Uses and risks of microblogging in organisational and educational settings

Nordiana Ahmad Kharman Shah, Soureh Latif Shabgahi and Andrew M. Cox

Abstract

Purpose
The paper aims to clarify the relationship between organisational and educational use of microblogging. Although enterprise and education are very different sectors of activity and have diverse research traditions, this review argues that there is a benefit to be derived from comparing research work across the two settings.

Design/methodology/approach
The paper conducted a thematic analysis of research literature on microblogging for the two fields. The collection comprised around 30 papers on enterprise microblogging (EMB), defined as use of microblogging primarily with internal organisational audiences behind the firewall. Twenty-five research papers on microblogging in higher education (MIHE) made up the rest of the corpus. A generic framework of uses and risks of microblogging was produced and it is the main contribution of the paper.

Findings
The comparison of the literature on microblogging in the two sectors has led to the development and evaluation of a generic framework, which graphically presents its use and risks. The paper has introduced some ideas about how microblogging is used and they are potentially useful for the other context, for instance, the concept of awareness from the organisational literature. While the organisational literature has a major focus on risk, this appreciation is far less developed in the educational context; increasing such an emphasis would improve employability.

Research limitations/implications
Most of the research on EMB to date has been about uses of microblogging in large organisations, often information technology based. Research on MIHE has been experiments on the effect of microblogging in learning and classroom activities. Therefore, there is room to expand research beyond these settings.

Practical implications
The developed framework can be a useful guide for other researchers to explore issues around microblogging in different settings, such as educators using microblogging for research or use in other contexts. It is helpful to researchers to see how different
theoretical concepts and research methods might be deployed in another context. The framework might also be used for comparing other technologies apart from Web 2.0/microblogging.

Originality/value
The paper has been the first review that we are aware of that has concentrated on the uses and risks of microblogging technologies in these particular contexts, organisation and education.

Introduction
It has been reported that the total number of Twitter users had reached 500 million by April 2013 (Smith, 2013). Twitter’s growth has outstripped predictions (Bennett, 2012). Microblogging, on Twitter and using other tools such as Sina Weibo and Yammer, is the most recent social phenomenon of Web 2.0, (Hauptmann & Gerlach, 2010) enabling users to broadcast information about their activities, opinions and status, as well as to receive quick notifications on a wide range of topics of interest (Günther, Krasnova, Riehle & Schöndienst, 2009; Java, Song, Finin & Tseng, 2007; Zhang, Qu, Cody & Wu, 2010a). It is a means for users to stay connected to their friends, family members and co-workers through their computers and mobile phones (Huberman, Romero & Wu, 2008). Inevitably, the phenomenon of microblogging has already attracted much research interest.

The use of microblogging has been investigated across a number of contexts by researchers, such as in political campaigning (Cetina, 2009), as a form of electronic consumer word of mouth (Jansen, Zhang, Sobel & Chowdury, 2009) or as a tool for social activism (Galer-Unti, 2009) as well as for its use in emergencies and natural disasters (Vieweg et al, 2010), in professional communities of practice (Dunlap & Lowenthal, 2009) and as a reporting tool for breaking news (Vis, 2013). The massive take-up of Twitter has formed new areas to study, for example, in self-production, the language people use and power relations in social networks (Murthy, 2013). Other studies have attempted to identify global patterns in Twitter usage, without focusing on differences between contexts (Java et al, 2007). Most research to date, however, has been limited to a particular sector of use.

The present study explores the value of a comparative literature review. It compares the literature on microblogging applications in two different areas, namely, enterprise microblogging (EMB) and microblogging in higher education (MIHE), with a view to integrating understanding across the two domains, be that copying practices between sectors or emulating theoretical viewpoints or research methods. More formally, the research questions of this study are:

1 How is microblogging being used in the two sectors?
2 Which practices might be borrowed between the sectors?
3 What are the main theoretical frameworks that have been applied in each sector?
4 Which theoretical perspectives and methods might be borrowed between sectors?
5 What are the risks of using microblogging in EMB and MIHE?

The two literatures from which the papers are drawn have their own distinctive theoretical traditions, methods and terminology. Yet there are similarities between the uses and risks in EMB and MIHE; these will be discussed in the following parts of this paper. Therefore, although the two sectors have very different underlying purposes, it is hoped that the common framework allows useful comparisons to be drawn between the two fields.

