

Graduate employability 2.0: Social networks for learning, career development and innovation in the digital age

Paper for discussion

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While the higher education sector is galvanised into action around graduate employability, both research and practice relating to this topic remain under-developed. Decades of research into career success, innovation and professional learning demonstrate the impact of social capital on success in work and life, and yet social networks and the capabilities required to build, navigate and use them, are rarely addressed either in graduate employability research or curricula. Over the last fifteen years the impact of digital networks and social media on all aspects of professional work has been significant, but these are even less likely to be addressed in university programs. This article explores the important roles of social capital and networks on various facets of professional life in the 21st century, and proposes ways forward for higher education in fostering students' social network capabilities for life and work now and into the digital future.

This article focuses on the social, networked ways that humans engage with information and learning, what this means for education, and our remit to prepare students for their professional lives – hence 'graduate employability 2.0'. The term 'Web 2.0' describes a second generation in the development of the World Wide Web. Rather than signifying a new version of the internet, it rather signals fundamental changes to the way the internet is viewed, the functionality of web pages, and what the internet is used for. Web 1.0 was about information access and content; Web 2.0 focusses on user collaboration, sharing of user-generated content, and social networking. Millions of people globally have embraced the power of social interaction and networks. However, universities still largely retain a distinctly 'Web 1.0' approach to their teaching activities, emphasising delivery of content ('information access').

This article is not just concerned with using social media in teaching (e.g., Cao, Ajjan, & Hong, 2013; Jenkins, Lyons, Bridgstock, & Carr, 2012). Rather, it seeks to reposition the value of university education towards quality and depth of the learning experience, the relationships that universities foster, and their bespoke content generation (research), all of which depend to some degree on social networks. Much of what students will truly value in the university experience will be meaningful interactions with people, and learning how to make the most of the social realm for work and life.

Social relationships, networks and the digital knowledge society

At the individual level, social network capabilities involve the skills and knowledge required to build, maintain and use personal and professional relationships with others for mutual benefit in work or career (Forret & Dougherty, 2001). It is through these relationships that many of the processes of learning, career development, and new knowledge production (innovation) occur. Being social network capable involves what McWilliam and Dawson (2008) refer to as network agility—the ability to develop and navigate social networks in a strategic and enterprising (and yet genuine) manner.

Coleman (1990) defined social capital as any aspect of the social structure that creates value and facilitates the actions of the individuals within that social structure. Social capital has long been acknowledged as important to the career success of individuals (Seibert, Kraimer, & Liden, 2001). However, how social capital is created and used has changed radically over the last fifteen years. The shape, functioning and use of people's social networks have all shifted under the influence of digital tools and social media. The strong ties in social networks have seen the least change; most people still typically have 7-14 individuals with whom they interact with in an ongoing manner, and with whom they maintain high levels of trust and intimacy. We may now text or iMessage these people through the day rather than calling them, but the fundamentals remain the same. However, digital networks have had enormous impact on weak and indirect ties in social networks.

Through digital networks, individuals are now able to connect and communicate with hundreds, and in many cases thousands, more people. The greater number of weak (and therefore also indirect) ties affords greater influence, information and resource flows (Kaplan & Haenlein, 2010). From an information science perspective, networks are ideal mechanisms of information resource allocation and flow. Structurally, they put people in direct contact via the provision of horizontal links across institutional boundaries, thus facilitating rapid information transfer. In addition to transmitting information, networks also help create it. New ideas may develop as each person in the network receives and synthesises information; information easily builds on information. Thus, new ideas are both shared and created via networks. The 'strength of weak ties' (Granovetter, 1973) is much greater in the digital age, both because of the potential volume of those ties, and for what those ties can be used.

Some readers may be concerned that building and making the most of social connections equates to instrumentalisation or manipulation of others for self-interest. It seems that while development of human capital (skills, knowledge and experience) is an acceptable aim of university, development of social capital (acquiring and managing personal connections) may not be as accepted (Tyman & Stumpf, 2003). Acquiring and managing social connections is often associated with selfishness and insincerity.

