

A DESIGN OF COMPLEMENTARY COMMUNITY CURRENCIES FOR EDUCATION

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Abstract: This paper proposes a design for complementary community currencies for education communities to boost cooperation of the more advanced students with the less advanced ones. Its design follows two goals: motivating students to learn by doing extra homework (effort) and share knowledge with younger students (tutoring), and shifting the role of teachers towards a more supervisory, tutoring and dynamic tasks. The hypothesis, following a Brazilian example, is that colleges may accept as payment for their tuitions not only conventional legal currencies, but also educational complementary currencies. The traditional grants policies based on personal effort will be paid with bunnies, and modern community tutoring effort will be paid with knowls. The bunnies and knowls will be obtained as a reward of doing homework and providing help for homework, respectively, and as an expected result, students will have more solid knowledge background at all levels resulting from their boosted personal and community effort.

1 INTRODUCTION

Education has challenging problems beyond the well known ones of funding and methodology. The lack of motivation of the younger generations raises high up above them; students see no relevance in what is done in the school except for “good grades meaning good colleges”. Several on-line communities try to deal with this problem presenting initiatives that resulted for example in high interaction and outstanding results in complex mathematical problems, involving pre-college students. The drawback is that these communities are not connected to each another. Thus, it is conceivable to connect them with expectation of boosting teachers’ role of helping their students to learn and make academic progress.

Another problem is that teachers, burden with heavy teaching load, rarely participate in innovation forums, do not take into account the modern student incentivization tools (for example, on-line games), and as the result, they have no time to address the

problem of students seeing no relevance for their lives in what is done in school.

The current state of the art solutions attempt to increase the intrinsic motivation of students. Some solutions today are related to paying students for their academic progress, with either legal currency or complementary community currency that can be used towards college or university tuition. Other approaches are also increasing the intrinsic motivation of students by creating a strong sense of elitist community, like on-line communities. There are many other approaches, but we will keep focus on those, will discuss their pros and cons and will propose improvements to them.

The key fact is that the best students are some sort of *insiders*, who know the subject and also know how to motivate less advanced and/or younger students. Last, but not least, the universities, by allowing students to pay tuition with complementary community currencies, are promoting the *good will* as well as recruiting *good students*. At the same time the University will help with social services in the

educational community and will benefit the students who share their knowledge. Universities may hope also that the state will reimburse them for the lost tuition income as some sort of a tax-payers' payback based on the public benefit of the scheme.

2 PREVIOUS WORK

Some precedent systems paying for sharing education have been already proposed. According to (O'Brien, 2008), the Baltimore schools Superintendent, Andres Alonso, unveiled a controversial proposal to improve city schools: pay students to perform. It's a simple idea that has generated quite a bit of controversy from purists who cringe at the thought of paying students to learn and from realists who believe there simply must be a more effective way to spend \$1 million in a failing school system. Yet despite moral and practical objections, this approach does have a record of success abroad. What's more, there may be a way to tweak Mr. Alonso's plan so that it reinforces - rather than undermines - the value of learning and enables the city to earn a greater return on its investment.

Paying people to do what they should be doing, such as working hard in school, may seem like absurd policy, but this approach, as claimed by (Lietaer, 2006) is proving to be an effective tool for fighting poverty in the developing world. "Conditional cash transfer" programs, as they are known in the international development community, have increased health and education outcomes for impoverished families around the globe, from Brazil and Argentina to Mozambique, Cambodia and Pakistan. Perhaps the best-known such program, Mexico's *Progresa*, pays parents cash in return for forfeiting the wages their child could earn and instead keeping him or her in school. Not surprisingly, children of families enrolled in *Progresa* are much more likely to stay in school and acquire the skills they need for the high-wage jobs that can lift an entire family out of poverty.

Progresa's success inspired New York Mayor Michael R. Bloomberg to implement the first conditional cash transfer program in US. Launched last year, Mr. Bloomberg's Opportunity NYC is a privately funded demonstration project that offers cash payments to low-income workers who meet certain benchmarks, such as opening a bank account or meeting with teachers to discuss a report card. Early feedback from the program suggests that these transfers aren't simply a cash bonus; for many, they serve to replace the wages lost when a parent leaves work to meet with his or her child's teacher.

