

College Learning Environments (LE)

A Systems View

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This group of slides is my thinking about a systems view of a “learning environment” at a university or college. Much of what we’ve talked about for a “learning environment” involves what happens related to a course including what happens in the classroom and the interactions students have with learning materials either on the web or in their books. The university is a part of the learning environment that develops students. I tried to think about the factors associated with this level and how our efforts impact them.

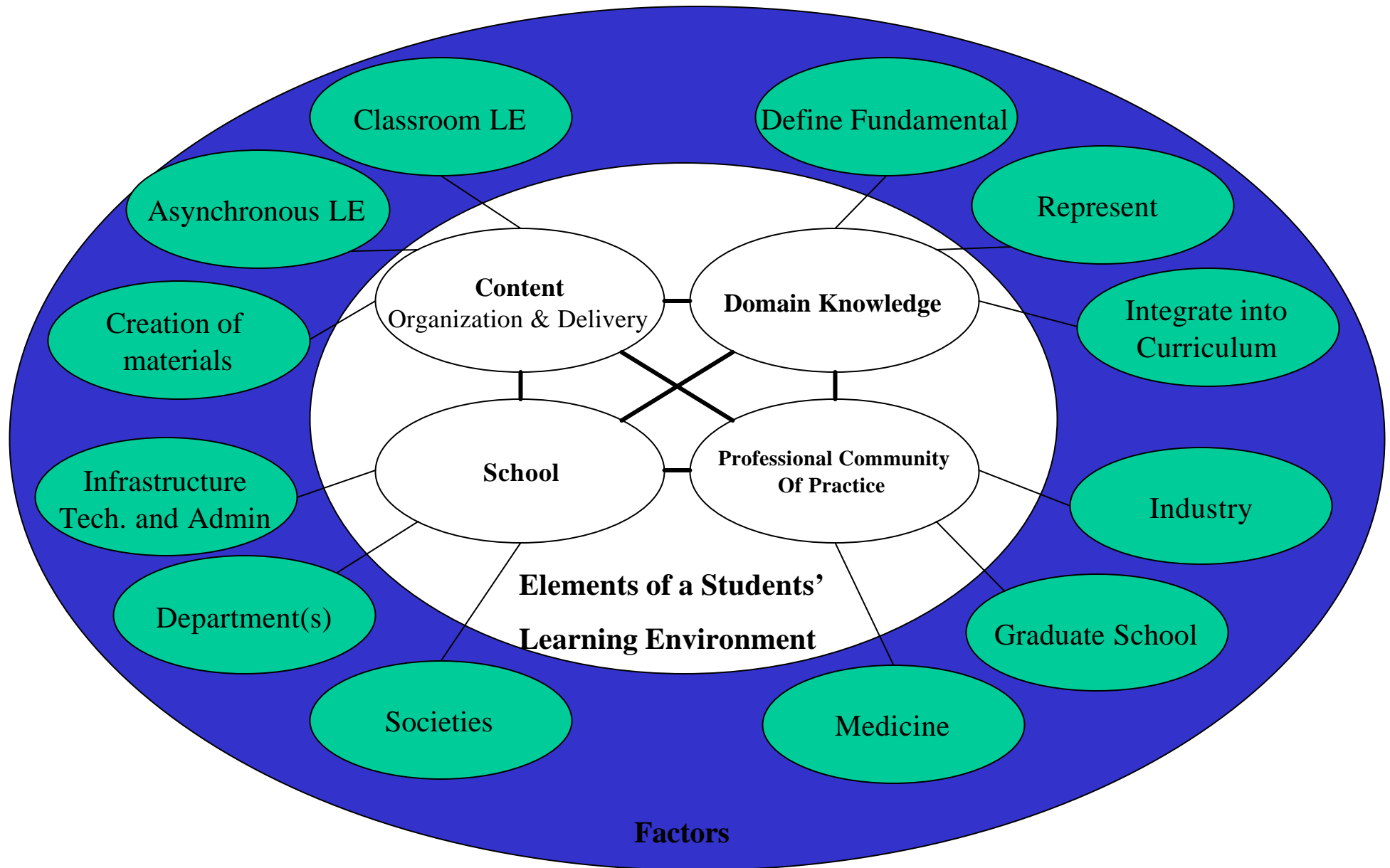
VaNTH is founded on the principles associated with the HPL framework which is founded on the research of many effective learning environments. The HPL framework represents the common dimensions between these learning environments in four major categories that make it successful. There are a number of pedagogical methods and instructional techniques that can be used to target these categories, which I believe we are achieving. However, I also believe there is an implicit model we’ve been using of what a college level learning environment is and what influences it. Therefore, I’ve made an initial attempt to visualize what I see are the major components of this learning environment and how they relate to each other. In many ways it seems intuitively obvious, but I think the representation can help use reflect on what we’ve accomplished and where we need to continue.

