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## Fostering multi-partisan interactions online around a socially polarized science-based controversy

Philip Bell

*University of Washington*

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## Fostering multi-partisan interactions online around a socially polarized science-based controversy

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# Fostering multi-partisan interactions online around a socially polarized science-based controversy

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By **Philip Bell** <[pbell@u.washington.edu](mailto:pbell@u.washington.edu)>

Assistant Professor Cognitive Studies in Education, University of Washington

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Over the last century, new scientific findings and technological developments have dramatically shaped human society—for better and for worse. This trend continues today. Many of these advances have been seamlessly integrated into the workings of society to great benefit and without serious conflict or contention. However, in specific situations, profound and complex controversies result when developments in the natural sciences are applied to the arenas of everyday life. These controversies often feature highly technical and multi-partisan debates involving extended policy negotiations, the airing of different values, ethics, and priorities—while there is often still the need to make specific policy decisions before significant resolution of scientific ambiguity (Brante, 1993; Collins & Shapin, 1986). From global warming to the evolution /

creation debates to human cloning, the social world—as partially viewed through our professional and informal publication outlets—is rife with scientific controversies.

This article reports on design-based research where an attempt was made to promote and study online interaction and learning around a socially polarized science-based controversy. Specifically, within the context of the genetically modified food debate—which was highly visible in the mainstream press at the time—we launched an Internet listserv focused on an even-handed presentation of news announcements about the controversy. Several stakeholder groups—most of which had preexisting online listservs and informational web sites—contributed their streams of information to this new listserv, leading to a blended information conduit or ‘middle space’ that was depicting multiple dimensions of the controversy. Aspects of how this middle space listserv was cultivated and the emergent interactions that transpired between the partisan stakeholders were studied to understand how localized uses of Internet technologies might promote or hinder generative discourse and education in the face of complex, contemporary controversies in society.

**.01 Approaching the prospects and perils of the Internet as empirical research** ([return to index](#))

Internet technologies represent a technical infrastructure by which productive interactions and education might be promoted for members of society around contemporary science controversies (Bell, in press). The affordances of global networking allow for accumulations of extensive data, opinion, and information; the complex organization and novel navigation of such information; and new modes of social exchange from far-flung participants around the world. At least, there is a case for such activities, in principle. In a similar manner, Levy (1997) depicted a communal image whereby the emerging global network infrastructure could be used to bring about new forms of what he called collective intelligence around pressing of the day. Similar images for the Internet were advanced by others as well based on the many-to-many source/consumer architecture of the Internet (as opposed to the one source-to-many consumers model of broadcast television). And yet, in profound ways, the hype of Internet possibilities have thus far outstripped an understanding of how network technologies can be used to promote interaction and learning around the complex issues currently facing society. Hine (2000) has advanced a similar argument in great detail, arguing that Internet activity is a ripe social and cultural context for empirical study. We have been engaged in such work since 1994, while scholars studying computer-mediated-communication have been engaged in such work for decades.

Hine and other Internet researchers (e.g., Miller & Slater, 2001) have specifically endorsed and demonstrated the benefits of exercising an ethnographic sensibility when studying Internet phenomena. I adopt an ethnographic analytical frame within this study. Additionally, I build upon interventionist research traditions—found in education, social work, public health, engineering, and other disciplines that attempt to speak directly to praxis—that employ design-based research methods to couple theoretically-motivated design and enactment of complex interventions in

everyday settings with subsequent phases of empirical study and analysis (Brown, 1992; Collins, 1992; Design-Based Research Collective, in press; diSessa, 1991). By engaging in interventionist research that is ethnographically analyzed, it is possible to pose specific theoretical conjectures within the complex environments of the real world, study what transpires, and refine a theoretical understanding of the associated phenomena and how it came into existence (or failed to do so for particular reasons).

Why should researchers intervene and promote Internet phenomena as opposed to just studying what is already taking place? Design-based research—empirically grounded in the appropriate inquiry traditions of the social sciences—allows us to more specifically understand the actual prospects and perils of specific interventionist approaches (e.g., artifacts, technologies, curriculum, activity structures) as they come to be actually used for real purposes. The design space of possibilities, in terms of enacted affordances of Internet networks in this case, can also be explored more quickly compared to a scenario we researchers wait for natural experiments and comparisons to emerge naturally from the world of Internet activity. With design-based research, theoretical ideas can be refined relatively quickly through iterative, closely coupled interventions where compelling comparisons can be built into the design of the studies in ways that sharpen theoretical conjectures or highlight the interconnected nature of elements in the design and in the research context.

