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Supporting Arts and Science Communities On-Line

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Abstract: This paper examines the use of the Web to support continuing professional development (CPD). It outlines the factors driving the adoption of CPD and highlights areas where the Web can aid in the development of successful professional communities. A survey examining the use of the Internet to support professionals working in the domains of the Arts and Science is presented. The study reviews twenty four sites for the presence and degree of adoption of several key features including: - community building, range and value of content, user friendliness and guidance, sophistication of employed Web technology.

1. Introduction

The use of the Internet and the World Wide Web is growing, and the number of applications where it is employed to support, or even to replace, many traditional activities associated with work and recreation continues to expand. Such new technology means that the nature of the jobs we do has changed, as has the professions in which we work and the skills required. Life-long learning has never assumed greater importance than it does today, allowing us to remain competent and achieve personal satisfaction and job fulfilment, throughout our careers. From an employer's viewpoint, lifelong learning contributes to competitive advantage through excellence of employees. At a national level, it allows us to remain competitive in a world participating in free trade and experiencing rapid changes through technology.

In this setting it is not surprising that many professional communities have turned to the Internet to augment or replace continuing professional development (CPD) support. Traditional approaches to professional development rely on a mixture of activities including conferences, meetings, scholarly reading, newsletters and short courses. However, no matter how excellent any of these activities prove to be, they are of little value if they are not accessible to those who need them most, when they need them. While many will argue that the Web cannot provide all the things that come with more 'traditional' approaches, Web technology can provide flexible support to professional communities, especially under circumstances where the community members are geographically dispersed and are subject to time constraints.

The level of support will vary between communities, depending on the subject requirements, the technical sophistication of providers and audience, as well as resources available for the upkeep of the support mechanism itself. Resources available on websites supporting professional communities can range from links to other informative sites, to provision of original content, to full-blown community facilities including online discussion forums. In the latter case, the professional community can support itself via a 'Web community'.

Significantly, the use of new technology does not guarantee success in encouraging and supporting CPD. Any successful Web community must be built upon solid foundations. "Web communities need 'social scaffolding' to grow and thrive. Social scaffolding refers to those aspects of a site - roles, rituals, features, events, and leadership - that facilitate community development. Much like a trellis enables a plant to grow, social scaffolding enables members to become progressively more involved in the community" (Kim, 1998). Simply launching a website with a bulletin board and chat facilities does not automatically generate a community (Mager and Karlenzig, 2001). There are numerous examples of quickly launched message boards with many topics but no responses. Creating gathering places alone is not enough - they need to be organised and integrated into the community. The central issues surrounding communities are people issues - Web technology merely acts as a facilitator, providing the tools for helping people come together (Cothrel and Williams, 1999).

This paper begins by outlining the factors driving and inhibiting the formation of Web communities to support professional development. It then goes on to survey two disparate professional groups, in the Arts and in Science/Technology, and attempts to gauge their level of adoption of Web technology in their professional development activities. Twenty four sites are examined, twelve in each group, and a number of measures,

ranging from 'level of adoption of community interaction' to 'technical sophistication', are considered.

2. Continuing Professional Development and the Web

Getting people to 'buy into' continuing professional development can often prove difficult. Individuals often need to be reminded that they have a career - not just a job (Arnold and Smith, 1998). In order to be truly effective, individuals need to take ownership of their approach to personal development and life long learning. The Web enhances this process by allowing individuals to extend their professional interaction, seeking out and exchanging new ideas and opinions, beyond the boundaries of the organisation in which they work. Web technology can be used to complement existing forms of learning and development, delivering CPD to a widely diverse and dispersed audience. Individuals may get less benefit from face-to-face conferences as conference size increases. The Web can mitigate these effects by enabling users to take a more 'personal' approach to professional development, so that individuals can tailor a developmental programme to their own requirements. "Every learner can, at his or her own choice of time and place, access a world of multimedia material... immediately the learner is unlocked from the shackles of fixed and rigid schedules, from physical limitations... and is released into an information world which reacts to his or her own pace of learning" (Benjamin, 1994, p49). While the use of Web technology does mean that individuals can work at their own pace, there still needs to be a forum for obtaining feedback on their progress. Further, there are some subjects, requiring more nuance or hands-on involvement, which may prove more difficult to translate to an online environment (Stuart, 1999).

Professional development can be substantially enhanced by opportunities to collaborate with others within Web communities (Hixson and Tinzmann, 1990). The opportunity to take advantage of the expertise of others can provide community members with important reinforcement and incentive for continuing growth and development, along with enhanced personal status and respect that comes from membership in a learning community with their professional colleagues. The asynchronous nature of much of the communication that takes place online lends itself to CPD and supports synthesis of knowledge (Salmon, 2000). Individuals have 24-hour access to the system and can log on whenever they wish and for however long they wish. Users are able to reflect on issues raised online, and their own ideas and thoughts can germinate through composing replies.