However, there is consensus among social network scholars that the strongest forms of social capital result from genuineness and service to others (Adler & Kwon, 2002). Helping behavior and sharing creates strong ties, connectedness, reciprocity and trust. Success in networking is about bringing something of value to the relationships in which one is engaged. Through putting effort into building meaningful relationships, all parties benefit and grow (Villar & Albertín, 2010). This article is intended to encourage students to learn to build these genuine reciprocal connections, and for higher education to support them to do this.

The next section of this article presents a brief review of the literature relating to higher education and approaches to graduate employability, focussing on current literature and practice relating to social relationships, social networks and skills and knowledge for these, and highlighting gaps in provision. It continues by exploring the key roles that social relationships and networks play in the digital society, and the important ways that university graduates can learn to make the most of these

affordances. Finally, it examines how we might foster social network capabilities in higher education programs more effectively going forward.

Higher education, graduate employability and social networks

At present the higher education sector is highly motivated to engage with graduate employability and graduate outcomes, in part because in the current policy environment, these have become key indicators of university performance. One of the central tasks of higher education has become to prepare students as far as possible for the world of professional work, a task that continues to receive significant attention by policy makers and scholars. This task has become much more difficult in recent years because of widespread labour market uncertainty and massification of the higher education system (Tomlinson, 2012). In contrast to the previous era, in which ongoing professional work was virtually guaranteed to university-qualified individuals, contemporary graduates must be proactive and flexible, and adapt to a job market that has continually shifting requirements (Clarke, 2008). Rather than seeking security in employment, graduates must now seek security in employability.

Universities have sought to address the graduate employability agenda through developing their students' 'employability skills', or 'graduate capabilities', in order to prepare them to meet the challenges of gaining and maintaining employment. Employability skills are most commonly categorised into discipline-specific skills and knowledge (skills and knowledge for specific jobs), and generic / transferable skills (skills and knowledge that can be transferred from one employment context to another). In university policy documents, employability skill lists are often accompanied by lists by other desirable graduate qualities or attributes, such as resilience and proactiveness.

Social skills are of course included in the employability skills and graduates attributes discourses. Skills such as oral communication, teamwork, and interpersonal skills are commonplace in graduate attribute skill lists, and are also routinely included in higher and professional education programs (Bennett, Dunne, & Carré, 1999) often through learning activities requiring students to work in groups. These socially oriented generic skills are certainly essential to social network capability, and group work is congenial to the development of a subset of the social capabilities required by graduates. However, the skills commonly listed and addressed in curricula form a small subset of the skills required to form, develop, maintain and use social networks effectively. Following Barrie (2006) and Jones (2009), it is suggested that a far more nuanced and contextually specific approach to graduate capabilities is required across all employability skills. With respect to social network-related capabilities specifically, students should graduate from programs with a working knowledge of how to form and maintain professional relationships (particularly with stakeholders from multiple disciplines and with diverse aims), and how different kinds of relationships can contribute to various aspects of professional work. This knowledge must be specific to the contexts that the student will encounter professionally, including 21st century contexts such as online social networks.

Several scholars have argued that developing employability skills is not all that universities can or should do to enhance graduate employability (e.g., Holmes, 2013; Vilapakkam Nagarajan & Edwards, 2014): this article adds to this literature. It is highly advantageous for students develop a functioning professional social network

that then continues beyond the degree program into professional life, rather than starting from scratch at course completion.

For universities to address students' professional social network learning sufficiently, an authentic approach is essential. This authentic approach involves breaking down the walls between the classroom and the 'real world'. Actual interactions with industry, community and other stakeholders occur; social networks are formed and used for various professional purposes through the program.

While not an exhaustive list, the social network applications of particular relevance to university graduates that universities should seek to engage with are: (i) innovation and enterprise; (ii) career development and employment generation; and (iii) lifelong professional learning. Each of these will now be explored in turn, describing the roles that each application play in the contemporary knowledge society, the ways that individuals navigate and use social networks for these applications, and the extent to which universities currently teach for them.

