

PAPER

Teachers Motivating Themselves by Motivating Students: A Cryptocurrency Appears

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University, Hanoi, Vietnamjohn.andre@isneu.org**ABSTRACT**

The attitude of teachers has a powerful influence on whether or not they will adopt a new technology. How much that technology helps the teacher do their job is a key determinant of their attitude. Exploratory research was done to discover the preferences of university lecturers for a novel cryptocurrency token (NCCT) which focuses on education and is intended to increase student motivation. Working in both public and private universities in Vietnam, responding teachers participated in unstructured interviews, then in structured interviews with open responses, and finally in structured interviews with closed response options. Responses show that 57% of university lecturers in Vietnam are either interested or very interested in being able to utilize this NCCT to motivate their students to change behavior. The top behaviors that educators wish to change include doing homework, preparing before class, and asking and answering questions during class time. This focus on in-class behavior could be intended to improve the sense of agency felt by students. In a previous study, students reported they would change their behavior in order to receive these NCCTs so there is reason to believe the teachers' efforts would be successful if they had access to an NCCT like the one described herein.

KEYWORDS

teacher motivation, student motivation, cryptocurrency, higher education, Vietnam

1 INTRODUCTION

While the topic of student motivation in relation to how it can impact student outcomes is a topic of ongoing research, much less research has been done on how student motivation can impact the working experience of university educators. As a major aspect of lecturers' jobs is being in the classroom, educating students, we should remember that the emotions and job satisfaction of teachers matter. Considering that higher education teachers in Vietnam already carry a heavy workload [1] and with the same credentials they could earn higher salaries in another

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line of work [2], it should be seen as important to keep lecturers satisfied in their daily work experience.

This issue of how satisfied educators are with their job impacts the quality of their in-classroom service to the students [3]. It also influences how well an educational institution performs [4]. This is not surprising given that research shows job satisfaction positively correlates with employee retention [5], [6], and retention has been shown to link to firm performance [7], [8]. Since university lecturers feel happier in their job when they have more influence [9], a tool which gives teachers increased control could play a positive role in these issues. This paper will explore the use of a novel cryptocurrency token (NCCT) as a tool for educators to use in order to enhance student motivation, thus increasing the teacher's own motivation.

1.1 Background

The idea of designing an NCCT with the specific intent to motivate students was recently introduced [10]. The proposed NCCT does not yet exist and the purpose of that study was to explore the student's perspective on such an NCCT so that it could be designed in a way to satisfy all appropriate stakeholders. In short, the idea behind this NCCT is that teachers would be able to motivate students to change their behavior (for example, getting students to complete homework more often, study more, try for higher grades, etc.) by rewarding certain behaviors through the granting of these NCCTs.

In that initial study of 322 university students, 89% reported that they would be motivated to study more if they were rewarded with such an NCCT. Not only did the students respond that they would be motivated but 69% also believed that the average Vietnamese higher education student would also be motivated by it. This second question may, at least partially, address the issue of selection bias.

That study explored not only whether students would be motivated but on what those students would choose to spend the NCCTs they received. While many students were interested in buying things which require real money (for example, paying tuition), the vast majority of students would spend their NCCTs on things which do not necessarily have any monetary value (for example, retaking a failed assessment or receiving improvement recommendations before assignment submission).

In the above-mentioned paper, it was proposed that teachers would be in control of the distribution of the NCCTs to students. That is, teachers would decide which behaviors to encourage and to what extent. In other words, teachers would decide what a student would need to do in order to earn exactly how many NCCTs.

It is important, especially in the context of the adoption of any new technology in an educational context, that the perspectives of multiple stakeholders be fully considered [11]. Since the earlier paper focused on the student view, the goal of this current study is to explore the perspective of the teacher, as both teachers and students must participate in such a system for it to succeed.

While some might consider the Unified Theory of Acceptance and Use of Technology (UTAUT) or the Technology Acceptance Model (TAM) to see what drives teacher acceptance of this NCCT, these models are focused on technologies which are well understood (for example, [12]) or at least can be demonstrated to users (for example, [13]).

