million tweets. They also conclude that Twitter has "unprecedented opportunity for computer scientists, sociologists, linguistics and physicists to study human behavior" (Kwak et al, 2010).

Zhao and Rosso (2009) discuss the motivations of Twitter and how organisations link the benefits of informal communication to customer engagement. They also report that there is huge variety and diversity around the type of content users are creating, and the reason for this diversity is due to the immediate real-time nature of the posts and how these are related to 'real-life' situations. They concluded that posts are recognised to be somewhat more valuable than other outlets when connecting information to personal goals and for understanding what is on each others' minds. This in turn prompts more opportunistic conversations.

For me, one of the most important and appropriate conclusions is that of Humphreys (2013), who suggests that the popularity of Twitter has come about due to its resemblance to others in a longer historical context and argues that Twitter should be

part of our everyday writings. He makes a connection between the technology and historical diaries and suggests “It is these kinds of writings that warrant a closer comparison with contemporary microblogs.” (Humphreys, 2013).

This idea is also presented by Gao et al (2012), who describe a study where learners were asked to tweet everyday as part of a teacher education program. This activity encouraged students to share and reflect upon their teaching experiences. The students were given specific questions to respond to via the technology.

Humphreys (2013) also states that Twitter may allow people who may not usually get involved in a discussion to get involved, whilst also representing themselves and their perceptions of the world and I would be keen to try and understand if this is the case within the #McrMed community.

## **2.2 Twitter in an educational context**

As it stands, there is no conclusive evidence to suggest that Twitter can replace a current technology or process, or indeed create a better learning experience by using the tool. What has been identified and implemented by a number of colleges and universities are a variety of affordances such as disseminating information and teaching related resources and links and facilitating discussions amongst students, academics and teaching organisations.

In an experiment assessing the effectiveness of student interaction using Twitter in a formal and assessed setting, Fox and Varadarajan (2011) say that the technology encouraged class participation, allowed students to voice their opinion and allowed them to share ideas amongst themselves. This is also concluded by Ebner et al (2010), whilst also discovering that students in a course to foster communication using Twitter regarded it an opportunity to be part of an ‘informal learning’ community. These students were also motivated by the rapid feedback they received from their peers and more importantly, their teachers.

Ebner et al (2010) also conclude that microblogging supports process-oriented learning; this is achieved by the constant flow of information available and the ability to look back on posts that may not have been taken in fully at the time of the class or initial discussion. Ebner summarises by outlining the following advantages to students and teachers when using Twitter.

<b>Students</b>	<b>Teachers</b>
<p><i>Informal learning through informal communication.</i></p> <p><i>Support of collaboration.</i></p> <p><i>Feedback on thoughts.</i></p> <p><i>Suggestions to reflect one’s own thoughts.</i></p> <p><i>Collaboration independent of time and place.</i></p> <p><i>Direct examination of thoughts and causes of learning</i></p>	<p><i>Current information on the status of learning.</i></p> <p><i>Possibility to steer the intervention in the learning process of individuals and groups.</i></p> <p><i>Possibility for immediate, direct feedback.</i></p> <p><i>Facilitation of student group work.</i></p> <p><i>Getting an impression of the learning climate.</i></p>

*Figure 3 - Benefits of social media adapted diagram from Ebner et al, 2010, p 99)*

It is without doubt that Twitter has been generally well received and seems to be enjoyed by the people who use it and as Saeed and Sinnapon note: “Once a technology is received well and is deemed enjoyable the likelihood of extending it to further educational usage is high.” (Saeed and Sinnapon, 2010, p1118). They say that their “paper brings an important contribution towards the usage of Twitter in higher education that may pave way to further utilisation of Twitter for pedagogical usage.” (Saeed and Sinnapon, 2010, p1118).

In their critical analysis of microblogging in education, Gao et al (2012) discuss how educators and researchers are integrating Twitter. They again acknowledge the way the technology allows for changes in whom, and how, people (specifically students in this context) can engage immediately and with a whole range of other users.



Kassens-Noor (2012) suggests that teachers are having to adapt to the technology and are being encouraged to be innovative in the use of Twitter in order to improve student participation, enable a more interactive environment and to excite learners. This is done in the main however, by experimenting with the technology in the hope that students adapt and embrace themselves.

In a random sample of the Fortune 500 companies (n=93), Rybalko (2011) concludes with the importance ensuring the authors of Twitter profiles are trained in how to use the tools in a dialogical manner and have appreciation of public relations practice. Waters (2011) however, explains that scholarly scrutiny has identified that most organisations (non profit, corporate, government) are still not interacting or engaging via the Internet. I understand that in this specific context, this conclusion is in relation to organisations and not educational establishments, but I believe it is an important one. One could suggest that most Twitter accounts, or even hashtags, from an educational point of view have been created on the back of the popularity of the technology.

A number of these experiments involved using Twitter to enable instant feedback during class and Kassen-Noor explains that “Twitter has been primarily used as an instant feedback tool for student-teacher communication and is in the early stages of exploration for student-student interaction.” (Kassens-Noor, p 11, 2012). With Wankel (2009) concluding that this type of live tweeting within the classroom encourages careful listening, improved attention, information gathering, and multi-tasking.

A study by Junco (2010), which at the time was the first of its kind, concluded that using Twitter can increase engagement and improve grades. The experiment was one semester long and involved 125 students, 70 of which were in an experimental group (where Twitter was used to communicate amongst students and teachers) and 55 students in a control group. Junco suggests that students were “both highly engaged in the learning process through communication and connections on Twitter” (Junco, p 130, 2010).

Another study by Sandars, Homer, Pell & Crocker (2010) revealed that a higher percentage of students use the technology - as much as 70% of a cohort. A conclusion was drawn that I feel is very important: the use of Twitter should be integrated into current curricula and more importantly within the students' virtual learning environment.

### **2.3 Twitter in healthcare**

If we try and relate this more specifically to healthcare there are a number of papers to suggest that there are unequivocal benefits when using microblogging, in particular, when interacting with patients. Hawn (2009) explains that physicians and medical professionals who use e-health are likely to achieve happier patients and a more patient-centered system. In a USA national survey, Bosslet et al (2011) explain the patient-doctor relationship using online social networks including Twitter. They found that although they do create an opportunity for the development of relationships between clinicians, medical students and patients, there is still some degree of ethical acceptability that concerns those involved.

George and Dellasega (2011) carried out two pilot studies using social media on graduate-level medical humanities students and concluded that patients have indeed begun sharing their experiences and offering support to fellow patients using the technology.

NHS employers have taken “a leading role to promote and encourage the use of social media in the NHS. We have produced a suite of publications covering topics, such as increasing staff engagement with social media, HR and social media as well as an essential guide for chief executives” (NHS Employers, 2014)

Both Hawn and Prasad suggest that although these interactions offer opportunities and empowerment for patients, they raise concerns around both standards of care and patient privacy (Hawn 2009, Prasad, 2013). Indeed, Prasad offers a word of caution: “there have been a number of high-profile cases where physicians have been fired

over indiscreet postings on social media sites, particularly where there is the risk of patient confidentiality being breached” (Prasad, p494, 2013)

This is also noted by Boulos et al (2006), whilst they also raise concerns over the possibilities of blogs being vandalised, issues around copyrighted material being violated and probably most worryingly, content being re-posted with incorrect or misleading information (Boulos et al, 2006). Although these issues are raised they provide no actual evidence to suggest this is, or has happened within their research.

There is however, a strong body of literature to suggest that there is in fact disagreement between medical professionals that the use of Twitter as a communication tool between patients and medical professionals is acceptable (Bosslet, Torke & Hickman et al. 2011).

There is also disagreement amongst the myriad of policy and guidance, NHS Employers (2014) provide tips on how to use Twitter and suggest that leaders, teams and organisations embed social media in their organisation. They provide links to guidelines from 3 main regulators; Nursing & Midwifery Council, General Medical Council and Health and Care Professions Council and 10 other professional bodies providing guidance and policy; Royal College of General Practitioners, British Medical Association, Royal College of Nursing, Royal College of Midwives, Royal Pharmaceutical Society, British Association of Occupational Therapists & College of Occupational Therapists, British Dietetic Association, The British Psychological Society, Chartered Society of Physiotherapy and the British Association of Social Workers.

Clinicians are often torn between having a professional and personal presence online (essentially two accounts) and one could argue that this is due to the sheer volume of information they are provided with. DeCamp & Cunningham (2013) suggests that this has resulted in clinicians making the choice to not engage at all and they also suggest that this will not change unless more and more of their peers become engaged.

The practicality of using Twitter may seem an unlikely disadvantage but put into the healthcare context we can discuss a number of potential areas of concern. The content that clinicians post online can negatively affect how much they themselves are trusted, the organisation they work for and the profession as a whole, which could of course reflect badly on their reputation and career progression (Prasad, 2013).

Many medical professionals argue that they should not just follow the trend and join the Twitter community. There is still an apparent varying access to technology issue, with a point to be made that certain types of people/patients will not have access to this type of technology and this divide is pretty much unmanageable, particularly when we look at the digital divide between generations (DeCamp & Cunningham, 2013).

Twitter usage in healthcare comes into its own during conferences and official events. Robinson (2013) explored this and discovered a 56% increase in activity from 2011 to 2012 across four major US conferences and concludes that there are opportunities for new publications and also a number of areas for future research or analyses. I will discuss the healthcare hashtag movement in section 2.4.

The idea of a non-verbal, real-time, communication which does not interrupt a presenter or event can be described as digital backchannel communication, and this type of communication is becoming more popular within academic conferences, education and organisations (Ross, 2011).

Ross describes the reasons for Twitter being used in this setting being down to “lack of feedback, nervousness about asking questions, issues raised by the single speaker paradigms where the focus on only one speaker can lead to a decrease in participation by others’, reduction in collaboration and interaction due to the limiting factors of the setting” (Ross, 2011). By having an official Twitter hashtag for a conference Ross (2011) suggests that this allows for a much more active participation in the backchannel discourse. Whilst Gao et al describe a number of studies that showed “microblogging can be used to enable interactions between audience and speakers in a

live event or to encourage virtual participations from people worldwide” (Gao et al, 2012).

One of the most relevant papers for me is that of the 2009 H1N1 (‘swine flu’) pandemic in 2009 in which Chew (2010) used a content analysis of tweets to discuss whether knowledge could be transferred by analysing the term ‘swine flu’ against the recommended H1N1 term created by the World Health Organisation, whilst also looking at the sentiment of tweets by developing 6 categories in which to group the 5,396 tweets. Although the results are not of particular interest in this situation a more important conclusion for me is “the potential and feasibility of using social media to conduct “infodemiology” studies for public health”. She also goes on to say that Twitter will allow “health authorities to become aware of and respond to real or perceived concerns raised by the public” (Chew, 2010)

#### **2.4 The healthcare hashtag community**

There are certainly a significant number of hashtags created around healthcare, education and even undergraduate medical education, although there is a paucity of scholarly work that identifies any major conclusions as to whether these are serving much more of a purpose than just bringing information together.

What are becoming more available are analytical tools and an understanding that this content generation can be valuable across the healthcare community around the world.

The Symplur website maintains the largest database of healthcare related conversations via Twitter and describe the goal of the Healthcare Hashtag Project “to make the use of Twitter more accessible for providers and the healthcare community as a whole. By lowering the learning curve of Twitter with a database of relevant hashtags to follow, we hope to help new and existing users alike to find the conversations that are of interest and importance.” (Symplur, 2014, <http://www.symplur.com/healthcare-hashtags/>)

The project has not gone unnoticed in the academic community either as Prasad (2013) explains: “The Healthcare Hashtag Project analyzes the group influence and growing role of Twitter in health care, which has resulted in a captured conversation that is now over the 100-million tweet threshold, which equates to 100 million individual pieces of health care information shared. These numbers are staggering, and it is hard to ignore the momentum of this form of medium.” Whilst McCracken (2012) suggests that the project simplifies Twitter for the healthcare community. He also goes on to suggest some healthcare related hashtags, some of which I will explore now.

The #nhssm hashtag and linked account @nhssm has 20,792 followers and was created in April 2010. They ‘meet’ weekly to “discuss the use of social media in the UK’s National Health Service (NHS)” (Social Media in the NHS, 2014). The website, hashtag and account are managed by 2 NHS employees and a patient lead. The site brings together the chats and some information but provides little more and does not seem to be regularly updated - one could argue the role of the hashtag provides all the content they require. An assumption is made that this site, account and hashtag are all managed by the individuals in a voluntary manner.

Figure 4 shows the tweet activity from the #nhssm hashtag for the period 1<sup>st</sup> August 2013 and 31<sup>st</sup> July 2014.

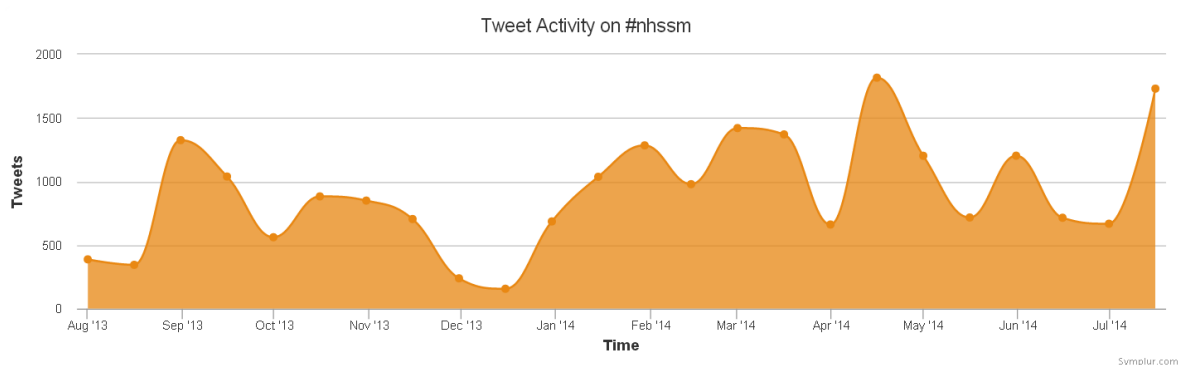


Figure 4 - Tweet activity of #nhssm for period August 2013 - July 2014 taken from Symplur.com

#FOAMed, which is an acronym of Free Open Access Medical Education, has a large following in which medical professionals from all over the world share resources for free. The original term FOAM - Free Open Access Meducation was coined in June 2012 at the International Conference on Emergency Medicine. “FOAM is the concept, #FOAMed is the Twitter hashtag” (Lifeinthefastlane, 2014)

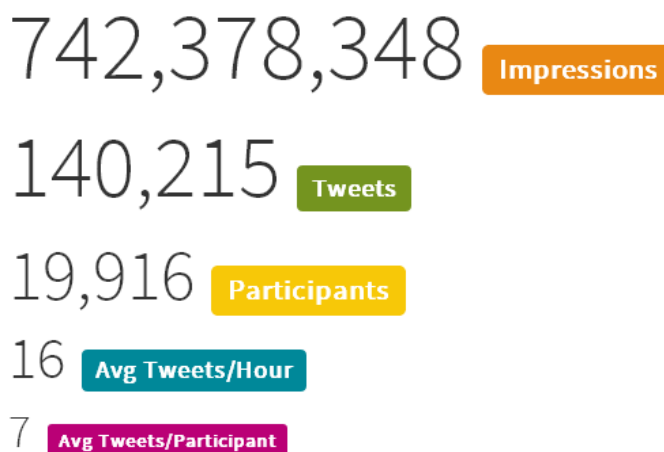


Figure 5 - Tweet activity of #FOAMed for period August 2013 - July 2014 taken from Symplur.com

Green suggests that “the enthusiasm around FOAMed centers on the ability of participants to share opinions about new research, suggestions on clinical technique, and other ideas rapidly through Twitter and blogging” (Green, 2013). Yet she also identifies that there is not much data supporting learning through collaboration online versus the more ‘traditional’ ways, specifically regarding clinicians.