Social networks for innovation and enterprise

Many of the world's advanced economies have shifted from industrial to innovation economies – that is, economies that emphasise the value of new knowledge production, based on the creation of knowledge, information, and innovation. It is also increasingly recognised that innovation and enterprise processes are also highly advantageous when solving and managing social and environmental problems (Sarasvathy & Venkataraman, 2011). A key task for educators is to prepare learners to be capable of contributing to the innovation economy and society. However, it has been argued by many that both compulsory and post-compulsory education fail to address this need (Hearn & Bridgstock, 2010; Robinson, 2011; Sawyer, 2006), primarily because traditional education *turns students into consumers rather than producers of knowledge*. In the main, universities teach knowledge that is static and finite, require demonstration of attainment of provided fixed learning outcomes. Further, where creativity and innovation are included in the curriculum, they are often focussed on individual activities and performance.

Innovation thrives on social interaction. It tends to occur in complex collaborative and otherwise social contexts, involving the active combination of people, knowledge and resources (e.g., Mascia, Magnusson, & Björk, 2015). Empirical research suggests that successful innovation relies on social networks in three main ways: (1) by fostering creativity through exposure to new people and new ideas (particularly through multidisciplinary input and trans-disciplinarity) (Granovetter, 2005); (2) by providing a uni-disciplinary 'powerhouse' of strong-tie relationships which helps ensure that creative ideas are integrated, implemented, and brought to fruition (Obstfeld, 2005; Tocher, Oswald, & Hall, 2015); and (3) by finding opportunities for enterprise – for example, new markets or new sources of resources. Education should address all three of these, through situated, collaborative learning activities involving authentic social network building and use, including trans-disciplinary interactions.

It is widely accepted that trans-disciplinary ties are important to innovation. For instance, Granovetter (1985, 2005) argued that networks were beneficial to innovation because they were an ideal mechanism for transmitting unique and non-redundant (i.e., potentially innovative) information between clusters of actors. "Innovation means breaking away from established routines. Development of resources outside

their usual spheres may often be a source of profit and new institutional forms can facilitate such deployment” (Granovetter, 2005, p.46). Exposure to people who have different perspectives and knowledge bases can facilitate cognitive flexibility and autonomous thinking, and supports recombination and association of seemingly disparate ideas into something that is new and innovative (Perry-Smith & Mannucci, 2015). Conversely, too many intra-disciplinary strong ties can lead to redundancy of knowledge and ideas, group-think through conformity, and long term enculturation.

However, there is also evidence that strong uni-disciplinary ties can be beneficial to innovation. My research on the social networks of successful innovators in STEM and the Creative Industries has found that clusters of strong, intra-disciplinary ties seem to function as idea integration and implementation ‘powerhouses’ (Bridgstock, Dawson, & Hearn, 2011), and this has been borne out by other literature. Strong ties are characterised by trust and sharing, reciprocal assistance, and open communication (Dyer & Singh, 1998) and these are ideal conditions for the integration of knowledge, resources, and ideas. Without strong ties, Obstfeld (2005) observed that innovative projects can suffer from the ‘action problem’ and stall at the level of concept integration and implementation.

Uni- and trans-disciplinary tie strategies have often been assumed to be exclusive of one another, and in fact operate in opposition and in competition with one other (e.g., Coleman, 1988). In fact, it seems that ‘alliance ambidexterity’ and the ability to maintain both strong uni-disciplinary and trans-disciplinary ties is advantageous (Tiwana, 2008). Indeed, de Vaan, Vedres and Stark (2015) demonstrate empirically that one can build the innovation capacity of groups by creating cognitively distant (that is, with different disciplinary knowledge and perspectives) and yet socially cohesive, strong-tie team structures – that is, creating teams that contain both uni-disciplinary and trans-disciplinary ties, where individuals maintain full membership of two or more social networks. The resultant mixing, ambiguities and tensions can be highly productive, because the group can then override what is taken-for-granted, and think deliberatively and reflexively (De Vaan, et al., 2015; Vedres & Stark, 2010).

