

## **Knowledge Forum:**

### **A Different View for a Younger Audience**

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## **Abstract:**

Knowledge Forum is an eLearning software program that embodies the pedagogical principles associated with “knowledge building” theory. This paper puts forth a design for an alternate version of the Knowledge Forum platform that could better meet the needs of users at the elementary and high school levels. This design contains 8 proposals that aim to highlight key tools and functions and establishes a more user-friendly layout.

## **Introduction**

In 1960, the University of Illinois at Urbana-Champaign embarked on a project to create a computer-based learning system that could automate individual instruction. The project came to be known as PLATO, Programmed Logic for Automatic Teaching Operations. In 1967, after countless revisions and the addition of a powerful authoring language known as TUROR, PLATO signaled the arrival of the multi-user eLearning platform.

That same year, Jean Piaget first used the term “constructivist epistemologies” to highlight a model of learning that contrasted with the common behaviourist-based teaching methods of that time (Piaget, 1967). The traditional model of learning projected the human mind as a *container* that needs to be *filled* with knowledge (Bereiter, 2002). While competing notions of constructivism would evolve in later years, the notion that the human mind *constructs* its own knowledge has persevered.

*"The central principles of this approach are that learners can only make sense of new situations in terms of their existing understanding. Learning involves an active process in which learners construct meaning by linking new ideas with their existing knowledge". (Naylor & Keogh, 1999, p.93)*

Over the last two decades, advances in cognitive research have demonstrated the effectiveness of constructivist-based learning. Meanwhile, the number of eLearning software programs has grown dramatically.

Today, eLearning programs are promoted under various terminologies, including Learning Management Systems (LMS), Content Management Systems, Computer Mediated Communication (CMC), Learning Content Management Systems (LCMS), Computer Learning Content Information Management System (CLCIMS), Virtual learning environments (VLE), Managed Learning Environments (MLE) and a number of lesser known terms. Educational institutions around the world are investing increasing amounts of time and resources into creating eLearning environments that serve the needs of their educators and learners.

Among this growing list of eLearning platforms, however, only a few purport to draw from constructivist-based pedagogies. Moreover, of the few that make this pedagogical claim, many do so by merely employing tools that allow learners to function in groups, through forums, chat rooms and *wikis*. While such tools can be valuable components in a constructivist environment, the presence of such tools does not necessarily constitute a constructivist approach.

### **About Knowledge Forum**

Knowledge Forum (KF), first introduced as CSILE (Computer Supported Intentional Learning Environments) in 1983, is a unique eLearning platform that was created explicitly to promote a pedagogy based on Knowledge Building theory. While KF contains many of the tools and functions associated with mainstream eLearning platforms, KF distinguishes itself as a system built on the pedagogical principles associated with a branch of constructivism called *knowledge building*. Knowledge building theory, and the KF program itself, was developed by professors Carl Bereiter and Marlene Scardamalia.

Scardamalia identifies twelve principles of Knowledge Building. These principles highlight a pedagogical approach that is grounded in democratizing knowledge. By promoting ideas as “improvable objects” that can be used to understand real problems in the world, learners are encouraged to construct their own understanding, rather than locate pre-fabricated answers. Through a process of sustained inquiry where diverse ideas are continually assessed and negotiated, students and teachers play an active part in the advancement of collective knowledge. (Scardamalia, 2002)

One of the most salient goals behind KF is to “put knowledge at the centre” by allowing users to construct and continually improve upon ideas (Learning in Motion, 2000). Unlike other platforms, KF provides an immersive environment that challenges users to operate in “design mode”, rather than “belief mode”, as Bereiter and Scardamalia explain:

When in belief mode, we are concerned with what we and other people believe or ought to believe. Our response to ideas in this mode is to agree or disagree, to present arguments and evidence for or against, to express and try to resolve doubts. When in design mode, we are concerned with the usefulness, adequacy, improvability, and developmental potential of ideas... Educational programs in all their familiar variations operate almost exclusively in the belief mode as far as ideas are concerned (Bereiter & Scardamalia, 2003).

By way of example, so far this paper has focused on providing a cursory explanation of KF - a “belief mode” task aimed at providing a context for the reader who is unfamiliar with KF. For the reader who wants to do further reading on the KF platform or Knowledge Building theory, articles and archived presentations can be found at [www.ikit.org](http://www.ikit.org) or by entering these terms in any generic Internet search engine. The remainder of this paper will apply a “design mode” approach to propose a version of KF that is aimed primarily at elementary and secondary schools.