CPD is an ongoing process and as such, the use of Web technology to aid this process is not a one-shot event. Traditionally, individuals within an organisation would take one or two weeks off from their daily grind to go on a training course. The use of Web technology enables professional development to be a constant continuing process. However, technology is no panacea for professional development. In order to be truly effective, the use of technology must be linked to the objectives and goals of any professional development programme, and must deliver real value to the community.

3. Web Communities

The use of the Internet to develop Web communities has meant that localised communities can now have a more global outlook. "The Net erases boundaries created by time and distance, and makes it dramatically easier for people to maintain connections, deepen relationships, and meet like-minded souls that they would never have met" (Kim, 2000, p.x). In order to be successful and deliver true value to the users, the aims of the community must be clear and the first step to building a loyal community of members is to understand the purpose of the community (Kim, 1998). Web communities grow and thrive when members are able to fulfil their purpose and accomplish those goals that require other members to participate. The concept of collaborative purpose is one of the Web's premier strengths as a means of building community (Real Communities Inc, 2000). There are a number of features that aid the development of an on-line community (Kim, 2000). These include: -

Backstory: The community's backstory provides a powerful tool in shaping members' expectations about the purpose and personality of the site (Kim, 1998). The term backstory comes from filmmaking and refers to the part of the movie's story that has happened before the first frame of the film. Backstories introduce the community founders, communicate their motivation, and impact a sense of the community's core values.

Site Map: The site map gives an overall picture of the community space and may include links to each section of the community. Site maps should be updated as sites evolve and sections of the community are added.

Feedback: Through implementation and maintenance of feedback loops, communities evolve over time and may react to the requirements of its members. Regular surveys will help gauge the community opinions and re-enforce a sense of shared purpose.

Database: A member database system is crucial for creating and maintaining member profiles that evolve over time. This database can be used to control access to Web pages, mailing lists, chat rooms, conference areas and member profiles. Many communities also allow members to develop their own home pages, thus helping each member develop their sense of belonging to the community (White, 2001).

Frequently Asked Questions: These address the needs and questions of newcomers without alienating established members. FAQs serve a key role in breaking down initial barriers for new users and making them feel more at ease with the technology and the community environment itself.

Communication Technology: Communication is at the heart of online communities. The technologies employed can be public (interactions between several people) or private (one-to-one interactions); synchronous (messages are exchanged in real time) or asynchronous (messages are accumulated and users need not be online simultaneously). All communities need a mixture of public and private meeting places and it can often prove difficult to identify a single space where the Web community 'lives'. This is a result of the range of tools adopted by members (Cothrel and Williams, 1999). The most commonly used tools include: - *Electronic Mail*- The use of e-mail is widespread and as such, it is an extremely powerful communication medium that may be used to hold a community together. E-mail distribution lists may be used for making announcements and for encouraging communication between users. A community newsletter can serve a key role in keeping members up to date with key events or issues that may arise within the community. E-mail can also be used to encourage feedback and suggestion from community members. Poling (1994) found that the use of e-mail enhanced the quality of communication within groups and ultimately aided group cohesion: *Mailing Lists and Bulletin Board* - Community mailing lists can facilitate conference-style interaction between community members. However mailing lists do not create the same sense of gathering in a location with fellow community members that conference-style interaction can provide (Steuer, 1998): *Chat* - Real-time chat is a frequently misused community technology (Steuer, 1998). Nothing discourages users more than an empty chat room, or an interactive event that has very little or zero interaction between users. However when utilised correctly, real-time chat can be a very effective communication medium.

4. A Survey of Arts and Science Websites

Our investigation of Web-based support for professional development focussed on two broad subject areas, viz., Arts/Humanities and Science/Technology. Twenty four websites were chosen at random - twelve from the Arts domain and twelve from the Science domain (see Table A). The aim of this survey was to gauge the degree and nature of support afforded by these subject-oriented sites. To this end, a feature list was formulated (see Table B) to map the characteristics across the sample sites. The features in question span three broad categories: Usability, Resources, and Community Interaction; with each sample site examined for the presence/absence of these features.