Traditionally it has been assumed that trans-disciplinary ties tend to be weaker ties (Granovetter, 1973; 1985), essentially because people tend to be closer to people who are similar to themselves. DeVaun, Vedres and Stark’s (2015) findings show that this is not necessarily the case. Weak ties in a person’s social network, whether uni-disciplinary or trans-disciplinary, can be very useful – they can be a source of new and different ideas and knowledge; they can be a conduit of new relationships (via indirect ties, or friends-of-friends), and in the era of digital social networks, they can become part of a ‘crowd’ in crowd-sourcing or crowd-funding activities, and therefore become part of bringing new ideas to fruition (Belleflamme, Lambert, & Schwienbacher, 2014). Weak ties can also become part of networked marketing processes, to raise awareness of, and engagement with, new products, services, and ideas. While weak ties are far less time and resource-intensive to maintain than strong ties (Perry-Smith & Mannucci, 2015) they also can be turned into stronger ties if needed.

Balkundi and Kilduff (2005) noted that it is important for organisational leaders to recognise that ties of any kind, whether strong, weak, trans-disciplinary or uni-disciplinary, can be formal or informal, and intra- or extra-organisational. Beneath

most formal teams within organisations “lie a sea of informal ties” (Powell, Koput, & Smith-Doerr, 1996), and this is even more the case since the advent of digital social networks. In contrast to closed, organisationally-based knowledge production of previous times, innovation is becoming more and more ‘open’ (Chesbrough, 2004), that is, autonomous, diverse and decentralised. Increasingly, value is to be found in building external and internal networks of people and knowledge resources, and finding new ways to link them. Open innovation processes are often facilitated by digital tools for collaboration, ideation, structured problem solving and feedback, so collaborations for innovation can be globalised, and can include broad and diverse input or ‘co-creation’ from throughout the social network, including from consumers / customers (Frow, Nenonen, Payne, & Storbacka, 2015).

Social networks for career development and employment generation

Professional relationships, networks and social capital have always been important to career success (Duncan & Dunifon, 2012; Seibert, et al., 2001). In 2001, Seibert et. al described empirically the positive effects of social capital on career outcomes as relating to access to career resources and information, and career sponsorship. In turn, they found that strong ties rather than weak ties were of value on providing information, social support and assistance. They further suggested that people should invest in weak ties to increase the level of social resources embedded in their networks, but then invest selectively in tie-strengthening as needed to increase direct career benefits (Seibert et al., 2001). This process of weak tie acquisition, selective strengthening and use for career development is commonly known as networking (de Janasz & Forret, 2008), and has been demonstrated repeatedly to have positive effects on promotions, salary, perceived employability, and career satisfaction (e.g., Wolff & Moser, 2009). Forrier and Sels (2003) point out that weak ties can provide important career enhancing insights into the labour market, such as knowledge of the possibilities for transition, of available jobs and the channels leading to jobs, of mechanisms that promote transition. Jackson (2014) demonstrated, through statistical modelling of Australian national university graduate outcome data, the importance of networking (including capitalising on family, social and work contacts) to graduate career outcomes, with a 54% increase in the odds of job attainment if social networking strategies were used.

In the digital age, social networks continue to have a strong impact on how careers unfold. Digital tools mean that the reach of career development activities can be significantly larger than before. Individual branding, digital networking, online portfolios and resumes (such as LinkedIn) have become accepted and indeed expected ways to enhance careers (Nikitkov & Sainty, 2014; Roman, 2014), and digital networks have also become important sources of career information (Hooley, 2012). Employers and recruiters now routinely screen potential employees using social media and search engines. Lancaster (2014) discusses the results of one survey of American recruiters: 91% had used social media as an applicant screening tooling, and 7 in 10 had made positive recruitment decisions based on information posted on social networking sites. In Australia, about half of graduate recruitment program employers who had screened applicants on social media were able to gain insights about the applicant’s ‘personality, character, and cultural fit’ (Nikolaou, 2014). Conversely, job seekers are now able to gain insights into employers via sites such as glassdoor.com, which publishes reviews and advice written by current and past employees of those firms.