Methodology
The review is based on a thematic analysis of peer-reviewed research literature collected in October 2012. The collection comprised around 30 papers on EMB, defined as use of
microblogging primarily with internal organisational audiences behind the firewall. Twenty-five research papers on MIHE made up the rest of the corpus. The literature was identified through specialised journals and conference proceedings databases for research publications. For EMB, these included the Human-computer interaction (HCI), information systems conferences, International Conference on Collaboration Technologies and Systems, information security management conference, business and information systems engineering, Institute of Electrical and Electronics Engineers (IEEE) and Association for Computing Machinery (ACM). For MIHE, these included Education Resources Information Center (ERIC), Sage journals online and relevant e-learning conferences, such as Association for Learning Technology Conference (ALT-C) and Australasian Society for Computers in Learning in Tertiary Education (ASCILITE). Additionally, Web of Science was used, using keyword searches on terms including: “Microblogging,” “Twitter,” “Yammer,” “Social Media,” “Web 2.0,” “Higher Education” and “Enterprise.” The selection criteria included articles that contained the description, methodology, trials and results of EMB and MIHE.

In the EMB literature, the researchers found that the first paper was published in 2009. Most of the research to date has been published on studies in the USA and Europe (surprisingly little in the UK) and has been about uses in large organisations, often information technology (IT) consultancies; a gap has been identified in literature in the field of EMB and there is room for further, high-quality research to be conducted in the UK. They are typically of single case studies, rather than surveys of a number of organisations or a whole industry sector. The research is often the result of trials of microblogging tools internally. Research on MIHE was mostly published in the USA and Europe, with the first paper in 2008. Most of the publications have been experiments on the effects of microblogging in learning and classroom activities. Again, they tend to be single case studies, rather than a comparison between several classrooms or activities.

A thematic analysis was carried out of the corpus of papers. The researchers personally conducted the thematic analysis. They read and re-read the data, noting down ideas using Microsoft Word. Notes were made about emerging themes that could be recognised and how they would relate to each other. Relevant themes were identified from both literatures. The themes were developed using pen and paper only and they were also practised in Microsoft Word. The themes were developed based on the existing literature; some have been combined and rephrased for the purpose of this research. These themes were then analysed and cross-compared repeatedly for consistency and validity. The thematic analysis led to the development of a generic framework identifying themes of the uses and risks of microblogging in the two settings (Figures 1 and 2). The third and fourth sections will introduce the uses and risks of microblogging in organisational and educational settings. The fifth section discusses the main implications arising from the analysis.

**Uses of microblogging**

This section elaborates on Figure 1 by introducing how the literature describes the specific uses of EMB and MIHE. Table A1 is introduced at the end of the paper, in the Appendix, pointing out the major differences between the uses of microblogging in organisations and in higher education.

**Communication**

Perhaps not surprisingly, researchers have viewed microblogging as a tool for communication. However, different authors have stressed rather different aspects of this and focused on particular modes of communication, eg, expressing opinions or clarifying various matters of interest (Riemer, Diederich, Richter & Scifleet, 2011a), communicating to release emotional stress (Zhao & Rosson, 2009), providing feedback on ideas (Riemer, Altenhofen & Richter, 2011; Zhao, Rosson, Matthews & Moran, 2011), and asking or responding to questions (Ehrlich & Shami, 2010; Mayfield, 2009). In the field of EMB, Riemer and Richter (2010) explored communication patterns in a team using microblogging tools. They found that coordinating with others (20.9%) was the second largest category of ways that microblogging was used. Coordinating others
referred to individuals who aimed to directly influence others and their tasks. This was achieved by frequently posting items that would require attention by the team. In educational settings, Twitter is considered useful as an instant feedback tool for quick communication between instructors and students, as well as among students themselves in the classroom (Grosseck & Holotescu, 2008; Kassens-Noor, 2012; Kop, 2012). Other studies have found Twitter to extend and enhance communication outside the classroom. For example, Ebner, Lienhardt, Rohs and Meyer (2010), Ross, Terras, Warwick and Welsh (2011), Lowe and Laffey (2011), Rinaldo, Tapp and Laverie (2011) and Perifanou (2009) have all suggested that Twitter is a useful tool for asking questions, engaging in discussions, sharing resources and learning materials, or announcing events and assignments. By comparing the parallel situation between EMB and MIHE, it can be proposed that microblogging tools are an extension to communication mediums. They provide users with quicker and different ways to engage, other than, for example, phone and email. Microblogging could increase awareness outside the project group to a wider audience, in addition to spreading awareness beyond the classroom.