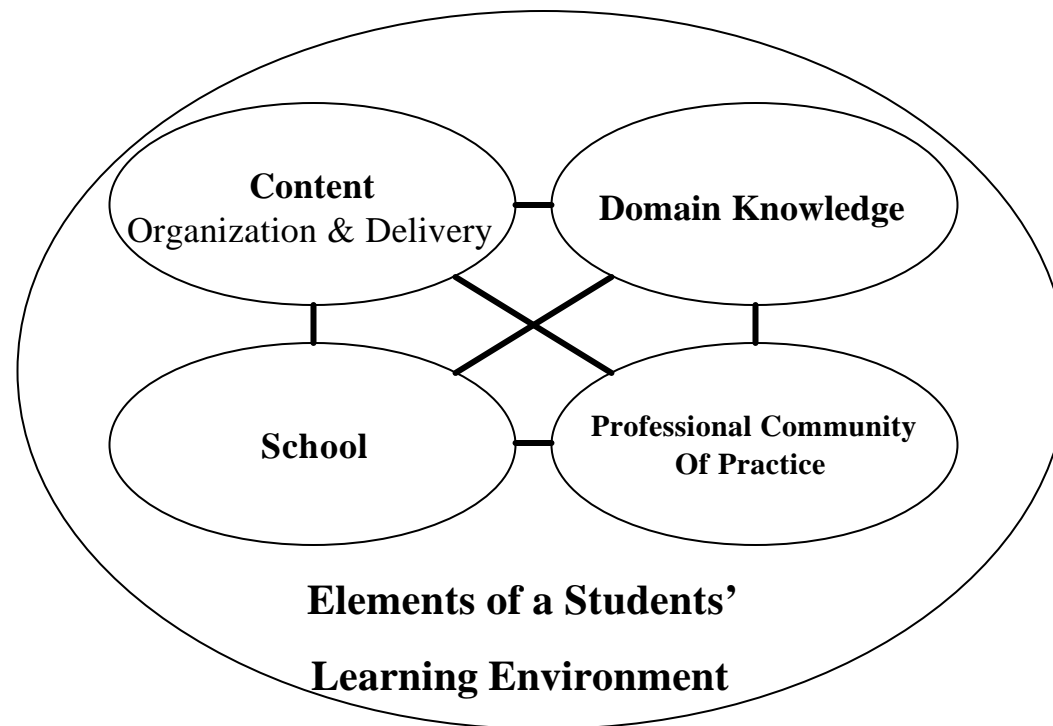
I think this description is very LS centric, but consider the source. If we define our major learning objective for VaNTH as -- to prepare students to excel in their bioengineering related professions. Then our goal is to create an environment that targets the areas where they need to perform on the job

- identify, analyze and trouble shoot problems
- design “innovations” to solve problems
- adapt to new situations
- be able to teach others

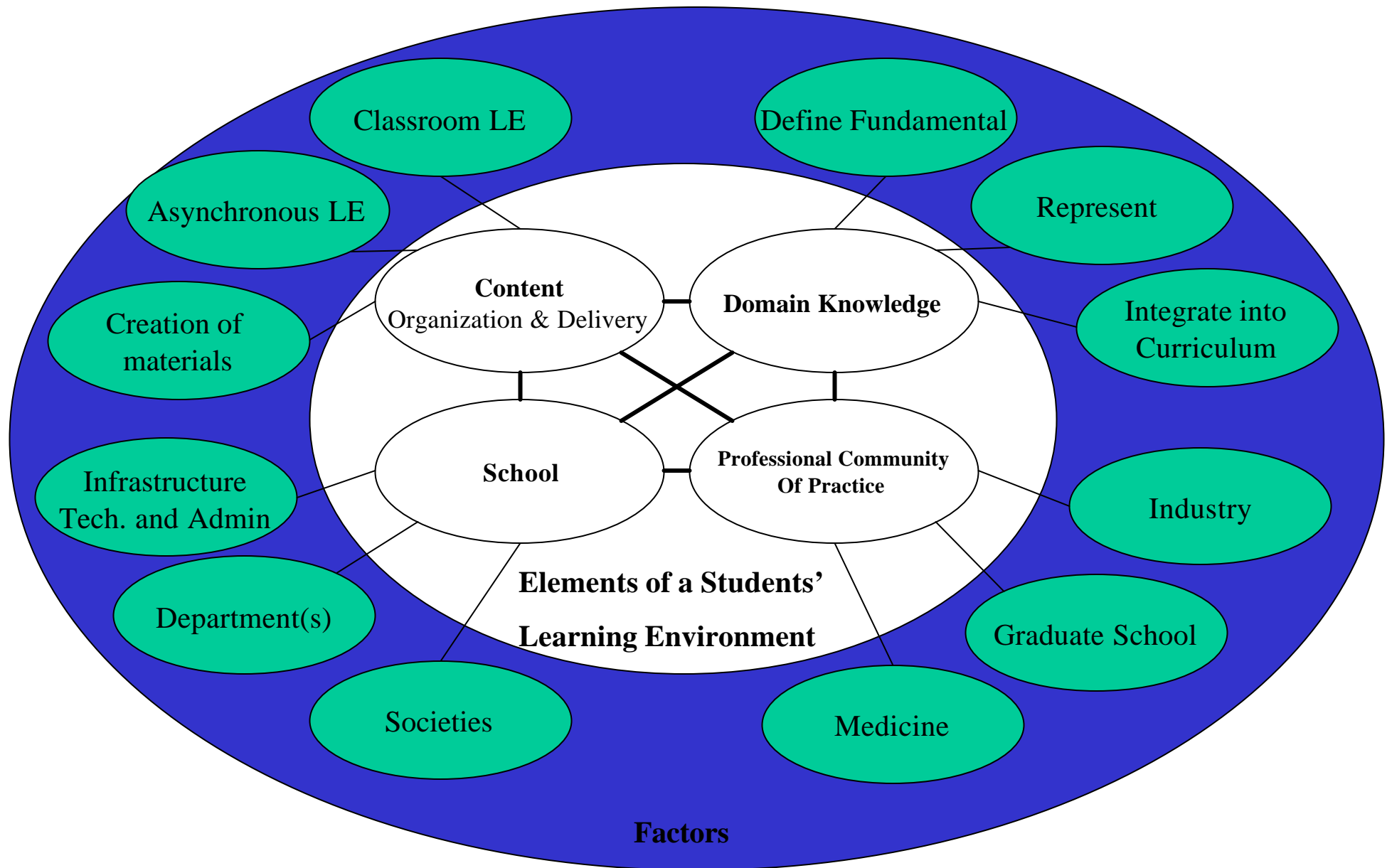
I believe these are all domain independent and common to all professions (depending on how one defines innovations).

Below is one interpretation of the Systems View of a learning environment at the university level. This is an attempt to visually represent some of the major components we are trying to influence in VaNTH. We could use this to help think about how VaNTH projects work together to meet our objectives. Click through each slide for a brief description of how to interpret this representation.