Indelible digital footprints mean that it is straightforward to retrieve historical data on individuals, including information shared on social media not intended for professional audiences. This ‘context collapse’, where digital communication reaches unintended audiences as well as intended ones, can have serious negative ramifications for job seekers (Pritchard, 2013). The effects of context collapse and digital footprint permanence can go far beyond ill-advised social media posts falling into unintended hands. In the 21st century, previous and current career aspirations, interests, capabilities and experiences are all laid out online. Digital networks mean that it can be much more challenging to manage multiplicity in the professional realm – for instance, it is no longer a simple matter to ‘tweak’ a resume to address the interests of a particular employer. Experienced online content producers have therefore developed specific strategies to navigate their online identities and manage their diverse audiences (Marwick, 2011).

The study of the impact of digital social networks on individual career development is still in its infancy. Many topics investigating the effects of unique characteristics of digital social networks are ripe for research. For instance, a recent major movement in recruitment is ‘talent’ or ‘people’ analytics. Seeking a competitive advantage, employers are increasingly using algorithmic analytical processes to generate characteristics of desirable employees, and then retrieve and interrogate digital data and metadata online to find the best potential talent match (Davenport, Harris, & Shapiro, 2010). Research into talent analytics could reveal information about the attributes commonly sought through such processes, and investigate the implications of this for job seekers (for instance, it has been suggested that in the future, job advertisements will be much less common, and headhunting on the basis of analytics will be much more common). In companies that are not yet engaged in talent analytics for recruitment, the human resource professionals who are screening applicants are employment gatekeepers, and it would be useful to know exactly which elements of an online presence they find to be persuasive. For instance, are LinkedIn reviews and skill-specific endorsements from an individual’s social network useful in determining the suitability of an applicant? What about the extent to which someone can demonstrate that they possess online influence (that is, having impact on others’ behaviour or attitudes)? (Harrison, 2016).

The role of social relationships and digital networks in career development is even greater now because of enormous shifts to the labour market that are occurring in many advanced economies. Under the interconnected influences of labour market structural alterations, volatility, and changes to employment culture, policies, and practices (Noon, Blyton, & Morrell, 2013), traditional organisational careers are becoming less common. People are increasingly engaged in ‘boundaryless’ (Arthur, Khapova, & Wilderom, 2005) self-managed careers, in which the individual must be both proactive and agile, learning how opportunity structures operate, strategising how to access them, and investing time, energy and resources to take advantage of them (Smith, 2010). In order to do this, they need to actively cultivate their human, cultural, and social capital. They may seek work as employees within firms (increasingly on a contractual, part-time or casual basis), but more and more people are also engaged in freelance employment, a phenomenon that has grown exponentially due to the facilitative effects of social media and digital networks.

As AirBnB threatens major hotel chains and Uber challenges the taxi industry, there are also moves towards distributed, networked options for other ‘human services’ tasks. Amazon Mechanical Turk (2016) advertises that ‘we give businesses and developers access to an on-demand, scalable workforce’ to perform small activities that at present cannot be automated, such as checking automated categorisations, creating titles for images, or describing associations between images. The US-based Upwork, one of several rapidly growing freelance talent platforms, connects freelance workers with clients who require piece work, such as software and app development, design and creative services, data science and analytics, and writing of digital copy. Upwork’s website (Upwork, 2016) reports that as of the end of 2014, it had nine million registered freelancers and four million registered clients. Three million jobs are posted annually, worth a total of \$1 billion USD, with corporate targets to reach \$10 billion USD in six years. In Australia, Airtasker.com reports that it has 420,000 people signed up and ready to perform task as wide ranging as mattress removal and disposal, market research services, and translation of advertising material for an AirBnB apartment into Mandarin.