In the current context, we are dealing with a topic (cryptocurrency) that not only do teachers not understand well but neither does the public at large [14], despite it

being in the news frequently. Importantly, the parameters of this NCCT have not, yet, been defined. Indeed, the purpose of this and prior research is to determine the wants and needs of the various stakeholder groups so that the parameters can be designed in an appropriate way to motivate usage by the largest number of individuals and institutions.

To better understand why the TAM and UTAUT are inappropriate at this early stage of development, it might be useful for the reader to see some survey questions from these instruments.

- From TAM3 [15]: “The quality of the output I get from the system is high.”
- From UTAUT [16]: “Working with the system is fun.”
- From UTAUT2 [17]: “At the current price, it provides a good value.”

As the system does not yet exist, there is no output, nor user experience, nor is there a price. Therefore, respondents would be unable to answer these questions until there is, at a minimum, a functioning prototype available for them to experience.

Once a prototype exists, one of the existing instruments could be used to find out how best to persuade teachers to adopt this NCCT. In the meantime, this paper intends to provide an initial exploration of teachers’ thoughts on the subject.

Existing research from Belgium indicates that teachers’ attitude toward a new technology is the most important factor in determining whether teachers will adopt it and that the perceived usefulness (from TAM) was central to the formation of that attitude [18]. Similar results were found in China [19] and Nigeria [20]. Therefore, it is reasonable to believe that teacher attitude might be an issue for teachers’ adoption of this NCCT. Following from this, it is necessary to discover what teachers would find useful about an education-focused NCCT so as to create the most favorable and receptive attitudes possible.

2 METHODS

Exploratory research is used to investigate problems which are not yet well defined [21, p. 45]. Given that only one paper has been found in literature referencing the use of cryptocurrency for student motivation [10], and that was focused only on the student perspective, it is important to now explore the issue from the perspective of the teacher.

In this study, mixed methods were used to discover the issues that might be important to university lecturers. Initially, in depth interviews were performed to get an overall view of teacher concerns. The results of those interviews informed the creation of an online questionnaire to gather more data. The questions were open-ended to allow for more nuanced and complete answers [22], which is important in any exploratory research, while still making it possible to compare answers between respondents, as well as aggregate them, in order to find common themes.

After 26 responses to the online questionnaire were received, an additional online questionnaire was created with the same questions but with closed ended response options, based on the initial responses, to make it more convenient for additional educators to respond. This second questionnaire was in both English and Vietnamese to maximize the ease with which teachers could answer the questions.

2.1 Sample

Respondents included a total of 61 lecturers at both public and private universities in Vietnam, with the majority coming from public universities, as shown in Figure 1. The sample was selected using snowball and purposeful sampling based on the criteria of being a university lecturer. The sample included both Vietnamese and foreign educators.

