**Tessr.foundation – Tessr.network**

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Tessr.network - An Educational Blockchain

What is the Tessr.network?

An educational blockchain that uses our Tessr.credit as an educational credit. Educational providers will have the ability to own, securely store, manage and share content with a vast online community using our blockchain solution. Each provider maintains his or her own rights to the information and all transactions are approved by active members, collectively. The information stored on the blockchain contains: transactions, contracts, course data, certificates and identities. Entries are permanent and transparent. The Tessr.foundation aims to end paper based learning, automate the award, recognition and transfer of accreditation. This will increase the educational providers' ownership and control over their own data, reducing institutional data costs and risk.
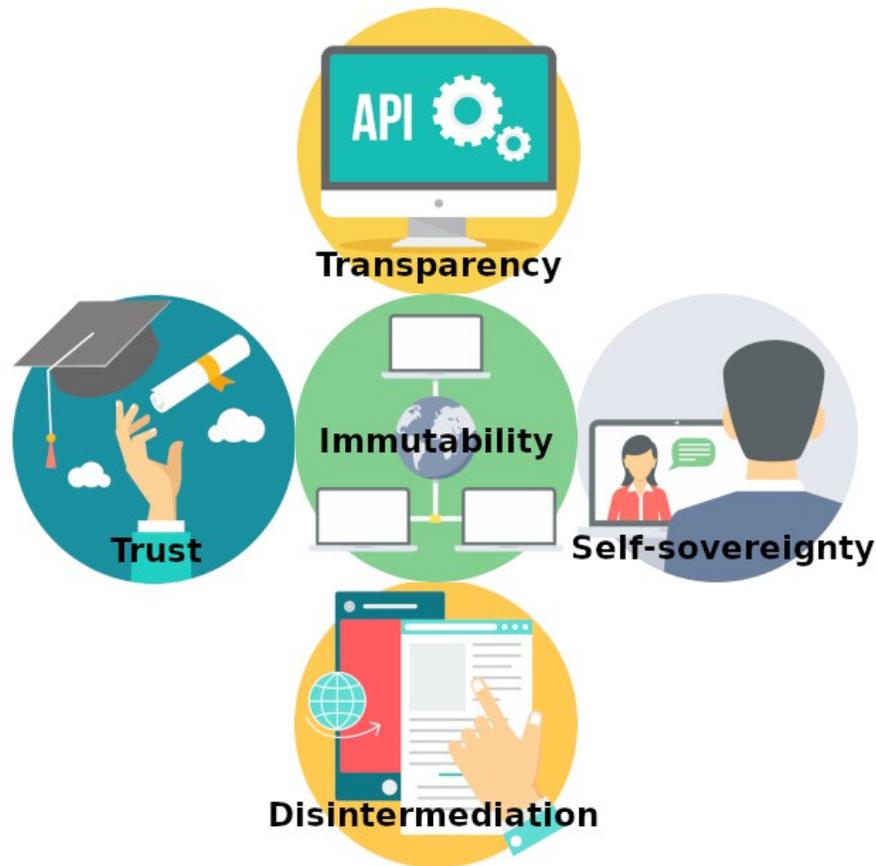
How education can benefits from the Tessr.network:

- **Self-sovereignty:** Educators can identify themselves while securely maintaining control over their personal data.
- **Trust:** Infrastructure that gives confidence in its operations, such as payments or the issuance of certificates.
- **Transparency:** Knowledge that each educator and student has the capacity to conduct transactions.
- **Immutability:** Records are written once and stored permanently without the possibility of modification.
- **Disintermediation:** There is no need for a central controlling authority to manage transactions or keep records.

Blockchain entries are permanent, transparent and searchable, which makes it possible for community members to view transaction histories in their entirety. Each update is a new "block" added to the end of a "chain." A protocol manages how new edits or entries are initiated, validated, recorded and distributed. With blockchain, cryptology replaces third-party intermediaries as the keeper of trust, with all participants running complex algorithms to certify the integrity of the whole.

Using the Tessr.network to permanently secure certificates

Educational organizations that issue digital certifications will use the Tessr.network to store the associated digital signatures. Unique, signed digital certifications are given directly to the users. Thus, verification of the authenticity of a certificate only requires comparison with the digital signature/hash stored on the blockchain.

The proofs of the certificates will be stored completely, securely and permanently on our blockchain. Thus, even if the institutions that issued the certificates were to close down, or if the entire system of education collapses, those certificates are still verifiable against the blockchain records. Furthermore, once institutions issue a certificate, they do not need to spend any further resources to confirm the validity of that certificate to third parties, since they will be able to verify the certificates directly themselves on the blockchain.

Using the Tessr.network to verify multi-step accreditation

Not only would educational organizations use digital certificates in the manner described above, but organizations which accredit them would also put their own digital signatures onto the blockchain. This would allow for verification that not only Student X had received a certificate from Institution Y, but also that Institution Y was certified by Accreditation Organization Z.

Such a system could be used to ensure that the educational organization issuing the certification was licensed by a government, or to verify that the educational organization had specific quality-certifications, e.g. that an MBA-provider was actually certified with accreditation. Using a blockchain, rather than researching these connections, institutions needing to check the 'pedigree' of a degree could easily do so with a single click. A fully-automated process would then be able to visualize the accreditation chain and verify that certificates had indeed been issued and that they were still valid for each step of the chain.

