STEM4Schools: An Online Community for STEM in Middle School

Assessment 3

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New Jersey City University

EDTC 816

Spring 2017

**Link to my online community’s web page:**

[**https://fbacha8.wixsite.com/website**](https://fbacha8.wixsite.com/website)

**Link to the Facebook page**

[**https://www.facebook.com/STEM4Schools/**](https://www.facebook.com/STEM4Schools/)

**Link to the Twitter page**

[**@STEM\_4Schools**](https://twitter.com/STEM_4Schools)

Research shows that early exposure to STEM has an impact on increasing elementary school students’ awareness and inclination towards STEM (Bagiati, Yoon, Evangelou, & Ngambeki, 2010; Wyss, Heulskamp, & Siebert, 2012). Catching student’s interest in STEM fields at an earlier age will provide more exposure and will guaranty that students are STEM ready and on track to pursue STEM studies (DeJarnette, 2012). In order to build interest in STEM, students need to be exposed to STEM fields (Knezek, Christensen, Tyler-Wood, & Periathiruvadi (2013); Rivoli & Ralston,2009; Wyss, Heulskamp, & Siebert,2012) and STEM disciplines need to be taught in K-12 education as recommended by the National Research Council (2009,2013). Teaching Computational thinking skills, engineering and computer science in k-12 have been linked to success in STEM and increasing students’ interest in STEM careers(Barr & Stephenson,2011; Carr, Bennett & Strobel,2012). According to the US department of Education, the number of teachers and students skilled in STEM is insufficient and the need to grow the STEM pipeline to meet the demands for STEM jobs and to remain competitive is an imminent (Science, Technology, Engineering and Math: Education for Global Leadership, 2015).

STEM4Schools is an online community that provides educators, school districts’ principals and administrators with best practices in implementing STEM academies in middle schools. This niche will provide its members the opportunity to learn through interaction and sharing of information as well as building social and professional connections (Resnick, Konstan, Chen and Kraut, 2011). STEM4Schools is a niche where school principals and educators share their successes, discuss their challenges and discover valuable resources in curriculum design, instructional programs, funds, grants, training, research, achievements and best practices as well as track success in k-12 STEM education as recommended by the National Research Council (2013).

STEM4Schools online community’s design is based on the design alternatives highlighted by Kraut and Resnick (2011) in terms of community structure, content, communication, feedback, rewards, rules, access and presentation. Its’ design is centered on the community’s scope. Topics and activities are focused on STEM academies implementation and are shared via posts, blogs, events and webinars. Members create the topics of discussion and choose the communications channels to use. Among these tools of communications are Google apps, Meetups, Skype, WhatsApp and/or face-to-face meetings in various events organized by the members.

The conceptual theory behind STEM4Schools derives from the Basic Motivation Model developed by Rheinberg (2008, p. 72). This model describes behavior as a result of motivation and motivation as the outcome of the relationship between people’s goals, needs, values and incentives. The effectiveness of this conceptual theory as described by Cornelli & Von Rosenstiel (1995) and Rheinberg (2002) depends on how incentives affect personal motives. Therefore, incentives will play a major role in the conceptual framework of STEM4Schools web site. These incentives that will be used to motivate members of this online community and will match personal motives (Rheinberg, 2008). In addition to the Basic Motivation Model, a social, material and cognitive rewards systems will be used to encourage contribution and create motivational factors (Federspiel, Schaffner, & Mohr,2014).

Motivation is one of the biggest pillars in designing STEM4Schools online community. Keeping members of the community active and motivated is key in achieving the goal of sharing best practices in STEM academies at the middle school. STEM4Schools design is based on creating content and activities that have the potential of satisfying diverse motives that trigger contribution as described in Reiss’s sixteen motives. Among these motives are, power, curiosity, status and acceptance(Reiss,2004). STEM4Schools uses a rating system where members’ contribution about best practices in STEM academies implementation is rated. Monthly ratings of best practices in STEM academies will be displayed on STEM4Schools’ dashboard. In addition, members will also earn acknowledgements, recognition and rewards. This system of recognition will motivate members of STEM4Schools to stay involved and active to earn acknowledgment for themselves and for their school as described in Kraut and Resnick (2011, p.250) in Design Claim 18 that states that providing incentives for early members to trigger content can amplify bootstrapping. The acknowledgment system has the potential of improving the professional career of the members of the community and their school’s image and rating. It also has the potential of encouraging recruitment of entire schools personal and create competition and enthusiasm for STEM implementation in middle schools.

Memberships in STEM4SChools is only open to verified members who have professional emails that link them to an educational institution or organization. Membership will be divided into two categories: basic and advanced memberships. The basic membership will allow members to view posts and participate in blogs, forums and events. The advanced membership will allow the members to contribute the same way basic members can but in addition will be given the ability to rate content, select monthly winners and give feedback as specified in Kraut and Resnick (2011, p.40) in Design Claim 15 which asserts that goals have more impact when people receive feedback frequently about how they perform. Advanced members are verified administrators, school principals and educators that have experience in implementing STEM academies or are working in STEM academy. This strategy of creating high-status members steer contribution and increases recruitment as described in Design Claim 9,10 and 11 that describes that people respond and comply to requests made by high-status people who they are familiar to and/or attracted to (Kraut and Resnick,2011, pp. 32-34). To recruit new members, STEM4Schools will allow members to import their profiles and contacts in order to allow newcomers to quickly build social and professional connections a well as gain status in the community as shown in Design Claim 16 (Kraut and Resnick, 2011, p. 43), social contact causes members to contribute more to the online community.

