Designing for Children 2019
Play and Learn

Playing Together a Learning Experience: ELeCT Curriculum & Human Factors in Design

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Abstract: In this paper an analysis of how optimisation of technological affordances can help new learners of technology is presented. Indigenously developed open platform for adolescent children extends to drawing, calculations, typing, mind-mapping and mathematical learning with digital educational resources. The design of E-learning for community Technology (ELeCT) curriculum puts digital learning in context of the community of Mward people. Mward has been declared a low Human Development Index (HDI) geography. A learning lab offers free, responsible, digital classes followed by apprenticeship. The curriculum is scaffolded with workbook, buddy login, peer mentoring, reflective practices that help in make, share, seek and reflect through a constructionist approach. Children self-attest their learning with creation of artefacts and sharing of knowledge. A non-formal, heterogeneous and dynamic learning lab environment offers an island of peaceful growth for the people of M East ward, Govandi.

Socio-cultural and constructionist worldviews are captured through the perspectives that are embedded in the learning ecosystems of the challenged societies; some of these can be described as adolescent learners, language and communication, micro-social interactions, multiple human-computer interface, technology agnostics, learning design, dancing digital pyramid and quantifiable evidence.

The learning design concept is premised on socio-cultural reproduction theory (Bourdieu, 1986) and the concept of learning by design derived from constructionist theory (Papert, 2000). Further it explains that socio-economic and cultural inequalities depict a divergence in resource acquisition amongst the privileged and not so privileged sections of the society. Learning by design opens opportunities to construct artefacts created by learners

themselves thereby owning the consequences of community learning resulting in shared responsibilities to improve learning situations through reflective practices.
Predictors and case studies are proposed through the detailed paper on designing for children with empirical evidence available from the field.
Key words: Learning Design, E-learning for Community Technology, Constructivist, Computer-Human Interface, Micro social interactions

1.Introduction

Co-existence of a highly privileged community and a community with one of the lowest Human Development Index (HDI) within a geographical distance of five kilometres, tells a story by itself. One of those stories is that of Govandi M-Ward , East bifurcated only by a railway track passing through the locality decisively marking territories for two worlds sanitized of each other's aspirations, opportunities and access to resources. Technology does offer an opportunity to scale the wall of mutual confinement of these two communities. Technology is considered a panacea offered as a solution to learners and teachers to reach a breakthrough from their problems. On the other hand, education is considered a long-term investment of effort. Both assumptions are up for a revisit in the backdrop of many failed attempts of solving educational issues with technology that is in need of acknowledging identity of the learners, types of responses, difficulty of concepts and resolutions of problem areas.

It is time to think beyond technology to include more techniques that tell what to do with affordances of technology once the comfort of usage is acquired with available electronic devices. This means that providing laptops, network, content and interactive space is not enough to move the learning process in the minds of the learners. Creating, conversing, sharing and reflecting is happening all the time in young learners in their natural spaces too even before the devices arrived. Many platforms replicate this opportunity by offering greater anonymity, faster speed and more points of contact. Yet, it remains only a replication not better than the real. Investments are increasing in creating such technological spaces aimed at connecting the learners for better conceptual clarity to understand their surrounding phenomena well.

Let us explore, through case studies, experienced in-situ, to understand how we reached out to build on existing designs and educational technology tenets for ascertaining a replicable model that includes learning communities to participate with children's playful engagement with constructing knowledge. This is a model that can be strengthened with rigorous replication in any part of the world as poverty, insecurity and everyday violence is symptomatic of a settlement community relegated to a secondary existence.

The learning lab offered at the library and study centre supported by the corporation and run by TISS School of Habitat Studies is an extension of support to communities in need. Learning for Community Technology (ELeCT) curriculum adopted a different design of learning as compared to its parent project Connected Learning Initiative (CLIx) of CEIAR, School of Education, TISS. The need to tweak earlier design arose especially because of the learning environment, though both were addressing under-served communities, yet, EleCT curriculum is geared for learners who reach the lab voluntarily forming heterogeneous cohorts with varying constraints and real demands on learning outcomes. Mentorship /apprenticeship from among the learners was a high motivator in addition to the certification that measured competency levels by learners verified by peers. Each batch containing sessions of two hours through five days for five weeks of skill-sets learning plus one week of community assimilation and additional equivalent apprenticeship period of the same stretch amounting to one hundred and twenty hours across three months, was transforming the learners and facilitators as well. Open and free learning space brought a stream of interested visitors from the community as if in disbelief in ready access to quality devices, network, learning environment and promising skill sets.