Mr. Alonso's proposal to pay students to perform draws ire from those who believe our instant-gratification culture has infiltrated every corner of society; no longer are students compelled to learn for learning's sake, or to achieve in the hope of securing a better future. The critique that these payments for passing send the wrong message to students is potent enough for Baltimore to reconsider how it structures and frames its program.

In our opinion, first, the city should split the payment by handing one part directly to the student and deposit the rest into a restricted savings account that can be used only to pay for higher education or skills training. The straight payment would give the city the instant results it seeks, while directing the savings to an account in the child's name would reinforce the expectation that passing the state assessment test is just one step in the journey to achieving a postsecondary credential and, with it, a better life. As a bonus, such a solution helps provide these students - those who work hard to achieve - with the financial boost they need to continue their education.

The program is thus transformed from a bribe for kids to past tests to a vehicle for students to chart a path to higher education through building academic skills and earning their college scholarship.

According to (O'Brien, 2008), the Bloomberg's claim was: "We've reached a breakthrough agreement establishing a new program that will reward excellent performance by individuals and by entire schools." Mayor Bloomberg also said: "We are rewarding our teachers who prove that they are the most successful in helping students make academic progress".

We claim that this approach has another problem resulting from the use of legal currencies that are not appropriate for certain types of communities like education-centered ones, since these communities may have other values.

For example, online communities blossom around specific subjects. Some examples are the art of problem solving www.artofproblemsolving.com, the Interactive Mathematics Miscellany and Puzzles, www.cut-the-knot.org, and the Maths Forum @ Drexel mathforum.org. They represent different approaches to attracting highly motivated high level students that love maths and enjoy exchanging solutions. These communities have strong community sense. From our point of view, they are disconnected from the less advanced students, who do not benefit from this excellent collective source of knowledge. This paper is an attempt to provide a framework for connecting these communities with regular students and teachers.

In some sense there is a solution: it is the *saber* of Bernard Lietaer (Lietaer, 2006). This is an alternative rewarding system that helps students to achieve access

to colleges and at the same time incentivize the advanced students to teach the beginners. The main social goal of *saber* project is to multiply the number of students that can afford to obtain a college-level education in Brazil. The additional goals are having a direct impact on the entire primary and secondary school learning potential, as well as improving the cross-generational and social awareness of the kids that will go to college. To avoid stagnation, they apply a 20% yearly inflation (or tax) on accumulated sabers, so that advanced students have an incentive to have a plan to be in college at a certain year. The discount rate applied for the tuition is 1 saber = 1 riai (the official currency in Brazil).

Finally, and far from being educational applications, there are the question-answer communities like yahoo answer, where the rewarding is based on simple points, but has attracted the attention of several hundreds of thousand users with about 70.000 questions posted every day. The question – answer approach may fit well with educational communities, and part of their incentivization schemas may adapt to them. In the on-line communities, people look for status, raising high in the ranking system, with predefined reward tables sorted according to their activity. Apparently, it is something that they enjoy (Howe, 2008). A problem that these communities have is that most of the most active users love to help, but do not like or need to be helped, making the points in their accounts not too useful.

3 GOAL

The challenge is to find a way to connect students and teachers so that collectively they act more intelligently than any individuals or groups have ever done before.

The goal is to incentivize students and teachers with intrinsic motivations, by a strong sense of community. This will be done by designing a special currency, whose unit will be called *Wit* and will be issued under highly controlled conditions as explained below. Its face value would be nominally the same as the legal currency of countries in which they are earner (i.e., Euros, Dollars, etc), and would be redeemable either for paying tuition for higher education programs in participating universities or for other benefits inside the educational community. The **balance is the key for achieving the motivation** of students and teachers. This would be a paper currency (although electronic accounts can be kept where they will accumulate), with all the security precautions against fraud used for printing conventional national currency.

The proper design of the Complementary Community Concurrencies (CCC) is critical, since as (Krohn and Snyder, 2008) states, eighty-five percent of the local paper currency systems (a type of CCC) initiated in the United States since 1991 have become inactive. This is discussed in the following section.

