

TuiChain:

A Blockchain Platform for Higher Education Financing

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The TuiChain platform enables students to request financial support to pay their tuition and allows investors to provide such funding through the Ethereum blockchain¹ using the Dai stablecoin.² Students are legally obliged to repay their investors if and only if their income is above a certain threshold, and the value of the payments is proportional to their income, similarly to what is typically accomplished with income share agreements.³ Additionally, investors can trade shares of their loans with other investors, increasing liquidity.

The primary market. A *student* (the first kind of user) begins by applying for the chance to request a loan on the TuiChain platform. This application must include any required official documentation regarding their identity and financial or legal status, and is reviewed by a human at TuiChain. If approved, a legally-binding contract is then signed between the student and TuiChain. This contract specifies the terms under which the student must make the aforementioned payments. The student must also commit to notifying TuiChain of any changes to its academic and professional status and income.

For every approved loan request, two smart contracts are deployed on the Ethereum blockchain: (1) a standard ERC-20 token contract⁴ and (2) a loan management contract. Each token minted by the former corresponds to a predetermined amount of the loan value (e.g., 1 token = 1 Dai), and the total amount of tokens is set to match the full loan value (e.g., 5000 tokens total for a 5000 Dai loan request).

The loan management contract initially owns all tokens, and allows interested *investors* (the second kind of user) to acquire any number of them by depositing their corresponding value in Dai plus a proportional fee (e.g., 1050 Dai for 1000 tokens with a 5% fee). Potential investors have access to details about the student's academic progress and income status. Once the loan is fully funded, the portion of deposited Dai corresponding to the fee is transferred to a TuiChain account and the remaining Dai is transferred to the student. If, however, the loan is *not* fully funded after a predetermined amount of time, then it is canceled and investors can recover all deposited Dai by returning their tokens.

Students make their payments directly to the loan management contract, which in turn transfers part of the value to a TuiChain account as an additional fee (e.g., 10% of the paid amount). Once the final payment is performed or the student is otherwise exempt from any further payments (as stipulated by the aforementioned legal contract), and once a human at

¹ <https://ethereum.org/en/what-is-ethereum>

² <https://community-development.makerdao.com/en/learn/Dai>

³ <https://www.thebalance.com/what-is-an-income-share-agreement-4687242>

⁴ <https://eips.ethereum.org/EIPS/eip-20>

TuiChain verifies that this is the case, the crowdsale contract begins allowing investors to redeem their tokens in exchange for a proportional amount of the Dai deposited through the student's payments.

The secondary market. The TuiChain platform also provides a marketplace where investors can post token sell positions. Other investors can then browse through existing positions using specialized search features such as filtering by loan and student attributes.

Briefly, investors post sell positions (e.g., sell 90 tokens for 100 Dai) by transferring their tokens to a designated marketplace smart contract, which causes the position to appear in the platform's marketplace page. Other investors can then purchase those tokens through the same page using their wallets, sending the requested amount of Dai plus a proportional fee (e.g., 102 Dai for the full 90 tokens with a 2% fee) to the marketplace contract and obtaining ownership of the respective tokens. The fee amount is transferred to a TuiChain account and the remaining Dai to the seller. Sell positions may also be removed by the seller, causing non-purchased tokens to be transferred back to them.