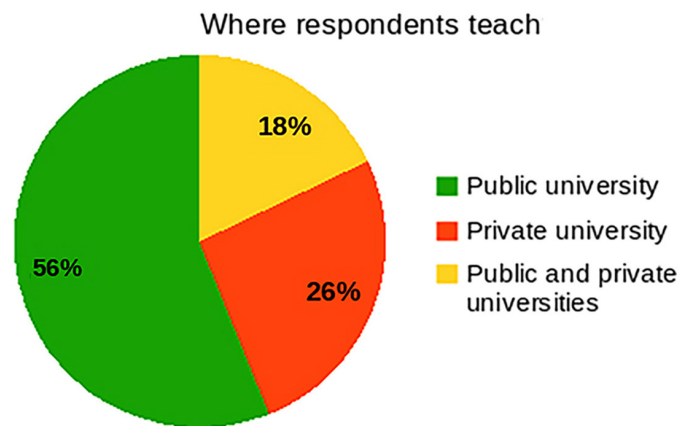


Fig. 1. Work locations of respondents

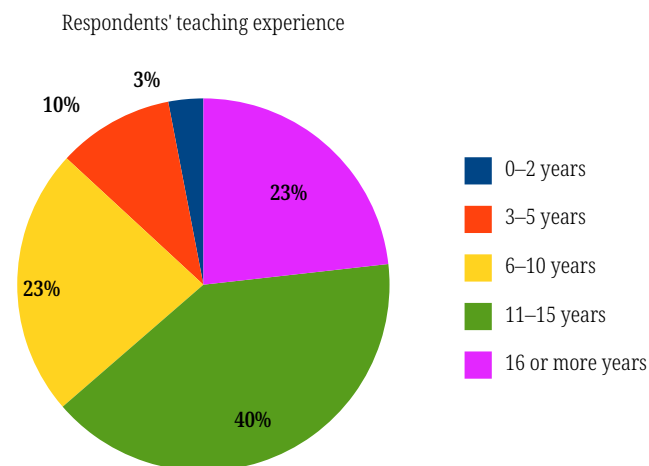


Fig. 2. Teaching experience of respondents

Table 1. Respondents' gender

Gender	Respondents
Female	56%
Male	44%

On average, respondents have been teaching for 12 years with only 3% of them teaching for two years or less and 63% of them teaching for more than 10 years, as shown in Figure 2. The gender of the respondents was fairly balanced, as shown in Table 1.

80% of respondents teach business and/or finance subjects.

Beside the sample size being small, at only 61 respondents, we must recognize that, due to the fact that many people may not understand cryptocurrencies, it is possible that self-selection has biased this sample. Nonetheless, as this research is exploratory in nature, it is hoped that the findings will still provide useful information.

3 FINDINGS AND DISCUSSION

The following will report on the responses for various questions asked.

How interested are you in having this NCCT available to motivate students?

57% of respondents reported they were interested or very interested (4 or 5 on a five-point scale) in being able to use this NCCT to change student behavior. This should be seen as a positive sign. High levels of interest might be expected as this NCCT would give greater power to motivate students and earlier research indicates that having a greater sense of control correlates with higher job satisfaction for university lecturers [9]. However, unlike students, who get a benefit from the NCCT at no cost, teachers must put in some effort to make any system like this work and so it should be expected that fewer teachers would be interested than the 89% of students found in earlier research who were interested [10]. Since this NCCT would require, at a minimum, teachers and students to participate, the fact that a majority of both are interested is promising.

What student behavior would you like to motivate with the NCCT?

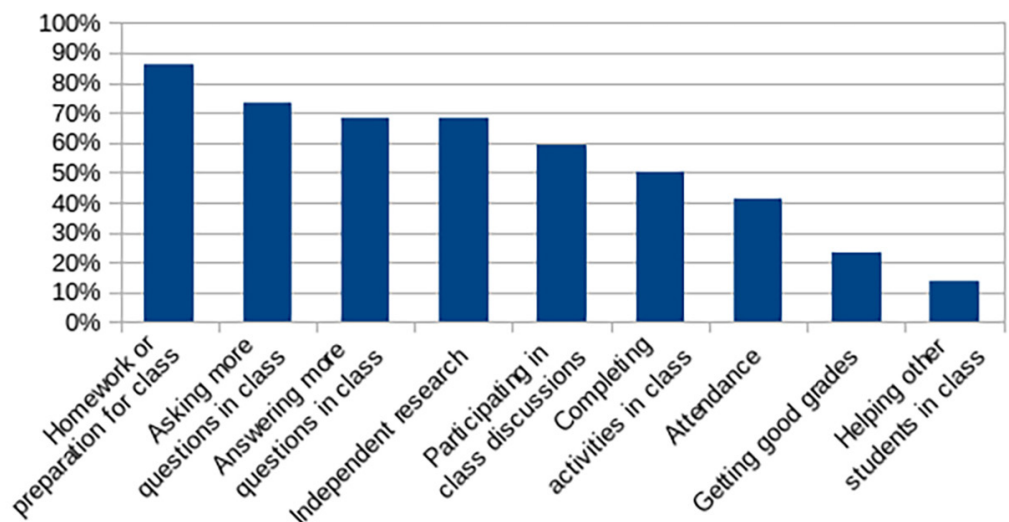


Fig. 3. Percentage of teachers wanting to motivate each behavior

It is surprising that highest on the list of student behaviors to motivate, lecturers chose homework and class preparation, as shown in Figure 3. It is surprising because teachers already have the ability to motivate that by assessing the homework as part of the student's grade. A study in Thailand, culturally similar to Vietnam, found that homework was an important way to improve student knowledge [23], so it is quite normal for teachers to focus on that. However, they might not be assessing it simply because the additional work required by the educator would be overwhelming. Lecturers in Vietnam are already overburdened [1] and underpaid [24] and being a teacher was found to be the most damaging to physical health of 26 investigated professions [25]. In that study, being a teacher resulted in worse physical health than being a prison guard.