Higher education lags a long way behind in preparing students to navigate 21st century careers. While there is burgeoning recognition of the importance of career self-management skills to graduate employability (Bridgstock, 2009), the vast majority of employability initiatives continue to focus on developing capabilities for job performance that may appeal to organisational employers. Very few are focussed on the mushrooming freelance careers. Educational programs that include effective professional networking, building and making the most of social relationships, are likewise quite rare. This last is particularly surprising given the commonality of job offers arising out of student work integrated learning / internships, a phenomenon that is a clear demonstration of the effects of student social capital on employability. Through the internship experience, the employer comes to know and trust the student intern. They become aware of the intern’s capabilities, and engage the intern in socially-based professional learning for the profession and workplace’s culture and role requirements. However, both the scholarly literature and the practice of work integrated learning tend to focus on its capacity for ‘employability skill’ transfer and development rather than relationship development (Jackson, 2015; c.f. Peach & Gamble, 2011).

The deficiencies of higher education provision for social network capabilities for career are even greater with respect to digital networks. Despite the fact that digital behaviour, particularly via social networks, has enormous and increasing impact on the employability of graduates (Nikitkov & Sainty, 2014), there is evidence that most graduating students have little idea how to exploit the professional affordances of social media (Benson, Morgan, & Filippaios, 2014; Hooley, 2012). Very few higher education institutions facilitate students’ engagement with digital career development possibilities beyond offering an ePortfolio or pointing to SEEK and LinkedIn. Still fewer take systematic, evidence-based, or curriculum-embedded approaches to digital career capability development (Longridge, Hooley, & Staunton, 2013).

Social networks for lifelong professional learning

The importance of socially facilitated learning to work and life has been recognised in numerous areas of literature. Bandura (1977) pointed out how much of human

behavior is learned and modelled by observation of others. Scholarly explorations of teamwork (Schuller, 2001), collaborative learning (Hmelo-Silver, Chinn, Chan, & O'Donnell, 2013), collective intelligence (Malone, Laubacher, & Dellarocas, 2009), learning communities (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006) and the learning society (Ellington, 2012) among others all acknowledge that social connections facilitate transmission of skills, and also reciprocity in knowledge sharing and exchange for information (Field, 2005; Maskell, 2000; Wasko & Faraj, 2005).

The roles that social relationships and networks play in professional and lifelong learning are of great relevance to graduate employability (Field, 2009). Students who can build and use relationships effectively to learn in an ongoing way at, and for, work, are more likely to have up-to-date and relevant skills and knowledge. They are therefore more likely to gain and maintain employment and be successful in professional contexts. Billett (2008), Lave and Wenger (1991; Wenger, 1999) and Boud (Boud & Middleton, 2003) among others emphasise the importance of informal social learning at work for professional learning and organisational acculturation. For these theorists, valuable learning is achieved through situated practice that is embedded into an informal framework of social support and development. Informal social learning processes include expert modelling, mentoring, explicit instruction, advice and feedback, within a learning process of what Lave and Wenger (1991) call 'legitimate peripheral participation'. Under this model, people begin with simple and low-risk tasks that are nonetheless useful and legitimate. Through these peripheral activities, beginning workers gradually become more advanced contributors in collaborative projects.

As job roles in the knowledge society continue to change because of digital influences such as automation and increased computer processing power, social connections also play an important part in helping people learn new capabilities and keep up to date (Bridgstock, 2014). These connections are not limited to intra-organisational contexts, or indeed face-to-face interactions. As with the use of social networks for innovation and career development, strong and weak ties and analogue and digital connections tend to be used for different purposes in 21st century professional learning.

Recent research into the preferred professional learning strategies of digital media professionals (employed in multimedia and software development, visual effects and animation, computer and online games, mobile content, and digital film/ television) sheds some light on this (Bridgstock, 2016, published online). In this study, the digital media professionals had a strong preference to employ socially-based informal learning strategies over formal, course-based options. While a few interviewees reported using online tutorials or engaging in other forms of individual learning (such as Lynda.com online courses), the vast majority of the informal learning strategies employed by the interviewees relied on social relationships in either face-to-face or online modes. Face-to-face learning strategies tended to be employed along the lines of a 'community of practice' (Wenger, 1999) involving active relationship building and maintenance between individuals within and outside the organisation with similar interests. Communities of practice involve repeated and extended reciprocal interactions (strong ties), and are thus fairly time and energy resource intensive – but in this study were central to professional currency, career development and ideation, and were seen as very valuable.