Arts and Humanities Sites	Science Sites
History Classics and Archaeology	LTSN Centre for Information and Computer Sciences
Humbul Humanities Hub	Association for Computing Machinery
CORD	Joint Information Systems Committee
Philosophical and Religious Studies	Scottish Teachers Online Resource Modules
Art, Design and Communication	IEEE
Performing Arts (PALATINE)	IEEE Computer Society
Sociology, Anthropology and Politics (C-SAP)	International Federation for Information Processing
English Subject Centre	Computer Science Discipline Network
Hospitality, Leisure, Sport and Tourism	Geography, Earth and Environmental Sciences
LeisureTourism.com	LTSN Engineering
Social Policy and Social Work (SWAP)	LTSN Physical Sciences
European League of Institutes of the Arts	Royal Astronomical Society

Table A: Sample Sites

Presence of Features: The feature survey covers aspects that are commonly employed on websites that actively try to develop a sense of community. Naturally, a professional group may decide not to adopt all such features for their particular community. Every site gained one point for each extant feature (see Table B).

Usability	Backstory, Contact details, Details of last site update, Search engine, Elementary search and navigation instructions, Site map
Resources	Details of conferences/ seminars, Resources – academic, Resources – magazines/ newsletters, Links, FAQ section
Community Interaction	Feedback forms/ surveys, Mailing lists, Chat rooms, Bulletin boards, Registration required in order to contribute to site

Table B: Features

Scoring of Features: Having surveyed the presence of various features for supporting communities online, a deeper analysis of each feature sought to gauge the range and depth of material on each site, estimate site reliability, and assess site appearance. The appearance and overall feel of the site is considered significant since this is likely to influence the return of users to a site. Each of the feature categories was examined in detail to afford a further dimension of ranking for our twenty four websites.

As a basis for ‘ranking’, each site was awarded up to 4 points for features in each category. Points are awarded on a qualitative basis, dependant upon areas where there are discernable differences between the features present on each individual site. In cases where a site had none of the features examined in a particular category, the site was assigned zero points for that category. For example, a site that does not have any of the Community Interaction features would be awarded zero points in that particular category.

Technological Features: This final measure gauges the sophistication of the technology used on the website. The technological features present on a site do not necessarily yield better results in terms of supporting a professional community. Four simple to detect measures were used to estimate the ‘sophistication’ of each site. Namely, the presence and use of HTML, different Data Types, use of Scripting, and use of Server-Side Scripting. HTML examines the sophistication of the HTML code employed on the site (see Table C).

HTML	Raw HTML code, Image maps, Frames, Cascaded Style Sheets, Tables
Data Types	Adobe Acrobat files, Windows Media files, Word documents, PowerPoint presentations, Zip files, Flash, Rich Text Format files
Scripting	Instances of scripting, Number of functions, Size of functions, Number of times function called
Server-Side Scripting	Use of GET method in forms, Use of POST method in forms, Use of cookies, Site adding information to their database

Table C: Technological Features

The source code for pages from each of the twenty four sites was analysed across each of the four categories to gauge the level of complexity and technical sophistication of the code. In a similar manner to the Scoring of Features section, the categories were assessed in order to arrive at a site ranking that was based on those areas where there are discernible differences between the websites, with 3 points being awarded to the most sophisticated site in each category.

Results and Analysis

Almost predictably, study of the twenty four sample sites has highlighted the fact that Science sites score higher than Arts sites in every respect. This may be explained by the quicker uptake of technology in science-based subject areas, and the greater experience of those maintaining these sites.

Presence of Features

When analyzing the Presence of Features on each of the twenty four sample sites, Science sites consistently score higher across each of the three categories examined. However it is interesting to note that Arts and Science subjects can actually be found to be progressing entirely in parallel. Science sites may be a step ahead all of the time, but nonetheless it holds true throughout that where Science sites score highly in categories such as Resources and Usability, so do Arts sites. Similarly, in the Community Interaction category where Science sites gain lower scores, Arts sites also gain lower scores. It could perhaps be argued that Arts sites are following in the footsteps of Science sites (see Figure A).