Unsurprisingly, teachers in the current study want to motivate students to participate more during class (asking and answering questions). Participation is synonymous with student behavioral engagement (as opposed to cognitive or emotional, which are not directly observable) [26]. Add to this the fact that we know engagement is critical to student learning [27] and the fact that the teacher's purpose is student learning and it makes even more sense. In research from Taiwan, agentic behavior was identified as distinct from participative behavior for high school students [28].

More recent research confirmed this in the Vietnamese higher education context [29]. Therefore, it can be interpreted that teachers are actually trying to push students to be more agentic, something known to be demanded by employers in Vietnam [2]. As participation is more difficult without proper preparation, it would seem all of these top responses are closely connected.

When we consider the daily experiences of the teacher, when students are more active and engaged, the teacher feels more motivated [30]. Student passivity is more of a challenge in Asia than the west [31]. When students are passive, whether in the classroom or online, it is extremely demotivating for the teacher. So motivating students to participate more during class time might not just be about student learning but also about making the teacher's experience at work more enjoyable. This is further supported by the fact that, in the current study, only 23% of teachers responded that they would reward student grades. While grades are the end result, participation during class is what the teacher feels on a daily basis and the current findings indicate that teachers are not satisfied with the level of participation they are currently seeing from their students.

Teachers' focus on encouraging participation should also consider that rewards have been shown to be powerful in motivating behavior momentarily, rather than for the long-term [32]. However, if teachers are focused on getting through the day, while trying to have some positive impact on their students, it seems reasonable to consider something which will work for today. Using such a tool does not preclude other techniques which can have a more long-term impact. While it was found that tangible rewards can undermine intrinsic motivation in some circumstances, that was found to be less true for university students [33].

Another consideration is, if students want to participate but feel constrained by social pressures, these rewards may act as a liberator and thus enhance student agency. That is, students could tell their friends that answering the question was not an attempt to show off, rather it was just to get those NCCTs. Further on this issue, it is important to point out that what motivates someone to begin a task may very well be different from what motivates the completion of that same task [34]. Therefore, an extrinsic reward, such as the one mentioned herein, may still be beneficial to the get the student to initiate the desired activity, at which point the intrinsic motivation to "finish what you start" could take over.

One more factor to consider is the context. This study took place in Vietnam, a country which has only reached lower-middle income status [35]. Consider that Maslow's Hierarchy of Needs [36] shows that extrinsic motivators are more fundamental (food, safety) and intrinsic motivators are higher order (self-actualization). Also consider that Herzberg's Two-factor theory [37] of motivation again shows that extrinsic motivators are more fundamental (hygiene factors, like salary or status) but intrinsic motivators (motivator factors, such as personal growth or the work itself) can take effect once basic needs are met. In both the cases of Maslow and Herzberg, we see that the extrinsic, or more fundamental, elements must first be satisfied before the intrinsic or higher order factors can work their magic.

It was also found that more money (extrinsic) led to greater happiness but only up to a salary of \$75,000 per year [38]. This indicates that, like the argument above, extrinsic motivation is important until some basic needs are met, then intrinsic motivation can take over. Recently, an updated study indicated that the relationship is more complex. However, it did confirm that unhappiness decreases as income increases but, once a threshold is achieved, there is no further improvement [39]. This all confirms the idea that extrinsic motivators are important up to a point. As the average salary in Vietnam is quite low in comparison to the Global North, using the proposed NCCT to motivate students seems reasonable at this stage of Vietnam's development.