## .02 **Research context: A contemporary scientific controversy playing out on the Internet** (in part) ([return to index](#))

Controversies in science come in many different forms and flavors. Brante (1993) proposed a somewhat coarse, although beneficial, categorical distinction between *scientific controversies* that involve scientists toiling with specific knowledge claims and evidence around a specific issue or dispute and *science-based controversies* that involve the contentious application of scientific knowledge or perspectives onto the activities of the broader society. The former category of controversies are largely internal debates within the corridors of science and are generally held to be resolvable disputes by the participating scientists, while the latter form of controversies typically involve diverse stakeholders with highly varied knowledge and value systems debating disputed issues within the arenas of formal policy or social life more broadly (e.g., mainstream press, organized social actions, informal information spaces of the Internet).

Transgenic agriculture—more generally known as ‘genetically modified foods’ (GMF) or the partisan label ‘franken-foods’—is a contemporary issue that includes both scientific and science-based dimensions of controversy. Recombinant DNA technologies now allow for the customized design of plant species to include genes from other species although they may be evolutionarily distant. That is, genes can now more easily flow horizontally across the evolutionary tree. This technology leads to combinations of genetic materials within a transgenic species that probably would never have come to existence without being intentionally designed. Plants with such genetic combinations represent new varieties with very beneficial characteristics (e.g., crops can be engineered to be more tolerant of frost, drought, or high salinity—among myriad other

possibilities). In part, concerns arise around the introduction of these novel GMF varieties into natural ecosystems and around the consumption of such engineered foods based on unanticipated effects. The GMF controversy includes scientific, economic, political, environmental, geographic, cultural, and ethical dimensions. It represents a compelling, interdisciplinary issue within the context of the global society whereby sustained discussion, debate, and learning could be highly beneficial (or ethically necessary in another view).

The Science Controversies On-Line: Partnerships in Education (SCOPE) project, funded by the National Science Foundation, was focused on the design and study of Internet communities around contemporary controversies in science (see <http://scope.educ.washington.edu/> for details). It was a collaboration between the University of Washington, the University of California, Berkeley, and editorial staff at SCIENCE magazine. SCOPE research focused on the educational possibilities that surround making Latour’s notion of ‘science in the making’ (Latour, 1987) more visible and educationally engaging through the design of Internet technologies and learning experiences. (In addition to focusing on genetically modified foods, SCOPE also spent time working with the following controversies: the treatment and control of malaria, global declines in amphibian populations, claims from comparative genomics, and the possible causes of global warming. Each controversy has been quite distinct [Hines, 2001] and the associated educational issues have been correspondingly variable [Bell, in press].)

The research described in this article took place within the context of an online SCOPE forum launched on the genetically modified food topic. The SCOPE GMF Forum was designed to serve as an educational home for GMF on the Internet. The forum ultimately included over 600 registered members and has been visited by thousands of others since it was launched. The site includes original content about the controversy, individual reactions to aspects of the controversy, curriculum materials for precollege science education, a reference database about the controversy, and several email lists dedicated to the controversy—including the one studied in this research (see the figure below to view aspects of this forum).



### .03 **Theoretical background: Online scientific controversy communities**([return to index](#))

Building upon such ideals as promoting collective intelligence or recapturing social capital, coupled to the Internet boom of the 90s, there has been substantial attention focused on the promotion of virtual or online communities—typified by the emergence of Rheingold's (1993) popular book as a central text of the Internet age and also mirrored in the academic corners of the cyberculture research literature (e.g., Bell, 2001; Renninger & Shumar, 2002). In some corners of the broad ecology of the Internet, such communities have indeed flourished. In other cases, enabling technologies that have been put in place have gone largely unused or even actively resisted. Internet researchers have studied these online communities to some degree—how they rise and fall (Kolko & Reid, 1998), the nature of specific 'communities' and their practices (Fischer-Fortier & Bell, 2002), and how they enable personal development, learning, and interaction (Renninger & Shumar, 2002).