Figure 5 gives us some idea of the numbers involved who are interacting with the #FOAMed community. Nickson (2014) describes FOAM as a dynamic collection of tools, an exciting global movement, an add-on to traditional teaching and an aid to knowledge translation whilst identifying flaws and challenges that can be managed. He concludes that it “can be integrated into an asynchronous learning and ‘flipped classroom’ model of education, or used to supplement existing educational approaches (Nickson, p82, 2014).

The medical education community hosts a weekly conversation on Twitter about topics in medical education and the #MedEd hashtag chat takes place over an hour on Thursday evenings (there are actually two chats happening, one geared toward Europe

and the other geared to North America, both administered by clinicians). All participants are asked to use the #MedEd hashtag so the conversation is kept together. The last (US) based chat on 21<sup>st</sup> August 2014 was around three different topics;

- @mededchat “TOPIC 1 - What should educators do when learners exhibit severe deficits in a major competency? What if they seem beyond remediation? #meded”
- @mededchat “TOPIC 2 - What should a learner do if s/he DOESN'T recognize his/her deficit? What if s/he feels sanctions/penalties are too harsh? #meded”
- @mededchat “TOPIC 3 - How could a learner make the best of his/her bad situation? What role(s) should/shouldn't SoMe play in a learner's recourse? #meded” (#MedEd chat transcript, 2014, Symplur)

During this hour long chat there were 544 tweets and 75 participants, with an average of 7 tweets per participant.

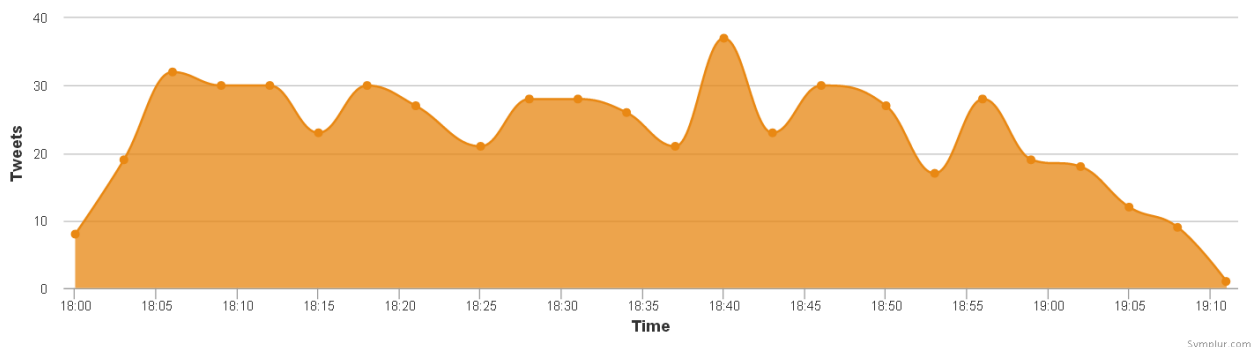


Figure 6 - Tweet activity of #MedEd chat 21st August 2014. Downloaded from Symplur.com

## 2.5 Twitter in Medical Education

There is still a lack of conclusive evidence to suggest that Twitter is being used in the medical education area with an effect on the performance of students. What we do know is that it is being used and the feedback from students is generally more positive than negative (Bahner et al, 2012, Cartledge, Miller, Phillips, 2013, DeCamp & Cunningham, 2013, Weberg, 2009,). Alongside this Cartledge (2013) suggests that because of the didactic nature of social networks it becomes difficult to deliver



material, the reason for this is that Twitter posts are not didactic but rely on the collaborative nature of participants.

Green (2012) suggests that older clinicians may see students suggesting Twitter posts that are relevant to a clinical decision that is being made and they should welcome that. Regular means of collecting content via journals is still being used of course, but a new group of students and junior doctors are immersing themselves in social media and bringing a different way of thinking about the literature, alongside providing a huge amount of it.

More and more medical schools are using the flipped classroom model where the learner is essentially looking at the problem prior to facing or discussing it with a tutor. There is a suggestion by Green (2012) that tutors are seeing more engagement using these tools and students are reaching out to others who are not in the classroom to learn from each other, using 'whatever tool that works' - Twitter being one of those.

A US faculty member in Pharmacology, Gina Thames (2009), is using Twitter to critically evaluate the information and sources of healthcare stories and concludes that she sees Twitter as a very useful tool when helping students form opinions and verify information. Thames (2009) also goes on to explain how they will set challenges to students to find news and then rank a list of the best tweets on a course blog.

A study by Sandars, Homer, Pell & Crocker (2010) suggested that a large percentage (70%) of medical students use Twitter and the main conclusion stated that use of Twitter should be integrated into current curricula and just as importantly - embedded within the students' virtual learning environment. The work by George and Dellasega introduced next highlights this in more detail.

George and Dellasega (2011) conducted two case studies in order to achieve pedagogical goals through social learning. The first case study used Twitter in a creative writing elective placement and the medical students involved found that

developing their skills to succinctly phrase their thoughts and ideas was a valuable skill, especially as in their future careers as Doctors they will need to communicate both concisely and comfortably at all times. They also highlight students' 'lively discussion' and merging texts using the Twitter interface and suggest that this helped them process a number of parts of their medical school experience.

The second study also used Twitter integrated into course activities. George and Dellasega (2011) explain that participants were encouraged to use Twitter to send observations from the field to the course tutor. This allowed the tutor to observe and respond to questions in real-time whilst also creating an archive of content that was used in later discussions in the classroom.

Both of George and Dellasega's (2011) studies received really positive student feedback. They concluded that the activities they carried out offered benefits over and above traditional educational materials and methods and that "in both case studies, social media applications provided platforms that enabled novel moments of learning to occur." Whilst specifically concluding that Twitter "sustained and augmented learning conversations, enabling real-time dialogue to take place between instructors and students; this ultimately made homework assignments a more dynamic experience, while encouraging creativity on mediums familiar to a generation of students facile with such technology." (George and Dellasega, e432, 2011)

There does however, seem to be evidence to suggest that students, unlike their seniors, are posting unprofessional content on social media. Chretien (2009) discovered that 47 out of 78 (60%) US medical schools reported incidents of students posting unprofessional content online. But they do conclude that schools may not have adequate policy in place, and even though this study was in 2009 a lot has been done about this due to the number of students using social media. What we can see is that medical schools are changing, and as Green (2012) explains there are certain US universities that are running courses specifically aimed towards the digital natives around digital professionalism especially when students are adjusting to clinical medicine.

## Chapter 3 | Methodology

### 3.1 Research questions

I have decided upon three research questions when designing this methodology and I will look to answer these questions over the course of the next chapter (Results & Discussion). In this chapter I will endeavor to explain the rationale behind the choices I have made whilst providing some context for this rationale. I will also discuss my research methodology that will allow me to answer the following questions:

1. Who is using the #McrMed hashtag?
2. What are people using #McrMed to talk about?
3. Are people being emotive when using #McrMed hashtag?

Although these questions are the key questions in this study, I do hope to explore some other questions as a result of the data I collect. The three above are however the main focus of this content analysis and thus my rationale and the context of such mainly discuss these. I hope to draw further conclusions with the data collected in Chapter 4.

### 3.2 Rationale & Context

Although the #McrMed hashtag was created by a student, is it actually being used by students? Are all the Tweets coming directly from MMS? I hope to identify key authors and types of authors, which will allow for reflection as to which categories are most prominent. Can the 90:9:1 ratio suggested by Nielson (2006) be assigned to users in this community?

The Bachelor of Medicine, Bachelor of Surgery course (MBChB) at Manchester is a five-year course. In 2013/14 there were 738 students based within MMS Stopford building

on Oxford Road in Manchester in Years 1 & 2. The ‘clinical years’ are in the 3rd, 4th and 5th years where students are based around four different base hospitals:

- 372 students at Central Manchester University Hospitals (approximately 0.4 miles from MMS)
- 384 students at Salford Royal Hospital (approximately 5.9 miles from MMS)
- 399 students at University Hospital of South Manchester (approximately 7.9 miles from MMS)
- 253 students at Royal Preston Hospital (approximately 38.2 miles from MMS)

Understandably due to the geographical location of some of the students, building a community is of obvious importance to MMS. In January 2014 they launched the Manchester Medical Student Communities (MMSCs). MMSCs are made up of around 125 students from every cohort who are at, or will be joining, the same base hospital. A bespoke social network (called the Hub) was also created to enable interactivity between students and clinicians. “The Hub is an online meeting place for you to get in touch with other members of your MMSC. You can contact your MMSC Champion and students from all years in your MMSC directly, ask questions, start a discussion and share information. The Hub has an informal feel, but professional standards of behaviour still apply” (Manchester Medical School Communities, The Hub website, 2014).

My job role in all of this should provide more context, which I will also reflect on later in Chapter 6. I am the IT and Communications lead within the Undergraduate Medical Education Department at Central Manchester University Hospitals Foundation Trust (CMFT) - the department’s primary function is to support and administer the medical student journey through the clinical years. My role covers a range of areas; I interact with a whole range of medical students and provide technological support to them as and when required.

I created my own Twitter profile in February 2009 (@Mr\_Masterman) and really started to understand how I could utilise it on a professional and educational level around a

year or so later. I decided to create an account specifically for the department in February 2011 (@CMFT\_UGME) as I felt it could provide an innovative and different way of interacting with our students - I believe it was the first hospital administered account aimed at MMS students. Most of the tweets and interactions from the account @CMFT\_UGME are published by either myself, or two other colleagues; one who is the student support manager and the other a clinical skills tutor.

The account now has 639 followers and a number of partners, colleagues and academics linked to MMS have followed suit subsequent to the creation of this account and now have their own accounts.

MMS is at the forefront of developing educational content especially for mobile learning. A huge amount of this has been created particularly over the past 3 years, the majority of which is available online. This content is not just available via the students' virtual learning environment but also on open access sites such as YouTube, where an abundance of videos have been created specifically for MMS students.

In 2012 the School made a decision to provide each student in the clinical years with an Apple iPad tablet to enhance students' learning experience and to some extent, enable a better connection to the students who are away from the Stopford building. Feedback over a number of previous years from the National Student Survey identified that students did not feel connected to the school when they are based in one of the four hospital sites. In part I want to understand if access to this technology has meant that more students will engage with the hashtag. Having access to this technology surely enables more opportunities to use tools like Twitter to develop the desired community feeling. Is this the case?

Just as important as who is using it, is what are they using it for? Hashtags are designed to bring together a community, a topic, idea and/or events. Yet the purpose of the #McrMed hashtag was never really identified, it is assumed that this will mean that the hashtag lacks any regular or linked discourse. Having been created by a student one could argue that the main users will be students, if not who will the users

actually be, and can I identify what links them to using the hashtag. It would also be useful to discover who else is using the hashtag apart from students, at this point an assumption is made that there are others, but who are they and what are they talking about?

I have discussed in my literature review that there seems to be an awful lot of activity based around hashtags and specific Twitter communities, the literature would suggest that most of this discourse is information sharing and chit/chat or commentary; is this trend continued within #McrMed?

It was also identified that the tone of tweets can be a good way of analysing the general feeling amongst users in a online community and with the emergence of internet trolls and more and more customer service complaints being channeled via Twitter I am interested to see (as is MMS) if the general tone of the Tweets is neutral, positive or negative.

I will indeed look for any examples of unprofessional behavior or ethical issues amongst the data. These are still issues raised by medical professionals that I have discussed in my literature; one would suggest that this data set could provide some further evidence for or against these claims

### **3.3 Content Analysis**

Weber (1985) says “Content analysis classifies textual material, reducing it to more relevant, manageable bits of data. Social scientists who must make sense of historical documents, newspaper stories, political speeches, open-ended interviews, diplomatic messages, psychological diaries, or official publications - to name a few - will find the technique indispensable.” (Weber 1985)

The term content analysis was new to me when I started this research. There is a huge amount of scholarly work on the subject and quite a lot of recent research that uses Twitter as the main data source. The methodology in these though is usually quite

varied due to the authors asking different types of questions and inevitably, the data collection methods and coding schemes are varied.

Linvel (2012) notes a number of papers that have done a content analysis of tweets based around dialogic communications and theories (the idea that communication online is two-way and not just the dissemination of information), but again a specific coding scheme was developed to analyse a sample of 1130 tweets from 13 different colleges and universities across the United States. The introduction to dialogic communications and theories was of value but this kind of in-depth analysis was not suitable for this type of data.

### **3.4 Data analysis and coding**

The data set was collected using Twitter's own application programming interface (API). This is easily searchable and open to all. The date ranged used for this study was from the 1st August 2013 to the 31<sup>st</sup> July 2014 - this range covers the academic period for all students on the MBChB course for the 2013/14 academic year. It is felt that this time period gives a wholesome view of the 'normal' activity and in fact will be the first full academic year in which the hashtag could be analysed.

Each tweet will be coded on its own merit, by that I mean the information provided in the tweet will form the coding categories, not the information that maybe linked from the tweet to outside of Twitter. That said most pictures and some video links contained within a tweet usually include a preview or screen shot of the content and in this instance that information will be used to code appropriately.

Manual data collection took place over three days with one person coding the tweets and another inputting the data into a pre-defined spreadsheet, both coders work within undergraduate medical education at CMFT. Each tweet was carefully studied to clearly identify the categories that were chosen for coding, I will discuss these categories in more detail next. See appendix for a copy of the full data sheet.

Four initial coding categories were developed to ensure the data collected would answer the three research questions I outlined at the beginning of this chapter. The main four categories are author, type of tweet, what is the tweet linked to and tone.

Although efforts were made to look at collecting and even calculating the overall data by computational means (via SumAll, Hootsuite, Symplur, TweetReach, Twapper and Twitter itself), due to changes in the Twitter API historical data is now not available to the public as it may have been previously, in some cases it is possible but this would have required significant financial outlay, which I did not feel the need to do given the other options.