Sharing knowledge/information

EMB can be used to share knowledge or information, which is a further aspect of communication. Mayfield (2009) suggested that one of the benefits of Twitter was sharing knowledge and
information. EMB has also been found useful in announcing events or activities (Riemer, Diederich et al., 2011a; Riemer, Diederich, Richter & Scifleet, 2011b), news distribution (Case & King, 2010; Riemer, Diederich et al., 2011a) and sharing social events (Heilmann, 2010). MIHE research has also introduced the idea that it can be used for information sharing. Ebner, Beham, Costa and Reinhardt (2009) argue that microblogging can act as a backchannel in conference-based settings. In these contexts, it can support to extend discussions and commentary on presented topics and facilitates the exchange of additional information.

Reputation management
The use of microblogging to enhance someone’s status in their social network or manage their reputation may have a direct impact on the intention to use EMB (Schöndienst, Krasnova, Günther & Riehle, 2011). For example, employees use microblogging to share information such as news related to some project and this gives an indication of their contribution as well as capabilities. This can result in more interactions with colleagues and clients (Schöndienst et al., 2011). Similarly, in MIHE, scholars have engaged with Twitter mainly to draw attention to their work through sharing information related to their interests. They can also highlight personal characteristics such relations between co-workers and students (Veletsianos, 2011). It can be concluded that microblogging is used for reputation management in similar ways in both contexts.
Learning
Learning is one of the central themes of microblogging in organisations and is often presented as the main theme in MIHE. Learning can be enhanced in organisations through the sharing of contents and information, as it has been suggested (Yap & Robben, 2010). According to Zhao et al (2011), EMB tools such as Yammer do not only facilitate those outside the core project team to be aware of a project’s progress, but can also enable learning from related projects for one’s own benefit. In MIHE, most studies have focused on the use of Twitter, to support learning activities. According to Dunlap and Lowenthal (2009), using Twitter in an online course can enhance social presence among college students, increasing engagements and communications between them and supporting their learning.

Such studies focus on aspects of learning efficiency, learning motivation, learning outcomes and assessment. The following parts of this section will introduce different aspects of learning that are found in MIHE: learning community, sustained interaction and engagement, collaborative learning, mobile learning and reflective thinking.

Themes found exclusively in educational microblogging
This section introduces several aspects of MIHE: learning community (formal and informal), collaborative learning, mobile learning and reflective thinking as aspects of microblogging in education environment.

Learning community (formal and informal)
The formation of a learning community is a dominant theme in the literature of MIHE. This concept rests on a social view of learning, which values the collective and collaborative aspects of learning. Researchers have suggested that microblogging allows users to be virtually present and involved in a community without time and space restrictions. It is also claimed that it can increase student–instructor and student–student communication, while reducing the sense of isolation among student groups (Ebner & Maurer, 2009; Ebner et al, 2010; Wright, 2010). According to the notion of Lave and Wenger (1991), learning occurs when an individual beginner participates in a community of practice (CoP) and develops his or her own skills and knowledge through a series of activities. Learning is a process that is supported through social interaction and shared engagement within a group that defines a practice (Lave & Wenger, 1991). If adopting a situated learning perspective, microblogging embraces learning beyond the limitations of the classroom community and where learning takes place in a broader communal atmosphere.

Collaborative learning
Microblogging has been used in the classroom to support collaborative activities, such as discussions about readings, digital storytelling, organising study groups (McWilliams, Hickey, Hines, Conner & Bishop, 2011; Perifanou, 2009), sharing materials or helping each other with assignments that lead to social interactions and collaboration (Dunlap & Lowenthal, 2009).

Mobile learning
Mobile pedagogy (m-learning) is a new approach to learning in education. Studies have suggested that with the incorporation of microblogging in m-learning, students were able to extend their communication and participation for their learning activities within groups or individually in an informal manner (Holotescu & Grosseck, 2011).

Reflective thinking
It is possible to discuss information online over a period of time within a microblogging community. Through participating in a microblogging platform, students can engage
in critical and reflective thinking, which can stimulate ideas and debate (Ebner & Maurer, 2009).

Recording information for future reference
There is evidence to suggest that employees are often using microblogging to post information that requires attention from the rest of their work team and such information is then available for future reference. EMB can also enable the recording of information such as login data, inputting contact details or meeting minutes (Riemer & Richter, 2010). For example, Riemer, Altenhofen et al (2011) reported that their EMB tool Communote was used to keep certain information for later reference. By engaging with microblogging, others were notified about documents or team-related data. Users were able to post locations of specific files or attach documents relevant to their messages. In MIHE, microblogging has also been found to be a useful reference tool: students were able to seek or refer to any important information shared by their colleagues, or important announcements regarding the course, ie, classroom changes (Grosseck & Holotescu, 2008). This parallel situation between both settings shows that microblogging can be useful not only for interacting with others, but also for personal advantage, such as storing useful and important information that can be accessed at any time.