The face-to-face learning communities ranged from involving fairly structured regular group meetings and with specific aims, to casual "coffee catch ups", as needed and

fairly ad hoc modes of operation. Instances of both formal and informal mentoring and coaching were also common (broadly defined as a dyadic relationship where specific knowledge and skills are transferred from one to the other, with an overall aim of fostering independence (Garvey, Stokes, & Megginson, 2014)).

Online modes of social informal learning were less likely to employ a community of practice model, but rather a distributed learning network of professionals and other interested people (including users as well as producers) (Albors, Ramos, & Hervas, 2008), in which professionals may not even know the people with whom they were interacting, or know them only slightly (weak ties and indirect ties). The participants used informal learning to obtain on-demand, 'just in time' quick-turnaround information and skills via social networking sites, obtaining information quickly and then passing it along. This form of social learning was generally much less time and energy intensive than the community of practice model. In fact, study participants commented that a major reason that online social learning was so appealing to them was that it was often largely passive and required little effort.

The type of online social learning undertaken by the participants maximised the volume of information that could be processed. Under this learning approach, knowledge building occurs in small increments and decrements, with maximum task relevance and efficiency. However, the passive learning experience is also imbued with what might be thought of as 'agentic possibility', in self-regulatory learning terms (Martin, 2004) – that is, the individual has over time carefully curated their social sources of information, to include those that cover topics of interest most effectively, and that they can trust to be credible. If a post or tweet is of interest, it can be a launching off point for further, active searches for information and/or enquiries of the social network.

The other ways that digital networks are often used for learning can be more active, but still rely on weak or indirect ties. These are collective intelligence, and crowdsourced approaches to learning (Leimeister, 2010), the most prominent generic example of which is Wikipedia. The power of digital networks for informal, personalised learning is considerable (Brooks & Gibson, 2012). In order to take advantage of this power, learners must also possess the critical capacity to (a) select where to go online to learn and how; (b) filter data for credibility and usefulness; and (c) synthesise it with existing knowledge (Bridgstock, 2016).

Finally, where socially based learning and socially-based innovation overlap is in so-called dialogical learning (Hakkarainen & Paavola, 2009; Paavola & Hakkarainen, 2014). Dialogical learning theorists emphasise the collaborative creation of knowledge rather than learning as socially-based acquisition of knowledge (Ausubel, 2012) or learning as participation in shared practices & existing knowledge frameworks (Wenger, 1999) The argument for dialogical learning is that contribution to professional work in the innovation society and economy requires emergence and continual collaborative learning for new ideas and the advancement of knowledge.

Universities do acknowledge, at least to some extent, that socially-based learning is important; for instance, group and team-based learning is common in degree programmes. It is true that group work, when effectively employed, is associated with the development of personal, social and self-capabilities such as interpersonal communication, teamwork, negotiation, professionalisation and self regulation (Rossin & Hyland, 2003). However, the ways in which group work is often

undertaken in the university curriculum (“now form groups of four and work on this problem in the tutorial”) do not emulate how it is done in professional contexts, do not optimise learning, and are often unpopular with students. Digital social networks are not at all well integrated into student learning at present, with many undergraduate students not even recognising digital networks as a valuable source of learning (Madge, Meek, Wellens, & Hooley, 2009).

Developing social networks for professional learning, career development and innovation at university

From the preceding discussion it is clear that social connections have always been central to learning and professional work, and that in the digital age there are numerous new ways that social connections are important and also new ways that they can be used, particularly ways that exploit the affordances of weak ties and one-to-many communication via digital networks. While there are instances of higher education good practice in the growth and use of students’ social networks and teaching social network capabilities, in the main universities do remarkably little to support and foster the development of students’ social capital.

While the discussion so far has focussed separately on social networks for innovation, career development and professional learning, these applications are in fact inextricably linked. Not only do individuals use the same social network for all three purposes, but there is also a great deal of overlap between the applications outlined here. For instance, dialogical learning has already been discussed, which is a mode of collaborative learning for knowledge production (innovation). Another example of overlap between the social network applications is participation in informal digital learning networks such as online forums, where career reputation and influence benefits can accrue through reciprocal knowledge contribution and asking / answering questions (Wasko & Faraj, 2005).