In order to answer the first research question - Who is using the #McrMed hashtag? - it was important to understand and categorise the type of authors as well as identify and collect the usernames of each author - it is hoped that this will allow for an understanding as to the number of actual authors vs. the number of tweets posted.

The main objective of this is to try and quantify whether the number of tweets in a category is disproportionate because of a certain user or small number of users. It is to be expected that categorising authors may sometimes be impossible as not all Twitter user accounts have a description - only information available on the users' Twitter profile will be considered when trying to categorise authors, no further investigation will be carried out. It is likely that the two coders have an awareness of individuals that may not have a full description of the profile given their roles within MMS and this should be considered.

All authors (where possible) will be coded at the time the tweet was posted, for example, some students may now be doctors, staff previously based within the School may have changed jobs to a new organisation.



The coding categorisation of authors table is displayed in figure 7.

<b>Author</b>	<b>Definition</b>	<b>Example account name</b>
<i>MMS</i>	<i>A member of staff within MMS, either clinical or non clinical, including MMS Twitter account @MMS_UoM</i>	<i>@ProfFreemont @MMS_UoM</i>
<i>MMS Student</i>	<i>A student from MMS</i>	<i>@znbaj</i>
<i>MMS student society</i>	<i>A student society affiliated with MMS - most accounts are managed by a student committee member</i>	<i>@scalpel_mcr</i>
<i>NHS</i>	<i>Clinical or non-clinical NHS staff member, dept or organisation. Including teachers from any of the four base hospitals</i>	<i>@NickHarveySmith @CMFT_UGME</i>
<i>Other</i>	<i>An account that does not require categorisation or a student/person from another organisation</i>	<i>@GMCuk</i>
<i>Unknown</i>	<i>An account that cannot be identified or is protected</i>	<i>@haider_ali</i>
<i>UoM dept</i>	<i>Another department within the University of Manchester</i>	<i>@AlumniUoM</i>

Figure 7 - Author coding categories, definition and example

The main author categories are aimed at identifying the different personnel, whilst also identifying who they are within the school. It is also important to identify the different personnel that are based outside of MMS (teachers based in the four NHS hospitals are not, in most cases, directly linked to MMS but teach students as part of their clinical role). The student and student societies have been separated because although students generally manage the student society accounts, there is no specific student or students generally linked to them. This will be considered in more detail in the results and discussion chapter.

By linking the two of these categories together (authors and type of tweets) I hope to understand and draw some conclusions as to why certain authors are tweeting about particular things and I think it will be useful to understand what categories are providing the majority of discussion for each group of authors.

The second research question - ‘what are people using #McrMed to talk about?’ required categorisation and analysis of each tweet involved in the #McrMed discussion. Having analysed literature in relation to content analysis of tweets it was clear that in the majority of scholarly work, all ‘type of tweet’ coding categories differed and were dependant on the type of information the researcher wanted to analyse. There are however, some general categories that seem to re-appear. Commentary, information sharing and experience are such examples - although sometimes described differently - but in definition usually the same or similar.

By the very nature of this research it is almost impossible to categorise every tweet exactly how the author may have intended. Small (2011) categorises tweets in a study of Canadian politics into 9 different categories, going into immense detail for each tweet and by doing so gathers some extensive data on the discourse on a random sample of over 30,000 tweets with a specific hashtag. Those categories provided a good basis to work from and thus I present the categories that were defined when coding the #McrMed hashtag in figure 8.

Category	Definition	Example
Advertising	A tweet that is advertising something	Surgical TALK! A forum for individuals at any stage of their career to discuss surgery <a href="#">link</a> #ilovesurgery #mcrmed
Commentary	A tweet containing un specific commentary on something other than an experience	Good luck to everyone @MMS_UoM sitting year 4 OSCEs this week! #McrMed #ukmeded
Experience	A tweet that includes a comment on an experience they have been involved or participating in	Great day at my GP practice today #McrMed
Information sharing	A tweet containing knowledge or information sharing	Check out this video from @CMFT_UGME <a href="#">link</a> #McrMed
Modified tweet	A tweet containing another tweet that the users may have edited or included the #McrMed hashtag	RT @Kind4Kids: 10 keys to success in 3 <sup>rd</sup> year #medschool <a href="#">link</a> #meded #mcrmed
Question	A tweet containing a question for the community	How many words does my PEP have to be? #McrMed

Figure 8 - Type of tweet coding categories, definition and example

By coding each tweet in one of these six categories I hope to answer what people are using the hashtag for whilst also trying to understand why they may be using the hashtag for this purpose. Understandably without further investigation a clear conclusion may not be possible in all cases, I will also include a sub-category field to identify if there seems to be more than one category within a tweet (the sub-category field will use the same type of tweet categories shown in figure 8.

The final research question - Are people being emotive when using #McrMed hashtag? - will be answered by categorising the tone of each tweet as: positive, negative, neutral or not applicable.

Further data will be collected in order to provide some further investigation into the interactivity and popularity of each tweet and to provide further explanation to the purpose of a tweet, they are:

- Month - the month the tweet was posted
- Link to: Website - a tweet that contains a link to another website, Picture - a tweet that contains a link to a picture, Video - a tweet that contains a link to a video (if a tweet contains more than one link the first link will be coded).
- Number of re-tweets - the number of times the tweet has been re-tweeted (RT)
- Number of favourites - the number of times the tweet as been clicked as a favourite by another user. NB. an author can favorite their own tweets
- Number of mentions - the number of people also mentioned in the tweet, not including the author.
- Number of replies - the number of replies a tweet receives
- Was #McrMed included in replies - Yes or No

These supplementary categories or questions will look to provide further discussion when relating to the more generic categories I have introduced.

The month (not actual date of tweet) will be recorded to judge whether there are any trends relating to exam periods, holiday periods or indeed if there are any other reasons why people may or may not tweet at certain times, this could also be related back to the type of information they are publishing.

What people are linking to in their tweet is important as it will provide more opportunity to discuss the second research question - what are people using #McrMed to talk about and also does the linked content in a tweet have any relationship to its apparent usefulness.

The number of re-tweets and favourites is significant as it may give a deeper understanding as to the popularity of certain types of tweets or indeed specific authors of tweets.

I'm interested to see whether the number of mentions has any bearing on the type of conversations #McrMed may facilitate and does the number of mentions have any other significance. Counting the number of replies to a tweet will also provide some further evidence as to whether conversations are taking place around the hashtag, whilst defining whether the hashtag is included in these replies should, to some extent, explain whether the resulting conversation is indeed completely related to MMS.

### **3.5 Reflective journal**

Whilst conducting this research and bringing together my methodology and data coding, I decided to write a mini reflective journal in order to keep track of any issues with the data and possible recommendations for further study or investigation. The idea behind writing this journal is so I can provide some useful reflection towards the end of the study.

Moon describes reflection as "... a form of mental processing with a purpose and/or anticipated outcome that is applied to relatively complex or unstructured ideas for which there is not an obvious solution". (Moon, 1999, pp23)

This quotation rang particularly true with me as the idea of content analysis is very new to me and although I have done some research in my previous studies, there has been a significant gap in my learning. The idea that I may come across methods and concepts that are new and perhaps complex, encouraged me to continue the reflective work that has been key to my development during this course.

Alongside this I hope to reflect upon the journey as a whole and I hope to understand my decision making process and highlight some of those ‘light-bulb’ moments one would expect to experience in doing this type of work, this reflection is not purely for academic reasons but related to the way I conduct myself both as a person and professionally in my current role and in my continuing professional development in the future.

A summary of my reflections are included in Chapter 6.

### **3.6 Ethical considerations**

Due to the nature of this research and the freely available data via Twitter and the public World Wide Web there were no major ethical considerations to adhere to

## Chapter 4 | Results and Discussion

The content analysis of tweets containing the specific #McrMed hashtag between 1<sup>st</sup> August 2013 and 31<sup>st</sup> July 2014 resulted 316 tweets. A small number of tweets that were in no way related to MMS, despite containing the hashtag, were not included in the analysis. A smaller number of tweets that contained mcrmed within the tweet as a word rather than a hashtag - in the address of a website for example - were also not included.

Of the 316 tweets, all bar one of the authors were categorised and therefore a clear understanding of who is using the hashtag can be examined.

As can be seen in figure 9, the most active author group is MMS, with student societies 2<sup>nd</sup> and MMS students 3<sup>rd</sup>. 33.9% of the tweets were by members of MMS or indeed the account created by MMS. I will go on to discuss the author numbers within each category.

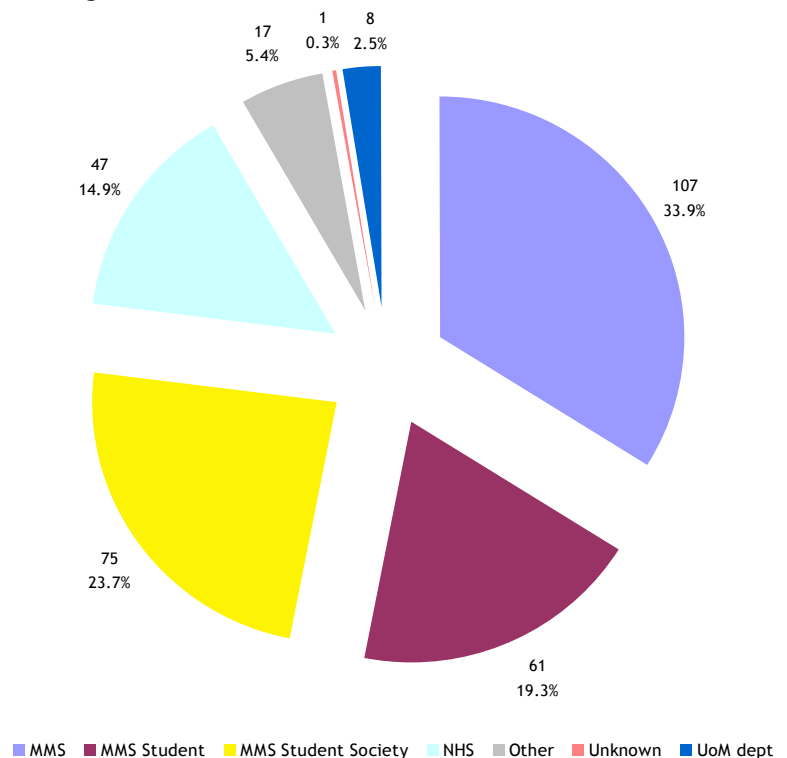


Figure 9 - Number of tweets by author category

Of the 107 tweets by MMS there were 7 individual authors, the number of tweets per author was as follows: @drcjlumsden = 30, @enamhaque3 = 30, @mms\_uom = 17, @luciebd =

15, @proffreemont = 13 @corfielddoug = 1, and @ jonijojo = 1. Although the number of authors in this category is relatively small, when we compare this to the number in the student category, the amount of content produced is considerably higher.

The number of individual authors is quite different when we look at the MMS students. Of the 61 tweets that were categorised as individual students there were 14 different authors, double that of the MMS category. One specific author, @drjshin (the original creator of the hashtag who is now a doctor, hence the username) was responsible for 20 tweets, accounting for 32.8% of the tweets. Almost a third of the tweets were his.

If we compare this number to the whole student cohort in 2013/14 which was 2146, just 0.65% of students used the hashtag and thus continues with the scholarly attention and specifically Nielsen's (2006) idea that 90% of internet users are lurkers, 9% participate a little and just 1% participate most of the time.

Student societies posted 75 tweets during the period, of which there are 13 separate authors/societies. I am almost certain that a student or number of students manages each one of these accounts, it is therefore suggested that by combining these two categories it could provide a more accurate number. This is presented in figure 10 and illustrates that 43% of the content for the hashtag has been produced by students.

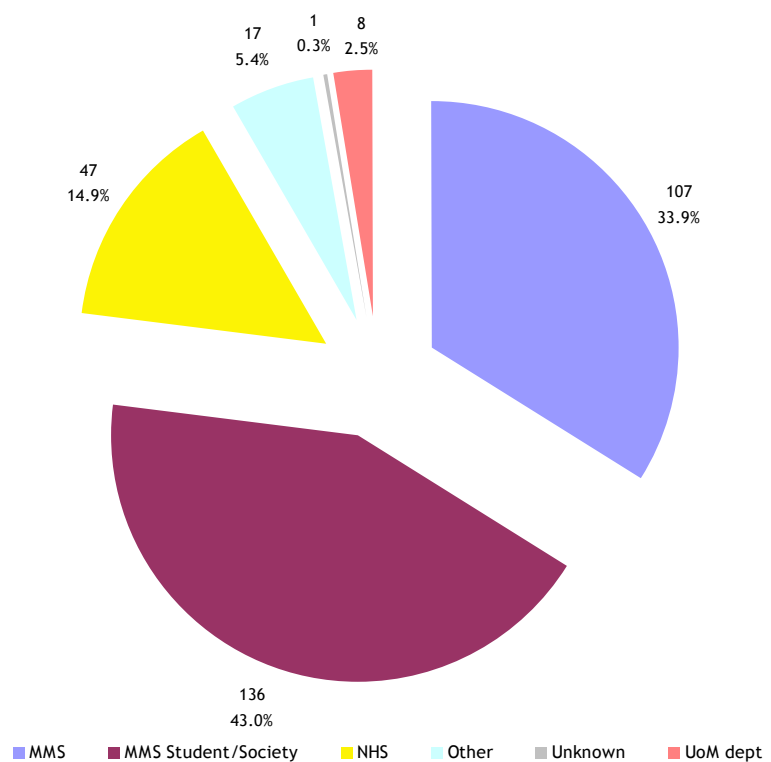


Figure 10 - Number of tweets by author category comparison

The other authors in these results are significant because although a smaller percentage, a further 12 authors who fit into the NHS category (n=47,14.9%) used the hashtag. This significance may be minimal but considering the hashtag was developed within a University system, it is interesting to see how the hashtag may have come to the attention of some of the authors mentioned and with a further 12 authors

categorised in 'Other or Unknown' it is acknowledged that it is not just people within MMS that are partaking in the use of the hashtag, albeit in very limited manner.

Having discussed who is using the hashtag and to some extent providing some clarity on how the numbers can be analysed further, I will now present the data around how people are using it.

So how are people using the #McrMed and what are they talking about? The results suggest the majority of the tweets include some type of advertising with 30.8% (97) of the tweets being categorised as such. Of these tweets, the overwhelming majority of authors are students or student societies (n=66, 68%).