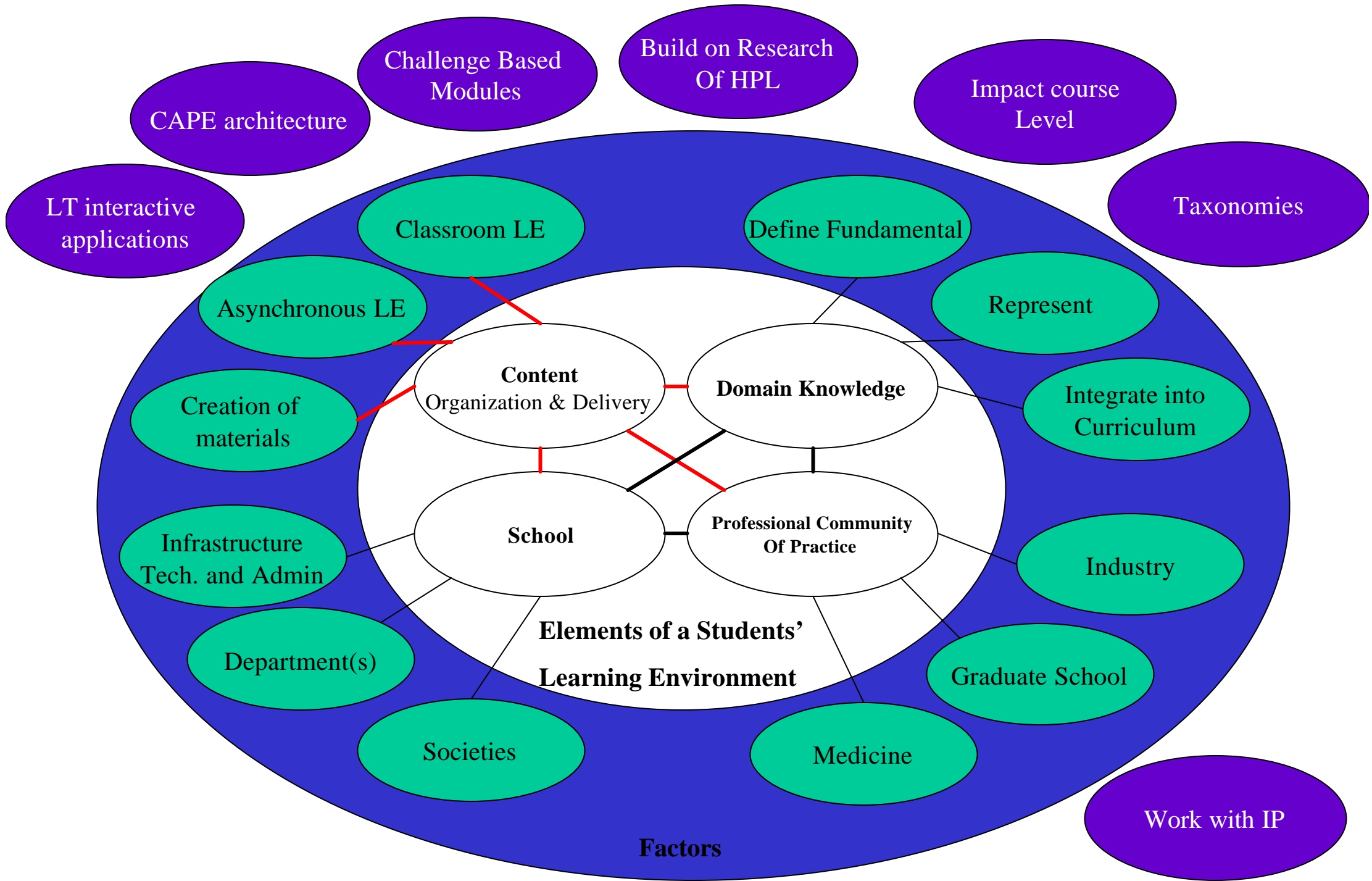




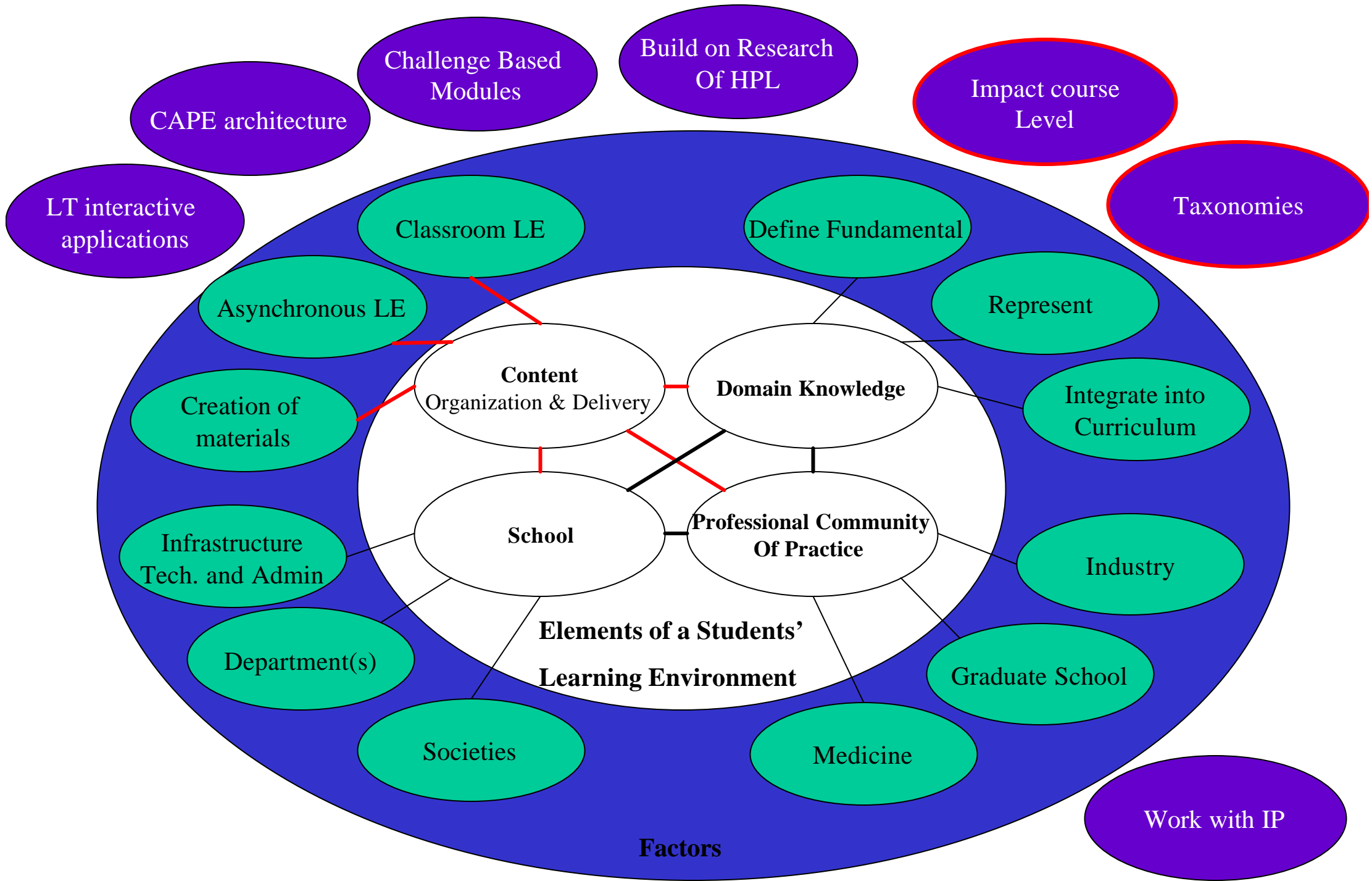
An engineering student's undergraduate experience is influenced by the environment created for him or her. The figure above identifies four major factors that can potentially interact with each other to define an effective environment for learning. One of VaNTHs goals is to take advantage of these opportunities to create an optimal learning environment for all students.



