**Functional Specifications:**

The program will be a web app on a local private network and server.

One of the key specifications of this app is security and access. On the one hand, new content will be needed, user profiles will need to be maintained and kept current, and updates will be required. On the other hand, there are very real security risks, both to the software and to other humans, in allowing prison populations access to a communication platform.

This tension between the functionality of open access on the one hand and security in closed access on the other is a challenge in any database. What makes this system unique is (a) the proven criminality of every user, and (b) the need for a third party to add content.

Security was one of the unique features we began to focus on, and it remained one of our customer’s top requests for refinement as we developed our plan.

*Tiered access*

This will have a tiered access structure.

On the lowest tier (most restrictive), a user will only be able to access a learning module that is physically loaded by a guard or a proctor on a device that is not connected to the network and has no other application installed. At a software level, the device itself will have no connectivity and will have loggers installed and running always. Physically, the device will also be mounted to the learning kiosk with an external security camera focused on it. These external security cameras will record on a different software platform using technology already developed for test proctoring at computer based testing locations nationwide.

Proper use of the educational system and incentivized behavior in the prison community will earn access to a less restrictive user environment where an inmate will be able to login to his/her own account and choose his/her own learning modules. This less restricted user environment will still be disconnected from the internet. All updates will have to be done manually from physical media. Loggers will be installed, and any attempt at unauthorized use will flag a warning system and earn a loss of privilege. The external cameras will also be utilized at this use level. As added protection, cameras of the physical user terminal will be mounted above the work stations and will record on a separate security system.

At the highest level of access (the least restrictive), users will earn access to course material that involves research. This research will require, and students will have access to, outside internet. This increased access marries advancing coursework with advancing trust. A student who is progressing in trust and progressing in advanced study will have earned this privilege. This use environment will still have loggers installed internally, physical mounting of the user interface with external cameras, and inline key loggers.

Some in prison can already access online accredited education via various media.[[1]](#footnote-1) These currently existing education programs that lead to a degree are outside the scope of this project. They represent a tier of access less restrictive than what is covered here. The scope of this project is to provide educational access for those who may not otherwise qualify in the hopes of instilling a love of learning.

*Isolation of Database.*

At the least restrictive tier, this platform closely resembles many other online content programs such as Udemy and Coursera. The two lower tiers involve a uniquely managed database. For simplicity, the entire delivery platform will utilize these unique elements.

At a mid level restrictiveness, this database is isolated from the internet. It is an isolated network in which all user data and learning content will be stored in a database managed by the local server. All updates must be made manually using physical media such as USB drives.

Users will login into their account and this will give them access to their learning modules and the learning module store. They will select course work and their completions will be updated to the database.

At the most restrictive end of the spectrum, not only is the user database isolated from the internet, but each user station is itself isolated from the database. Modules are manually loaded by staff and the user database is manually updated the staff. This is both a security measure and a reward structure. Considering security, one user can theoretically pass a message to others via login changes or which modules have been selected. Considering rewards, there is something annoying about telling your selection to a guard / proctor who will then load it up for you. The graduation into self-directed learning is a reward.

*Key logging system.*

Technology already exists to use either an external camera to log key strokes or a hardware based inline device between the keyboard and screen.[[2]](#footnote-2) In addition to these, a software based logger within the user interface will be used. The combination of these systems provides redundancy and at a logical level, a threefold presence of matching key entries is required. (i.e., the system not only monitors for the absence of obvious tampering, but also monitors for matching entries between all three systems). To defeat these, all three must be tampered with simultaneously, and it is not possible to remove a piece of hardware connecting keyboard to screen at the same time one is using the keyboard-to-screen conduit to change software logging settings.

Any attempted use outside the course work or attempts to access unauthorized functionality will be grounds for lost access privilege.

*Other system capabilities*

Users will be able to select which language to use to interact with the system. Users will be able to select which language(s) they want to see available content in. (i.e. a bilingual user may select their preferred language to use to interact with the system, but see available content in both of his/her spoken languages.

App navigation will be much like using a normal interactive webpage. A control menu will be on the left hand side of the screen allowing them to access other parts of the app, like their current learning path, the learning module store, their assessment results, modules, wish list, wallet balance, etc. Users will not be able to alter their logon credentials

At all times there will be a notebook drop down pane on the right side of the screen that will allow users to access their notebook in page without leaving the current page. Users will be able to add folders and notes to the notebook to organize their thoughts regarding their current materials.

Prison staff will be able to monitor learning progress and be able to add currency to users’ wallets as a reward system within the broader prison structure.

All learning will be mediated through the web app—readings, lectures, quizzes, and note taking etc.

In following along with the isolated nature of the database, all course material stays on the servers. There will, however, be available a certificate of completion that logs hours and modules completed.

**Non-functional Specifications:**

The server will have a MySQL database that will contain all necessary user data, learning materials and will be managed by an administrator.

To maximize compatibility with minimum hardware specs the web app will target Internet Explorer 8 for that is the last native browser supported by Windows XP which is likely the operating system running on end user’s machines.

The Local server will be air gapped from all other networks besides the local network during normal use. If updates are to occur the local server will be air gapped from the local network ensuring that it is not possible for inmates to access outside networks.

The interface for guard staff will be a different app that accesses the user database. As part of safety protocol, this will only be accessible from workstations that also have external cameras. Any changes to a user’s database profile will create an entry into an entirely separate database that includes login information for the staff person making the adjustment, a photograph from the web cam of the machine, and a photograph from the external camera. Nightly, a search can be done comparing the account information from the previous night to the account information from the current night.

1. https://www.adams.edu/extended\_studies/undergrad/prisoncollegeprogram.php [↑](#footnote-ref-1)
2. https://en.wikipedia.org/wiki/Closed-circuit\_television#Crime\_prevention [↑](#footnote-ref-2)