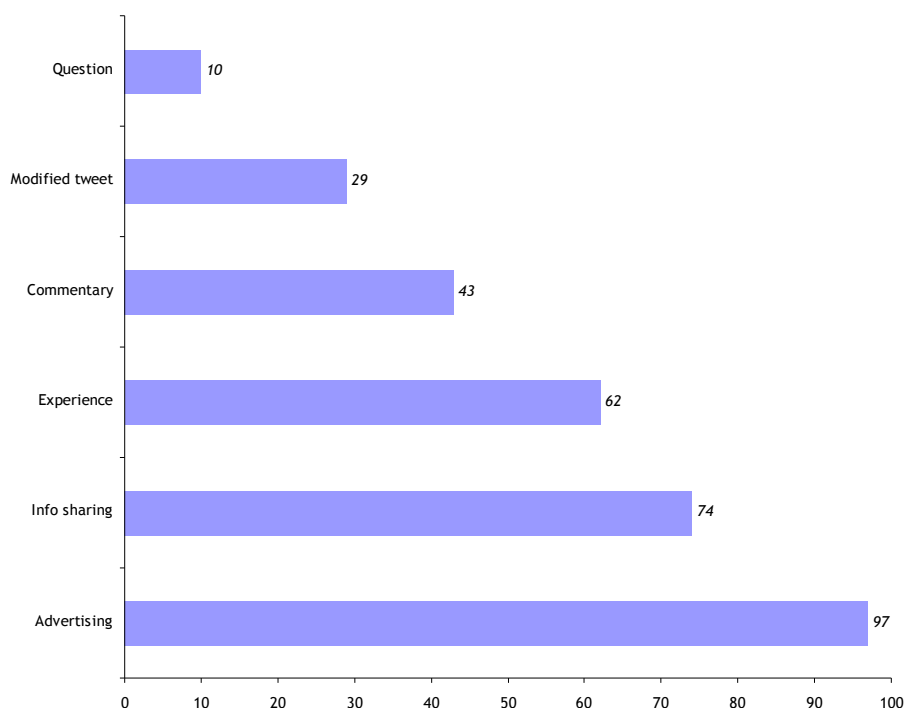


Figure 11 - Number of tweets by type of tweet category

Although a lot of the research suggests that in the main people tweet about 'nothing much' or commentary, it seems within the #McrMed hashtag that there is actually a reason for the tweet, be it advertising (n=97, 30.8%), Information sharing (n=74, 23.5%) or experience (n=62, 19.7%). What is surprising though is that in the question



category, which is the lowest with 10 tweets, 5 of them came from the same author. With only one response to one of the 10 tweets this result is fairly consistent with other research that suggests dialogic communications is not really happening in the Twittersphere.

The data showing which categories authors are tweeting about is presented in figure 12.

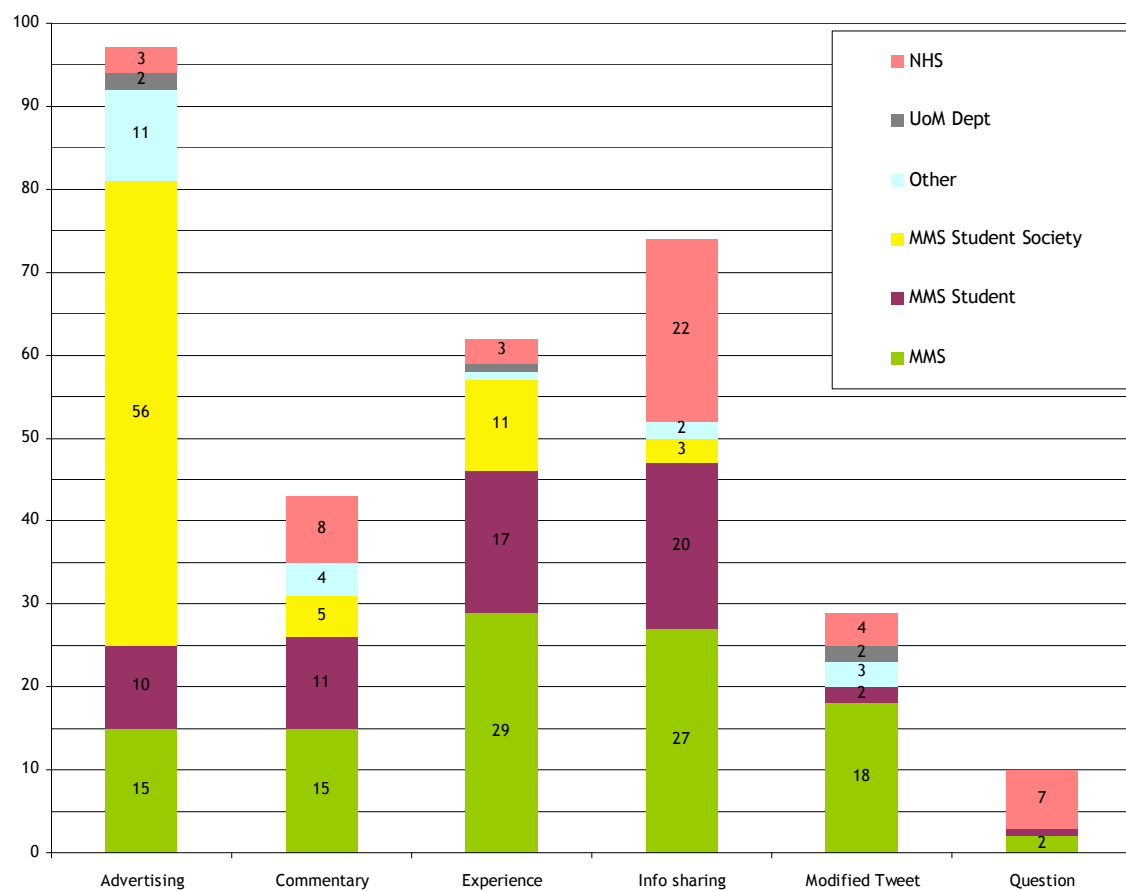


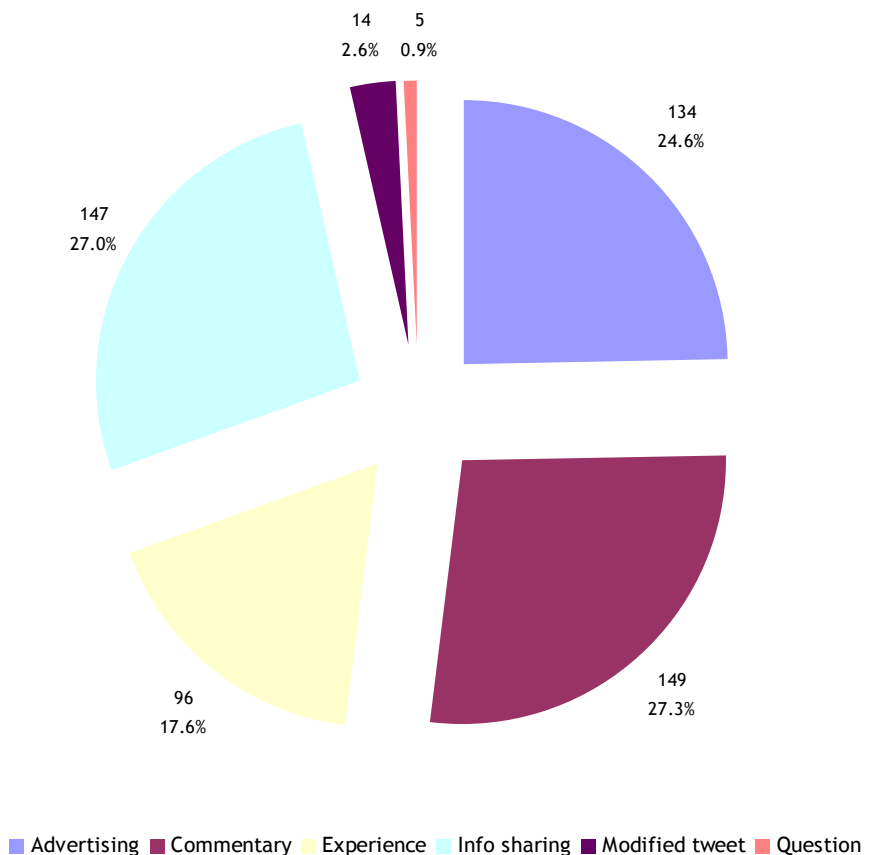
Figure 12 - Number of Tweets by authors and type of tweet category

This too presents some significant results. It is pretty clear from this that the student societies use the hashtag to advertise their events and share thoughts and comments about them.

As one would expect, the majority of the information sharing tweets are written by MMS and NHS staff, yet the experience category is the most popular category for MMS users - of which however, just 5 authors were identified. What should also be noted is the number of tweets students are posting with information as the main content. It is in fact the largest category of tweets for students (n=20, 32.8%).

Figure 13 shows the number of re-tweets by category. Re-tweeting is significant as Kwak et al state “the re-tweet mechanism empowers users to spread information of their choice beyond the reach of the original tweet’s followers.” (Kwak et al, 2010).

The numbers are quite evenly spread across the main four categories discussed earlier. What is worth noting is that overall, 199/316 (63%) of all the tweets were re-tweeted 545 times in total. What is significantly different here though is that despite advertising being the most tweeted category, the information sharing and commentary categories are more popular categories to re-tweet.



Maybe just as significant, out of the top 5 re-tweeted tweets, 4 of them

Figure 13 - Number of re-tweets by type of tweet category

were positive in tone, 3 of them were classed as commentary and 2 information sharing. Two of the tweets were authored by MMS, one from a MMS student, one NHS and one other.

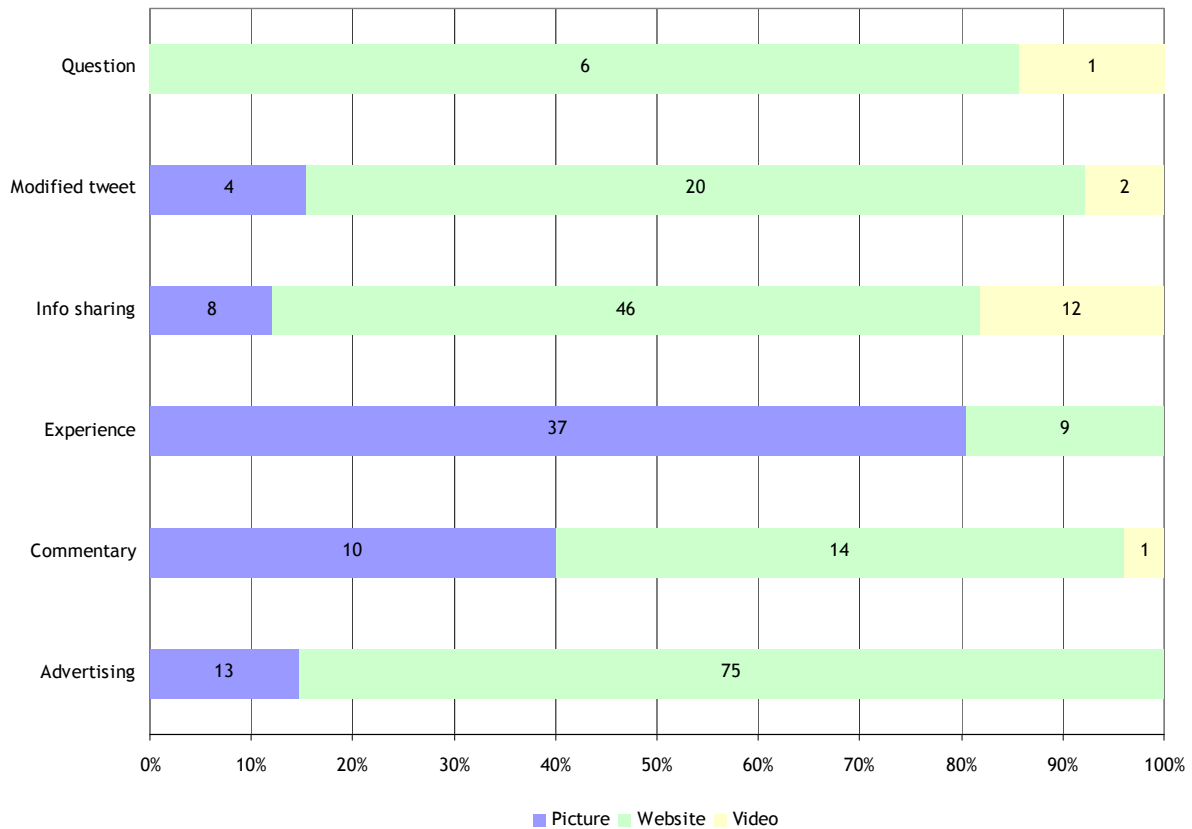


Figure 14 - Link to resource by type of tweet category

Whilst investigating the category of tweets I was also interested to see what type of content users were posting. Figure 14 shows the type of content tweets were linked to by category.

Of the 316 tweets 258 (81.6%) had a link to something, websites were the most popular linked resource with 170 (65.9%) tweets, the number of tweets with websites linked within them was 72 (27.9%) and there were 16 (6.2%) tweets with a link to a video or videos.

The information sharing category is the only one with a significant number of each type of linked content and it's worth noting the highest number of links to a video come within that category. It is clear that the experience category a higher number of tweets with links to pictures. Whilst unsurprisingly the tweets in the advertising category mainly contain links to websites.

As I mentioned earlier it is somewhat difficult to obtain historical data for Twitter hashtags. This would have allowed us to explore further into the number of impressions a certain tweet may have - impressions are the number of times a tweet has been delivered to a user's Twitter stream - we can use this number to understand the potential audience of a search term or hashtag. To put this into some perspective, according to TweetReach.com, over the period of August 8<sup>th</sup> to August 14<sup>th</sup> 2014 the #McrMed hashtag reached 14,201 accounts with 15,707 impressions - this is based on the 17 tweets in that period. Figure 15 shows the data for those 17 tweets.

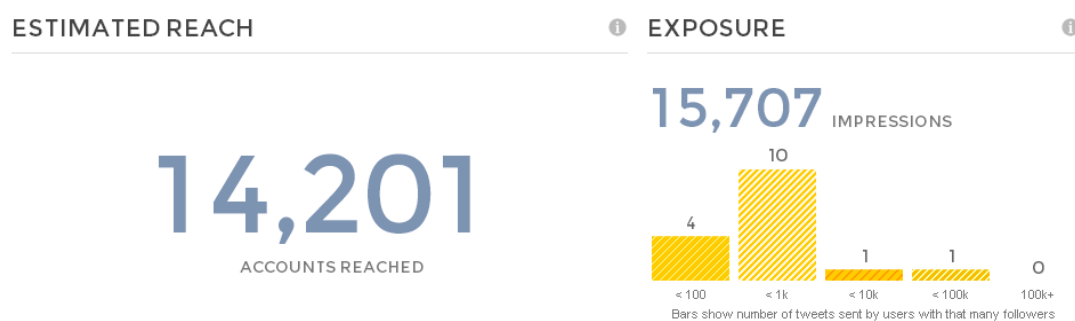


Figure 15 - TweetReach data for the period 8<sup>th</sup>-14<sup>th</sup> August 2014 [www.tweetreach.com](http://www.tweetreach.com)

By this calculation, although only estimated, each tweet containing the #McrMed hashtag would have approximately 981 impressions. Multiply this by the number of tweets during the period of coding and this means the estimated number of impressions would be 309,996 and the number of accounts reached 263,860.