As can be seen in Figure 4, there appears to be a change in the teacher’s perspective over the course of his or her career. We see that, at least for this small sample, novice teachers view independent research as either not a problem, or not important, for students to complete, as shown by the fact that none of them would motivate that behavior. However, as teachers gain more experience, they care much more about motivating students to do independent research. Asking questions during class showed a smaller and more complicated change with teachers giving the lowest importance to it in the early years of teaching and the highest importance in their middle years of teaching (6–10 years). However, teachers who had been on the job for at least 16 years rated it lower than mid-career teachers but higher than novice teachers. A similar, but more extreme, pattern is seen in attendance where novice and very experienced teachers see attendance as of very minor importance but teachers with 6–10 years of experience saw attendance as extremely important to motivate.

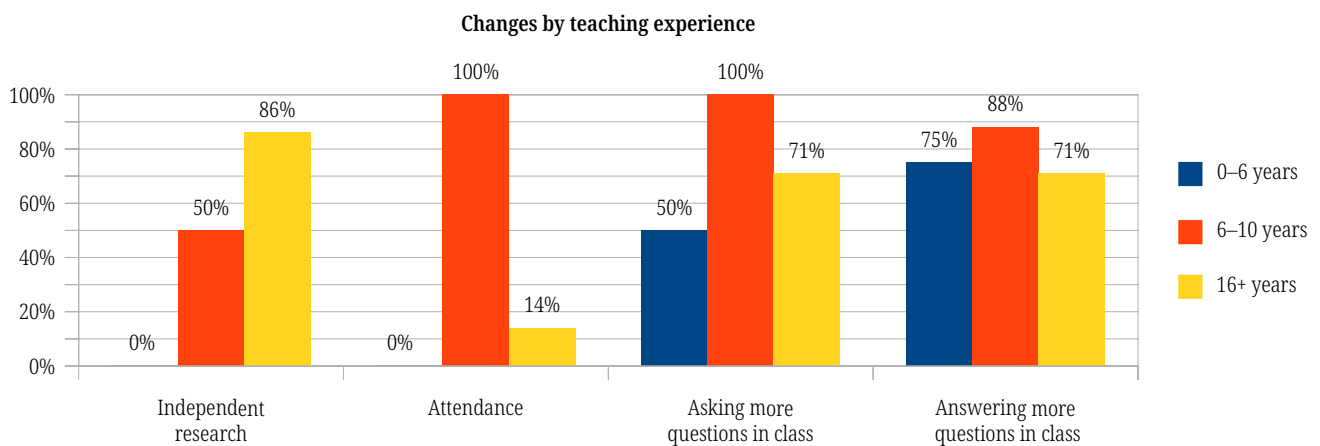


Fig. 4. Lecturers’ preferences throughout their career

This may indicate the complex learning process that teachers go through whereby, in the beginning, they believe students will come to university for the pure love of learning. However, in time, the teacher learns that students must be forced or they will not attend. However, in the long run, the teacher realizes that tertiary education is not compulsory and students have to want to be there if they are to learn. Regardless of the teacher’s experience in teaching, an NCCT, like the one discussed herein, could allow the teacher to motivate whatever they feel is important.

An example response on what behavior to motivate, from a teacher in a public university who has been teaching for 11–15 years was:

Raising questions, answering questions from teacher and classmate or actively participating in group discussion during class.

Another response from a teacher at a public university with over 16 years of experience:

Attendance, participation during class, time for academic discussion.

From a teacher at a private university with 3–5 years of experience:

I would love to see more participation and group work done equally by all team members.

To what extent do students take advantage of what you currently offer for free?

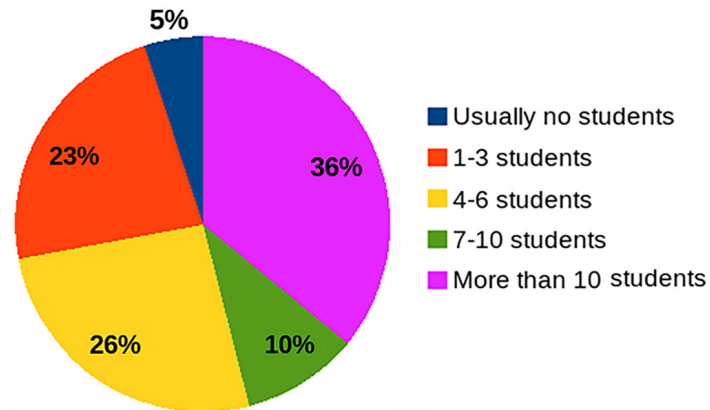


Fig. 5. Percentage of respondents and students utilizing current free services

Another indication of student passivity is the fact 54% of respondents reported six or fewer students per semester take advantage of those things that the teachers currently offer their students for free (for example, office hours), as shown in Figure 5.