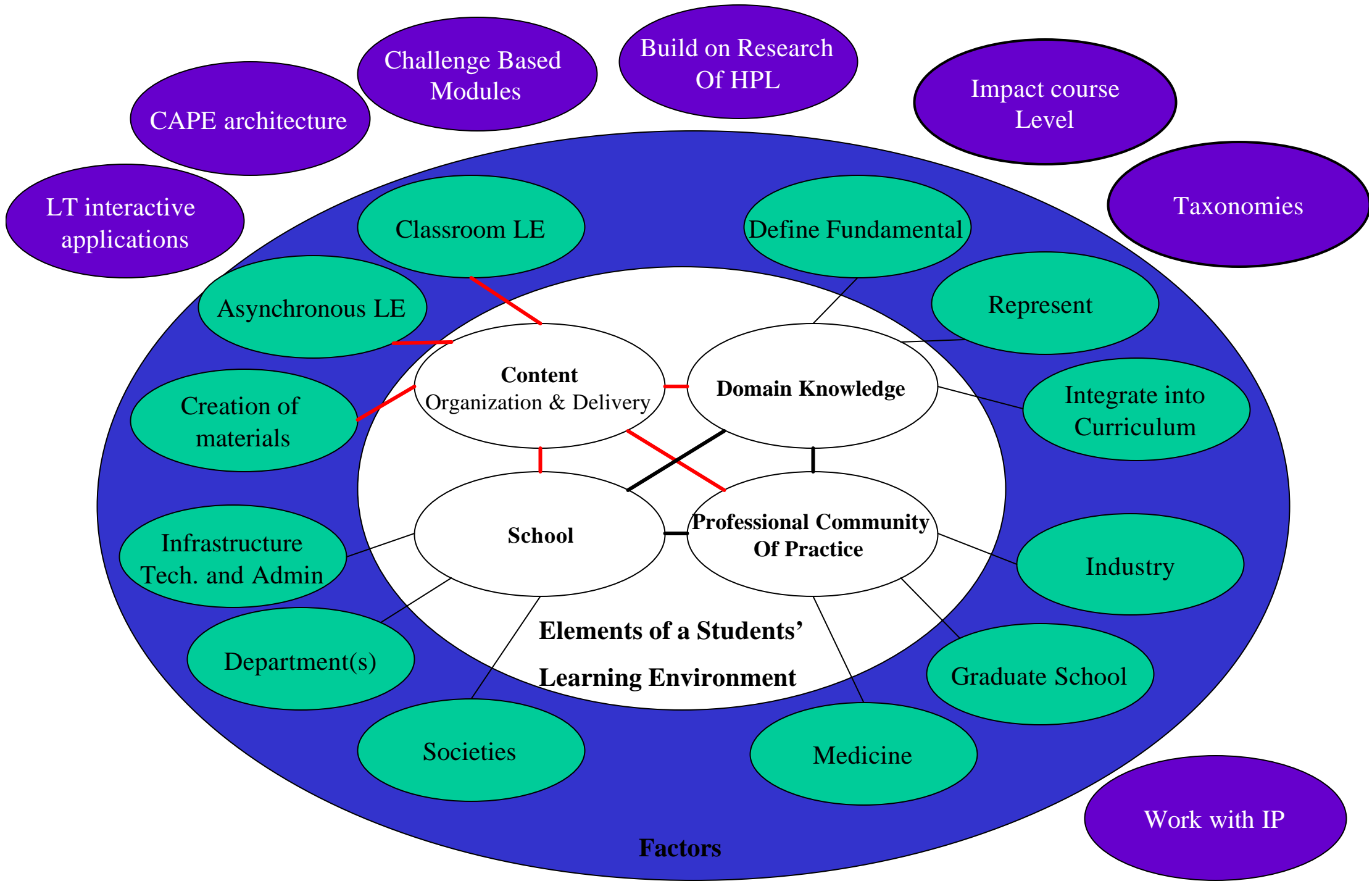
One could argue that each element is defined by a series of factors. The strength of these factors ultimately determine a student's learning experience. These are only a representative sample and I'm sure there are many more.