How can online communities be promoted? How do they come into existence? In contrast to some kind of grand quest for generalized design principles for the promotion of online communities, an emerging theoretical perspective frames these enterprises as socially embedded activities that hinge upon the specific, localized purposes, norms, and practices of the individuals in question taken in conjunction with the unique affordances of the network technology (see Agre, 1998 for further discussion of one such framing of online communities).

So, what would a localized online community look like where participants are learning about, sharing information, and discussing a specific controversy in science? How could such a community be promoted? Based on the distinctions made earlier about the nature of scientific controversy and the present argument about the local character of online communities, it is reasonable to bracket the nature of the online community to one focused on a science-based controversy (in Brante's sense). Such controversies are fueled by partisan politics and the systematic interaction between policy decision-making, scientific knowledge, as well as public discussion, communication, and activism. (The inclusion of genetically modified foods as a central issue within the WTO demonstrations in Seattle provides evidence that GMF represents a science-based controversy.)

The nature of these science-based controversies shapes their online manifestations. Within this context, online communities and information conduits develop around these partisan poles (e.g., pro and anti GMF positions in this particular case). As these activist communities come to naturally have a presence online, they understandably tend to resemble balkanized partisan communities. A particular value-driven group (or sometimes just an individual) will filter, annotate, and present information selectively based on their position within the controversy. While there is a trend in most mass media publications to engage in balanced journalism (to variable degrees), these online partisan communities are under no such social obligation. They are engaged in a form of political action, persuasion, and education from the vantage point of their perspective. In practice, this leads to streams of information flowing from these online groups that do not represent the range of perspectives associated with the controversy. These groups typically

construct partisan streams of information (as found more generally in the political landscape).

Such sources of information make it more difficult for information seekers (citizens, politicians, students, educators) to encounter the plurality of perspectives about a controversy. Information seekers are left to personally locate and make sense of divergent streams of information. This difficulty makes education, deliberation, and possible resolution of aspects of the controversy—if it is possible at all—more challenging.

#### .04 **The intervention: Fostering a multi-partisan, online ‘middle space’**([return to index](#))

The resulting fragmentation of the Internet around controversial topics—a drawback associated with the naturally-occurring online communities—inspired the intervention in this study whereby a ‘middle space’ was created for a controversy that sought to include information feeds and perspectives from multiple stakeholder groups—all funneled through one listserv. If an individual wished to view and learn about the issues associated with the broader controversy from multiple perspectives, we tried to make it possible through the act of signing up for just one email distribution list.

There is a tacit assumption—or perhaps more correctly an embedded hypothesis and desire—built into the desire to promote a ‘middle space’ in that it will be a generative alternative to the more partisan communities that predominate online around controversial topics. Perhaps information seekers will be able to more easily learn about the complexities of a controversy—what is known, what is conjectured, what values fueling a perspective, and what the trade-offs might be with particular decisions or priorities. Perhaps such a middle space will bring the different stakeholders into more direct interaction. Perhaps stakeholders can surface and work through differences in their opinions and interpretation of the facts of the matter. To test these ‘middle space’ hypotheses, we needed to promote one around the genetically modified foods controversy.

In conjunction with the larger effort to launch the SCOPE GMF Forum, we created the GMF-News email list to serve as this middle space. In our prior work on the treatment and control of malaria, we did not have much success at all with using web-based discussion boards to explore controversial topics online (Fischer-Fortier & Bell, 2002). As an additional hypothesis, we conjectured that we could more directly leverage the social activity of stakeholders and information seekers by aligning our technology platform with the prevailing user technology choice for online social interaction—namely, email. We used a common, freeware email listserv system that also created a web-based archive of the postings. This choice allowed people to participate without having to change their daily Internet practices.

The design principle guiding participation on the middle space list was the free exchange of information between any subscriber and the list subscribers around news relevant to genetically modified foods. Over the course of 22 months, eight megabytes of text messages were sent over the list. This became the primary corpus of research data.

## .05 **Analysis of the Designed Intervention as it was Enacted** ([return to index](#))

The Berglund fellowship funded an ethnographic analysis of events that transpired on the GMF-News email list. Data sources included the extensive listserv message corpus, publicly available information about participating stakeholders, and research and information about the GMF controversy itself. Associated with the hypotheses surrounding the creation of a middle space about the controversy, the following three themes emerged from the analysis.

