

SBAC: A Community-Based Distributed Education Model Research

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Is there any change on contemporary educational paradigm after Frederick Emmons Terman? How will growing grass-root strength affect it? Based on classical University-Business Partnership and modern community micro-generation achievements, this paper attempts to establish a community-based distributed education platform model to promote collaboration among business, schools and academia in a resilient and bottom-up way. By case and literature studying, a conceptual SBAC education model is featured, which suggests to engage resources of business, schools and academia in communities, especially residential areas, and make transformations of professional expertises to enlarge the influence of education and activate communities. What's more, five types of quality are enabled in SBAC, which includes art, enterprise, maker, research and vocation, participants will enjoy related services. Essentially, SBAC is a distributed incubator system, by educational operation, resources are transformed and delivered more efficiently, which may start another educational renovation.

Keywords: *University-Business Partnership; community micro-generation; distributed educational system; education paradigm*

1 Introduction

Contemporary urban development has witnessed micro-generation in communities occupies a large proportion, and distributed system thinking has directed a large number of urban micro-generation events. In China, residential communities act as power station for social running, though it has not been paid sufficient attention until 2012. QIU Bao-Xing claimed theory of reconstructing microcirculation on International Conference on Urban Development and Innovation, which suggested developing sustainably instead of obsessing with mega-city. In 2016, Shanghai reflects on this call with 22 micro-generation projects within "Walking Shanghai" plan in a bottom-up way and which leads a micro-generation trend ever since. In addition, institutions also respond to this tide in a more academic attitude. For example, College of Design and Innovation of Tongji University started Open Your Space program in Siping community from 2015, which can be seen as a platform lead by faculties, managed by students and social innovators, and residents are engaged in series of projects. Based on former practical and academic research findings, this paper attempts to explore the feasibility of educational micro-generation in communities on an academic conceptual level.

2 Literature Review

From 1862 Morrill Land Grant Act to 1904 Wisconsin Idea to 1951 establishment of the Stanford Industrial Park, the primary classical University-Business Partnership has been formed. Then, Freeman proposed National System of Innovation to supplement University-Business Partnership, in which business, universities and institutions constitute a network system under the leadership of governments and intermediary agencies. Next, this paradigm was introduced into China in 1992, and Joint Development Project of Industry, University and Research was launched and implemented by a top-down approach. Finally, LIU Li summarized characteristics of University-Business Partnership and defined that it is a collaboration between academia and industry in order to realize the target of innovation. However, with emerging social power, such as NGO, bottom-up paradigm begins to contribute on social transformation. This new trend obliges us to reflect how we can promote the collaboration among business, schools and academia (universities and institutes) by a more penetrative and resilient way. Given this, a community-based educational experiment may provide a perspective. For instance, conventional intermediary agencies among business, schools and academia are directly assigned by governments, what if intermediaries changed to social self-governance side?

3 Methodology

Main methods used in this paper are literature study, field study, case study, qualification research and expert interview. This paper has collected research materials from Siping Community by an ethnographic method, including participate community micro-generation projects, interview with local residents and photography. On the other hand, online case study helps to realize other practical programs all of the world. Then, combined with literature study and qualification research, rough materials on hand are classified by characteristics and common operation logics are found, which lays foundation for emerging SBAC education model. Finally, experts interview helps to criticize and iterate the conceptual model.

In general, this paper is based on descriptive study. Cases are selected from worldwide social innovation programs, which can present a certain or a synthetic category of innovative type. In terms of classification of these programs, researcher apply qualification research method to classify them according to their main quality. For instance, children’s design thinking cultivation by hand madding is classified into ‘maker education’.

4 Discussion

4.1 Case Study

Fifteen international representative educational social innovation cases have been studied and they are classified into five types of educational model by qualification analysis, which will be discussed according to classification below.

Table 1 Worldwide selected educational social innovation programs and classification.