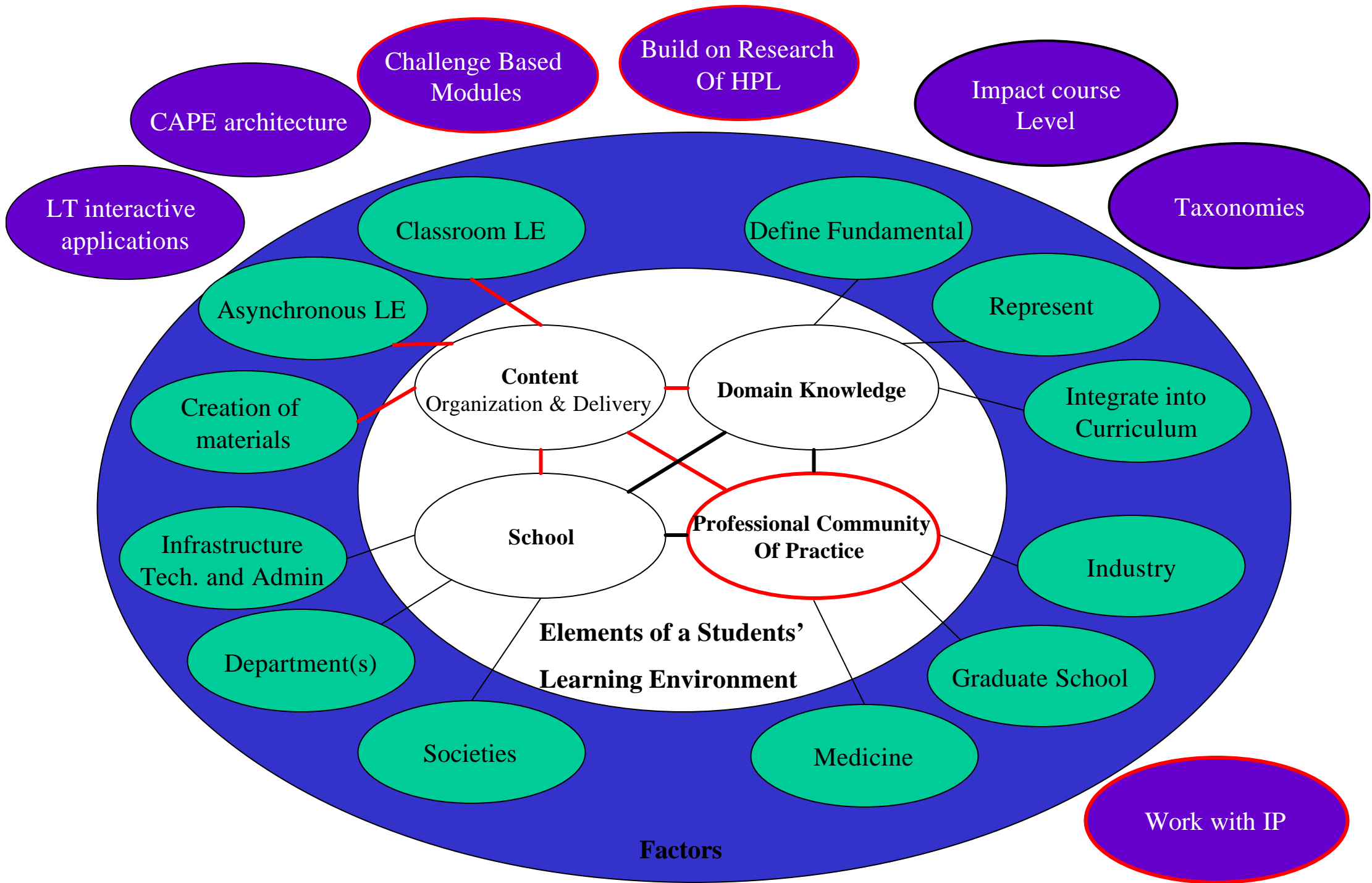
VaNTH is engaging in a series of projects designed to improving factors related to the content area of the students experience. Therefore, we are very interested in understanding all the links related to how content is defined, organized and delivered to the students.



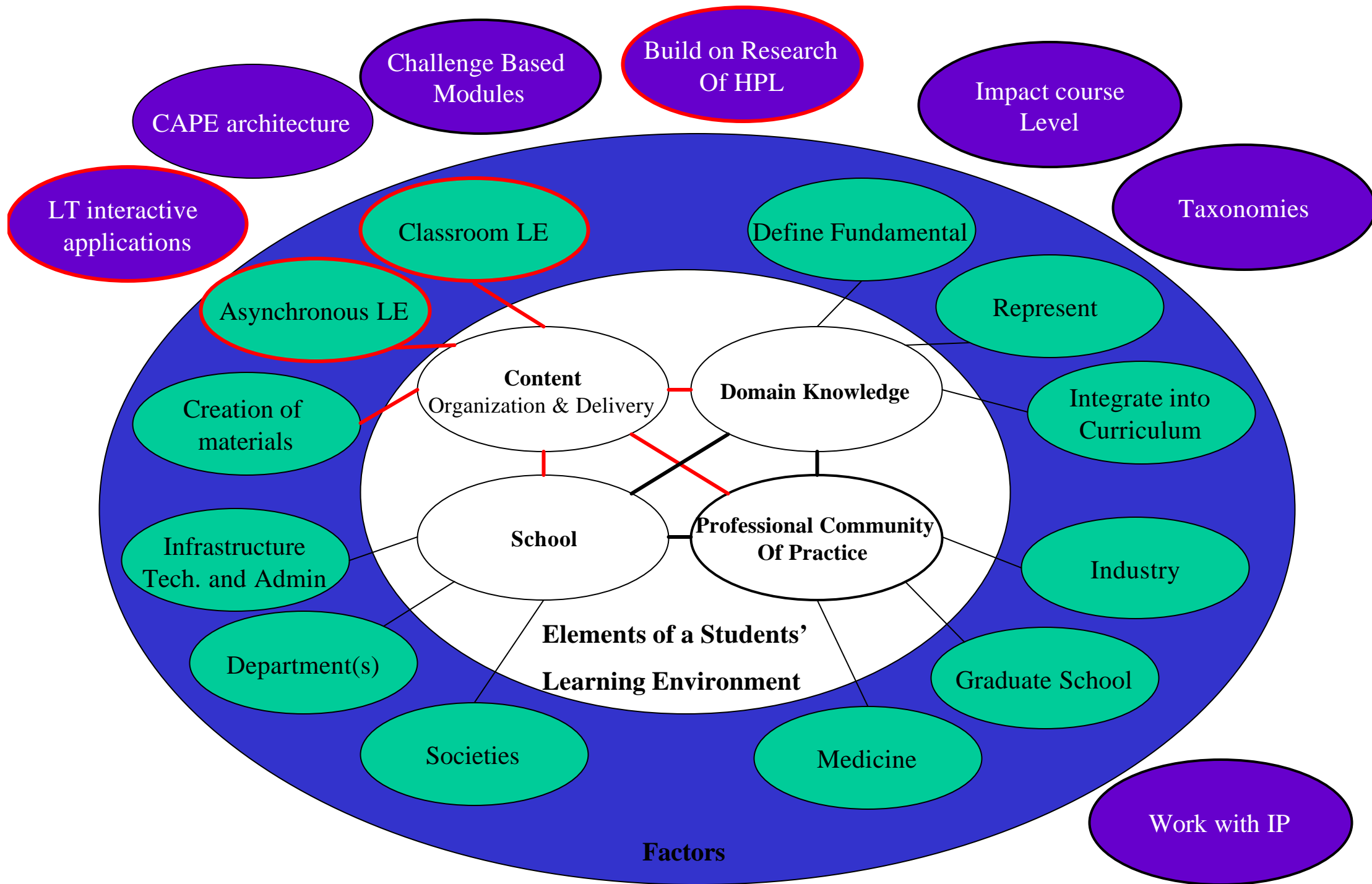
VaNTH's initial focus has been to understand the content at both the domain level through taxonomies and at the course level with this information we can begin to prioritize the knowledge students need to know.