Themes found exclusively in organisational microblogging
This section introduces several aspects of EMB: awareness and a sense of connectedness, forming relationships and coordination as aspects of microblogging in organisations.

Awareness/sense of connectedness
The concept of awareness has been used in understanding microblogging in organisational contexts much more than in educational settings, but seems to be potentially relevant there. Researchers have produced evidence to suggest that microblogging can enhance awareness among co-workers (Günther et al, 2009) and can be used for creating or sustaining a feeling of connectedness, ie, feelings of intimacy between colleagues (Zhao & Rosson, 2009). In MIHE, the concept of awareness has been introduced using similar terminology, for example, increasing social presence through ambient awareness especially in distance learning (Dunlap & Lowenthal, 2009).

Forming relationships
The literature on EMB has suggested that it can strengthen social connections between employees. Zhao et al (2011), for example, found that Yammer can enable employees to learn more aspects about other employees beyond their own immediate team. Forming relationships is an important concept, particularly as relationships can influence the learning process. However, this concept has not been focused on so much in MIHE.

Risks of microblogging
This section elaborates on Figure 2 and the aim is to answer the last research question. This section introduces how the literature describes the specific risks of EMB and MIHE. Table A2 in the Appendix points out the major differences between the risks of microblogging in organisations and in higher education.

Difficulty/unfamiliarity in using microblogging
Unfamiliarity with using microblogging can be considered as a risk of attempting to introduce their use (Grit, 2009; Lenhart, Purcell, Smith & Zickuhr, 2010). In educational settings, it has been suggested that many learners may not be familiar with microblogging tools and may face difficulties or feel intimidated to engage with the tool (Costa, Beham, Reinhardt & Sillaots, 2008; Rinaldo et al, 2011). Both literatures have suggested ways of minimising risks of difficulty/unfamiliarity when microblogging. In organisations, for example, Raeth, Smolnik, Nils and Butler
(2009) argue that it is important to train users in areas such as software use and business guidelines, in addition to providing training for early adopters and users. Othman and Siew (2012) also suggest that organisations have to continuously emphasise the usefulness of their internal system and continue to educate users on how to engage with the tool and gain benefits from their usage. In educational settings, several researchers have suggested introducing creative ways to convince students about Twitter’s benefits and how to establish rewards to encourage usage (Rinaldo et al., 2011).

**Distraction**

Distraction has been identified as a risk of both microblogging in organisations (Case & King, 2010) and in educational settings (Grosseck & Holotescu, 2008). The issue of spending too much time using microblogging has also been seen as a risk in both organisations (Ehrlich & Shami, 2010; Günther et al., 2009) and educational settings (Grosseck & Holotescu, 2008). Noise-to-value ratio (Ebner et al., 2010) or information overload—the difficulty of finding relevant information among a large number of postings (Zhang, Qu & Hansen, 2010b) has been identified as a risk of microblogging in both settings (Günther et al., 2009; Holotescu & Grosseck, 2009; Rinaldo et al., 2011). Günther et al. (2009) suggested that codification effort refers to the actual act of placing information on the EMB tool, which requires time. Users revealed to be concerned about this issue, to some extent resulting from expected involvement and so, “increased codification effort” (Günther et al., 2009, p 4). Expected involvement can cause employees to get distracted from doing their work. Ways of reducing risks of distraction include monitoring the uses of microblogging, providing training for early adopters (Raeth et al., 2009), ie, to make sure they can concentrate on their work, and continuously educating users on how to engage with microblogs without getting distracted (Othman & Siew, 2012). In educational contexts, it is necessary to avoid overtweeting and information overload because it will cause distraction in the classroom learning. To reduce such tendencies, Lowe and Laffey (2011) suggest using hashtags and shortening links in the tweets.

**Privacy of the user**

Notions of privacy may influence the decision to use EMB (Günther et al., 2009) both for contributing content and responding to others (Schöndienst et al., 2011). Employees may have concerns regarding the safety of discussing work-related information using microblogging, as they have no control over who views their postings (Zhao & Rosson, 2009). The issue of trust is therefore important and may influence the use of microblogging (Mayfield, 2009; Zhao & Rosson, 2009). In MIHE, microblogging may also disturb teachers’ private lives, because of students constantly tweeting (Grosseck & Holotescu, 2008). According to Case and King (2010), the introduction of rules can balance the advantages of EMB tools, such as Twitter for communicating, with the risks associated with protecting sensitive data.