KF is a robust platform that allows learners and administrators to access a myriad of functions. Arguably, while the basic forum-based functions associated with the exchange of messages are relatively easy to grasp, gaining proficiency in the higher level functions that promote knowledge building presents the user with a rather steep learning curve. This complexity makes it particularly difficult for teachers with limited computer knowledge, support and/or preparation time to adopt KF into their local classrooms. Moreover, the text-heavy format and lack of a clear navigation system can present significant challenges for many students. Invariably, such students will spend an undue amount of time learning to use the platform, or possibly never develop an adequate understanding of the many tools that promote knowledge building.

In the spirit of the knowledge building process, and as an acknowledgement of the high-quality work that has gone into the development of current KF platform, the ideas expressed in this paper are meant to provide a different “view” of the current KF system.

The following “mock-up” images illustrate a number of the features and tools that are proposed below.

## The Site Level

Figure 1.1

The screenshot shows the Knowledge Forum website interface. At the top left, the logo "KNOWLEDGE FORUM" is displayed in a purple banner. To the right of the logo are two buttons: "My Scaffolds" and "My Profile". Below the banner is a search bar with a magnifying glass icon on the left and a "Log out" button with a question mark icon on the right. The main content area is divided into three sections. On the left, there is a "Recently Published Ideas" section with a purple header. It lists four items, each with a document icon, a title, and a course code: "Why We Grow" (SNC13W07), "The Perfect Number" (MAT52W07), "Meaning of Life" (SNC13W07), and "Plants vs. Animals" (SNC13W07). Below this list is a "Search..." button. To the right of the "Recently Published Ideas" section is a large white box containing the text "(custom content goes here)". Below the "Recently Published Ideas" section is a "My Forums" section with a purple header. It lists three forums, each with a forum icon and a title: "SNC13W07 - Science", "MAT254 - Calculus", and "SNC12W06 - Science".

The Forum Level

Figure 1.2

The screenshot displays the forum interface for CTL17W07, 'Evaluating Online Learning Environments'. The main content area shows a discussion thread titled 'Week 2: History of CMC' with a 'Show as: discussion' setting. The thread includes several posts with titles and authors, such as 'About Week 2' by Joao, 'Movie of the week' by Larry, and 'Mel and Sarah's Moderation Efforts' by Thomas. The interface also features a navigation sidebar with 'Main Discussions' (Weeks 1-8) and 'Side Discussions' (Course Cafe, Group Project 3b), a 'Views' section with options like 'Notions of Privacy' and 'Assessment Types', and two right-hand panels: 'Rise Above Notes' with links to 'Practical Assessment & Distance Option' and 'Issues of access for users with special needs', and 'Publication Candidates' with links to 'CMC: A Case for Open-Source Software' and 'Sensory overload in hyperlinked environments'. The top right corner contains buttons for 'My Scaffolds', 'My Profile', and 'Log out'.

**Proposal 1:** Create a single login point for all courses that are associated with a particular institution and move preference settings to personal profile.

The current login page (shown below) requires users to specify Language (1a), desired Database (1b) and UI Mode (1c) before entering username and password.

Figure 1.3



The screenshot shows the 'Welcome to Knowledge Forum' login page. On the left is a blue banner with the 'KNOWLEDGE FORUM' logo and a classical column. The right side contains a registration form with the following elements:

- Language: English (dropdown menu) - annotated with red arrow 1a
- Database: CTL1609W07 (dropdown menu) - annotated with red arrow 1b
- UI Mode: Default (dropdown menu) - annotated with red arrow 1c
- Buttons: 'Register for a username...', 'Sign On'
- Input fields: 'Enter a username' (containing 'fern'), 'Enter a password' (containing masked characters)
- Footer: 'www.KnowledgeForum.com', 'Credits'

Since the Language and default UI Mode settings are not required at the login stage, they could be placed in a “Preferences tab” within the user’s Personal Profile (more information about the Personal Profile feature is outlined in proposal 2).

The “Database” selection can be completely removed since the database itself can determine the forums that are available to a particular user. Once a user logs in, the interface should list all the forums for which the user is registered. This function is made possible by incorporating the site-level structure (also outlined in proposal 2).

Removing these settings would simplify the login process and ensure that users are not able to see forums that they cannot access. This would allow users to access all their forums via a single login.



**Proposal 2:** Create a two-tiered system – site level and forum level.

Knowledge Forum is currently a one-tiered system that focuses on discussions. While it is important to present the forum as the focal point, creating a two-tiered system would add increased functionality and navigational simplicity. The following tiers are proposed:

Site level: This space would act as a public “lobby” or “hallway” for a particular school. It is here that the user is able to login in. Once the user is logged in, this space becomes the gateway to all her/his forums. Much of content on this space would be defined by administrators at the school-level, rather than the forum administrators, and could include things like a welcome message, information about the school, weekly announcements, showcases, invitations to participate in public forums, etc. In general, this space would be aimed at the local KF community (ie. users from all forums).