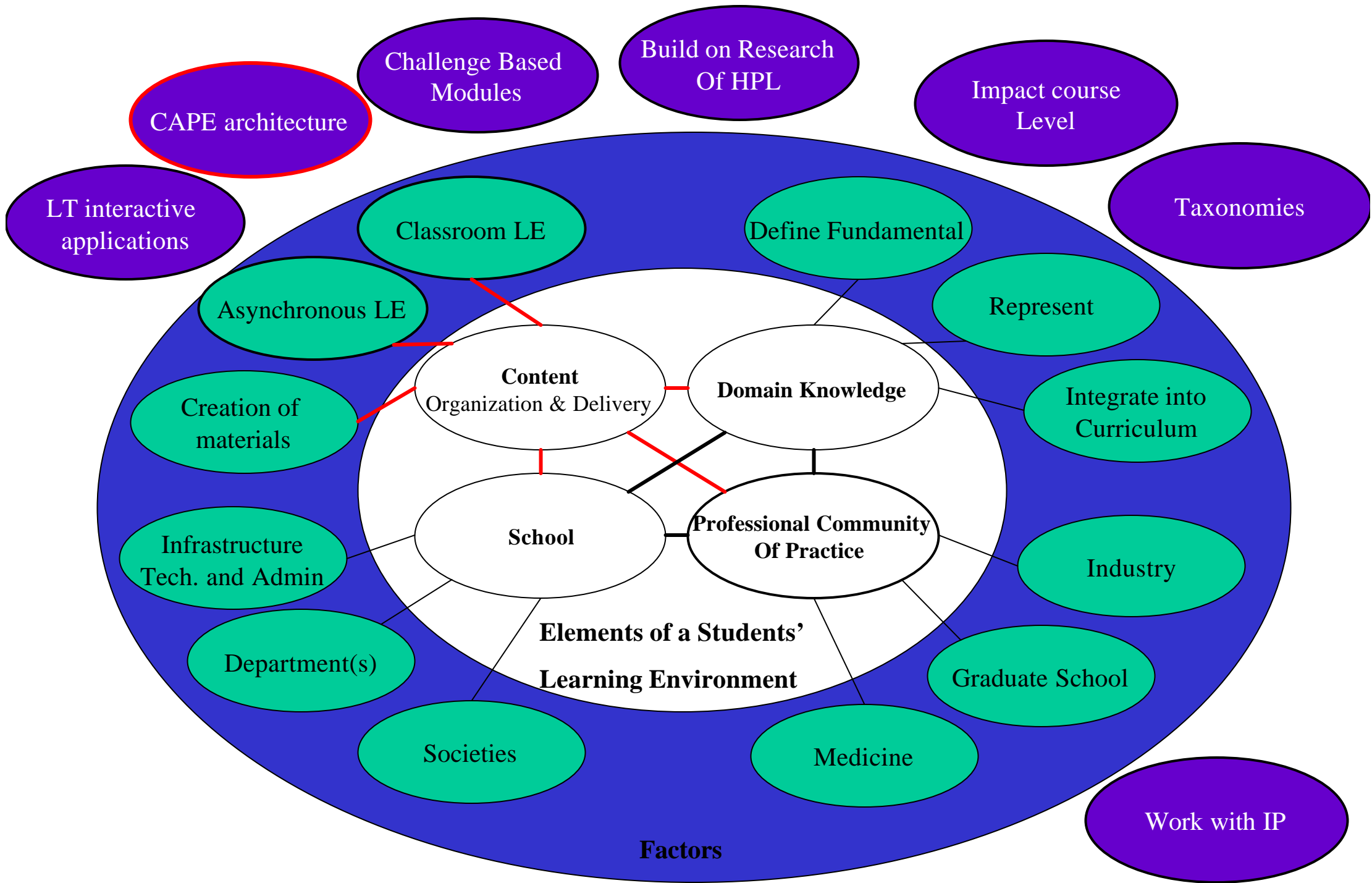
Our design of instruction organizes content around challenges. This has many advantages. The approach has roots in prior research that has utilized knowledge of what we know about how people learn. The challenges and the interrelationship with other challenges help student understand the domain knowledge so they can apply it.