The tone of the tweets across the spectrum provides important yet not surprising results. It appears that an almost insignificant number of tweets (n=2) were negative. Of these two tweets (0.6%), just one was posted by a student. This is displayed in figure 16.

Of the positive tweets (n=97, 30.8%), MMS provided 52 (53.6%), students/societies provided 28 (28.9%), NHS 9 (9.3%), Other 5 (5.2%) and other University departments posted 3 (3.15%).

The general tone of tweets overall was neutral (n=216, 68.6%). Of these, MMS student societies provided the most tweets (n=64, 29.6%), with MMS (n=54, 25%), MMS student (n=43, 19.9%) and the

NHS providing 17.1% (n=37) and the other three categories (Other, Other UoM and Unknown) providing 8.3% (n=18). Figure 17 shows the tone of tweets by author category.

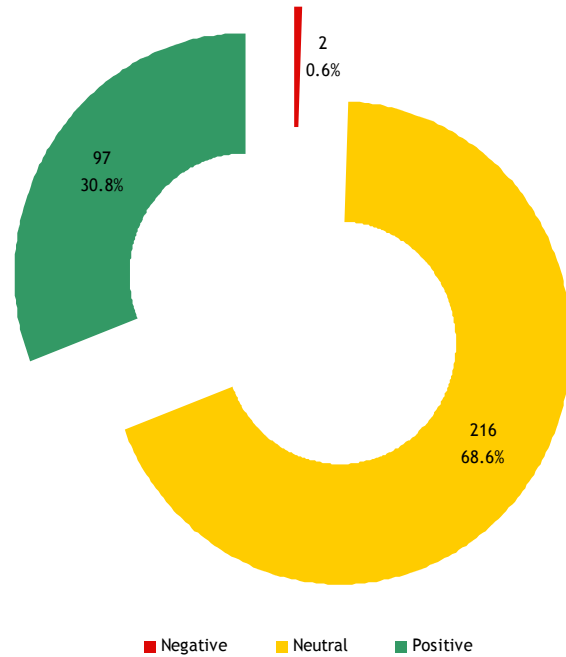


Figure 16 - The tone of tweets

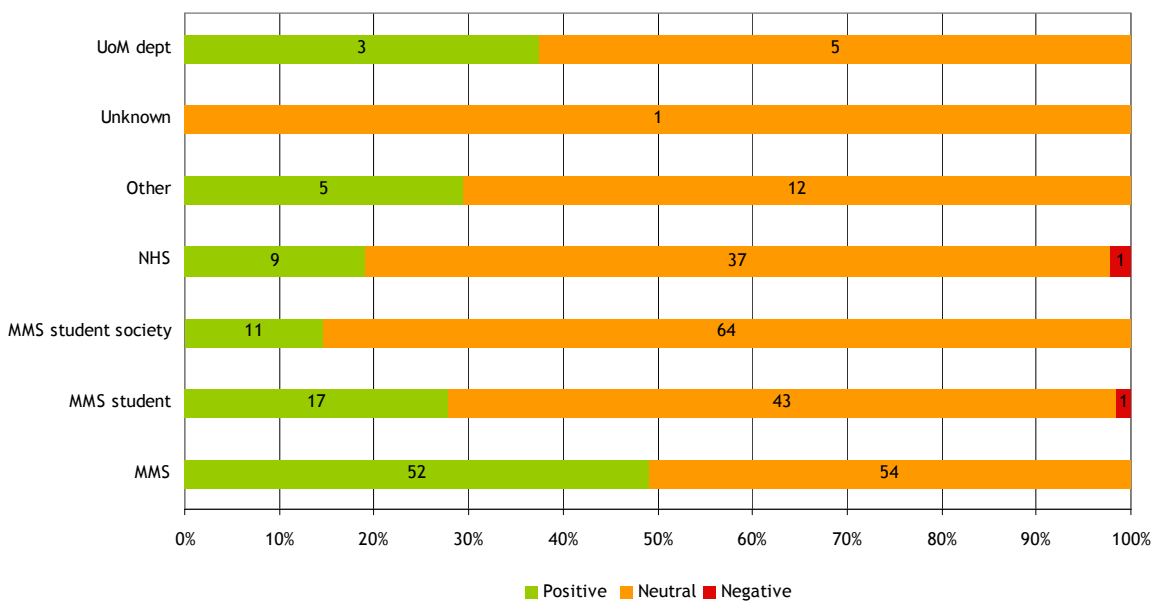


Figure 17 - The tone of tweets by author category

Out of the 316 tweets posted, only 59 (18.7%) received replies and this would suggest that there is not a huge amount of dialogical communication happening within the hashtag.

The number of replies for each type of tweet category is presented in figure 18. The category that received the largest number of replies was the commentary category (n=52, 35.1%). What is worth noting is the number of replies the advertising category received in comparison to the other data discussed.

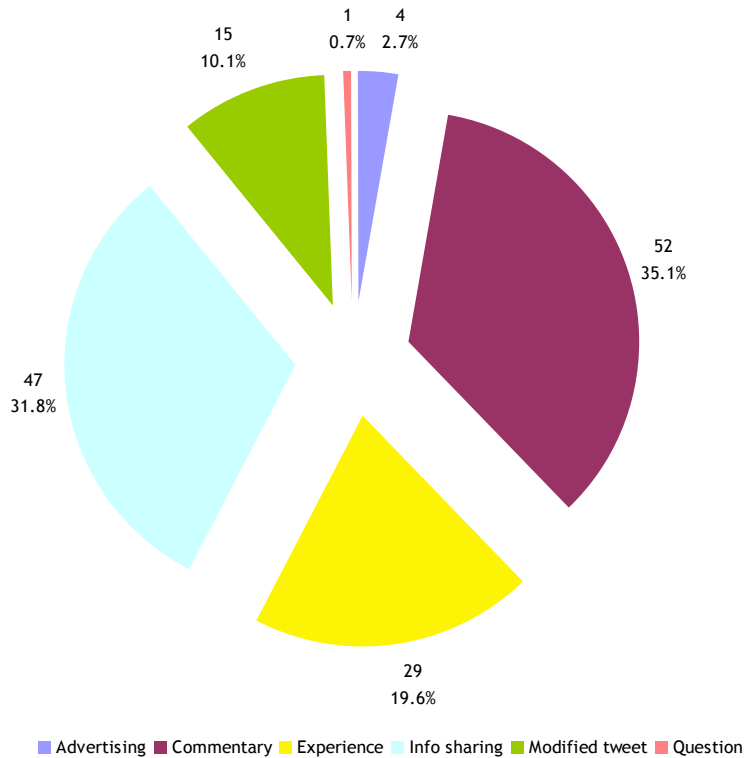


Figure 18 - Number of replies by type of tweet category

There were 10 tweets which included a question and of these tweets just 1 received a reply.

There is a slight caveat to the information sharing category in this example as one tweet provided 21 (44.7%) of the 47 replies and the subsequent replies did not include the #McrMed hashtag. In fact of the 59 replied tweets, only 14 (23.7%) included the #McrMed hashtag.

## Chapter 5 | Conclusions

There are a relatively small number of medical students engaging with the #McrMed hashtag continuing with Nielson's (2006) 90:9:1 internet user ratio. The number of authors outside the student body is harder to compare due to the almost impossible task of understanding the amount of people that could realistically engage in the community (MMS itself, NHS staff & organisations, administrators, GP practitioners and many more). Although comparatively the numbers are small, those who are using it are publishing either positive or neutral tweets around a range of categories. On the surface this is to advertise, share information, share their experiences or comment. There was a minimal amount of questions being asked and indeed answered using the hashtag.

Without further investigation it is impossible to answer whether the people engaging with the hashtag do or do not normally engage in discussions in classrooms, lecture theatres, hospital wards etc. I am convinced however, that some of the discourse around the Commentary category is happening because of Twitter and this conclusion follows on from similar work by Prasad (2013) and George & Dellasega (2011). As far as I can see there is nowhere else that this kind of publishing and content generation is happening in the online medical education domain.

It is also difficult to answer one of the questions I proposed earlier as to whether the students' access to their own mobile tablet device has allowed them to be more engaged with the Twitter hashtag. Due to the small numbers of students partaking, one could justifiably argue that it doesn't seem to have made any kind of impact. Does the Wi-Fi only element of these devices have any bearing on this and if so what types of devices are the students using to engage with Twitter?

The varied nature of the type of tweets did not come as a surprise. As I alluded to in my introduction the hashtag was created with no specific purpose or identity. When comparing to other more successful structured healthcare/education hashtags one can see a clearer and more useful discussion. This conclusion suggests that given more

structure and identity, the #McrMed hashtag could offer more affordances than currently understood, especially, in my opinion, when building a community without the need for bespoke systems.

There is also a clear understanding that patients are indeed utilising the technology and it has been suggested that the interactions between patients and medical professionals and also between patients themselves (with similar conditions) is generally a positive experience (Hawn, 2009 and Bosslet et al, 2011). I don't think this can be ignored and even if it means just acknowledging and understanding these interactions via the use of Twitter and hashtags is taking place amongst students it can only bode for potential integration as and when appropriate.

There is a conclusion to be made when it comes to content within a tweet, the data highlights that there is certainly more to a tweet than just the categories I have identified earlier. 81.6% of tweets contained a link to more content, be that a website, a picture or a video. This shows not only are people creating content for the community but they are also prepared to share resources that they personally feel are appropriate for their peers, their tutors and to a certain extent the WWW as a whole. This is not to be ignored as to some extent the users of the community are in fact peer-reviewing and partaking in their own sharing medical practice activities and for the medical students involved, this must be particularly daunting knowing that your ideas, thoughts and suggestions could be questioned by your peers (and perhaps even more worryingly) your seniors.

The amount of learning content (created by MMS) that is available to students is vast, especially open-access videos that have been purposefully created for MMS students. This begs the question as to why such a small amount (6.2%) of this content is being shared amongst the community. It's certainly not because the students don't value it as it receives high praise amongst the cohort and a suggestion may be that they are already freely available and well publicised.



I discussed the research and perceptions around why people re-tweet and how it empowers users to share information and the re-tweet data suggests that it is of immense value to the users of the #McrMed community as 63% of all tweets were re-tweeted. This not only shows that the community values the information posted but that it is reaching others outside of the #McrMed hashtag. I suppose the next step on from this would be to examine the people who are re-tweeting and if they are not directly linked with MMS why are they doing so? By the very nature of a re-tweet though we can be certain that these tweets are seen and indeed viewed by users not directly linked to MMS.

There is an apparent desire to both develop and facilitate the idea of a community or communities within MMS. It is therefore useful to acknowledge and identify that at least some of the student cohort value Twitter as a means to communicate and be a part of a community, otherwise why would they tweet at all? Students, tutors, academics, administrative staff all have shared their thoughts, experiences, and information they value however, there is a limited amount of dialogical discussion happening via the hashtag, some is taking place but not a great deal. Is this important? Why is this not happening? Is Twitter the place for this? This is not unusual though as both Rybalko (2011) and Waters (2011) concluded the same when relating it to non-healthcare related Twitter accounts. One could argue that Twitter may not be the place for this type of communication in a healthcare setting.

What could be suggested however is that this is again down to the identity of the hashtag, although it could also be as a result of the type and quantity of users interacting with the hashtag. I believe this is key to raising the awareness and effectiveness of this and any other hashtag.

If the #McrMed hashtag wants to become more than a 'random' collection of general but unrelated tweets, clear guidance and identification needs to be provided by MMS (I would suggest with student and tutor input - ideally those who are already using Twitter). The key academics, students, NHS tutors and administration staff who wish to be involved in the community need to promote said hashtag and promote its

identity and potential affordances. Of course there is no reason why the hashtag cannot continue as it is - it will continue to be used - but this work would suggest that the growth would only be temporary and still dependant on a small number of active users, who in turn may be de-motivated by the relatively small amount of interactions and other users engaging with it.

As I have briefly mentioned already, a lot of content created via #McrMed is by MMS - and valued by students. It is apparent that this is being created by a small number of staff members who are valued and respected within the community (this is important in such a peer-led area like medical education and healthcare in general). The only way to increase this valued content is to increase the number of this type of author into the community.

In order to do this I would suggest raising awareness of other hastags; #nhssm, #FOAMed and #MedEd were examples introduced earlier. There are many more which could provide a catalyst to which others see the potential of Twitter and thus relate it back to a more MMS related hashtag, be that #McrMed or others created for more specific elements of the course, communities, years, modules... The list is almost endless and there are a range of opportunities to consider. Administration is also key; the most successful hashtags I have discussed all have corresponding websites or blogs, analytics, transcripts and in some cases moderators to ensure the purpose of said hashtag or chat is taking place and being used appropriately by it's users. In most cases the moderator is there to facilitate discussion and in fact controlling the chat is not really required as it develops itself appropriately.

Education is key - not only is there still concern around professionalism and ethical issues but there is still a distinct lack of engagement due to the relatively quick development of the technology.

There is still very little evidence to suggest that unprofessionalism via Twitter, particularly by medical students is a current problem, that said of course it can and will still happen. There was certainly no evidence in this study to suggest that

anything of this nature was or is happening. There is an abundance of policy and guidance around the use of social media and I would suggest this has ensured users are aware of their responsibilities online, with much discourse in the media around the general public making mistakes and misdemeanors, I'm sure the medical profession have acknowledged and understood the potential issues whilst still maintaining an online presence.

Engagement can be achieved by education and training. Students, tutors, academics and administrative staff should be introduced to the ways in which Twitter is being used - this is the only way people can really relate to it and understand the affordances it presents, and more importantly, how it is valued by their peers (this is not just related to students). This could be a supplementary course or a fundamental part of the curriculum/training. Some would argue that the technology should and will only be used by the people that want to use it - an old anecdote springs to mind here: you can lead a horse to water, but you can't make it drink. The point here is that a decision should be made as to how and if educational establishments use the technology and until the scholarly work suggests more than just positive feedback to said courses, this could be a risk.

Once people are regular and interactive members of a community on Twitter the evidence suggests they do return and re-engage with it time and time again (weekly chats such as #nttwitchat and #nhssm as an example).

In order to achieve an interactive, effective and engaging hashtag, #McrMed (and any others that may be introduced or supported) need to be clearly identifiable, have a purpose, and some kind of supporting information as to what it hopes to achieve in relation to MMS, its students and staff. This in turn needs to be communicated amongst the relevant and interested people via appropriate means - MedLea, The Hub, email, or Blackboard.