There are several online communities on STEM education that cater to students,

educators and school districts among them: STEM101.org, Rokenbok Education, and STEM@ESC-20. STEM101.org online community focuses on high school level curriculum and professional development programs for school districts. Rokenbok Education’s mission is teaching children engineering skills by promoting curiosity and the persistence in STEM. STEM@ESC-20 online community fosters leadership, collaboration, critical thinking, creativity and communication among students. School districts and educators can purchase resources and be part of a collaborative STEM community. These communities all share a common goal which is promoting STEM education. However, STEM4schools online community only caters to middle schools and will never sell or promote any instructional products. It is will focus only on its members’ posts and ratings on best practices in implementing STEM academies at the middle school level.

The success of STEM4Schools relies on a strategic plan based on data collection and analysis to guide and support the online community. The community manager’s role is to make adjustments based on the data analysis, to ensure that the rules set for the community are enforced, to moderate interaction and welcome newcomers to the community. This prototype for STEM4Schools along with its strategic plan will guide the launch of the online community and sustain its growth using various criteria and measures among them monitoring the numbers of active members, its scope, its geographical concentration and its ability to reach its goal in sharing best practices in STEM academies and bringing STEM academies in our communities.

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*science education*, *7*(4), 501-522. ­­­

Appendix

Turnitin Originality Report

Design an Online Community by Fahima Bacha

From Assessment 3: Design of an Online Community (EDTC 816 Adv Method for Building Online Community)

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Running head: AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL STEM4Schools: An Online Community for STEM in Middle School Assessment 3 Fahima Bacha New Jersey City University EDTC 816 Spring 2017 Link to my online community’s web page: https://fbacha8.wixsite.com/website Link to the[17**Facebook page https://www.facebook.com/** STEM4Schools/ **Link to** the Twitter**page**](javascript:openDSC(3294244805,%201179,%20'1243');)@STEM\_4Schools Research shows that early exposure to STEM has an impact on increasing elementary school students’ awareness and inclination towards STEM (Bagiati, Yoon, Evangelou, & Ngambeki, 2010; Wyss, Heulskamp, & Siebert, 2012). Catching student’s interest in STEM fields at an earlier age will provide more exposure and will guaranty that students are STEM ready and on track to pursue STEM studies (DeJarnette, 2012). In order to build interest in STEM, students need to be exposed to STEM fields (Knezek, Christensen, Tyler-Wood, & Periathiruvadi (2013); Rivoli & Ralston,2009; Wyss, Heulskamp, & Siebert,2012) and STEM disciplines need to be taught in K-12 education as recommended by the National Research Council (2009,2013). Teaching Computational thinking skills, engineering and computer science in k-12 have been linked to success in STEM and increasing students’ interest in STEM careers(Barr & Stephenson,2011 ;Carr, Bennett & Strobel,2012). 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This prototype for STEM4Schools along with its strategic plan will guide the launch of the online community and sustain its growth using various criteria and measures among them monitoring the numbers of active members, its scope, its geographical concentration and its ability to reach its goal in sharing best practices in STEM academies and bringing STEM academies in our communities. References[2**Bagiati, A., Yoon, S.Y., Evangelou, D., Ngambeki, I. (2010). Engineering curricula in early education: describing the landscape of open resources. Early Childhood Research & Practice, 12(2),** 2-13. **Barr, V., & Stephenson, C. (2011). Bringing computational thinking to K-12: what is Involved and what is the role of the computer science education community?. Acm Inroads, 2(1), 48-54.**](javascript:openDSC(594715908,%201,%20'3522');)[5**Carr, R. L., Bennett, L. D., & Strobel, J. (2012). Engineering in the K‐ 12 STEM Standards of the 50 US States: An Analysis of Presence and Extent. 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Retrieved March 17, 2017, from https://rokenbokeducation.org/?gclid=Cj0KEQjwhpnGBRDKpY-My9rdutABEiQAWNcslL1W STEM.[14**(n.d.). Retrieved** March 17, **2017, from http://www.esc20.net/default.aspx?name=ci\_**](javascript:openDSC(773875397,%201,%20'4244');)stem.STEM Stemacademy. (n.d.). Retrieved March 17, 2017, from https://stem101.org/[3**Tyson, W., Lee, R., Borman, K. M., & Hanson, M. A. (2007). Science, technology, engineering, and mathematics (STEM) pathways: High school science and math coursework and postsecondary degree attainment. Journal of Education for Students Placed at Risk, 12(3), 243-270.**](javascript:openDSC(133627872,%202209,%20'263');)[6**Wyss, V. L., Heulskamp, D., & Siebert, C. J. (2012). Increasing middle school student interest in STEM careers with videos of scientists. International journal of environmental and science education, 7(4), 501-522. 1**](javascript:openDSC(333493201,%201,%20'3401');)AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 2 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 3 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 4 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 5 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 6 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 7 AN ONLINE COMMUNITY FOR STEM IN MIDDLE SCHOOL 8