The two communities were now meeting and transforming each other through Library learning lab and ELeCT curriculum , let us see how and what were the take-aways to impact learning designs while playing with content offered through technology.

2. Time Interval for Cause & Effect

Aftab learns very fast as *if he had known it earlier though he says it is the first time he is using a laptop independently. A class eleven student, would have been in twelfth had he known that class eleven requires re-admission post class X holidays. He had enjoyed holidays thoroughly though missed being a class ahead.*

His learning pace makes him restless until he is asked to help others to learn as much as he did. Or until he is informed that class results are announced student wise and not subject wise as he thought when helping a co-learner aspiring to be a headmistress to analyze the marks obtained data using spreadsheet. For a moment, Aftab did think why should HMs not announce results subject wise rather than by students' name and what would happen if they did. The thought got transmitted and set the facilitator thinking of interesting examination scenarios.
Well, Aftab's learning was purposeful. The moment it was announced that now they can plot data as per what they wish to do as professionals, he straight away created annual profit chart for Aftab Motors Vehicle Service Workshop. The profit margins were unrealistically low, so when reminded of prevalent service costs and real profits, he smiled shyly with a hope of dreams that might have a real chance. Of course, Aftab is the future owner of the workshop.

Quite evident in the above case is the concept of *learning by design* that derives from "Constructionism," a concept proposed by educators which emphasizes that students take part in gradually constructing their own knowledge by themselves (Papert, 2000). Papert posits that, learning by design activities enable students to design and integrate their learning independently through exploration and thus keep alive their interest and motivation, progressing to higher levels of learning.
It has been very much pointed out by researchers that, instruction of learning by design could open up ample opportunities for students to learn. Students in the process of constructing knowledge through the process of designing and incorporating their learning in life are quite influenced by the learning approaches. This can also kindle the potentialities of students, given a well-designed teaching strategy.

There were many others like Aftab who directly transferred their learning to a real life situation. A life that will liberate them from the constraints of a life in the settlement. Each of these learners demanded an instantaneous application of what they learnt in the lab even if it was for the first time. The long time benefits of their learning curve did not matter, their scores or position did not matter. What mattered was how the skills and knowledge is going to improve their lives and livelihood for the matter. Learning had to make sense to them without any waiting. Their intelligence was applied in this mode of cause and effect that was here and now. There were no long chains that pavlovian conditioning or skinnerian

operants could explain with expected responses. Only constructions that were in context of their real habitat which motivated and effected as learning.

Learning situation was a challenge to facilitators as they had to be creative in their own way to meet learners' demand and sustain their motivation and hope every minute and hour of the curriculum. How a learning instance was going to transform the lives of learners by opening better opportunities of livelihood, had to be brought closer to the community. ELeCT curriculum weaved in a community responsibility for every participant to take their learning to their families, neighbours and to schools if they were attending one. This was brought out when creating posters about prevention of alcoholism, cleanliness and basic nutritional requirements. So much so that forthcoming batches comprised of learners from these very environments.

Apprenticeship experience itself brought in a disbelief amongst guardians that some of their wards who were banned from stepping out of their homes could be one day teaching their peers in a lab. Some of them visited the library learning lab and interacted with batches to make sure. This is what initiated a learning pyramid that is dynamic and dancing in its structure and function.

3. Dynamic and Dancing Digital Learning Pyramid

Bourdieu's social- and cultural reproduction theory explains educational participation, success and attainment by different forms of "capital", wherein social and cultural capital encompass hidden conditions for success in education by representing social ties and cultural conceptions for easy functioning in these settings. Below is a case from the M-Ward community depicting the interconnections of social and cultural capital in fostering a continuous learning process.