Program \ Classification	Art education	Enterprise education	Maker education	research-oriented education	Vocational education
Agency by Design			●		
Artists for Humanity	●				

Boston Design Museum				●	
Cambridge Community Art Center	●				
Cambridge Educator Design Lab				●	
EurekaLab			●		
Lifelong Kindergarten			●		
MIT D-Lab				●	
MIT Media Lab			●		
Startup Institute					●
Shorelight					●
The Possible Project		●			
Urbano	●				
Youth Cities		●			
Zumix	●				

There are two approaches derived from *Artists for Humanity*, *Cambridge Community Art Center*, *Urbano* and *Zumix*, all of them are implemented in art education model. On one hand, when learners had grasped related artistic skills after several week's cultivation, they can participate commercial projects in the lead of supervisors. On the other, works of learner will be invited to exhibit at local galleries, visitors have chance to purchase or rent these works.



Figure 1. photographed by Artists for Humanity group



Figure 2. photographed by Cambridge Community Art Center group



Figure 3. photographed by Urbano group



Figure 4. photographed by Zumix group

In terms of enterprise education, programmers of *The Possible Project* and *Youth Cities* hold regular thematic salons once a week toward community members, they can be undergraduates, educators, lawyers, entrepreneurs or civil servants. Each topic focus on a

concrete issue and will be given limited time to generate solutions. In addition, there are also customized projects for school students and make them experience entrepreneurial process under safe circumstance. For example, participates are asked to find out problems toward low income families and middle school students in Boston, then incubate primary business ideas and test prototypes. Then make out practical products and operate projects in order to accumulate practical business experience. Finally, supervisors leave and make participates operate by themselves.



Figure 5. photographed by The Possible Project group



Figure 6. photographed by Youth Cities group

Agency by Design, EurekaLab, Lifelong Kindergarten and MIT Media Lab are engaged in maker education, they implemented four renovations, self-education, didactical subject, didactical object and didactical model. Firstly, self-education indicates to develop 1) ability to observe, which asks students to slow down, consciously watch the things or systems, to understand what systems are made of, what are the intentions of these components in design, to find the nuances between things, to understand one simple things/system complexity; 2) ability to explore complexity, which asks them to think what they can't see? What is the relationship between the part and the whole? How was this item/system made, and how was it used? 3) ability to find design opportunities, which is to find the possibility of invading, building, refining, or redesigning things or systems based on careful observation and exploration complexity. Secondly, didactical subject renovation means decentralization of teaching, in details, 1) let students teach to improve the efficiency, release teachers and help build their confidence; 2) members of communities stand for the resources in maker centres to provide professional guidance, invite creators from communities to share and communicate, set up workshops to teach crafts, participate in student projects and maker educators create more opportunities for students; 3) finding resources on the Internet and deciding how to use them requires students to develop very strong self-driven learning; 4) let students use diverse tools and materials, not only to master a specific skill, but to extend the imagination. Thirdly, didactical object renovation implies to encourage self-directed, interest-driven, peer-to-peer learning, in particular, 1) help students to group, ensure that students have enough time to study with team members, provide goals and principles of action for group tasks; 2) encourage mutual inspiration and evaluation among students; 3) encourage knowledge sharing, change the stereotype of the teacher's mind as the authority to disseminate knowledge, and let students proactively acquire knowledge through peer learning and other resources. Lastly, renovation of didactical model asks to replace traditional one-to-many pedagogy with project-based learning, 1) maker spaces are closely linked to teachers' daily teaching activities, transforming the learning of traditional classroom scenes into a project-based learning, different disciplines such as mathematics, art,

language, natural sciences, social sciences can be designed to be project-based learning that requires students to create.



Figure 7. photographed by Agency by Design group



Figure 8. photographed by EurekaLab group



Figure 9. photographed by Lifelong Kindergarten group



Figure 10. photographed by MIT Media Lab group

Research-oriented education model is designed towards teachers and students within *Boston Design Museum*, *Cambridge Educator Design Lab* (in partnership with the *Cambridge Public Schools* and the *Center for Artistry and Scholarship*) and *MIT D-Lab*. On one hand, methods and toolkits of design thinking are expected to be introduced to public schools, faculties learn and develop special working systems according to their own characteristics. On the other, for students, 1) organize students to visit companies to increase perceptual knowledge; 2) pay attention to poverty, environmental pollution, garbage disposal, gender equality, education equity, etc., from macro and micro perspectives; 3) global partnerships with local governments/schools/non-profit organizations in a number of poor areas to experience the lives of local people, understand problems, and design solutions; 4) in combination with the demands of local partners, for instance, D-Lab encourages students to solve problems through 'Design for, Design with, Design by'; 5) raise everyone's awareness of design and bring the transformational power of design to various places to inspire more creative problem solvers in the world.