Unfortunately I cannot answer what the #McrMed hashtag is actually for, and I'm unsurprised by that conclusion. During the lifespan of the hashtag, MMS created an

account which may since have replaced the hashtag to a certain extent. This observation is based again on the unclear purpose of both the account, and more likely, the hashtag. If users want to grab the attention of MMS or ask a question I would argue that they may now use a mention to @MMS\_UoM instead of #McrMed. Again this comes down to identification and classification, what is the account's purpose? What should people use the #McrMed for? Both are questions definitely worthy of further consideration and using the information I have presented here I would like to think these questions can at the very least be starting point to really identifying where Twitter belongs within MMS.

The potential reach of tweets in the community is considerable and this should be identified as a further opportunity. This reach can be seen most notably within the other healthcare hashtags discussed. Participants and hashtags in these domains are providing a huge amount of rich, peer led medical content that cannot be ignored.

I'm confident I have answered the initial questions I set out to answer yet for me personally the work has indeed raised more questions than I would ever have imagined. The #McrMed hashtag is being used by a community of people directly linked to MMS, whilst not tweeting about anything conclusively explicit, the general emotion is neutral with elements of positivity and fortunately there are no worrying signs of un-professionalism or negativity. There is a lot more that could be done to improve the effectiveness and pedagogical underpinning of this hashtag (and others) but let's be realistic here, #McrMed was never intended to be anything really, and yet has turned into something more than most would have predicted.

## Chapter 6 | Personal Reflection

Whilst conducting this study I have kept a journal - the way I have throughout my time completing this masters qualification, a reflective journal that I hope to learn from and use to make better decisions, understand things and make positive changes to the way I work, learn and live.

I have included specific reflections around this work in this section, as prior to the start of the study I was debating on a number of work related projects to consider exploring for this dissertation. To some extent a content analysis of the #McrMed hashtag may not have been the most obvious and even appropriate, mainly because of a shortage of understanding around Twitter within my work context, and even any significant, relative work that could potentially justify such analysis.

Some of my colleagues suggested that there would not be much or enough content to analyse, which in turn made the initial stages of the work quite important but also worrying for me. With no computational means of quickly identifying general numbers of tweets including #McrMed for the period of time I identified, it was difficult to gather such initial data to satisfy these concerns. A small-scale analysis was carried out and after discussions with my supervisor we were both happy there was indeed enough data. On reflection this was an important point in the process as it gave me the confidence that there was enough relevant data to work with.

The experience I gained from talking to colleagues and interested parties at this point (although in part fuelled my worry) was invaluable when I look back on it now, discussing the initial work, my coding categories, the data and my findings with others has given me acknowledgement that the work I was doing is of value and interest and I feel this is of real importance when working on something like this. We are all guilty of working alone at times and especially with this type of analysis one can be guilty of hiding oneself away and not looking at the bigger picture.

I discussed my job role in the methodology section to provide some context and drawing on the conclusions I have made I can reflect further on the possibilities of Twitter in medical education. I will use the information I have obtained and reflected upon to look at ways to introduce the technology in a much more pedagogical manner, whilst also looking at ways to introduce specific guidance on the use of Twitter. I will indeed share this experience with colleagues and students in order to explore my findings further and continue to analyse how we can use Twitter in medical education.

I hope to explain the opportunities for other clinical colleagues to interact and join the Twitter community by providing information that I have obtained and discovered, I will definitely be using my role to disseminate and hopefully educate others on the possible affordances of the technology, in particular hashtags.

The manual coding of tweets did present some minor challenges and although I carried out a thorough literature search and specifically examined other content analysis of hashtags, I found it difficult to actually know what to code above and beyond the categories specific to my research questions. On reflection, coding some of these elements was useful and some not so - I certainly think this was primarily due to me thinking past this work and looking at the opportunities for using this data past this dissertation.

Being introduced to the content analysis methodology has been a real-eye opener; there is a vast amount of material and studies which are all variable and posed to answer differing questions, this lead me to question my own coding categories. Was I not going into to enough detail? Was I collecting useless data that would waste important time? On reflection I think I got this about right, but I do think that is maybe as a result of knowing the subject area a little bit and not going in blind.

If I were to take on another content analysis project in the future I would allow more time for this part of the work, that's not to say I didn't for this study it's just that I can now see the value of extensive planning at this point, ensuring all relevant data is collected and in the most productive yet thorough way.

There is definitely scope in analysing the content of tweets in more detail. By this I mean the links that people include within their posts, what kind of picture is posted? Is it of value to any other people or just a snapshot of an experience. If a link to a website is included - What is it linking to, is the website a useful resource, should we trust it? If a link to a video is posted - is that video appropriate, what is it showing, has it been produced by a source that is appropriate? If it is a skills procedure - is it correct? This type of deeper analysis would, in my opinion, be of value and is certainly a consideration for further research. Potentially this would be more appropriate for more developed hashtags that have more of an identity than #McrMed.

Alongside the more professional/job related reflections I have made and how this relates specifically to my current role, employer and potential further investigation, the whole experience has allowed me to explore academic research in much more detail and relate this to me individually. Initially I wasn't completely convinced I would ever enjoy the process of research but finding a subject area, and indeed a methodology, that I have found both interesting and different has been enjoyable, challenging and incredibly rewarding.

My reflections have allowed me to challenge myself and examine the way I make decisions whilst igniting a flame to explore further research and investigation in this specific area whilst providing me with the confidence and ability to suggest possible ways of utilising the technology in the future in any given context. This is obviously of value to myself, my current and future employers.

## References

- Bahner, DP., Adkins, E., Patel, N., Donley, C., Nagel, R., Kman, NE., (2012). *How we use social media to supplement a novel curriculum in medical education*. Medical Teacher, 2012, Vol.34(6), pp.439-444
- Bosslet GT, Torke AM, Hickman SE et al. (2011). *The patient-doctor relationship and online social networks: results of a national survey*. J Gen Intern Med 2011; 26:1168-74.
- Cartledge, P., Miller, P., Phillips, B. (2013). *The use of social-networking sites in medical Education*. Medical Teacher 2013; 35: 847-857
- Chew, C. (2010). *Pandemics in the Age of Twitter: Content Analysis of Tweets during the 2009 H1N1 Outbreak*. PLOS ONE, (11).
- Cheston CC, Flickinger TE, Chisolm MS, et al. (2013). *Social media use in medical education*. Academic Medicine. 2013; 88(6):893-901.
- Chretien. (2009). *Online posting of unprofessional content by medical students*. JAMA - Journal of the American Medical Association, (12), 1309-1315.
- DeCamp, M., Cunningham, A.M. (2013). *Social media: the way forward or a waste of time for physicians?*, J R Coll Physicians Edinb 2013; 43:318-22
- DeCamp M, Koenig TW, Chisolm MS. (2013). *Social media and physicians' online identity crisis*. JAMA 2013; 310:581-2. <http://dx.doi.org/10.1001/jama.2013.8238>
- Domizi, D.P. (2013). *Microblogging to foster connections and community in a weekly graduate seminar course*. TechTrends, 57(1), 43-51.
- Dunlap, J.C., Lowenthal P.R (2009). *Tweeting the night away: Using Twitter to enhance social presence*. Journal of Information Systems Education, 20 (2)
- Ebner, M., Lienhardt, C., Rohs, M., Meyer, I. (2010). *Microblogs in Higher Education - A chance to facilitate informal and process-oriented learning?*, Computers & Education, Volume 55, Issue 1, August 2010, Pages 92-100, ISSN 0360-1315
- Ebner, M., Maurer, H. (2008). *Can microblogs and weblogs change traditional scientific writing?*. In Proceedings of e-learning 2008 (pp. 768-776), Las Vegas.
- Ebner, M., & Schiefner, M. (2008). *Microblogging—more than fun?* In Inmaculada Arnedillo Sánchez, & Pedro Isaías (Eds.), Proceedings of IADIS mobile learning conference 2008 (pp. 155-159), Portugal.



Forgie, SE., Duff, JP., Ross, S., (2013). *Twelve tips for using Twitter as a learning tool in medical education*. *Medical Teacher*, 2013, Vol.35(1), pp.8-14

Fox, B.I, Varadarajan, R. (2011). *Use of twitter to encourage interaction in a multi-campus pharmacy management course*. *American Journal of Pharmaceutical Education*, (5).

Gao, F ; Luo, T ; Zhang, K (2012). *Tweeting for learning: critical analysis of research on microblogging in education published in 2008-2011*. *British Journal Of Educational Technology*, 2012, Vol.43(5), pp.783-801

George DR, Dellasega C (2011). *Use of social media in graduate-level medical humanities education: Two pilot studies from Penn State College of Medicine*. *Medical Teacher*. 2011; 33:429-434.

General Medical Council. (2013). *Doctor's use in social media (2013)*.  
[http://www.gmc-uk.org/guidance/ethical\\_guidance/21186.asp](http://www.gmc-uk.org/guidance/ethical_guidance/21186.asp) [accessed 23 May 2014]

Greene, J. (2013). *Social Media and Physician Learning: Is It All Twitter?* *Annals of Emergency Medicine*, (5), A11-A13.

Grossec, G., and Holotescu, C. (2008). *Can we use Twitter for Educational Activities?*. Paper presented at the 4th International Scientific Conference, eLearning and Software for Education, Bucharest, Romania.

Hargittai, E., & Litt, E. (2011). *The tweet smell of celebrity success: Explaining variation in Twitter adoption among a diverse group of young adults*. *New Media & Society*, 13(5), 824-842.

Hawn, C., (2009). *Take Two Aspirin And Tweet Me In The Morning: How Twitter, Facebook, And Other Social Media Are Reshaping Health Care*, *Health Affairs*, 28, no.2 (2009):361-368

Hosek, A., Thompson. J.,. (2009). *Communication privacy management and college instruction: Exploring the rules and boundaries that frame instructor private disclosures*. *Communication Education* 58, no. 3: 327-49.

Humphreys. (2013). *Historicizing new media: A content analysis of twitter*. *Journal of Communication*, (3), 413-431.

Java, A., Finin, T., Song, X. & Tseng, B. (2007). *Why we Twitter: understanding microblogging usage and communities*, in *Proceedings of the 9th WebKDD and 1st SNA KDD 2007 Workshop on Web Mining and Social Network Analysis*, San Jose, CA, 12 August 2007, ACM, New York, NY, USA, pp. 56 -65.

Johnson, K. (2011). *The effect of Twitter posts on students' perceptions of instructor credibility*. *Learning, Media and Technology*, 36:1, 21-38

- Junco. R, (2011). *The effect of Twitter on college student engagement and grades*. Journal of Computer Assisted Learning, (2), 119-132.
- Kaplan A M, Haenlein, M, (2010). *Users of the world, unite! The challenges and opportunities of social media*. Business Horizons 53 (1). p. 61.
- Kamel Boulos, M. Maramba, I., Wheeler. S., (2006). *Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education*, BMC Medical Education 2006, 6:41
- Kassens-noor, Eva. (2012). *Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets*. Active Learning in Higher Education, 2012, Vol.13(1), pp.9-21
- Kind, T., Genrich, G., Sodhi, A., Chretien, K.C., (2010). *Social media policies at US medical schools*. Medical education online, 2010, Vol.15
- Kwak, H, Lee, C, Park, H & Moon, S (2010). *What is Twitter, a Social Network or a News Media?*. Raleigh, NC, USA. April 26-30
- Life in the fast lane, (2014). [www.lifeinthefastlane.com/foam](http://www.lifeinthefastlane.com/foam) [Accessed 11th July 2014]
- Linville, D, McGee, S, Hicks, L, (2012). *Colleges' and universities' use of Twitter: A content analysis*, Public Relations Review, Volume 38, Issue 4, November 2012, Pages 636-638, ISSN 0363-8111, <http://dx.doi.org/10.1016/j.pubrev.2012.05.010>
- Manchester Medical School (2014) *Facts & Figures*. <http://www.mms.manchester.ac.uk/about-us/factsandfigures> [Accessed 3rd June 2014]
- Manchester Medical Student Community (2014). *The Hub* <http://www.medstudents.manchester.ac.uk/what-are-mmscs/> [Accessed 11<sup>th</sup> August 2014]
- McCracken A. (2012). *#ClinMed: What have social media got to do with medicine?* Clinical Medicine 2012, Vol 12, No 4: 310-1
- McKendrick, DRA ; Cumming, GP ; Lee, AJ (2012). *Increased Use of Twitter at a Medical Conference: A Report and a Review of the Educational Opportunities*. Journal Of Medical Internet Research, 2012, Vol.14(6), pp.197-206
- McPherson, M. (2001). *Birds of a Feather: Homophily in Social Networks*. Annual Review of Sociology, 415-444.
- Moon, J. (1999). *Learning journals : A handbook for academics, students and professional development*. London: Kogan Page.

- NHS Employers (2014). [www.nhsemployers.org](http://www.nhsemployers.org) [Accessed 11th August 2014]
- Nickson. (2014). *Free Open Access Medical education (FOAM) for the emergency physician*. EMA - Emergency Medicine Australasia, (1), 76-83.
- Prasad, B. (2013). *Social media, health care, and social networking*, Gastrointestinal Endoscopy, Volume 77, Issue 3, March 2013, Pages 492-495, ISSN 0016-5107
- Rybalko S, Seltzer T. (2010). *Dialogic communication in 140 characters or less: How Fortune 500 companies engage stakeholders using Twitter*. Public Relations Review, 36 (2010), pp. 336-341
- Robinson, K. (2013). *Twitter hashtag usage at medical conferences: Follow-up analysis*. CURRENT MEDICAL RESEARCH AND OPINION, S17-S17.
- Ross. (2011). *Enabled backchannel: Conference Twitter use by digital humanists*. Journal of Documentation, (2), 214-237.
- Saeed, N. & Sinnappan, S. (2011). *Adoption of Twitter in higher education - a pilot study*. In G. Williams, P. Statham, N. Brown & B. Cleland (Eds.), Changing Demands, Changing Directions Proceedings ascilite Hobart 2011. (pp.1115-1120)
- Sandars J, Homer M, Pell G, Crocker T. (2010) *Web 2.0 and social software: the medical student way of e-learning* [published online ahead of print June 18, 2010]. Med Teach.
- Sandars J, Schroter S. *Web 2.0 technologies for undergraduate and postgraduate medical education: an online survey*. Post- grad Med J. 2007;83(986):759-762.
- Small, T (2011). *WHAT THE HASHTAG?*, Information, Communication & Society, 14:6, 872-895, DOI: 10.1080/1369118X.2011.554572
- Symplur (2014). *Healthcare hastags* <http://www.symplur.com/healthcare-hashtags/> [Accessed 24<sup>th</sup> August 2014]
- Symplur (2014). *MedEd Chat transcript*. <http://embed.symplur.com/twitter/transcript?hashtag=MedEd&fdate=08-21-2014&shour=18&smin=00&tdate=08-21-2014&thour=19&tmin=15> [Accessed 24<sup>th</sup> August 2014]
- Social Media in the NHS (2014) [www.nhss.org.uk](http://www.nhss.org.uk) [Accessed 23<sup>rd</sup> June 2014]
- Thames. G, (2009). *Twitter as an Educational Tool*. Journal of Child and Adolescent Psychiatric Nursing, (4), 235.
- Twitter (2014). *About Twitter*. <https://about.twitter.com/en-gb> [Accessed 2 May 2014]

Tweet Reach (2014) [www.help.tweetreach.com](http://www.help.tweetreach.com) [accessed 14<sup>th</sup> August 2014]

Weber, R. (1985). *Basic content analysis*. Beverly Hills ; London: Sage.