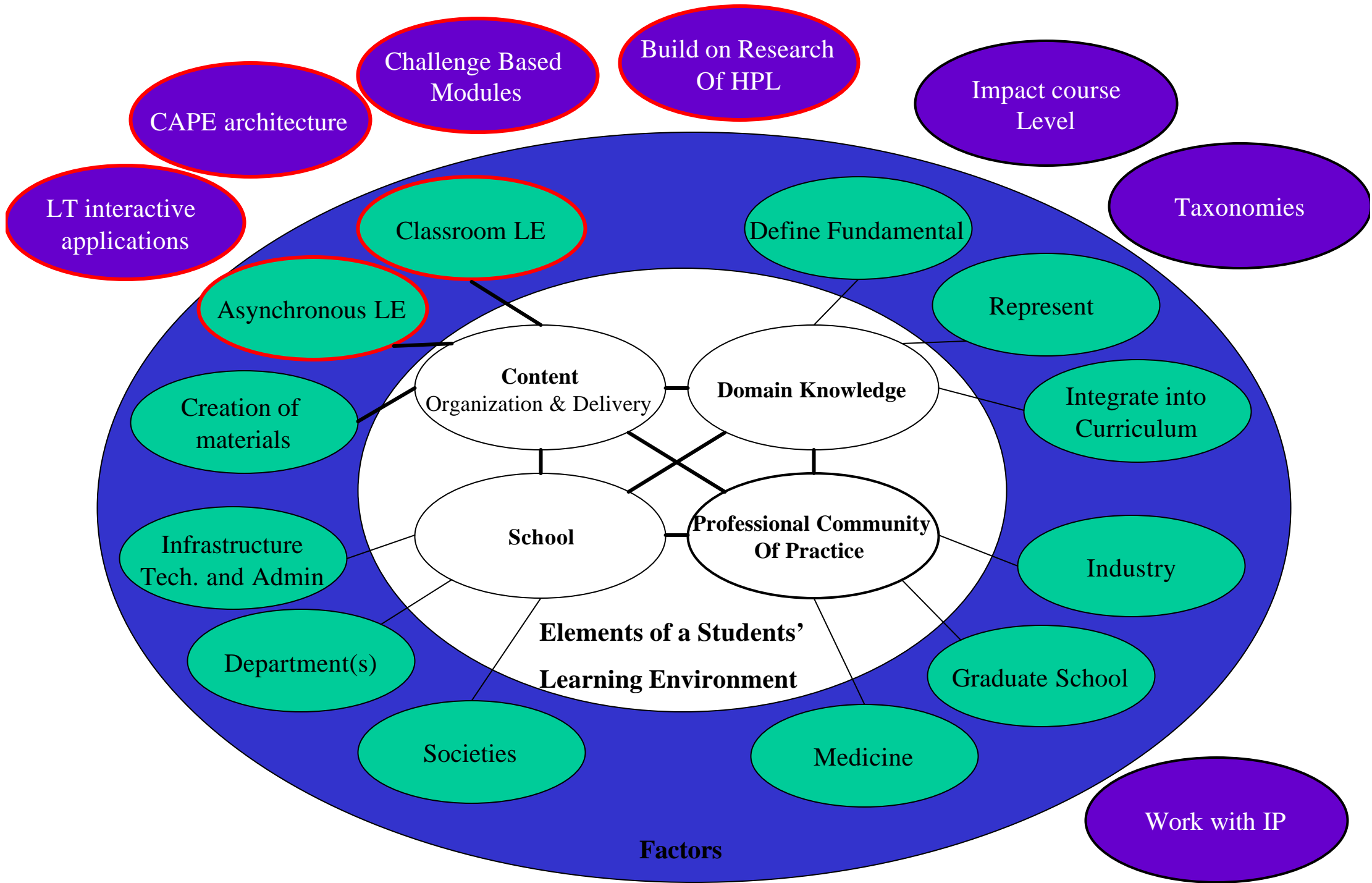
Challenges also provide the opportunity to develop skills associated with complex problem solving. Also, the challenges can help establish links to a community of practice for the students. The links we are establishing with our industrial partners (eg mult. Pers.) can help inform what challenge we could use and helps students become aware of what they do.



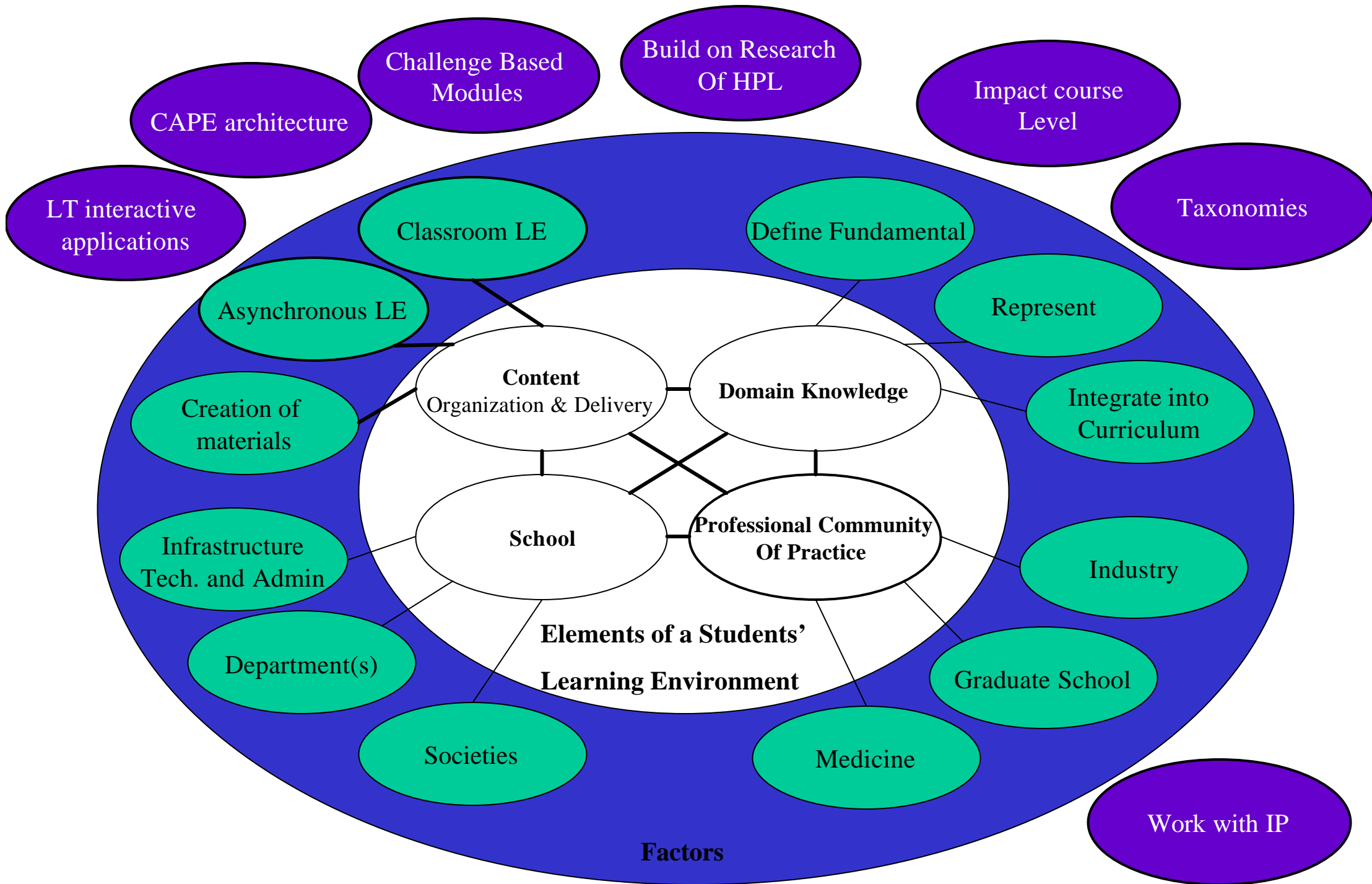
The other large component of the content relates to how it is presented to the students. We are researching pedagogical methods to optimize their experience in both the classroom learning environment and with their interaction with an asynchronous materials.