## .06 **Result: The growth of multi-partisan participation and the attraction of controversy lurkers** ([return to index](#))

Is it possible to create a middle space about the GMF controversy? Other hypotheses are moot points if a middle space is untenable. The candidate middle space listserv was initiated along with two other email lists focused on different GMF-related topics and a range of other functionality and content on the web site. The SCOPE GMF Forum was broadly announced to controversy stakeholders and science educators. Interested users that came to the web site were encouraged to sign-up for the email lists that interested them, including the middle space list.

In order to promote the use of the email list, staff from the SCOPE project seeded the list with regular monthly updates about GMF-related publications in the scientific literature along with two or three postings of news summaries each week culled from mainstream press sources. For the first month, this accounted for the lion's share of the traffic on the list. Shortly thereafter, the first GMF stakeholder started posting to the middle space list in tandem with his posting to his regular list of listserv subscribers. Two other leading GMF stakeholders from the other partisan perspective quickly followed suite and started regularly posting the list. In relatively short order, the list was indeed receiving regular information posts from both pro and anti GMF stakeholders. Messages from these sources included opinion pieces, news items, excerpts from technical reports, press releases, and excerpted emails with thoughts from specific individuals involved in GMF activities. On a couple of occasions, SCOPE staff communicated directly with the stakeholders posting to the list in order to assure them that postings from all perspectives in the controversy were desired. In some cases, they acted pleasantly surprised by this openness which is indicative of the contentious nature of the GMF controversy. Since these stakeholders were already collecting and posting information to their own email lists, it was quite simple for them to post to our list as well. This easily adopted, scalable practice allowed for a multi-partisan flow of information to be put in place in short order on the GMF-News list.

Over the 22 months the list remained active, hundreds of individuals signed up to receive its regular postings. However, very few of these individuals would go on to post to the list directly. Of the 613 messages sent out on the list, the majority of these postings were made by only five individuals. The number of lurkers remaining on the list over time implies that they were finding the details of the controversy to be at least somewhat interesting. Some direct interactions with lurkers bolstered this interpretation.

**.07 Result: The loose coupling of partisan information feeds** ([return to index](#))

Can a middle space listserv actually promote interaction between the participating stakeholders? Initially, the postings that came from the stakeholders were universally decoupled—they were separate news feeds generated by their separate processes. However, over time it became apparent that the news feeds were starting to become coupled, although loosely so. In one sense, the original stakeholder lists would pick up information from other stakeholder postings on GMF-News and repost that information to their private list. Although this meant that the same information was being posted multiple times on the GMF-News list, it was clear that there were new categorical types of information being appropriated and added to the existing information streams maintained by the stakeholders. For example, in several cases one of the anti-GMF stakeholders posted links and summaries about recent developments from the scientific literature—specific research items verbatim that had been contributed by another contributing stakeholder on the list which were largely supportive or agnostic to the notion of genetically modified foods. This emergent coupling between the email lists represents a step toward having a multi-partisan view introduced into the original information feeds. It is worth noting that in some of these cases, the stakeholder would edit the information to align with their position in the controversy in keeping with what were established practices of these listserv editors.

In one situation a strongly worded statement from a national leader was reported on a pro-GMF list, and it was quickly recounted as a forgery on an anti-GMF stakeholder list. In several similar situations information posted by one stakeholder was highlighted as misinformation and corrected by a different stakeholder in the following day or two on their email list. This highlights a second manner in which the separate information feeds became loosely coupled through their involvement in the GMF-News list. The coupling of the lists in this way provided a form of check-and-balances between the separate efforts mediated through the SCOPE middle space list.

**.08 Result: The emergence of indirect dialogical debate through self-contained arguments** ([return to index](#))

We had originally desired and designed for different partisan perspectives to be represented on the middle space list. When we began we did not know if being successful in that regard would lead to any substantial interactions between the participating stakeholders. The indirect forms of information coupling were also augmented with more direct coupling between stakeholder postings. On several discrete occasions observable in the data corpus, stakeholders became engaged in a form of dialogic debate over specific topics that involved back-and-forth postings of detailed arguments and evidence even though the arguments were only implicitly connected in a structural way. That is, the stakeholders posted arguments and counter-argument at one another without engaging in typical forms of email-based social discussion (i.e., they did not embed and engage with previous messages or even directly acknowledge prior postings). For example, a stakeholder posted an opinion or argument about a specific GMF topic in the form of an elaborated, rhetorical argument about the issue. Then a different stakeholder posted a competing rhetorical argument about the issue back to the middle space list. Then the original