Institutions could create self-sovereign identities to store identity-data – in this case the accreditation they had received. Thus, a third-party verifies the validity of the student-certificate against the blockchain, and checks the pedigree of the institution based on the published elements of its identity.

Using the Tessr.network for automatic recognition and transfer of Tessrs.credits

The primary advantage of this is that not only would the proofs of the validity of a certificate be stored on our blockchain, but the certificate itself would be stored,as well – meaning that the certificate itself becomes permanent and immutable. Furthermore, it means that no third parties would be needed to create and store the certificates – students/graduates would only need to give an employer access to their profile, and their entire educational history in terms of those credits would be instantly visible and verifiable.

Credit systems are often used for transfer and accumulation. Transfer means that a credit received in one institution is recognized as contributing towards a qualification in a second institution, while accumulation means that upon receiving a certain number of credits, students can be awarded with a qualification such as a degree.

Currently, credit transfer depends on institutions to negotiate agreements to recognize each other's credits subject to certain conditions – but students often report that these agreements are not recognized. Using Tessr.credits, these agreements will be written as smart-contracts, whereby upon fulfillment of the conditions of the contract, the Tessr.credits would automatically be transferred. The same goes for accumulation – a smart-contract will be programmed to automatically issue a degree upon the achievement of certain credit-targets, ensuring that the transfer and accumulation rules are applied equitably across all cases.

Using a blockchain as a lifelong learning portal

Learners would store their own evidence of education received from any source – whether formal, non-formal or informal – and when shared, the blockchain would be used for instant verification of the authenticity of these documents.

The advantage of this is effectively that every student would have an automatically verifiable CV containing a record and evidence of all education they had received – significantly reducing CV fraud, as well as, depending on the form of implementation, significantly reducing workload for organizations and individuals have an interest in verifying that CV.

Blockchain for tracking intellectual property and rewarding use and re-use of that property

Educators would use the blockchain to announce the publication of open educational resources and record the references they used. This would allow for notarization of the date of publication for copyright reasons, as well as allow the level of re-use of any specific resource to be tracked.

From a structural standpoint, this scenario is very similar to the existing system used to track citations for journal articles. However, tracking citations of journal articles has up until now required intermediaries which have put limits on the use of those articles in return for those services. These limits often include high costs for access and restrictions on the sharing and use of the intellectual property within them. This has limited uptake of the model for open educational resources. Using a blockchain, we eliminate the intermediary, thus allowing anyone to publish openly, and accurately keep track of re-use without putting limitations on the source material.

With such a system introduced, it would allow for teachers to be rewarded based on the level of actual use and re-use of their teaching materials, similar to how they are rewarded based on citations to research papers. By serving as a proxy for quality materials, it would also allow students and institutions to make metrics-based decisions on which teaching materials to use.

Receiving payments from students via the Tessr.network

Students would use our Tessr.credit system, for their studies. This system will act as educational credit hours, transferring into cryptocurrency tuition payments for educational providers. Students do not always have access to bank accounts or to credit cards, depending on the country they are from, their age, employment status etc. This can sometimes serve as a barrier to access education. Students can log on to our network via our mobile app and use our credits without issue. 1 Tessr.credit = 1 credit hour.

With the Tessr.network students will not have to worry about transferring your credits. There will be no need to hunt down transcripts to figure out which credits will transfer. The Tessr.credit can transfer to any educational provider on our network. As well, our credits never expire and can count towards educational courses years into the future.

Providing student funding via blockchains, in terms of Tessr.credits

Sponsors fund tuition by giving students Tessr.credits to be spent at any educational organization on our network. This systems will be a popular method for funding education, since we provide free education to students, but still allow institutions to compete among themselves to give the best possible offer to students. Depending on the funding model, these Tessr.credits may be subject to conditions such as requiring the student to graduate.

Funding for tuition would be given to students as Tessr.credits on our blockchain. Smart-contracts will be used to release funding to either the student or the educational organization, based on certain performance criteria. Sponsors can provide the entirety of the funding upfront (providing security for the students and institutions,) but only release it when certain criteria are met. This process can also happen automatically without the need for any intermediaries, vastly decreasing the bureaucracy required to manage such a system.

Verified blockchain identities for students within educational organizations

When students share their personal data with the admissions office within an educational organization, they would receive certification of their identity. Using biometric identification on a smart phone, coupled with this certificate, students would be able to identify themselves to any other part of the organization, such as the library, gymnasium, dormitories, student associations, etc. Each of these services would be able to identify the student without the need to ask for or store any personal data again.

By using verified sovereign self-identities, only the persons responsible for verifying the student's identity in the first instance, require access to the data. Other than that, the only person who holds the data is the student themselves. This means that the organization no longer needs to manage the complex systems for access rights and only needs to secure the device or network where the initial verification is taking place. This would save significant resources spent in hardening the network against data-breaches, staff training on data-protection and in managing access rights.

In conclusion, the purpose of our technology, is to provide simple and efficient interaction between students, educational institutions, private teachers and employers, while also being responsive to their needs. Universal and international mechanisms for interaction between all these participants will provide a good example of how pressing problems in the industry can be solved with the help of the Tessr.network.