**Security concerns**

There is evidence to suggest that organisations may leak confidential and private information to outsiders through microblogging tools (Case & King, 2010; Lee & Warren, 2010). In educational settings, Grosseck and Holotescu (2008) suggest that microblogging the very public nature of the platform may increase the risks to information security, such as accidentally revealing private information. According to Lee and Warren (2010), guidelines, policies, training and educating employees, which are all applicable to educational settings, can reduce security concerns and ethical threats associated with microblogging. Ehrlich and Shami (2010) also found that employees avoided posting confidential information publicly: instead, they preferred to post such information on their internal system.

**Length restrictions**

Restrictions on the length of text can be considered to be an issue with microblogging because they limit the user’s ability to share knowledge (Grit, 2009). In educational settings, Ebner et al.
(2010) have pointed out that although Twitter’s 140-character limit was viewed as a valuable feature by some researchers, others believed that it posed challenges to learners because it required the ability to focus and express oneself in too short a length. The length limit may also make microblogging inappropriate for certain activities, especially those requiring elaborate reflection on complex ideas (Rankin, 2009).

Discussion

The research reported in this paper made a comparison between companies’ use of microblogging for business-directed purposes (ie, project management and collaboration) and higher education uses to improve quality education outcomes/enhance pedagogy system (ie, teacher–student interaction, promoting social media tools, academic professional development). It demonstrates the falsity of the perception that most Web 2.0 technologies are being used mainly for personal purposes such as for socialising, networking and interacting with friends. As Hannay and Fretwell (2011) have argued, Web 2.0 has great potential to be implemented in higher education because these technologies enable interactivity, excite learners and foster greater student participation. Likewise, many companies are investing on Web 2.0 tools for internal employees’ communication and collaboration (Foroughi, 2011).

Given the very different contexts and differing theoretical traditions in the two areas, there might be a view that a comparison between the two would not be likely to be fruitful. However, there is considerable benefit in comparing literatures from two different settings, although researchers in different fields tend to use different theoretical frameworks and methodologies and this may make comparison hard.

Making the comparison has led to the development and evaluation of two generic frameworks, which together are the main contribution of the paper. By placing a number of works in such a simple, visual generic framework, differences and gaps in the literature can be identified. A number of benefits arise from such a comparison, both in identifying practices that could be transferred between contexts and theoretical and methodological approaches for researchers. The framework could also be expanded for a review across other contexts.

As regards Figure 1 and uses of microblogging, the framework identifies several areas that have been investigated in both literatures such as discussion/communication, knowledge sharing and reputation management (Grosseck & Holotescu, 2008; Kassens-Noor, 2012; Riemer, Altenhofen et al. 2011; Ross et al., 2011; Veteliasanos, 2011; Zhao et al., 2011, 201). Themes only found in organisational microblogging are forming relationships and coordination. Awareness/sense of connectedness through microblogging has also been an influential concept in organisational contexts (Günther et al. 2009; Zhao et al. 2011), much more than in educational settings, but seems to be potentially applicable there too. Arguably, Dunlap and Lowenthal’s (2009) exploration of social presence in the MIHE literature relates to the widely used concept of awareness from EMB literature. This illustrates how in some areas similarities are masked by different terminology. Nevertheless, on the whole, the perspective of awareness seems to be under-developed in MIHE and could probably be usefully applied to a greater degree. For instance, educators can learn from other academics’ professional practices including their ways of teaching and doing research and service activities. As an example, educators can replicate activities in regard to preparing teaching materials, publications, collaborations, management and students support. This notion can indirectly develop a learning atmosphere and strengthen educators’ CoP through being “connected” with others.

The majority of published studies in education have focused on Twitter to support learning in higher education. Themes of uses found in educational microblogging, but not in the organisational context, are learning community (Dunlap & Lowenthal, 2009; Ebner & Maurer, 2009),...
sustained interaction and engagement (Dunlap & Lowenthal, 2009), collaborative learning (McWilliams et al., 2011; Perifanou, 2009), mobile learning (Holotsescu & Grosseck, 2011) and reflective thinking (Wright, 2010). It might be beneficial for organisations, therefore, to also conceptualise microblogging as a learning tool. In education, learning community (formal and informal) stresses the value of continuous communication about work, through mobiles, regardless of the location and time. Although mobile learning has been applied a lot in the corporate sector, it has been usually based on organisational or personal preferences, rather than considering specific concepts or theories. Organisations can apply theories of learning that are widely recognised and adopted in MIHE. These include social constructivism theory (Wang & Ahmed, 2002; Vygotsky, 1978) or transformative learning theory (Mezirow, 2009).