stakeholder responded with an elaborated argument, taking the prior oppositional response into account but not explicitly referencing it. Although this was a form of dialogic argumentation that occurred on different occasions between the stakeholders, it took the form of posting these self-contained arguments back and forth at each other—rather than engaging with each other's postings in a more conversational form. In some way, they were maintaining the genre consistency associated with the rest of the content on their email lists. They were also not letting the interaction shift into the structural form of a conversation.

And yet, these sustained debates are interesting in that they represent the stakeholders working out the details of their positions and perspectives in response to one another. The controversial claims at hand evolved and the issues and criteria under dispute were refined over postings. In highly select instances, the debate shifted structural forms slightly as stakeholders made statements about needing to “agree to disagree” about specific aspects of the issues at hand. This was the closest thing to conversation that took place on the middle space list. To the degree that the degree of sincerity in these realizations could be assessed, it seemed to represent of modicum of progress. For the lurkers on the list, it represented something other than partisan posturing and outreach. These brief instances highlighted a difference in value systems associated with different positions in the debate.

#### **.09 Implications: Online interaction and education around controversies in science** ([return to index](#))

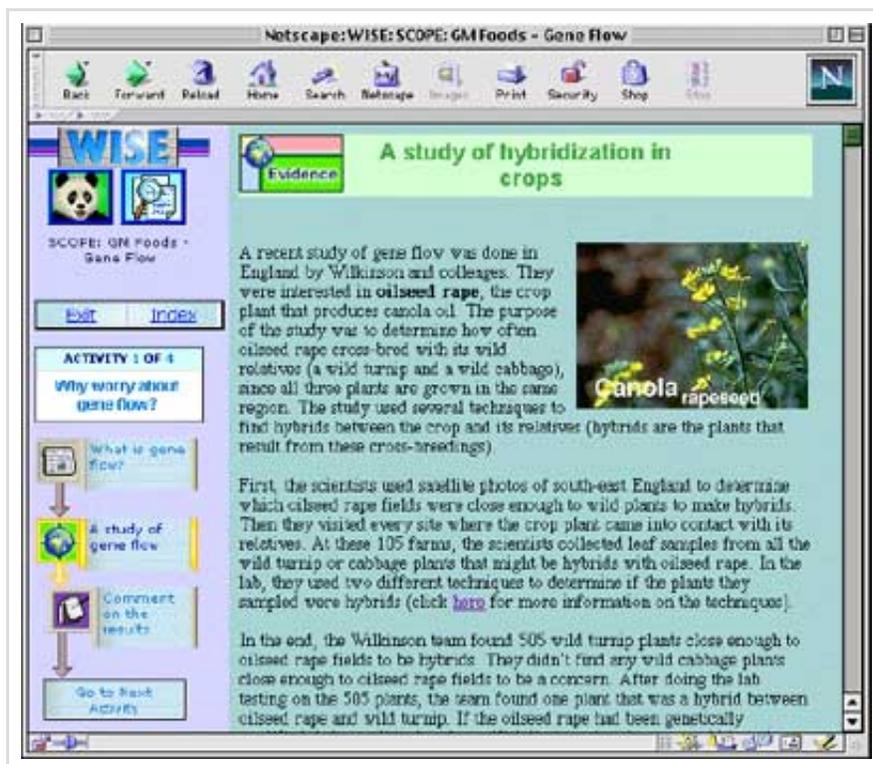
This design-based research suggests that it is possible to promote an online middle space, granted of a particular variety, focused on the multi-partisan issues of science-based controversies. This is contrast to naturally occurring, partisan-focused information feeds that seem to otherwise develop. These promoted middle space allow the casual reader to easily experience a multi-partisan stream of information about the controversy. It is interesting to note, however, that the list in and of itself does not provide any particular mechanism for helping information seekers reconcile and learn from these multi-partisan views of issues. Additionally, middle spaces also seem to bring stakeholders into specific forms of interaction around the issues in contention. These middle spaces can promote new flows of information in ancillary email lists and lead to sustained argumentation and debate around specific controversial issues.