Forum level: The overall function of the forum level would not change. It would remain a space for users to engage in knowledge building discussions around a particular topic or problem.

Navigation between the Forum and Site levels would be controlled via the “breadcrumb” icons located on the top-left section of the screen. The different colours, headers and block formation would also act as visual cues to separate these two levels. These features are illustrated in figures 1.1 and 1.2.

**Proposal 3:** Create a Personal Profile section (“My Profile”) that is accessible via the site or forum level.

Personal profiles promote ownership and would serve two functions: first, it would allow users to introduce themselves and provide information about their

interest, ongoing projects, contact details, etc. Personal profiles would extend across all forums. Whenever a user's name appears as an author of a note, the name would be displayed as a hyper-link that would call up a small profile window. It is important to keep the profile window unobtrusive by ensuring that it is small (ie. 20% of screen) and in a pop-up "bubble" format so as not to detract from the actual discussions.

Second, the profile section should include a "personal preferences" section that is used to determine the Language and UI Mode settings that were removed from the original login screen (shown in proposal 1) as well as other settings that affect the behaviour and "look and feel" of the platform in general.

**Proposal 4:** Allow "Published Notes" to be showcased at the site level.

The KF Manager's Guide explains a Published Note as follows:

Users can also collaboratively select a note for "published" status. This shows other readers that the author feels the material in the note is of high quality and meets standards. When an author wants to publish a note, that note first becomes a candidate for publishing. It will not become a published note until it is voted on by three peers (writers) or an editor who feels it is a "quality" piece. (Learning in Motion, 2000, p. 1-7)

Unlike a "rise above" note, which can be created by an individual to advance the ideas contained in a collection of notes, a published note is ultimately a negotiated product that is based on the support of a group. Such notes can be compared to polished articles, designs, slogans or any knowledge-based product that might come out of a board room or other knowledge-creation gathering. By implication, "published" ideas exist outside of, or at the end of, a knowledge building process. As such, they have a unique function in the KF platform. To promote an authentic use of this function, published notes should be published to the local KF community by showcasing them at the site level.

In order to encourage users to participate in the publishing process, Published Note *Candidates* should be showcased in a separate “candidate” block that is always visible at the forum level. Setting candidate notes apart from regular forum activity encourages users to play a part in the publishing process. These features are illustrated in figures 1.1 and 1.2.

**Proposal 5:** Make the email syndication function obvious and easy to use.

Like many advanced online platforms, KF has an email syndication function that allows users to receive email notices of online activity. This is an important “pull” function that allows users to stay connected to their forums even when they are not logged into their local KF system. Unfortunately, this feature is currently tied into the search function, which makes it rather difficult to locate and use. Casting this function as an icon that is always visible would provide a quick and easy way for users to activate and control their email syndication. Users do not have to worry about “missing out” on new developments. This feature is illustrated in figure 1.2.

**Proposal 6:** Create a clear separation between the “view” function from the navigation functions.

The “view” function allows users to organize their ideas in a visual context. The KF manual states:

Users create these shared view environments to represent an overall organization of notes. A single note can appear in more than one view, allowing the concept contained in the note to be framed in various representations. (Learning in Motion, 2000, p. I-5)

This is a powerful function that allows users and groups to create new perspectives from existing notes and resources. Unfortunately, in the absence of an alternative navigational system, forum administrators typically use the “view” function as a way to establish a structure within a forum. Teachers who are looking to create a forum with 10 distinct discussion topics or weeks, for example, typically do so by creating 10 different views. This usage not only confuses the intended purpose of the view function, but also makes navigation awkward.

This proposal aims to create a clear separation between the view function and site navigation by creating a node-based navigation block that is always visible at the forum level. Along with the discussion sections (ie. themes, topics, weeks, etc.) that are created by the forum administrator, the navigation block would also contain nodes for “side discussion” for things like group projects and casual discussions. In general, the contents of this block would be dictated by the forum “geography” as defined by the forum administrator.

Accordingly, the “view” function would be represented in a separate block. This block would contain a list of all the established views in that forum, along with a “create a view” button that is located at the base of the block. This feature is illustrated in figure 1.2.

**Proposal 7:** Allow scaffolds to be developed at the user and forum level.

Scaffolding is a teaching strategy that originated from Lev Vygotsky’s *zone of proximal development* (ZPD) theory. “The zone of proximal development is the distance between what children can do by themselves and the next learning that they can be helped to achieve with competent assistance” (Raymond, 2000, p.176). Within the KF platform, the scaffold function is presented as a think-aloud

tool that allows learners to label their thinking-type within a note. Some common scaffolds include:

- My Theory
- I need to understand
- New information
- This theory cannot explain
- A better theory
- Putting our knowledge together
- What I think I know

While scaffolds constitute an important function that encourages users to “think about their thinking,” the scaffolds themselves do not have much utility outside of the notes that contain the scaffolds. Moreover, as the discussions progress, the scaffolds become buried within the ever-growing list of notes. While users may use the search function to locate notes that contain scaffolds, there is little functionality associated with the scaffolds themselves.