The main risks (see Figure 2) identified in the EMB literature were difficulty/unfamiliarity in using microblogging (Grit, 2009; Grosseck & Holotescu, 2008), distraction and (Case & King, 2010; Raeth et al., 2009) wasting time (Günther et al., 2009; Othman & Siew, 2012), noise-to-value ratio (Raeth et al., 2009), privacy of the users (Mayfield, 2009), security concerns (Grosseck & Holotescu, 2008; Zhang et al., 2010a) and length restrictions (Enner et al., 2010; Riemer, Diederich et al., 2011a). As regards risks, the analysis identified that there was less concern with risk in the literature of microblogging in education, compared with the preoccupation with the topic in the organisational literature. This may be because educational uses are in their early stages, but seems to reflect a greater all-round consciousness of risk in organisations. This comparison suggests the argument that educators are not introducing users enough to the possible risks of microblogging. The focus on positive uses does not expose users to the same sense of risk. In terms of future employability in organisations (Foroughi, 2011), learners could be introduced to the risks of microblogging as a more central issue, even if this was through creating exercises that explicitly place learners imaginatively in organisational contexts.

The review also identified a number of possible guidelines and policies to address such risk concerns, mainly developed within the organisational literature. For instance, continuously emphasising the usefulness of internal systems (Othman & Siew, 2012) and providing training for early adopters and users (Raeth et al., 2009) are proposed as a way to help reduce difficulty/unfamiliarity in using microblogging (Lowe & Laffey, 2011), distraction (Case & King, 2010) and issue of time (Ehrlich & Shami, 2010; Müller & Stocker, 2011). Also, in terms of security, Mayfield (2009) suggested that there should be privacy restrictions on content, and documents and workspaces should be provided for users to only view activities they should have access to. These aspects could be introduced in the educational context too. It is proposed that in MIHE, there are no clear guidelines associated in preserving or protecting sensitive data when using microblogging. For instance, some educators may consider particular information they provide in classroom learning to be sensitive and may not wish for those data to be shared with the public; however their student may share those information with people outside of the classroom. Researchers in this study suggest that MIHE can learn from proposed policies in EMB, in that clear rules may be required in order to balance the advantages of using microblogging with the risks associated with protecting sensitive data, ie, rules to state clearly who should have access to postings and for how long.

The review also points to some lessons for researchers in terms of methodology. On the whole, the EMB literature uses a wider range of methods: logs, social network analysis, genre analysis, interviews and questionnaires. Sometimes information about staff members can be matched to their microblogging activity. MIHE tends to use a narrower range of methods. Small classroom studies tend to have quite restricted sample sizes and duration. Reference to the EMB literature could inspire researchers to undertake larger scale, more longitudinal studies (in fact, both literatures are relatively limited in these terms), so that researchers can better understand the
effects and potential of microblogging for their needs. Also, most of the research to date in both fields has been published on studies in the USA and Europe and surprisingly little in the UK. It is proposed that more studies on microblogging need to be conducted in the UK, including small to medium enterprises, sectors other than IT and in MIHE increase the sample size of groups, experiment diverse microblogging activities in classroom and include different backgrounds (e.g. disciplines, course levels, institutions). As a result, researchers could better understand the potential of microblogging for different needs and use them more effectively in the future.

Conclusion
This has been the first review that we are aware of that has concentrated on the uses and risks of microblogging technologies in two different contexts of the organisation and education. The comparison of the literature on microblogging in the two sectors has led to the development and evaluation of a generic framework, which graphically presents its use and risks. The framework could also be a useful guide for other researchers to explore issues around microblogging in different settings, such as educators using microblogging for research or use in other contexts. The framework is hospitable to expansion. By understanding microblogging behaviour and user trends, it is possible to evaluate and disseminate the most effective practices. It is helpful to researchers to see how different theoretical concepts and research methods might be deployed in another context. The framework might also be used for comparing other technologies apart from Web 2.0/microblogging.