What would you be willing to offer students in trade for NCCTs the student earned?

Table 2. Additional offerings for students to buy with NCCTs

What Could NCCTs Buy from You	Respondents
More of my time, discussing additional topics	56%
I am uncomfortable with a student buying anything from me because it might appear unethical	10%

From a teacher at both public and private universities:

They can buy more time from me (especially “urgent” time, when they need something quick).

From another teacher at a public university with over 16 years of experience:

Personal or small group tutoring (personal development).

From a teacher at a private university with 3–5 years of experience:

A visit to a hotel/restaurant, or a talk with a chef/restaurant manager, hotel manager. (I am teaching hospitality management), access to a professional conference.

For the question about what would teachers offer to students in trade for the NCCTs they earned, 56% said they would give more of their own time, including outside of standard hours, and they would increase the range of topics they would be willing to discuss, as shown in Table 2. This matches well with what students reported wanting in an earlier paper [10]. One example that came up (multiple times) was that the teachers would offer their consulting services. This is not surprising

considering most of the respondents were business and finance lecturers and, as such, often perform consulting services to industry.

One challenge which remains is represented by 10 percent of respondents who said that they would not feel comfortable asking students to pay them for anything because it starts to feel to them (and perhaps appear to others) like corruption (a particularly sensitive topic in Vietnam). This point supports the idea that the NCCT should not be redeemable for real-world money. Another issue which further supports this NCCT not having any monetary value is the fact that in some countries, such as Vietnam, using a cryptocurrency for payment is a violation of the law. By removing the monetary value, that legal issue should be resolved.

Would you require students to be your current student to get the benefits from you?

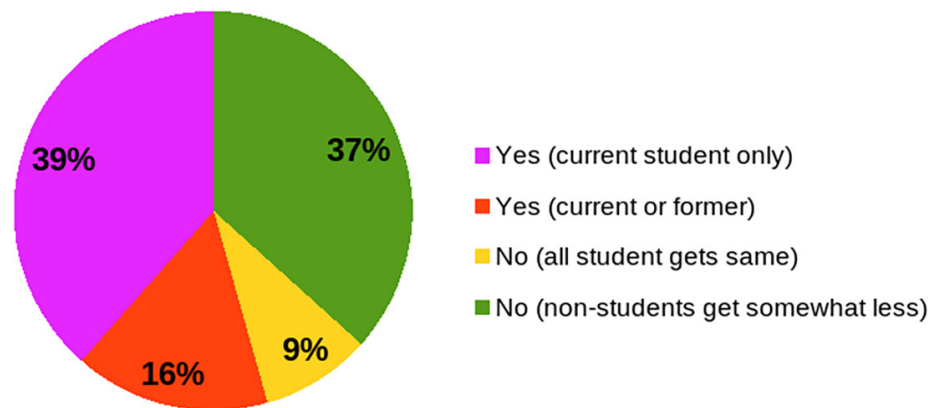


Fig. 6. Necessity of being the teacher's current student to redeem NCCTs

When teachers were asked if the students would need to be their current student in order to redeem the NCCTs with them, teachers were less certain. Responses were divided, as shown in Figure 6. Some lecturers would require the redeemer to be either the teacher's current or former student, or simply that they would set some limits for those who were not currently their student.

How important is it to you that you can spend the NCCTs you receive from students on something valuable to you?

Only 18% of respondents said it was important or very important (4 or 5 on a five-point scale) that the NCCTs have some direct monetary value for them. 65% reported that if they did receive NCCTs, they would turn around and use those NCCTs to further benefit their students.

What would you like to spend your NCCTs on?

Below are some examples to show how respondents would like to benefit their students.