4 A PROPOSAL OF COMPLEMENTARY COMMUNITY CURRENCIES FOR EDUCATION

Following (Carrillo et al., 2007), we proposed to introduce a new general class of currency called *wits*. The name intends to invoke the meaning of “things that make sense”. Any student that makes things that make sense to somebody else in his/her educational community will be rewarded with *wits*. The reward can be granted either for progress towards obtaining higher grades or for involvement with the community in the form of helping other students. The payment can be issued by the students’ parents or by public authorities. Teachers simply help students to advance themselves according to their goals. The redemption of their *wits* into *real* things may vary from exchanging them for tuition for colleges to exchanging for money or even for attaining certain roles in their communities. The rewarding will be always done from a meritocratic point of view. The educational community self-control will apply, so any fakes will be fixed inside the community itself.

Accordingly, we propose two different kinds of *wits*, as complementary currencies inside the educational communities:

- **Bunnies**, the first type of *wit*, will be a measure of individual progress as long as students succeed doing exercises. The bunnies may be also credited to parents when they are helping teaching their children and, when necessary call for help. They will be used by the students at the end of the term to redeem age-specific rewards of any type, according to the desires of students under the constraints set up by parents. The rewards are subject to achieving certain goals agreed by the parents and the educational community. Students start with zero Bunnies at every term. Bunnies are lost whenever a student quits the educational community though they might be given to other students at any given moment, or can be divided at the end of the term among the best students.
- **Knowls**, the second type of *wit*, is the currency that is assigned every term to students to reward

tutors, advanced students or even other parents for their efforts to help students do and understand their homework. Knowls are assigned as a loan to every student that joins the community, which means that any student can use them to reward any other student or tutor for their help. The knowls are redeemable primarily for college grants, though, other usages may apply. For example converting knowls into bunnies may be allowed at the exchange rate yet to be determined. Before redeeming knowls for tuitions or bunnies, the loans have to be paid back.

These types of wits can be divisible by 100 to facilities precise pricing. We expect that the prices for personal progress and community contributions will be self-regulated by the educational community itself, by sort of an invisible hand.

4.1 Educational Viability of Bunnies and Knowls

There are some examples (Threadless, iStockPhoto, Fotózz, etc.) that led us to believe that our learning community will benefit from crowd-sourcing, by taking advantage of the over-education of middle class making our interests more diverse than our business cards would have us to believe (Howe, 2008). A confluence of factors contributed to a sudden creative abundance for teaching. An exponential rise in education has coincided with the emergence of the greatest mechanism of distributing knowledge the world has ever seen, the Internet. But this diversely talented, highly skilled workforce must toil away in a labor market that requires ever greater degrees of specialization. This leaves people feeling overeducated and under-fulfilled, with job satisfactions rates reaching all-time lows. Thus, the ones who can teach can be advanced students, as well professionals interested in sharing their specific knowledge, housewives with high degrees but no paid jobs, and others.

Motivations in the communities fall into extrinsic and intrinsic categories. We can think of extrinsic motivation as consisting of carrots (a financial reward) and sticks (a scolding from your boss). Intrinsic motivations, on the other hand, consist of such factors as creative fulfillment, a belief in the project, the sense of community obligations, or the opportunity to enhance one's reputation in that community.

People are inspired to contribute to crowd-sourcing endeavors for similar motivations, though financial incentives also play a role, especially when the contributors hail from developing countries.

However, people derive enormous pleasure from cultivating their tales and from passion on what they have taught others. Collaboration, in the context of crowd-sourcing, has its own reward (Howe, 2008).

Fotózz (see Table 1. for some basic facts), an educational community in the field of photography, has rewarding schemes with some similarities to the concepts proposed in this paper. In Fotózz, there are over 40.000 users very motivated to learn and highly active in posting photos and writing reviews, so that users learn by doing. A participant sees others' photos and reviews, so that she understands deeply herself her own progress in photographic abilities. This community has a credit system quite similar to the complementary community currency proposed here, where every user receives some credits for every review made. A participant can use earned credits for publishing new photos, showing his progress or experimental work. If a user runs out of credits, then she cannot publish any picture until she reviews a sufficient number of other authors' photos. This is a powerful 'carrot' incentive.