This proposal establishes a separate scaffold interface that encourages users to make full use of their personal scaffolds. The current usage of scaffolds within notes would not change. Once a user creates a scaffold in a note, however, it is automatically listed in the user’s “My Scaffolds” interface. Within this interface, entries start off in a temporary “To sort” section that lists all the Scaffold types. From here, the user can click on the note title to see Scaffold in context or use the dropdown menu next to the scaffold to move it to a “Think About” or “Archive” section.

Such an interface would allow users to maximize the potential benefit of their scaffolds by encouraging them to “process” the ideas that make up their scaffolds. In addition, this interface would also allow the user to change the scaffold type that frames a particular idea (ie. after making changes to a “Need to understand” scaffold, it could be recast as a “What I think I know”) and also move the scaffolds across into any section (ie. move a scaffold in the archive section

back to the “To Rate” or “Think About” section). This interface is illustrated below in figure 1.4



In Vygotsky's *zone of proximal development* theory, scaffolds are temporary support structures that learners use to get to the next stage or level of knowing (Raymond, 2000, p. 176). Accordingly, the purpose behind this scaffold interface process is not to create a knowledge “artifact” (since the interface only mirrors existing notes that contain scaffolds), but rather to promote a thorough use of the scaffolds as a way to reach a higher level of thinking.

**Proposal 8:** Create user-types that promote a centralized and easy management system.

The following table (1.9) contains a hierarchically organized list of user types.

Special attention should be paid to the following functionality:

- The Forum Administrator can “enroll” and “un-enroll” students from within their forums but only the Registrar can add or remove students from the system. Separating the forum administration from the user administration in this way ensures that users only require one account to access their entire local Knowledge Forum and therefore facilitates the “single login point” described in proposal 1.
  
- The Forum Administrator has full control over the enrollment and layout of his or her forum(s). The Forum Leader has control over the participation-based functions. While, a single user could assume both roles, separating these privileges creates a practical “comfort zone” for teachers with limited computer skills, since they are still able to play a guiding role without having to worry about “messing up the forum”. This separation also allows for multiple Forum Leaders to exist within a single forum without increasing the risk of compromising the forum structure.

Table 1;

<b>Site Administrator:</b>	<ul style="list-style-type: none"> <li>○ Complete control over site layout and functionality</li> <li>○ Add and remove other site administrators</li> <li>○ Add and remove forums &amp; forum administrators</li> <li>○ Able to “login as” any user</li> <li>○ All privileges listed below</li> </ul>
<b>Registrar</b> (at the site level):	<ul style="list-style-type: none"> <li>○ Add and remove users to a central “registry”</li> <li>○ (All new users are Students by default)</li> </ul>
<b>Forum Administrator</b> (from within a forum):	<ul style="list-style-type: none"> <li>○ Add and remove Forum Leaders</li> <li>○ Enroll and “un-enroll” students (chosen from the registry)</li> <li>○ Mark forum as active or hidden</li> <li>○ Able to define navigation system</li> <li>○ Control all aspects of forum</li> <li>○ All privileges listed below</li> </ul>
<b>Forum Leader</b> (from within a forum):	<ul style="list-style-type: none"> <li>○ Able to control authoring privileges for students</li> <li>○ Able to “login as” any student</li> <li>○ Able to define groups</li> <li>○ All Student privileges</li> </ul>
<b>Student</b> (from within a forum):	<ul style="list-style-type: none"> <li>○ Able to participate in all aspects of the forum</li> </ul>

## Conclusion

Given the limited ‘real estate’ of a screen and the fact that each additional graphic, link or tab increases the complexity of a given interface, the act of designing software becomes a balancing act between achieving clarity and function. While this alternate design highlights certain functions and tools that promote knowledge building, it does so by relegating other powerful features to the background. Ultimately, the end-user should determine this balance.



Over the last two decades, the continued evolution of KF platform has made it an increasingly powerful and robust knowledge-building environment. In elementary and secondary schools, where computer know-how and support vary greatly, however, the complexity of the current KF system can present administrators and users with real challenges. Creating a version of KF that uses a format that is user-friendly and easy to manage would go a long way in promoting access and proper usage. The proposals advanced in this paper present a new way of looking at how KF could meet the needs of a younger audience, while still keeping ideas of *knowledge building* at the centre.

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