Figure 11. photographed by Boston Design Museum group



Figure 12. photographed by Cambridge Educator Design Lab group



Figure 13. photographed by MIT D-Lab group

Also, vocational educational model, *Startup Institute* and *Shorelight* involved, is set toward school students and incumbents. Initially, open technical marketing, sales and customer management, and web development courses for students; let employers have different interactions with students in different aspects, let students cooperate with start-up companies during their studies, and recommend them according to the needs of start-ups. What's more, for incumbents, 1) working with foreign universities and develop innovative degree programs based on a two-way understanding of student needs and university needs; 2) working with local schools to reduce infrastructure costs by renting existing spaces; 3) supporting with local language schools so as to reduces students' language and cultural barriers; 4) students enter foreign colleges' alumni systems in order to have opportunities to work on projects, internships, and employment with companies that have been establishing contact with their schools.



Figure 14. photographed by Startup Institute group



Figure 15. photographed by Shorelight group

The five types of educational social innovation model inspire diverse perspectives which should be considered into community-based educational platforms, and they lead to the generation of SBAC.

4.2 Concept of SBAC

As is shown in Figure 1, SBAC consists of four social elements, which are school, business, academia and community. For sharing a similar pronunciation with 'spark', SBAC stands that the four elements will invent innovation and wisdom when they get together. Specifically, school mainly stands for preschool education, primary school, junior high school and senior high school; business means all kinds of profit organizations; academia represents universities and institutes; fourthly, community indicates local residential area; Lastly, the directions of arrows indicate the flowing direction of resources. Derived from the collaboration of school, business and academia, education is reorganized. With the help of community platform and external operation, the gap among school, business and academia is closed, which directly cuts the cost of scientific investigation, information transmission, and commercialization. In addition, business, school and academia call on events regularly, which regards communities as consumer end and effectively promote the community-based regeneration.

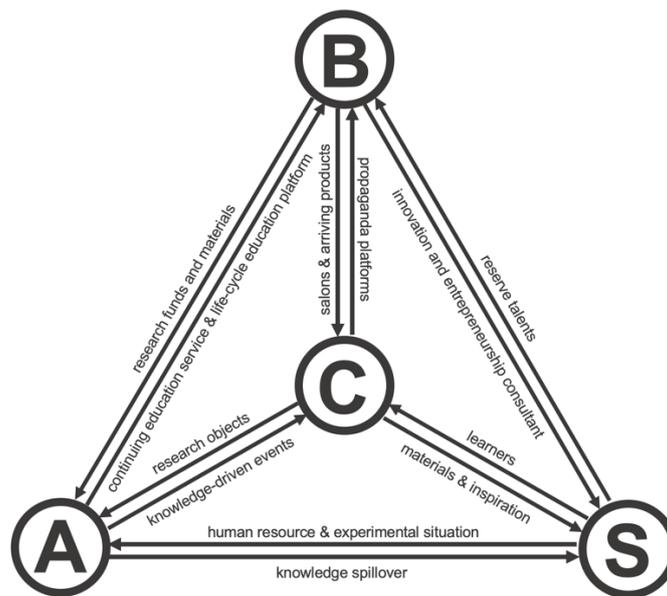


Figure 16. SBAC educational model diagram.