So how can the university start to address social network learning in an effective way? The answer lies in a different pedagogic approach, one that emphasises situated, authentic learning, communities of practice and networked, distributed activity. The aim of this is to have students graduate not only with the capabilities required to develop, manage and use their social networks for learning, career development and new knowledge production; but also to have functioning online and offline professional social networks at the point of course completion, that they can continue to use and grow. At present the development of students’ social networks tends to be fairly haphazard, with connections acquired through socialising with peers (Madge, et al., 2009), part-time employment, internships, extra-curricular activities, school networks and family members’ contacts (Clark, Marsden, Whyatt, Thompson, & Walker, 2015). Today’s students possess negligible professional networks when they graduate, and therefore need to start from scratch at that point.

A systematic approach should be taken to the development of students’ social networks and social network capabilities, commencing from the first year of their studies. This systematic approach involves genuine and ongoing partnerships with professional representatives, industry and community, in which learning experiences for all are based in communities of practice. Throughout their degree experiences, students develop and consolidate connections. They are in regular meaningful (online and face-to-face) contact with professional experts, more experienced students and

graduates, and students at the same level of capability as themselves (Murdock & Williams, 2011), as well as teachers who can support them with learning how to learn and making sense of their learning experiences (Shreeve, 2007). The community of practice thus becomes a source of information, support, and knowledge co-creation.

Students must learn explicitly about the affordances of social media and digital networks for networking and relationship building, and proactive strategies to make the most of these affordances. They learn how to represent themselves, their capabilities and their work, online (Pozzi, 2015), and how to use digital tools to find and learn about others. Then they must practice building and using their wider digital networks (weak ties) in an authentic way. Learning begins with a highly scaffolded process involving interactions with ‘safe’ contacts well known to (or even inside of) the program or School, where mistakes and faux pas will have minimal repercussions, and moving progressively into higher stakes networking scenarios with previously unknown contacts.

Strong social networks are best built through addressing and making genuine contributions to shared challenges and endeavours. As already discussed, innovation, knowledge production and enterprise are increasingly important activities that require social exchange. Collaborative innovation and enterprise (whether social or commercial in nature) are fast becoming cornerstones of the 21st century curriculum. They require ‘real-life’ interaction with industry and community to solve problems or find opportunities. Maximising potential knowledge production and authenticity, collaborative innovation and enterprise curriculum needs to be trans-disciplinary, involving multiple disciplines or schools. These activities start to build students’ socially based trans-disciplinary capabilities and networks, and supports students to bring their new ideas for products, services, processes and solutions to the world.

‘Students as partners’ schemes, which involve students partnering with teaching staff to co-develop curriculum or develop and run student initiatives (e.g., Cook-Sather, Bovill & Felten, 2014), are likewise helpful to build students’ self-management, collaboration, innovation, and enterprise capabilities, as well as their social networks. These schemes enable students to graduate with completed real-world projects (as opposed to those completed through the curriculum), which demonstrate their employability.

To support students to build and use their networks for professional purposes, the university must itself become much better at networking, and build its own social capital. At present, individual staff members and small organisational units tend to maintain and guard professional contacts jealously, with the fear that to share these contacts might cause their carefully cultivated relationships to sour through over-contacting, poor treatment, or misinformation. These fears are often legitimate – few staff members in universities know how to network sensitively and effectively, and there is a conception among some potential industry partners that universities are difficult to work with (Ankrah & Omar, 2015). More fundamentally, many universities are set up in ways that work actively against better-developed networks. Social networks are based on open sharing – of information, learning, and connections. Universities tend to be walled gardens, keeping their research, curriculum and people on the inside (c.f., the recent MOOC movement). There can be limited value in making a connection with a university that tends to use its social

networks only for the purposes of advertising and marketing for new students, requesting cash donations from its alumni, and asking industry partners to take on another student intern. We need to ask: how can we add value for, or indeed co-create value with, community and industry, such that they want to partner with us?

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