Sudeep (names changed) from the settlement went to night school and struggled to bring up his family by driving an auto-rickshaw. His hardships did not dim the fire for learning that lit inside him. As he drove the rickshaw, he interacted with travellers and learned about the existence of an education course at TISS. This drove him to prepare, compete and secure a seat for Masters in Elementary Education. As a student when he heard about ELeCT curriculum in the locality, he asked his daughters and cousins to enrol. They were part of the

first batch and completed the entire cycle of apprenticeship involving mentoring of the next batch. Harshita who came as a shy school girl was a natural at GeoGebra; she confidently planned how she could use her knowledge of multilingual typing, spreadsheets, Inkscape, geogebra and mind map to plan a career to become an IPS and pursue her hobby as an actor. Her batchmates too were able mentors.
Harshita, went back home everyday to teach her father what she had learned that day. Her father once was sharing with his teacher what he learned from his daughter. This was new to the teacher, so she picked it from Sudeep. In turn, the teacher shared a new tip which Sudeep could take back to his daughter Harshita. Learning was dynamic and harmonious with a regard that a thirsty learner will have for their teacher of any age or position.
Harshita did not stop just to share her learning with her father. She shared with her teachers too and also with other friends. Most important was her mentoring techniques as she apprenticed during the next batch. She was unfazed to mentor much senior persons, and learners too accepted younger mentors as it made learning process real and contextual. Sometimes a nuance that mentors had not encountered during their batch but was taught to new batch, did surprise them but they caught up pretty soon and learned that apprenticeship was a true learning process with a purpose to progress in pace with every new innovation.

4. Breaking the Boundaries

Logic and syntax of hierarchical protocol did not work to solve real life problems for this community as their learning discipline was beyond defined boundaries. Institution, organisation, age or position did not come in the way of learning in this case. More so, as the settlement people, by the nature of their continuous struggle to break free, were actually breaking monotones and moulds into which their minds were bound to be confined, if they stayed there longer. That was the hurry, to break free as soon as possible. The earlier it was understood the better were chances of applying learning as a tool in their struggle.

Innovation in learning to achieve whatever, was helping them was natural. Till the time a lab technician was conditioned to follow assumptions, he could not accept and therefore could not solve a minor but long standing connectivity issue. This was adversely impacting quality of learning for hopeful participants. One day, when told to behave like a scientist, the same technician applied exploration and solved the problem within a matter of hours. Accepting oneself as an empowered provider of solutions by applying his earned knowledge, transformed

his method of work. Now the lab as well as the curriculum was his. This scientist was a new guide to students who were expected to manage their own labs.

One seventh standard student when practicing on time, speed and distance to trace a rocket movement on Geogebra slider was making mistakes with his calibrations. His peers from senior classes too were in similar spots. After many critical questions, reflections and sharing they finally arrived at a path closer to reality. The sense of relief was overwhelming and they exclaimed ‘aapne to hame scientist bana diyaa’ - you made us a scientist. This was relevant in their struggle to know the real world.

Malleable free movement of persons from one role to the other with utmost ease was afforded by the anonymity of connectivity and sharing thoughts as one of the functionalities on the open platform. The interactions were far from the disparities in spaces of gender, relationship & social silences. They soon understood to objectively observe and suggest improvements to peers and accept changes in their own work. Scaffolding each other’s learning processes by resolving difficulties and roadblocks in acquiring and understanding skill-sets was priority engagement.

It was a collaboration to bring everybody in the batch to the best possible, in the given time. Of course, there was a lot of fun and banter as learners made every learning point a thing to play. It was not a classroom, it was a lab to learn.

5. Conclusions

The degrees of distortions on the view about people’s learning acumen and its relation to where they belong socially suffers a parallax. Simplistic connection of higher order learning process to the lack of, or an abundance of resources, access and opportunities is defied in the case of ELeCT curriculum over five batches and around a hundred enrolments. It worked as if, the more the problems they faced, more opportunities they created. The only catch point was ‘how to’. This point of challenge was addressed by the nature of the curriculum which offered multiple entry and exit points into batches and across skillset modules; offered the lead to the learner early and extended the learning to communities in real time. Formalizing a certificate verifying their own learning was a self-evaluation procedure supported by peers

and number of authentic presentations and artefact constructions. This was a trustworthy step to understand learning as a continuum and self-evaluation as a part of the continuum.

The design was not an inanimate sanitised circle but a spiral or rather a pyramidical spiral that took into account people of communities at the crossroads, discussions in library quadrangle, activities in the lab and an ever-changing curriculum attuned with demands of the learning spaces.

EleCT curriculum,an ongoing effort, in its first phase offers three main perspectives :

- Offering Technology with new techniques to learn with community
- Applying a living learning design- A 'Dynamic Dancing Pyramid'-which is responsible for a learning community's aspirations
- Creating a new learning logic & syntax for people who break boundaries

The ELeCT curriculum is replicable to all communities anywhere on the globe that are ready to learn to break free to create opportunities for a better life for their communities.

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