Four loops are raising among school, business, academia and community. People, substance and capital are involved and keep moving in each loop, which provides power and resource with iteration of SBAC. Firstly, schools offer learners to communities, which are main bodies of SBAC; communities provide propaganda platforms to business side; then business rewards schools with resource of innovation and entrepreneurship consultant. Secondly, academia supplies knowledge and intelligence to business, including continuing education service and life-cycle education platform; business calls on innovation and entrepreneurship salons in communities, and also introduces arriving products to residents; communities offer research objects to academia. Thirdly, academia calls on knowledge-driven events in order to enrich spiritual life; communities act as social innovation materials and inspiration toward schools, and make space for learners and educators to carry out

social practices; schools can provide potential human resource and experimental situation to academia. Lastly, business supports academia with research funds and materials; there will be knowledge spill over from academia to schools and make updated findings spread to next generation directly; schools also can be a reserve talents pool for business society. For now, a community-based education eco-system has been established.

4.3 Quality of SBAC

As mentioned above, five kinds of educational qualities are expected to nurture SBAC, which are art education, maker education, enterprise education, research-oriented education and vocational education.

Art education within SBAC offers artistic and innovative capacities and job opportunities, which help participants to practice in diverse projects and get paid. On the other hand, artists will be engaged in community micro-generation projects and to be artists.

Enterprise education is not only an approach of knowing the world, but also inner cognition. Equipped with entrepreneurial thinking qualifies learners with more freedom and flexibility in their occupation, and which will also aware learners to pay more attention to the collaboration with systems.

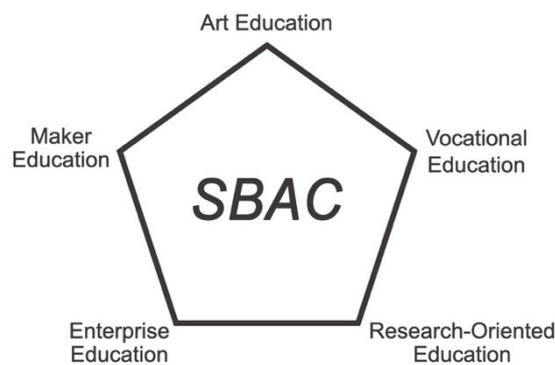


Figure 17. Five qualities of SBAC.

The most significant impact of maker education is not discipline-related curriculum and concrete knowledges, but driving force of learning and inventing. First of all, SBAC colleagues should visit existing maker spaces and maker education bases, interview makers with experience of making and teaching. Then, collaborating with makers and inviting them to build maker bases in communities in order to observe their procedures deeply and in long term. Finally, developing maker enablement, which indicates qualifying learners with sensitive awareness of treating objective things and complex social systems, looking the world as a reformable object and equipping with passion and ability of changing the world by invading, building, repairing and redesigning. There are no absolute-authority teachers in maker education, they come from students, residents, online materials and even tools. Regular activities of maker education include integrating cooperation among learners, encouraging them criticize and evaluate each other and sharing knowledges. In terms of maker space, teaching-based conventional classrooms are expected to be transformed to project-based space, flat structure is encouraged.

There are two educational objectives toward faculties and learners in research-oriented education. In one hand, training the creative thinking of teachers, which is essentially cultivate the attitude of Research through Design and it is probably the customized

methodology for design area. In the other, learners have a grasp of design thinking will help them to address issues systematically, and have empathy attitude and understand situations based on daily experience.

Two types of audience are settled in vocational education, school students and incumbents. First of all, SBAC will accelerate vocational education by focusing on entrepreneurship, which provide human resource to start-ups continually and also help applicants to obtain vocational abilities. Next, SBAC may help employees to accept international diplomas without studying abroad.

Besides content qualities, there is a spatial feature rooted in SBAC. Public or vacant space, either community centre or spare garage, may hold SBAC activities, of which the time is regular, but locations can be settled by demands. This enabled SBAC with distributed property and enlarge the influence.

5 Conclusion

As a community-based conceptual educational model, SBAC indicates a more integrated type of collaboration besides single project-based community micro-generation, which regards residential communities as platforms and reintegrates existing social resources of business, schools and academia, and make updated achievements flow to practical situation in a more efficient and low-cost access. On the other hand, SBAC makes knowledges spill over from professional areas and ivory towers to social life, which also responds to the contemporary mission of university. Based on existing findings, this study will go further on practical level to make the influence of education more ubiquitous.

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