Instructional Design as Engineering

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I was conversing with Rich Schultz, founder of GOLDEN, and sort of thinking out loud. One of the things that came up was the idea that a really good online course is something that is engineered. I think that really is a good sound, solid idea although some may think that it's not very creative academically, and possibly not academically sound. On the other hand making some kind of product that is of a high quality takes a lot of creativity as well as making it perform better. That would include being better academically.

The next big tech in education will be quality-lean. Although much of quality, especially lean was developed in manufacturing, the focus actually is on better meeting the needs of the customers. In the case of education, that would be the students. With the pandemic, we saw resources and educators stretched thin as teachers were forced into going online in a matter of a few days. There was always more to do but without the time or other resources to do it all. Lean was born through the need to do better but with a lack of resources. If we apply Quality and Lean to education, we should be able to better meet the needs of the students and do it with less stress on our resources. I see it as a way to making sure a course is what it is supposed to be and then, making it and other courses, better. However, it does take more time than just over the weekend to make happen.

A good online course is engineered. That is, it is written to cover certain competencies and program outcomes at specific times. This can also include the amount of time the students need each week to accomplish their learning, and to make sure they have the right resources they need at that time. A good asynchronous course will be based on a common course format or template. There are quality rubrics for online course design from different organizations. These are good things and these rubric requirements can be built into the template in order to ensure quality and simplify instructional design.

In online education the really well done programs will have a good solid template or form for what goes into a course. I think of the careful and complete use of a quality template as engineering. All required aspects are thought out and included in the correct quantities. This works quite well, because you have a good solid idea of the concepts, the competencies, the

program outcomes that need to be in that course as well as all the other courses. One knows where they're going to be taught, brought up, and how they're going to be assessed. Student work loads are also balanced with each week engineered to fit what they need that week. That makes a much more solid course and program because you know where everything is and how much it is there. The students are also more assured of getting what they need, when it is needed.

The solid and consistent course type, or template makes it a lot easier for students because the students don't have to relearn how to take a course every time they take a different course. The courses are common in navigation and layout. Accreditation is more simple because you can show where those competencies and program outcomes are covered, how much, and how well they're assessed.

Faculty and teacher involvement is a key part in the engineering of online education. Faculty or teachers need to work together in order to craft and engineer the courses and improvements because the knowledge resides where the work is done. That's in the course room not in the boardroom. At Toyota they say go to the gemba. That is where the action is taking place. That's where you learn what's going on and can then make things better. The people there who are doing the work have access to the latest and greatest knowledge of what's going on because they're the one’s doing it. In the case of education, it is the teachers.

A good example of this is the British Coal Board in 1939. They decided to finally ask the mine managers, that is the people down there working in the mines, what really works well. They told management this is working well, this isn't, and they were quickly able to increase productivity by 39%.

What could we be doing better in our classrooms, whether they be online or not, if we really do institute those teacher-led communities of practice? This would include making these findings and knowledge part of the organizational learning, implementing what works well. Of course, there should be a focus on the critical few, not the significant many. This is a key part of engineering, quality, and Lean. You do what is needed in the right amounts. Too much is waste. Too little is waste. Engineering courses so they have needed commonalities will make

them easier to take and teach. It also provides the means to build courses with the quality rubric requirements built in automatically.

These engineered courses may have a common template and form. That does not mean a departure from academic quality. It should be a good thing as what the course needs is implemented in the right amounts and is ensured to be there. There is plenty of space for creativity and academic rigor. The course needs to be engaging as well as properly teaching the required competencies and program outcomes. Documenting where they are and how much through the use of the template is a good way to make sure they are taught. By engineering the course ahead of time makes sure these competencies are there, and every time the course is taught. This also means a high quality course is there, ready to go when it needs to be taught. There is no having to try to figure things out the weekend before a teacher needs to go online.

Engaging the teachers and faculty in the process is a must. They see what is happening in the classrooms far more quickly than they may appear in the statistics. As a result, you might be able to increase quality a lot more and more quickly. This definitely holds true for online education, especially if the teachers are part of the engineering. You can get them together and create some pretty cool stuff like content or media pieces, and things that are more innovative. You should also be able to get those innovations into the course room a lot quicker. I would also expect these same things could be done with hybrid or more traditional face to face courses.