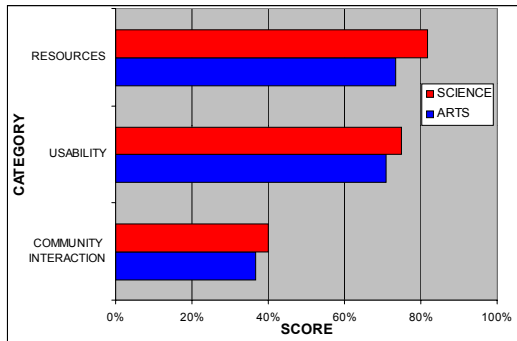


Figure A: Presence of Features

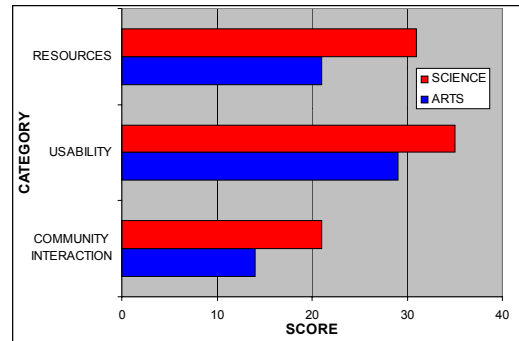


Figure B: Scoring of Features

If there is one thing that the results do *not* seem to imply, it is that Arts websites are good at providing one particular thing and Science websites at providing another. Essentially, the experiences of both communities are very similar. However, Arts sites do appear to cater more to the novice Internet user, with 50% of the Arts sites sampled offering elementary navigation instructions to users. Conversely, Science sites appear to assume a higher level of technological proficiency from those accessing their sites, with only 16% offering any form of help to users in navigating between pages.

Both Arts and Science communities have potential to improve the level of community interaction. Neither area has fully embraced the use of communication technology to enhance the level of interaction between community members. The reasons behind this could be varied. Maybe current implementation of these technologies is still relatively new and fragile. Perhaps many existing tools do not mirror well 'real life interactions'. Maybe the communities see no benefit from these forms of interaction.

Scoring of Features

Science sites appear to score higher across all of the categories examined. Similar to the results in the previous section, both groups of sites appear to be progressing in parallel, with Science sites scoring higher in each category (see Figure B). Both sets of sites scored highly when considering the Usability of the sites. Equally, both Arts and Science sites show less evidence of Community Interaction. This concurs with the findings of the previous section, where the majority of sites in each category are not fully making use of communication technology as a means of building community and developing a level of community interaction.

The difference between the scores of Arts and Science sites is greater in the Resources category. Across the sites surveyed, it is interesting to note that Science sites tend to have a greater range and depth of material, while Arts sites tend to rely more on providing links to material of interest.

Technological Sophistication

Again Science sites scored more strongly across all categories (see Figure C). This perhaps indicates a quicker uptake of technology or greater experience from those maintaining Science sites. Alternatively, Arts sites may have felt that this level of technological sophistication was not necessary.

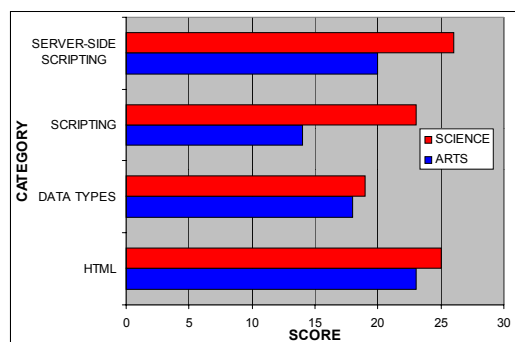


Figure C: Technological Features

Once more, there appears to be a degree of parallel progression between the two sets of sites: Arts sites score highly (though not quite as highly) in the same categories where Science sites achieve high scores. This holds true especially in the HTML and Data Types categories, where Science sites show only marginally greater sophistication than Arts sites. The only anomaly is the category of Scripting, which achieved the third highest ranking in Science, but comes fourth in the Arts. Interestingly, this category also shows the highest divergence between Arts and Science sites, with a difference of almost 10 points.

The main difference between Arts and Science sites appears in the Scripting and Server-Side Scripting categories, where Science sites score substantially higher than their Arts counterparts. There is certainly more complex processing around any areas of interaction on Science sites, and this may be the result of the maintainers of Science sites being more comfortable with using complex technological features.

5. Concluding Comments

The use of Web technology for professional development is perceived as being useful and is currently being employed by a wide spectrum of professional communities. The resources and features available on-line can range from lists of useful links, to the provision of original content, to full-blown community facilities including online discussion forums.

Our survey of websites providing support in the Arts and Science domains has found that overall there is more correspondence than divergence. An analysis of site features shows little difference between the two domains. The most interesting point to come out of this analysis is the relative lack of community interaction facilities on sites in both domains. There may be several reasons for this. Possibilities include a lack of perceived need and/or local administrative or technological constraints. This is an appropriate area for further study.

One of the few elements to show marked differences between sites in the two domains was the presence or absence of elementary navigation instructions. Arts sites are more supportive here, perhaps because their user base is assumed to be less proficient in the use of websites in general. Another marked difference emerges within the technological features, where Scripting is clearly employed more with sites supporting the Science community. This may be the result of the maintainers of Science sites being more comfortable with using complex technological features. Ultimately, however, the examination of the sites shows that, barring the exceptions mentioned above, differences between Arts and Science websites are ones of degree rather than kind.

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