Self-education - learning by sharing and doing

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The type of contribution I am submitting: _X_ hands-on, ___explore, ____poster.

ABSTRACT

Keywords - maker space, active learning, motivation

Background: The background for this article is to examine, how it is possibly to increase student's active learning by making a learning environment where motivation can flourish. It is my belief, that group activities can motivate the students by making it possible for them to share thoughts and gain new relationships. A makerspace may encourage creativity and exploration and students can learn new skills from other makerspace members. The students learn how to combine theory with practice in a learning by doing environment where it is possibly for them to take ownership of personal or collaborative projects.

Explanation: The aim is to establish a learning environment where students can engage in and develop new ideas together. It is seen that makerspaces can lead to high level of responsibility and project ownership where students can focus on step by step learning rather than just performance (Harnett et al. 2014). The makerspace at ASE is inspired by an organization climate where students are trusted and it is believed, that they perform best while given freedom and space to use their own judgement. This can lead to positive motivation (Biggs & Tang p.40-43). Students can be motivated in many ways by working with problem-based activities (Ibid p.34-35). A maker space may provide a framework for extrinsic, social, achievement and intrinsic motivation and thereby making higher level learning possible. To create a learning environment where students can use their creative skills, it is necessary to allow the students to dare to take risks and try to use their knowledge in new ways. It is important that teachers don't stifle the students creativity by determine the outcome of their projects or focusing more on the end goal than the development process (Ibid p.170-173). To work creative is important but it is essential that engineering students learn that designing is a complex process demanding a high cognitive level. This can be realized through problem based learning (Dym et al 2005).

Set-up: The participants will be presented with ASE´s current framework for its makerspace and some of the results from different makerspace activities. The hands on session will be at structured discussion based on a discussion sheet on how to create an interdisciplinary community for education based on the maker philosophy. When creating a makerspace there are some question that need answering e.g. payment for consumables for lab equipment, use of lab equipment for privet use and top down or bottom op management. The participants will address these and more topics in groups and discuss their findings with a peer group.

REFERENCES

Biggs J; Tang C. (2011). *Teaching for quality learning at university*. Fourth Edition.

Dym CL, Agogino AM, Eris O et al. (2005). *Engineering Design Thinking, Teaching, and Learning.* *http://static2.inovacaoedesign.com.br/artigos_cientificos/engineering_design_thinking_teachingan dlearning.pdf* Data generated d. 26/5 2015

Harnett, C.K.; Tretter, T.R.; Philipp, S.B. (2014). *Hackerspaces and Engineering Education* http://ieeexplore.ieee.org/search/searchresult.jsp?queryText=Hackerspaces%20and%20Engineering %20Education&newsearch=true. Data generated d. 20/5 2015