Design knowledge associated with promoting this particular middle space focused on numerous coordinated decisions. First, the medium of interaction (email) was selected to leverage the normal online social activity of individuals. Second, it seemed necessary to prime the email list with multi-partisan news before different stakeholders began posting to it as well. And third, it seemed necessary to actively promote inclusion of multiple perspectives in order to achieve and maintain their multi-partisan participation.

It should be noted that the educational impact of the middle space list is somewhat difficult to discern as it largely lies within the thoughts and actions of the lurkers. Even list participants only rarely engage in direct dialog with one another (in ways that are methodologically visible at least).

Through semi-structured interviews with GMF-News subscribers, subsequent research is investigating how a subset of the participants might have benefited from being on the middle space list compared perhaps to only subscribing to one of stakeholder lists.

In my role as a science educator, my work involves bringing this sort of complex image of controversial science into precollege classrooms through the design of web-based curriculum projects (as shown in the figure below; see <http://wise.berkeley.edu/> for details). We have designed the Web-based Inquiry Science Environment (WISE) to support students in the engagement and analysis of collections of scientific evidence (as found in controversies and in other scientific contexts). The results of this analysis of GMF-News middle space will be fed into our ongoing curriculum design efforts so middle and high school students can learn about both the substance of the issues being debated in these email exchanges and the structural forms of the arguments employed in science-based controversies. By investigating the nature of scientific work and engaging in coordinated educational design, students learn about the conceptual substance of science while also learning about the nature of scientific work and its articulation with society (e.g., Bell, 2002, in press).



Would the insights gleaned from this study apply to the promotion of middle spaces focused on other science-based or scientific controversies? The conditions with the genetically modified food controversy are somewhat unique. At the time of data collection, it was a highly prominent issue in the mainstream press and in the scientific literature. This was a necessary context for the priming of the email list and for the grist of discussion between the stakeholders. It was a topic with significant social momentum—in ways that have ebbed since. Other controversies that are very worthy of similar attention (e.g., the control and treatment of AIDS or malaria) are not as regularly covered in the press. It is likely that other design approaches might need to be explored

in these cases. In this way, the virtual community promoted here, embracing a broad sense of the term 'community,' is a perhaps a rather localized enterprise based on the specific nature of the participants, the controversy, and the trends in society at that point in time. In this particular case there seemed to be specific promises that surfaced associated with using the Internet to promote interaction around contemporary controversies in science. The perils were not as readily visible—at least under the premise that this alternative to disconnected, partisan politics is a desirable goal. At least in some cases, the Internet might be used as a platform that afford collective, sustained engagement with pressing issues facing society.

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5 THOUGHTS ON "FOSTERING MULTI-PARTISAN INTERACTIONS ONLINE AROUND A SOCIALLY POLARIZED SCIENCE-BASED CONTROVERSY"

**Pablo Giza**

on **January 30, 2014 at 5:18 PM** said:

I would like to thank you for the efforts you have put in writing this blog. I am hoping the same high-grade website post from you in the upcoming as well. Actually your creative writing abilities has encouraged me to get my own website now. Actually the blogging is spreading its wings quickly. Your write up is a good example of it.

**Clarence Jn**

on **January 30, 2014 at 6:17 PM** said:

Heya i am for the first time here. I found this board and I to find It really useful & it helped me out a lot. I hope to provide one thing back and aid others like you helped me.

**naija**

on **February 4, 2014 at 10:19 AM** said:

“Great, thanks for sharing this article post.Appreciate it Once more and again. Terrific.”

**nigeria entertainment news**

on **February 4, 2014 at 10:30 AM** said:

you’ve any? Kindly enable me realize so that I might just subscribe. Thanks. too conceive so , perfectly written post! .

**nigeria entertainment news**

on **February 4, 2014 at 10:40 AM** said:

One much more factor I would like to talk about is that as an alternative to trying to accommodate all your on-line degree lessons on times that you just end work (since the majority persons are tired when they get home), try to acquire most of the instructional classes on a week-ends and only a couple courses in weekdays, even if it techniques a little time away from your saturday and sunday. This really is beneficial because on the saturdays and sundays, you are far more rested along with concentrated in school work. Thanks a lot for the a variety of issues I have figured out through the site.