The challenge (indeed, maybe even the challenge of our times) is how to understand and improve communities where people might not be engaged in the same enterprise as everyone else.

But how do you define a community when there is no trust, no set of shared values, no sense of a common destiny, no sense of a common history or a common future, not even a shared, vocabulary, way of seeing the world, or even agreement on what counts as true?

We could just say that we have no community at all. A genuine community, it could be say, has some or all of these things. Perhaps. But what if we don’t have this? We still want the things that community brings us: peace and security, opportunity, and a place in the world. How do we accomplish this?

We have to remake a sense of community defined not by what we believe or what we value but rather by how we go about making these decisions. In this world, community is consensus, and the definition of a community is the means employed to reach consensus.

In the previous six weeks of this course we have sketched some of the major elements of this. We’ve looked at things like identity graphs, content-addressable resources, and recognition entities. These are assembled from data, organized in graphs, and stored in the cloud. Each of these, in some way, plays the role previously played by trust, truth and values.

For example: consider the question of whether Fred said “Apples are for sale at five dollars today.” In a traditional community, we would trust in Fred’s word and reputation to rely on this assertion. In a trustless world like the one we live in now, though, Fred could simply deny he ever made such a statement. How are we to know? But if the statement is secured with Fred’s digital signature, then we can know that Fred said it, even if Fred later denies this fact.

What’s key here is that each of us individually can verify Fred’s statement for ourselves. The validation of Fred’s signature is based on mathematics, not reputation. And so the determination of the fact of the matter becomes the mechanism through which we all share and recognize the veracity of this assertion. We call this mechanism ‘consensus’ and it becomes our source of truth in our decentralized, disunited and diverse community. (a)
The technical question faced in this module was the very practical question of “how does a decentralized community reach consensus?” It was posed to course participants in a very practical way, as the topic of this week’s task. It was also considered in the context of how Wikipedia reaches consensus in the content of its articles and how blockchain networks achieve consensus about transactions.

In a blockchain, contributors are connected together in a network. A chain is created by linking blocks of facts together using a hashing algorithm. Each entity in the network has a copy of the chain, and as new blocks are added new copies of the chain are propagated to members of the network. The reliability of the chain as a whole is what ensures the reliability of each fact recorded in the chain.

In a decentralized network there is always the possibility that a bad actor will substitute its own version of the chain for the actual chain, thus introducing falsehoods into the listing of facts. For example, it might record itself as receiving funds that it never received. From the point of view of any individual in the network, there is no way to know which of two distinct chains is the actual chain. It’s the consensus algorithm that resolves that dilemma, and the different ways consensus can be established are illustrative of the different kind of communities that can be created.

Some major consensus algorithms include:

- **Proof of Work** - any entity can add a block to the chain by performing a complex mathematical calculation and including the result of this calculation in the block. Reliability is ensured by the cost of introducing falsehoods into the chain.

- **Proof of Authority** - only entities who are authorized may add blocks to the chain (where the identity of these entities is secured, say, by digital signatures). Reliability is ensured by the reliability of the authority, and the impossibility of any non-authorities to add blocks to the chain.

- **Proof of Stake** - entities can mine or validate block transactions according to how many coins they hold. Reliability is ensured by the existing stake entities hold in the blockchain.

Though these approaches are specific to blockchain, with a little imagination we could see how they characterize different approaches to consensus generally. What we need for consensus in general is way to for each of us to determine what is a fact, and a means to preserve and project that fact, in order to find agreement with others. Without those facts there is no interaction at all, and without propagation and projection, there is no agreement, and hence, no community. And these are both what are in full retreat today especially in the online world.

We need, in essence, two things:

- First, a mechanism for us, as individuals and as groups, to create facts, and
- Second, a mechanism to preserve those facts and project them to the world
This is the new role for education in the 21st century. This is the core proposition of E-Learning 3.0. This is what remains for us to define through to the end of the course.

First, with respect to the creation of facts, as theorists such as Simon Blackburn argue, each of us can determine for ourselves whether something is true or not, at least to a certain degree. Are two numbers the same? Is one thing bigger than the other? These are matters of recognition based on our experience in the world and agency in projecting that experience to others. Recognition is supported and enabled by what I have elsewhere called the critical literacies, and in a society these run deeper than reading, mathematics and science. They include pattern recognition, perspective and context, inference and reasoning, and practical application and communication.

Second, with respect to preserving and projecting facts, what we learn is that community and consensus are about more than voting and about more than having power. What is required for a community to work is not merely control, but agreement on the part of the members of the community. History is filled with attempts to define that agreement and to make it operable in the physical world. Shall we leave it to a philosopher-king to decide? Or to the interpretations of the Qu’ran? Or is it something that is managed by an invisible hand? Or should the will of the majority prevail? Or should the algorithm? Can we trust the algorithm?

Underlying this is a set of laws, institutions and processes, and when these break down, and when consensus is lost, it is very difficult to restore. Fostering an understanding the importance of these processes, and the costs of not being able to establish them, is a fundamental goal of education. This can be accomplished best (and maybe only) through the process of engaging in them and developing community and consensus in the classroom.

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(a) I haven’t mentioned this at all in any of the documentation, but my use of the terms ‘fact’ and ‘source of truth’ have been influenced by my study of dimensional modeling (DM) in the context of a recent data management analysis project.