A teacher at public and private universities for 3–5 years responded:

Give them to good students.

Another teacher at a public university for 6–10 years responded:

Use [them] as rewards for other students.

Another teacher at a public university for 11–15 years responded:

To buy gifts/books to students but it's time-consuming.

Some examples which were not providing a direct benefit to students include:

Entrance to educational seminars, professional development training, and access to subscribed journals.

Educational materials, especially research.

Have some in-depth talk with specialists in my field.

I would like to spend [them] on buying books or short-term courses for me and my children.

A testament to the dedication of these teachers is that only 18% reported that they felt it was important or very important that the NCCTs have some tangible value to the teacher. Of those, only a few actually gave concrete examples of what they would want to purchase with their NCCTs. One example was to buy books or courses for themselves or their children. The other was to pay to have an in-depth talk with an expert in the field the respondent teaches. Others commented that they would use the NCCTs they earned to further motivate students, thus completing the circle. To be fair, many respondents needed more time to consider what they would do with the NCCTs they earned from students redeeming them. Given the novelty of this concept, it should be expected that clarity, on the part of multiple stakeholders, will take time.

As the picture becomes clearer as to what various stakeholders want in an educational NCCT, it is important to note that while teachers do share a common interest in motivating students' in-class participation, there is also a great variety of other student behaviors that different teachers wish to change. Combining this with earlier findings that giving educators discretion is important if the goal is to promote adoption of this new technology [40], we can see that this will be an important feature of the new system.

Another study found that teachers might be more positive about adopting new technology in the classroom but that does not mean they are necessarily more confident about it [41]. Given this information, we can predict that teachers will need support and not simply have an app that can be downloaded, which they must figure out for themselves.

As mentioned above, given the insight that teachers appear to care little if the NCCT has any real world value to them, and that when they do receive NCCTs they are likely to turn around and use those NCCTs to further motivate students, these NCCTs may not need to have any real world value. However, if the developed system does end up using the underlying technology of cryptocurrencies (blockchain, etc.) then additional consultation would need to be done in order to determine the key characteristics. For example, what information should be visible on the blockchain and should the information be public? If it should not be public, which stakeholders should be able to see which information (students, teachers, government officials, etc.)? Should transfers be allowed between students? How many NCCTs should each teacher receive at the start of each semester? Should that depend on the number of students they teach? If so, how is that number verified? If NCCTs are not considered a currency, is there any reason to tie each student's national ID to their blockchain address [10]? Should the purpose of each transaction be recorded or should only the amount be included?

4 CONCLUSIONS AND FURTHER RESEARCH

While the purpose of exploratory research is not to draw strong conclusions but rather to offer insights on directions for future research, some patterns in the teachers'

responses are worth highlighting. The first is that 57% of teachers reported they were interested or very interested in having this NCCT available for them to motivate students. Even though the sample size is too small to generalize from, it does hint that teachers, in addition to students [10], are interested in making this educationally-focused NCCT a reality. The main two student behaviors that teachers would like to motivate are more preparation outside of class (like doing homework) and increased participation during class time, showing that teachers are frustrated by low current levels of participation from students. Teachers would be willing to trade their time (beyond what they offer now for free) to students for the NCCTs they earn and might even support giving their time in trade for NCCTs that were given by other teachers. This shows that the NCCT could, potentially, be a system which connects through multiple educators in a way to amplify the motivational power upon the students. Lastly, respondents did not place a high priority on the NCCTs having direct value to the teacher. That is, their desires seem centered on changing student behavior rather than on personal gain.

Since some countries have laws against the use of cryptocurrencies, more attention needs to be given to how to not only satisfy the students and teachers but the government as well. The current and earlier research contains indications that the NCCT need not be redeemable for any currency. This would likely protect the system from being considered a violation of existing regulations.

Finally, the student behaviors that teachers want to motivate appear to change based on the teacher's level of experience. Newer lecturers do not seem to care about students doing independent research or about attendance. More experienced teachers appear to care more about independent research and much more about attendance. The most experienced educators care even more about students doing independent research but they are back to caring very little about attendance. This change based on time-on-the-job could be an interesting topic for future research.

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