References


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Appendix

Table A1: Major differences between the uses of microblogging in organisations and higher education

<table>
<thead>
<tr>
<th>Uses</th>
<th>EMB</th>
<th>MIHE</th>
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<tbody>
<tr>
<td>Communication</td>
<td>EMB has been found useful in:</td>
<td>In educational settings, Twitter is considered useful for:</td>
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<tr>
<td></td>
<td>announcing events or activities (Riemer, Diederich et al., 2011a, 2011b);</td>
<td>Quick communication between instructors and students, as well as among students themselves in the classroom (Grossec &amp; Holotescu, 2008; Kassens-Noor, 2012; Kop, 2012);</td>
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<td></td>
<td>News distribution (Case &amp; King, 2010; Riemer, Diederich et al., 2011a);</td>
<td>To extend and enhance communication outside the classroom. For example, Ebner et al. (2010), Ross et al. (2011), Lowe and Laflay (2011), Rinaldo et al. (2011) and Perifanou (2009) have all suggested that Twitter is a useful tool for asking questions, engaging in discussions, sharing resources and learning materials, or announcing events and assignments;</td>
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<td></td>
<td>Sharing social events (Heilmann, 2010); Expressing opinions or clarifying various matters of interest (Riemer, Diederich et al., 2011a);</td>
<td>Information sharing: Ebner et al. (2009) argue that microblogging can act as a backchannel in conference-based settings. In these contexts, it can support to extend discussions and commentary on presented topics and facilitates the exchange of additional information.</td>
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<td>Communicating to release emotional stress (Zhao &amp; Rosson, 2009); Providing feedback on ideas (Riemer, Altenhofen et al., 2011; Zhao et al., 2011); Asking or responding to questions (Ehrlich &amp; Shami, 2010; Mayfield, 2009).</td>
<td>In the field of EMB, Riemer and Richter (2010) explored communication patterns in a team using microblogging tools. Coordinating with others (20.9%) was the second largest category of ways that microblogging was used. Coordinating others referred to individuals who aimed to directly influence others and their tasks. This was achieved by frequently posting items that would require attention by the team.</td>
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The use of microblogging to:
Enhance someone's status in their social network or manage their reputation may have a direct impact on the intention to use EMB (Schöndienst et al., 2011).

For example, employees use microblogging to share information such as news related to some project and this gives an indication of their contribution as well as capabilities. This can result in more interactions with colleagues and clients (Schöndienst et al., 2011).

Engage with Twitter to:
Draw attention to their work through sharing information related to their interests. They can also highlight personal characteristics such relations between colleagues and students (Veletsianos, 2011).

Learning can be enhanced in organisations through:
The sharing of contents and information, as it has been suggested (Yap & Robben, 2010). EMB tools such as Yammer do not only facilitate those outside the core project team to be aware of a project's progress, but can also enable learning from related projects for one's own benefit (Zhao et al., 2011).

Most studies have focused on the use of Twitter to support learning activities. Studies focus on aspects of learning efficiency, learning motivation, learning outcomes and assessment.

Different aspects of learning found in MIHE:
Learning community; Sustained interaction and engagement; Collaborative learning; Mobile learning; Reflective thinking.

Themes found exclusively in EMB:
Learning community (formal and informal); Collaborative learning; Mobile learning; Reflective thinking.

Record information for future reference
EMB can enable the recording of information such as:
Login data, inputting contact details or meeting minutes (Riemer & Richter, 2010).

For example, Riemer, Altenhofen et al (2011) reported that their EMB tool Communote was used to keep certain information for later reference. By engaging with microblogging, others were notified about documents or team-related data. Users were able to post locations of specific files or attach documents relevant to their messages.

In MIHE, microblogging has also been found to be a useful reference tool:
Students were able to seek or refer to any important information shared by their colleagues, or important announcements regarding the course, i.e. classroom changes (Grosseck & Holotescu, 2008).

This parallel situation between both settings shows that microblogging can be useful not only for interacting with others, but also for personal advantage, such as storing useful and important information that can be accessed at any time.

Awareness/sense of connectedness
The concept of awareness has been used in understanding microblogging in organisational contexts much more than in educational settings.

Microblogging can enhance awareness among co-workers (Günther et al., 2009) and can be used for creating or sustaining a feeling of connectedness, i.e. feelings of intimacy between colleagues (Zhao & Rosson, 2009).

In MIHE, the concept of awareness has been introduced using similar terminology, for example, increasing social presence through ambient awareness especially in distance learning (Dunlap & Lowenthal, 2009).