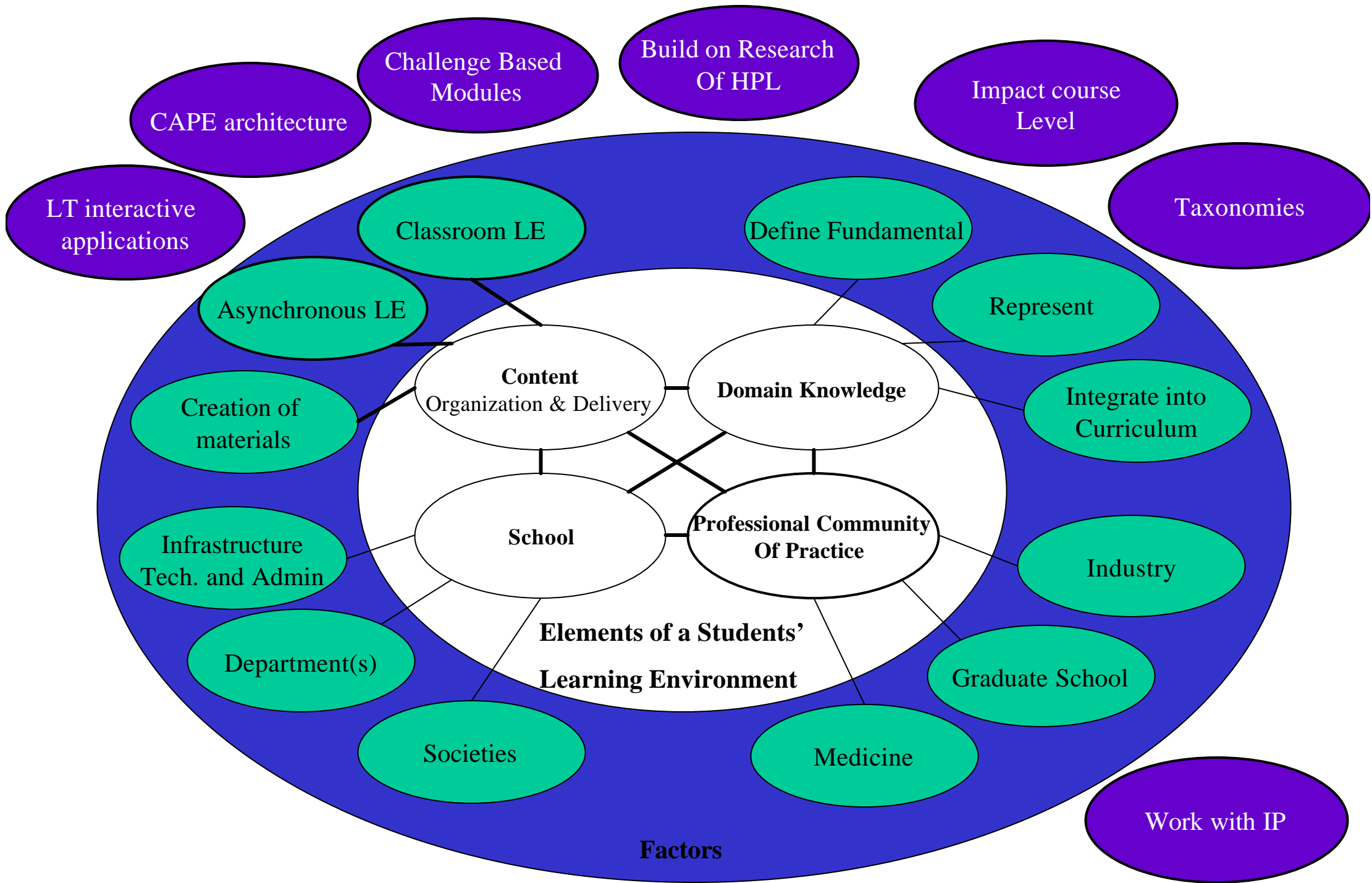
An architecture is needed to help manage the delivery of the content based on our innovations from Learning Sciences and the domain knowledge. CAPE provides a highly flexible architecture that allows us to accomplish many of our ideas for improving instruction.



Assessments **of** and **for** learning are built into the Challenge Based Instructional approach. Every learning activity students interact with should have the potential of providing students with some level of feedback that help them evaluate their progress.



Evaluation of our success is a function of where we are putting our emphasis. Our current focus is on creating an effective content delivery system that results in an optimal learning experience for all students. Our research is showing that we are advancing in this area. We are working on knowledge based assessment and assessment tools.



As we grow as a Center we can begin to make impact on other factors, such as, design teams to assist in creation of materials, working to advance the infrastructure of the school (eg choosing an LMS), and links associated with a community of practice including professional societies (not shown).