Table 1. Features of Fotózz and Wikipedia communities

Fotózz	Data obtained Oct 30, 2008 from Oct 1, 2003
43.181	users
147.813	active photos
1.646.372	reviews (hungarian)
	0,43% of the total population of Hungary
	3,4 photos per user
	38,1 reviews per user
Wikipedia (data obtained from en.WikiChecker by Oct 30, 2008)	
8.176.196	users
75.000	editors (higly active users)
2.606.566	articles (english)
260.875.565	edits
	0,20% of the total population in english
	0,3 articles per user
	31,9 edits per user - Note that edits are of lower magnitude
	16,0 reviewed edits per user (estimation)

The cumulative mass of credits of the whole community steadily grows with the level community activity. Also the quality of the photos of the whole community steadily grows, despite a steady flow of people joining or quitting it. Fotózz shows a stable process of teaching done by advanced users to the benefit of beginners that love learning. Interestingly, this community is by far more active than the Wikipedia committee is. Just as a matter of comparison with the most known educational community today, we provide interesting statistics for Fotózz and Wikipedia in Table 2. As shown there, Fotózz members contribute 10 times more entries than the wikipedians do mainly because of

the different nature of entries on those sites. What it is relevant is that they are twice as many Fotózz members as there are wikipedians, measured by the ratio of active users to their linguistic base (Hungarian and English), as well as twice the number of entries per user. This means that Fotózz community is highly attractive and by far much more active than the wikipedia community.

The learning community may work equally well as the Fotózz community does, imposing a set of social norms of behavior on their constituents, offering rewards in the form of enhance reputation, and conforming to those norms or excelling at skills that the community considers valuable.

The users of Fotózz love learning, and they learn a lot by doing, sharing, and reviewing until they reach the time they feel they must quit the community to follow perhaps a professional career with the high credits and skills that they accomplished during their community residence. This virtuous process may also arise in an educational community that uses educational complementary currencies.

Table 2. Comparison of Fotózz and Wikipedia communities

Ratios	Fótozz		
	Fótozz	Wikipedia	/Wikipedia
Users/population	0,43%	0,20%	210%
Publications per user	3,4	0,3	1074%
Reviews per user	38,1	16,0	239%
Reviews per user (rough)	38,1	31,9	119%

4.2 About the Currency Redemption and the Exchange of Knowls and Bunnies

Colleges in the USA and other countries may decide to accept students pay with knowls to gain students with strong community services and solid knowledge demonstrated by their teaching. This already happened in Brazil, with the *saber* complementary currency (Lietaer, 2006), where every family receives 200 *saberes* per newborn child in order to pay his/her education. The final redemption, at the moment of paying a college tuition is 1 *saber* = 1 *riai* (legal currency in Brazil).

Other colleges may accept students paying with bunnies that demonstrate high personal effort and solid working background of the payers.

Some colleges may accept both currencies, what might set, as a matter of fact, the conversion rate between bunnies and knowls. From this point of view, conversions between bunnies and knowls should be allowed inside the community under certain conversion rates.

5 FUTURE WORK

This is a concept of yet another application of knowledge backed complementary community currencies (wits), in the roadmap to citation auctions (de la Rosa and Szymanski, 2007). We are looking for many uses of wits (Carrillo et al., 2007) in preparation to their general introduction not only in the Internet 2.0 communities but also in other knowledge intensive communities. We expect to build up communities that love teaching and learning by doing, where users generate, review and distribute the contents.

In future work, we will test the concept in on-line educational communities, initially in those devoted to helping students to do their homework, as well as helping parent to help their children to do the homework. Examples of such communities are Notemari.ro in Romania, a New York State educational community like GoodGrades.us, as well as a charter school.

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REFERENCES

- Rourke O'Brien, 2008. Paying City Students is a Wise Investment, *New America Foundation*, The Baltimore Sun | June 27, 2008 http://www.newamerica.net/publications/articles/2008/paying_city_students_wise_investment_7445
- Bernard Lietaer, 2006. A Proposal for a Brazilian Education Complementary Currency, *Intl Journal of Community Currency Research*. Vol 10, pp 18-23
- Gregory A. Krohn, Alan M. Snyder 2008. An Economic Analysis of Contemporary Local Currencies in the United States, *International Journal of Community Currency Research*, Vol. 12, pp. 53-68
- de la Rosa J. Ll., Boleslaw K. Szymanski 2007., Selecting Scientific Papers for Publication via Citation Auctions, *IEEE Intelligent Systems*, Vol. 22, no. 6, pp. 16-20
- Carrillo C., de la Rosa J. Ll., and Canals A. 2007., Towards a Knowledge Economy, *Intl Journal of Community Currency Research*, Vol. 11, pp. 84-97
- Howe, J. 2008., Crowdsourcing: Why the power of the crowd is driving the future of business, *Crown Business*, First Edition.