Weberg, D (2009). *Twitter and Simulation: Tweet Your Way to Better Sim, Clinical Simulation in Nursing*, Volume 5, Issue 2, March-April 2009, Pages e63-e65, ISSN 1876-1399

Zhao, D, Rosson, M B. (2009). *How and why people Twitter: the role that micro-blogging plays in informal communication at work*. In Proceedings of the ACM 2009 international conference on Supporting group work (GROUP '09). ACM, New York, NY, USA, 243-252.

# Appendix - data coding sheet

Tweet ID	Author	Author category	Category	Sub category	Tone	No. of mentions	Other hashtags	Link to	Month	No. of replies	Additional participants in conv	No. of retweets	No. of favourites	Mentioned appears in following conversation?
1	OVFT_UGME	NHS	Info sharing		Neutral	1	Website	August						
2	djshin	NHS Student	Info sharing		Neutral		Picture	August		21	2		1	N
3	drqjursden	NHS	Experience	Commentary	Neutral		1	August						
4	enamhaque3	NHS	Modified tweet	Info sharing	Positive	1	1 Website	August						
5	enamhaque3	NHS	Experience		Neutral	2	3	August						
6	enamhaque3	NHS	Modified tweet	Info sharing	Positive	1	1 Website	August					1	
7	mcroncology	NHS Student Society	Experience		Neutral	1	3 Picture	August					1	
8	mcroncology	NHS Student Society	Experience		Neutral		Picture	August					1	
9	mcroncology	NHS Student Society	Experience	Info sharing	Neutral	1	Picture	August					1	
10	mcroncology	NHS Student Society	Experience		Neutral		Picture	August						
11	mcroncology	NHS Student Society	Experience		Neutral	1	Picture	September					1	
12	mcroncology	NHS Student Society	Experience		Neutral		Picture	September					1	2
13	djshin	NHS Student	Info sharing		Neutral	1	Website	September						
14	OVFT_UGME	NHS	Info sharing		Neutral		Website	September					3	1
15	enamhaque3	NHS	Modified tweet	Info sharing	Positive	2	3 Website	September						
16	mcr_masterman	NHS	Experience		Positive	2		September		2	2	2	2	N
17	manchesterwms	NHS Student Society	Advertising		Neutral	2	Website	September					1	
18	mms_uom	NHS	Commentary		Positive	1		September		1	1	4	1	N
19	halder_ali	Unknown	Experience		Neutral		2 Picture	September		3	5	1		N
20	anaisaMonica	Other	Modified tweet	Info sharing	Positive	1	1 Picture	September					1	1
21	HAPPYScheme	NHS Student Society	Advertising		Neutral	1	Picture	September					1	
22	enamhaque3	NHS	Info sharing		Neutral	1	2	September					7	3
23	MIPS_mcr	UoM dept	Advertising		Neutral	2		September		1	1	4		N
24	MIPS_mcr	UoM dept	Commentary		Positive	2	1	September		3	3	2	1	N
25	enamhaque3	NHS	Commentary		Positive	2	1	September		4	5	2	1	Y
26	mispaldiparus	NHS Student Society	Info sharing		Neutral	1	1	September					5	5
27	MIPS_mcr	UoM dept	Advertising		Neutral	2	Picture	September					2	1
28	jesusip	NHS Student	Experience		Neutral	1	Picture	September						
29	OVFT_UGME	NHS	Advertising	Info sharing	Neutral	1	Website	September					1	
30	enamhaque3	NHS	Info sharing		Positive	1	3 Picture	September					1	
31	SEMSoCUK	NHS Student Society	Advertising		Neutral	2	Picture	September					3	
32	mms_uom	NHS	Advertising		Positive			September					4	
33	enamhaque3	NHS	Info sharing		Neutral	1	1 Picture	September						1
34	anthplove	NHS Student	Info sharing		Neutral		Website	September						
35	enamhaque3	NHS	Experience		Positive			September					2	
36	HAPPYScheme	NHS Student Society	Advertising		Neutral	2	Picture	September					2	
37	enamhaque3	NHS	Commentary		Neutral	3	2	September					2	1
38	mcroncology	NHS Student Society	Advertising		Neutral	1	Website	September					4	2
39	jinq22	NHS Student	Info sharing	Commentary	Neutral		Picture	September					1	
40	enamhaque3	NHS	Modified tweet		Positive		3 Website	September		2	1			N
41	drqjursden	NHS	Info sharing		Neutral	2	Website	September		1	1	4	2	N
42	scalpel_mcr	NHS Student Society	Advertising		Neutral	1	Picture	September						3
43	manchesterwms	NHS Student Society	Advertising		Neutral	1	Website	September					1	
44	mms_uom	NHS	Info sharing		Neutral		Website	September					1	
45	jantjojo	NHS	Experience		Neutral		Picture	September						
46	OVFT_UGME	NHS	Info sharing		Neutral		Website	September						
47	enamhaque3	NHS	Modified tweet	Info sharing	Neutral	2	1 Website	September						
48	enamhaque3	NHS	Modified tweet	Info sharing	Neutral	1	1 Website	September						
49	proffreemont	NHS	Commentary		Positive			September					5	3
50	mms_uom	NHS	Info sharing		Neutral		Website	September					2	1
51	proffreemont	NHS	Experience	Question	Positive			September		1	1	9	5	N
52	scalpel_mcr	NHS Student Society	Experience		Neutral		2 Picture	October					2	1
53	mms_uom	NHS	Commentary		Positive	1	1	October					14	5
54	enamhaque3	NHS	Experience		Positive	2	1	October					4	1
55	proffreemont	NHS	Commentary		Positive			October		1	1	9	1	Y
56	enamhaque3	NHS	Experience		Positive	1	2 Picture	October					1	
57	enamhaque3	NHS	Experience		Positive	1	1	October		2	1	1		N
58	enamhaque3	NHS	Experience		Positive	1	2 Picture	October						
59	mcr_masterman	NHS	Info sharing		Neutral	1	Website	October					1	
60	enamhaque3	NHS	Modified tweet	Info sharing	Neutral	2	Website	October						
61	OVFT_UGME	NHS	Modified tweet	Info sharing	Neutral	2	Website	October						
62	mms_uom	NHS	Info sharing		Neutral	1	Website	October					1	1
63	luciebd	NHS	Experience		Positive	4		October		3	2	2	2	Y

Tweet ID	Author	Author category	Category	Subcategory	Tone	No. of mentions	Other hashtags	Link to	Month	No. of replies	Additional participants in reply	No. of retweets	No. of favourites	Monitored accounts in following column(s)?
64	manchestermcs	MMS Student Society	Advertising		Neutral	1		Website	October			4	1	
65	CMFT_LIGME	NHS	Info sharing		Neutral	1	1		October			1		
66	mumps_uom	MMS Student Society	Advertising		Neutral	1			October			6	1	
67	CMFT_LIGME	NHS	Modified tweet	Info sharing	Neutral	1	1	Website	October			2	1	
68	anthphoc	MMS Student	Advertising		Neutral	3		Website	October			1	1	
68	HAPPNScheme	MMS Student Society	Advertising		Neutral	1		Picture	October			1		
70	localdoctorpeta	NHS	Advertising		Neutral				October			4		
71	drclunaden	MMS	Info sharing		Neutral	1			October			5	2	
72	onfragrad	NHS	Modified tweet	Commentary	Positive	1		Picture	October					
73	anthphoc	MMS Student	Modified tweet	Experience	Positive	1		Picture	October					
74	manchestermcs	MMS Student Society	Advertising		Neutral			Website	October					
75	mms_uom	MMS	Advertising		Positive			Website	October			1		
76	meducation	Other	Modified tweet	Info sharing	Neutral	1	1	Website	October					
77	CMFT_LIGME	NHS	Experience		Positive			Picture	October			2		
78	drclunaden	MMS	Info sharing		Neutral				October			2		
79	scobel_nor	MMS Student Society	Commentary		Neutral		1	Picture	October			1		
80	mms_uom	MMS	Advertising	Info sharing	Neutral			Website	October			1	1	
81	mms_uom	MMS	Info sharing		Neutral			Website	October	1	1			Y
82	HAPPNScheme	MMS Student Society	Advertising		Neutral	1		Picture	November			1	2	
83	drclunaden	MMS	Info sharing		Positive			Website	November	8	2	4		N
84	riafferty	Other	Info sharing		Neutral		1	Website	November			10	1	
85	mr_masterman	NHS	Question		Neutral			Website	November			2		
86	zsbaj	MMS Student	Commentary		Positive	5		Picture	November					
87	djshn	MMS Student	Experience		Neutral			Website	November			1	2	
88	CMFT_LIGME	NHS	Commentary		Neutral	3	1		November	8	6	2	4	N
89	carfieldDoug	MMS	Info sharing		Neutral			Website	November	3	3			N
90	anthphoc	MMS Student	Advertising		Neutral	4		Website	November	1	1	1		N
91	jrs22	MMS Student	Commentary		Neutral			Website	November					
92	CMFT_LIGME	NHS	Info sharing		Neutral			Video	November				1	
93	profroemont	MMS	Experience		Positive				November			5	3	
94	bachyrobic	MMS Student	Commentary		Neutral			Website	November			3	3	
95	manchestermcs	MMS Student Society	Commentary		Neutral	2		Website	November			2		
96	manchestermcs	MMS Student Society	Advertising		Neutral	1		Website	November			2		
97	anthphoc	MMS Student	Experience		Positive	2		Website	November			1	1	
98	CMFT_LIGME	NHS	Info sharing		Neutral			Website	November					
99	drclunaden	MMS	Modified tweet	Info sharing	Positive	3	1		November			1	4	
100	imithyvy	MMS Student	Commentary		Neutral	2		Website	November			2		
101	anthphoc	MMS Student	Info sharing		Positive	1	2	Video	November			10	3	
102	jrs22	MMS Student	Commentary		Neutral	1		Website	November			1		
103	HAPPNScheme	MMS Student Society	Advertising		Neutral	1		Website	November					
104	jrs22	MMS Student	Info sharing		Positive	1		Website	November	1	1	4		Y
105	manchestermcs	MMS Student Society	Advertising		Neutral		1	Website	November			1	1	
106	profroemont	MMS	Commentary		Positive				November	1	1	7	3	N
107	galvanjgr	MMS Student	Experience		Neutral	1	2	Website	November					
108	fastleppglobal	Other	Advertising		Neutral			Website	November			1		
109	forofmanchester	MMS Student Society	Advertising		Neutral			Website	November			1		
110	fastleppglobal	Other	Advertising		Neutral			Website	November			1		
111	fastleppglobal	Other	Advertising		Neutral	1		Website	November			4		
112	manchestermcs	MMS Student Society	Advertising		Neutral			Website	November					
113	na_kalenderov	MMS Student	Info sharing		Neutral			Picture	November					
114	zsbaj	MMS Student	Experience		Neutral	3	1	Website	November					
115	ladreil	MMS	Info sharing		Positive	1		Website	December			7	1	
116	scobel_nor	MMS Student Society	Advertising		Neutral			Website	December			3	1	
117	djshn	MMS Student	Modified tweet	Advertising	Neutral	1		Website	December			1	1	
118	fastleppglobal	Other	Advertising		Neutral	1		Website	December			4		
119	klj_mcg	MMS Student	Advertising		Neutral	2	1	Website	December			1		
120	fastlepp	Other	Advertising		Positive	1		Website	December			3	2	
121	forofmanchester	MMS Student Society	Advertising		Neutral			Website	December					
122	diemac_mcr	MMS Student Society	Info sharing		Positive	1		Website	December			2	5	
123	fastleppglobal	Other	Advertising		Neutral			Website	December			1		
124	djshn	MMS Student	Advertising		Neutral	2		Website	December				1	
125	microecology	MMS Student Society	Advertising		Neutral	1		Website	December			1	2	
126	djshn	MMS Student	Info sharing		Neutral	1		Website	December			3		

MA in Digital Technologies, Communication and Education  
 EDUC71000 dissertation - A content analysis of the #McMed Twitter hashtag  
 Michael Masterman (7510921)