Forming relationships
The literature on EMB has suggested that it can strengthen social connections between employees.
Zhao et al (2011), for example, found that Yammer can enable employees to learn more aspects about other employees beyond their own immediate team.
Forming relationships is an important concept, particularly as relationships can influence the learning process.

In MIHE, this concept has not been focused on so much.

EMB, enterprise microblogging; MIHE, microblogging in higher education.

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Table A2: Major differences between the **risks** of microblogging in organisations and higher education

<table>
<thead>
<tr>
<th>Risks</th>
<th>EMB</th>
<th>MIHE</th>
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<tbody>
<tr>
<td>Difficulty/unfamiliarity in using microblogging</td>
<td>Unfamiliarity with using microblogging can be considered as a risk of attempting to introduce their use (Grit, 2009; Lenhart et al., 2010). In organisations, for example, Raeth et al. (2009) argue that it is important to train users in areas such as software use and business guidelines, in addition to providing training for early adopters and users. Othman and Siew (2012) also suggest that organisations have to continuously emphasise the usefulness of their internal system and continue to educate users on how to engage with the tool and gain benefits from their usage.</td>
<td>In educational settings, it has been suggested that many learners may not be familiar with microblogging tools and may face difficulties or feel intimidated to engage with the tool (Costa et al., 2008; Rinaldo et al., 2011). Several researchers have suggested the need to have creative ways to convince students about Twitter’s benefits and how to establish rewards to encourage usage (Rinaldo et al., 2011).</td>
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<td>Distraction</td>
<td>The issue of spending too much time using microblogging has also been seen as a risk in both organisations (Ehrlich &amp; Shami, 2010; Günther et al., 2009). Noise-to-value ratio (Ebner et al., 2010) or information overload—the difficulty of finding relevant information among a large number of postings (Zhang et al., 2010b)—has been identified as a risk of microblogging in both settings (Günther et al., 2009; Grosseck &amp; Holotescu, 2011; Rinaldo et al., 2011). Günther et al. (2009) suggested that codification effort refers to the actual act of placing information on the EMB tool, which requires time. Users revealed to be concerned about this issue, to some extent resulting from expected involvement and so, “increased codification effort” (Günther et al., 2009, p. 4). Expected involvement can cause employees to get distracted from doing their work. Ways of reducing risks of distraction include monitoring the uses of microblogging, providing training for early adopters (Raeth et al., 2009), ie, to make sure they can concentrate on their work, and continuously educating users on how to engage with microblogs without getting distracted (Othman &amp; Siew, 2012).</td>
<td>In educational contexts, it is necessary to avoid overtweeting and information overload because it will cause distraction in the classroom learning. To reduce such tendencies, Lowe and Laffey (2011) suggest using hashtags and shortening links in the tweets.</td>
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<td>Privacy of the user</td>
<td>Notions of privacy may influence the decision to use EMB (Günther et al., 2009) both for contributing content and responding to others (Schönästen et al., 2011). Employees may have concerns regarding the safety of discussing work-related information using microblogging, as they have no control over who views their postings (Zhao &amp; Rosson, 2009). The issue of trust is therefore important and may influence the use of microblogging (Mayfield, 2009; Zhao &amp; Rosson, 2009).</td>
<td>In MIHE, microblogging may also disturb teachers’ private lives, because of students constantly tweeting (Grosseck &amp; Holotescu, 2008).</td>
</tr>
<tr>
<td>Security concerns</td>
<td>Organisations may leak confidential and private information to outsiders through microblogging tools (Case &amp; King, 2010; Lee &amp; Warren, 2010). According to Lee and Warren (2010), guidelines, policies, training and educating employees, which are all applicable to educational settings, can reduce security concerns and ethical threats associated with microblogging. Ehrlich and Shami (2010) also found that employees avoided posting confidential information publicly; instead, they preferred to post such information on their internal system.</td>
<td>Grosseck and Holotescu (2008) suggest that microblogging the very public nature of the platform may increase the risks to information security, such as accidentally revealing private information.</td>
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<td>Length restrictions</td>
<td>Restrictions on the length of text can be considered to be an issue with microblogging because they limit the user’s ability to share knowledge (Grit, 2009).</td>
<td>In educational settings, Ebner et al. (2010) have pointed out that although Twitter’s 140-character limit was viewed as a valuable feature by some researchers, others believed that it posed challenges to learners because it required the ability to focus and express oneself in too short a length. The length limit may also make microblogging inappropriate for certain activities, especially those requiring elaborate reflection on complex ideas (Rankin, 2009).</td>
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</tbody>
</table>

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