Tweet ID	Author	Author category	Category	Sub category	Tone	No. of tweets Other hashtag	Link to	Month	No. of replies	Additional participants in conv	No. of retweets	No. of favourite	Marked access in following conversation?
127	daknatter	NHS	Info sharing		Neutral	4	Website	December			2	1	
128	forstmanchester	MMS Student Society	Advertising		Neutral	1	Website	December					
129	ra_lalenderov	MMS Student	Experience		Neutral		Picture	December				1	
130	OWFT_UGME	NHS	Info sharing		Neutral	5		December				1	
131	nr_masterman	NHS	Commentary		Neutral		Website	December	7	3	2	1	N
132	drjamsden	MMS	Experience		Positive	1	1 Picture	December				1	
133	profhwmont	MMS	Experience		Positive			December	1	3	6		N
134	luciele	MMS	Info sharing		Positive	1	Website	December				2	
135	klari_n	MMS Student	Experience		Neutral	1	Picture	December					
136	klari_n	MMS Student	Experience		Neutral	1	Picture	December				1	
137	klari_n	MMS Student	Experience		Positive	1	Picture	December					1
138	nr_masterman	NHS	Info sharing		Neutral	1	Website	December			4	3	
139	enrahazue3	MMS	Experience		Positive	2	Picture	December				1	
140	anthprowe	MMS Student	Info sharing		Neutral	3	Website	December	1	1	1	3	Y
141	reinasNews	Other	Info sharing		Neutral		Website	December			1	1	
142	scalpel_mcr	MMS Student Society	Advertising		Neutral	2	Website	December			3	1	
143	luciele	MMS	Info sharing		Neutral	1	1 Website	December				1	1
144	scalpel_mcr	MMS Student Society	Advertising		Neutral		Website	December					
145	enrahazue3	MMS	Info sharing		Positive	1	1 Video	December	3	2	6	2	N
146	enrahazue3	MMS	Mod'fied tweet	Commentary	Positive	1	3	December			4	5	
147	profhwmont	MMS	Advertising		Positive		Website	December					
148	nr_masterman	NHS	Question		Neutral	3		January					1
149	drjamsden	MMS	Experience		Neutral		Picture	January	2	2			N
150	drjamsden	MMS	Info sharing		Neutral		Website	January					
151	renisadgarus	MMS Student Society	Advertising		Neutral	1	Website	January				2	
152	zibaj	MMS Student	Commentary		Positive	1	2 Picture	January	2	3	4	2	N
153	drjamsden	MMS	Info sharing		Positive		1 Website	January				1	
154	nickharveywith	NHS	Info sharing		Positive			January	2	2	5	3	N
155	dralangrayson	NHS	Commentary		Neutral	2	Picture	January	1	1	2	4	N
156	renisadgarus	MMS Student Society	Advertising		Neutral	2		January	1	1		2	N
157	HEALTHsocial	Other	Advertising		Neutral	2	Website	January				1	
158	luciele	MMS	Mod'fied tweet	Info sharing	Neutral	1	Website	January					
159	enrahazue3	MMS	Mod'fied tweet	Info sharing	Positive	4	3 Video	January	10	2		1	Y
160	renisadgarus	MMS Student Society	Advertising		Positive	1	2 Website	January					
161	HEALTHsocial	Other	Advertising		Positive	1	2 Website	January				2	
162	luciele	MMS	Mod'fied tweet	Commentary	Neutral	1	Website	January					
163	gscuk	Other	Mod'fied tweet	Experience	Positive	2	1	January				2	
164	renisadgarus	MMS Student Society	Advertising		Neutral	2	Website	January					
165	HEALTHsocial	Other	Advertising		Neutral	2	Website	January				1	
166	HAPPYScience	MMS Student Society	Advertising		Neutral	1	Picture	January				2	
167	renisadgarus	MMS Student Society	Advertising	Question	Neutral		Website	January				1	
168	daknatter	NHS	Advertising		Neutral			January				1	
169	drjamsden	MMS	Advertising	Question	Neutral		Website	January				1	
170	luciele	MMS	Advertising	Question	Neutral		Website	January				2	
171	luciele	MMS	Advertising		Neutral		Website	January				2	1
172	luciele	MMS	Advertising		Neutral		Website	January					
173	nickharveywith	NHS	Commentary		Positive			January	1	3	9	9	N
174	luciele	MMS	Experience		Positive	2	Picture	January	1	8	3	2	N
175	renis_uom	MMS	Advertising		Neutral		Website	January				1	1
176	drjamsden	MMS	Commentary		Positive	3	Website	January				1	
177	renis_uom	MMS	Advertising		Neutral		Website	January				1	1
178	drjfn	MMS Student	Advertising		Neutral		Website	January				1	
179	renis_uom	MMS	Advertising	Question	Neutral		Website	January	1	1			Y
180	jackblake	MMS Student	Info sharing		Positive		Website	January					
181	jackblake	MMS Student	Info sharing		Positive	1	Video	January					
182	renis_uom	MMS	Advertising		Neutral		Website	January					
183	lgannon	Other	Experience		Positive	1	1	January				4	1
184	profhwmont	MMS	Commentary		Neutral		Video	January				1	3
185	drjamsden	MMS	Experience		Positive	1	Picture	January	3	2		1	Y
186	nickharveywith	NHS	Info sharing		Neutral	2	Website	January				1	
187	sals105	MMS Student	Info sharing		Negative	2	4 Website	February				1	2
188	drjamsden	MMS	Info sharing		Neutral		Website	February				2	1
189	iamjampson78	NHS	Commentary		Neutral	2	1 Picture	February	2	3	4	5	N

Tweet ID	Author	Author category	Category	Sub category	Tone	No. of replies	Other hashtag	Link to	Month	No. of replies	Substantial participants in conv	No. of retweets	No. of favourites	Marked explicit in following conversation?
190	djshin	MMS Student	Advertising		Neutral	2		Website	February			6	2	
191	djshin	MMS Student	Advertising		Neutral	1	1	Website	February			2	1	
192	nickharveysmith	NHS	Info sharing		Neutral		1	Video	February	1	1	6	3	N
193	HAPPYScheme	MMS Student Society	Advertising		Neutral	1		Picture	February			1		
194	tachjanibac	MMS Student	Advertising		Neutral			Website	February					
195	maechesterms	MMS Student Society	Advertising		Neutral			Website	February			1	1	
196	CMFT_LIGNE	NHS	Info sharing		Neutral	1	1	Website	February			3		
197	neuropbl	NHS	Modified tweet	Info sharing	Negative	2	1	Website	February					
198	nickharveysmith	NHS	Info sharing		Positive		2	Video	February			3	1	
199	jackblake	MMS Student	Commentary		Positive	1	1	Picture	February	1	1		1	N
200	drcljamesden	MMS	Info sharing		Neutral			Website	February			3		
201	manmehnuobun	UoM dept	Commentary	Question	Neutral		1	Picture	February			1	1	
202	thomasjlewis	NHS	Info sharing		Neutral		2	Video	February	1	1	1	3	N
203	mms_uom	MMS	Question	Advertising	Neutral			Website	February			1		
204	mms_uom	MMS	Advertising		Neutral			Website	February			2	2	
205	drcljamesden	MMS	Experience		Neutral			Website	February					
206	scalpel_mcr	MMS Student Society	Info sharing		Positive			Website	February			1	2	
207	nickharveysmith	NHS	Info sharing		Neutral	2		Website	February			4	1	
208	scalpel_mcr	MMS Student Society	Advertising		Neutral			Website	February			2	1	
209	djshin	MMS Student	Advertising		Neutral			Website	February					
210	scalpel_mcr	MMS Student Society	Advertising		Neutral			Website	February					
211	drcljamesden	MMS	Info sharing		Neutral			Website	February					
212	anthaklowe	MMS Student	Info sharing		Neutral	1	1	Picture	February			1	2	
213	anthaklowe	MMS Student	Experience		Neutral	1	1	Picture	February			2	3	
214	HAPPYScheme	MMS Student Society	Advertising		Neutral	1		Picture	February			1		
215	drcljamesden	MMS	Info sharing		Positive			Website	February			2		
216	scalpel_mcr	MMS Student Society	Advertising		Neutral			Website	March					
217	scalpel_mcr	MMS Student Society	Advertising		Neutral			Website	March			1	3	
218	scalpel_mcr	MMS Student Society	Advertising		Positive			Website	March					
219	jane_mccormac	Other	Advertising	Info sharing	Neutral	2	2	Website	March			5	2	
220	djshin	MMS Student	Advertising	Info sharing	Neutral	2	2	Website	March			1		
221	manchestermms	MMS Student Society	Advertising		Neutral			Picture	March			5	2	
222	anambhaqa3	MMS	Experience		Positive	1	1		March	1	1	7	9	N
223	anambhaqa3	MMS	Experience		Positive	1	1		March			8	5	
224	djshin	MMS Student	Info sharing		Neutral	1		Website	March					
225	inbaj	MMS Student	Question	Info sharing	Neutral	3		Website	March				1	
226	scalpel_mcr	MMS Student Society	Advertising		Neutral				March			1		
227	scalpel_mcr	MMS Student Society	Advertising		Neutral			Website	March					
228	inquiresearch	Other	Advertising		Neutral	2		Website	March			5	1	
229	nickharveysmith	NHS	Info sharing		Neutral			Video	March			5	6	
230	manchestermms	MMS Student Society	Experience		Positive	1		Picture	March	1	1	4	2	N
231	HAPPYScheme	MMS Student Society	Advertising		Neutral	1		Picture	March					
232	djshin	MMS Student	Commentary		Neutral	2		Website	March					
233	manchestermms	MMS Student Society	Advertising		Neutral			Website	March			2		
234	manchestermms	MMS Student Society	Advertising		Neutral	5			March					
235	manchestermms	MMS Student Society	Advertising		Neutral			Website	March			1		
236	manchestermms	MMS Student Society	Advertising		Neutral			Website	March			2	2	
237	manchestermms	MMS Student Society	Advertising		Neutral	1		Website	March			1		
238	manchestermms	MMS Student Society	Advertising		Neutral	1		Website	March			1		
239	CMFT_LIGNE	NHS	Commentary		Neutral			Picture	March	1	1			N
240	scalpel_mcr	MMS Student Society	Advertising		Neutral	1		Website	March					
241	scalpel_mcr	MMS Student Society	Experience	Advertising	Neutral		2		March					
242	scalpel_mcr	MMS Student Society	Advertising		Positive	1		Website	March					
243	amoziningham	NHS	Info sharing		Neutral	1		Video	March	2	1			Y
244	djshin	MMS Student	Commentary		Neutral			Website	March	2	1	2		N
245	CMFT_LIGNE	NHS	Question		Positive			Website	March					
246	CMFT_LIGNE	NHS	Question		Positive			Website	March					
247	drcljamesden	MMS	Info sharing		Positive			Website	March	1	1	3		N
248	drcljamesden	MMS	Info sharing	Advertising	Neutral			Website	March			1		
249	scalpel_mcr	MMS Student Society	Commentary		Positive	1	1	Picture	March			3	1	
250	manmedbac	MMS Student Society	Commentary		Positive	1	1		March			3	4	
251	jroJZ	MMS Student	Info sharing		Positive	2		Website	March				1	
252	CMFT_LIGNE	NHS	Info sharing		Neutral			Website	March					



Tweet ID	Author	Author category	Category	Sub category	Tone	No. of mentions Other hashtag	Link to	Month	No. of replies	Additional participants in conversation	No. of retweets	No. of favourites	Mediaid access in following conversation
253	drjshn	MMS Student	Experience		Neutral	1	1	March			2	1	
254	mms_user	MMS	Commentary		Neutral	2		March	3	1	2	4	N
255	nicholaveynieth	NHS	Info sharing		Neutral	1	1 Video	March			7	4	
256	enarrhaque3	MMS	Experience		Neutral	2	2 Picture	March	2	1	2	3	N
257	scalpel_rnr	MMS Student Society	Advertising		Neutral		1 Website	April				1	
258	ray_balenderov	MMS Student	Experience		Neutral	1	1 Picture	April	1	1	3	1	N
259	kuiebd	MMS	Experience		Positive		1 Website	April				1	
260	sabcl05	MMS Student	Experience		Positive	2	1 Picture	April	1	0	2	5	N
261	@jshn	MMS Student	Experience		Neutral		1 Website	April					
262	prof Freeman	MMS	Commentary		Positive			April			3	7	
263	mms_user	MMS	Advertising	Info sharing	Neutral		1 Website	April				2	
264	akunikuom	UoM dept	Modified tweet	Experience	Positive	1	1 Website	April					
265	scalpel_rnr	MMS Student Society	Advertising		Neutral		1 Website	April			1		
266	nicholaveynieth	NHS	Commentary		Positive	1	1	April	1	1	6	4	N
267	susielenshaw	MMS Student	Experience		Positive	1	1 Picture	April				4	
268	susielenshaw	MMS Student	Commentary		Positive		1 Picture	April					
269	drjshn	MMS Student	Info sharing		Neutral	1	1 Website	April					
270	susielenshaw	MMS Student	Experience		Neutral		1 Picture	April				1	
271	mcgobalhealth	MMS Student Society	Commentary		Positive			April				1	
272	susielenshaw	MMS Student	Experience		Neutral		1	April					
273	mcgobalhealth	MMS Student Society	Advertising		Neutral		1 Website	April			1		
274	kuiebd	MMS	Modified tweet	Info sharing	Neutral	3	1 Video	April	1	1	1	1	Y
275	ackr_	NHS	Experience		Neutral	1	1 Website	April	1	1	1	1	Y
276	drjshn	MMS			Neutral		1 Website	May				1	
277	prof Freeman	MMS	Experience	Question	Neutral		1 Website	May			1		
278	drjshn	MMS	Experience		Positive		1 Picture	May					
279	drjshn	MMS	Experience		Neutral		1 Picture	May				1	
280	scalpel_rnr	MMS Student Society	Advertising		Neutral		1 Website	May			2		
281	prof Freeman	MMS	Advertising		Positive			May			4	2	
282	scalpel_rnr	MMS Student Society	Experience		Positive		1 Picture	May			2	1	
283	manhealthpsych	UoM dept	Commentary		Neutral	3	1 Website	May			2	1	
284	kuiebd	MMS	Commentary		Positive	2	1 Website	May	1	1	4	3	Y
285	scalpel_rnr	MMS Student Society	Advertising		Neutral		1 Picture	May			1		
286	scalpel_rnr	MMS Student Society	Advertising		Neutral		1 Website	May			1		
287	scalpel_rnr	MMS Student Society	Experience		Positive	1	1 Picture	May			1	1	
288	enarrhaque3	MMS	Experience		Neutral	3	1 Picture	June			6	9	
289	enarrhaque3	MMS	Commentary		Positive			June	3	1	4	4	N
290	prof Freeman	MMS	Question	Experience	Neutral		1 Video	June					
291	mr_masterman	NHS	Question		Neutral	1	1	June	1	1		1	N
292	drjshn	MMS	Info sharing		Neutral	1	3 Picture	June					
293	kuiebd	MMS	Experience		Neutral		1 Picture	June			1		
294	manpsychiat	MMS Student Society	Advertising		Neutral	1	1 Website	June					
295	drjshn	MMS Student	Info sharing		Neutral	1	1 Website	June					
296	drjshn	MMS	Info sharing		Neutral		1 Website	June					
297	mr_masterman	NHS	Question		Neutral	1		June					
298	prof Freeman	MMS	Commentary		Positive			June	3	1	15	12	Y
299	drjshn	MMS	Modified tweet	Info sharing	Neutral	3	1 Website	June			1	1	
300	kuiebd	MMS	Modified tweet	Info sharing	Positive	2	1 Picture	June	2	1	1	2	N
301	jackblake	MMS Student	Info sharing		Positive	2	1 Website	July					
302	jackblake	MMS Student	Info sharing		Positive	2		July			1		
303	enarrhaque3	MMS	Experience		Positive	5	2 Picture	July	4	2	3	3	N
304	drjshn	MMS	Modified tweet	Info sharing	Neutral	1	2 Website	July				2	
305	drjshn	MMS	Modified tweet	Info sharing	Neutral	1	1 Website	July					
306	drjshn	MMS	Modified tweet	Commentary	Positive	3	1 Website	July					
307	drjshn	MMS Student	Commentary		Positive	2	1 Website	July			5	1	
308	enarrhaque3	MMS	Experience		Positive	1	4 Picture	July			1	8	
309	enarrhaque3	MMS	Info sharing		Positive	2	2 Video	July			5	3	
310	uomschools	UoM dept	Commentary		Positive	1	2 Website	July			6	5	
311	mr_masterman	NHS	Question	Info sharing	Neutral	2	1 Website	July			1	1	
312	healthcommunication	UoM dept	Modified tweet	Question	Neutral	1	1 Website	July					
313	mr_masterman	NHS	Info sharing		Neutral	1	1 Video	July			2		
314	drjshn	MMS	Commentary	Question	Neutral			July	0	4	4	2	N
315	drjshn	MMS Student	Info sharing		Neutral	3	1 Picture	July	1	1	1	1	N
316	CNFT_UGIVE	NHS	Commentary		Neutral	1	1 Website	July			2	1	