

Flipped Gaming: The Teachers Role When Using the Students as Content Providers

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Abstract: In order to activate students and make them active contributors in a class, the concept of “Flipped Classroom” has been used at several Universities, also at The Inland University of Applied Sciences Norway. Flipping the classroom and making the students contribute, and being active, has supported the students learning outcome. Generally, when using games for learning, the game scenario is either decided by the lecturer/teacher, or defined by the designers and/or producers of the game used. In this paper we will explore how the teachers/lecturers role changes when the scenarios to be played in the game environment are defined and developed by the students themselves. The methodological approach is mainly qualitative and the data are observations from gaming sessions, minutes from review processes and interviews with faculty staff responsible for the course. The paper will present how the lecturer/teacher changes role from being the center of attention and the provider of knowledge, to a facilitator that both empower the students and enables the students to contribute towards developing increased understanding and enhanced learning outcome. By enabling the students to contribute in such a way, the support towards the reflection processes described by Donald Schön in his work “The reflective practitioner” from 1991, is being supported in all stages. The reflection before action is when they discuss and agree on scenario, they need to reflect in action upon action, and they need to reflect on action when finished gaming. These reflection processes need to be facilitated in order to support the learning process and when flipping the gaming, this is one of the roles of the facilitator; the lecturer/teacher. The paper will present a project called “Seed corn 2017 – Pedagogical Use of Games in Crisis Management Education”, using a course at The Inland Norway University of Applied Sciences, Campus Rena, Norway, and the results from the research.

Keywords: teachers as facilitators, student developed scenarios, co-creation of knowledge, flipped gaming

1. Introduction

Games developed for learning purposes has been around for a long time (Bergeron 2006, Michael and Chen 2006). However, there has been several attempts that has failed (Gee 2003), some due to game designers trying to be pedagogues, or vice versa. With very few exceptions most of the games have had input from the users other than feedback from beta testing (Salen and Zimmermann 2004). In some games, like “Gophers” the content is user generated (Casey et al. 2007). This is mostly an exception rather than the rule.

When learning about crisis, crisis management, crisis communication and crisis prevention, it is important not only to learn about the theory, but also practice and learn by “doing”(Dewey 1902). Doing real live exercises is very expensive and it requires a lot both financially and work force wise to set up a good training facility.

At The Inland Norway University of Applied Sciences, a simulation game has been introduced in order to provide the students with a training facility. The game is based on a platform developed by Bohemia Interactive Simulations (BohemialInteractiveSimulations 2016). The simulation game allows the university to add its own scenarios, which opens up for a very different approach to gaming; allowing the students themselves to develop scenarios for playing. Many of the students attending the study programs regarding crisis management are

themselves from either call out services or have similar backgrounds. They are subject matter experts as they come from a background in e.g. the police, work as fire fighters, volunteers in the Norwegian Red Cross, or similar. They have themselves been taking part in many incidents, and can thus provide many scenarios.

It is possible to expand on the different varieties of scenarios by utilizing the backgrounds of many of our students. Having a game master that can adapt the scenarios on the simulation platform; it is possible to play the students scenarios.

What does this do to the teacher's role? When the teacher is no longer the "subject matter expert" and the students will have more real-life experience in the different courses in a study program. This paper explores the changed role a teacher will have with these preconditions.

2. Theoretical backdrop

Serious games or games for learning are a part of what Diana Laurillard (2002) would call "adaptive media". Laurillard has defined adaptive media to be "computer-based media capable of changing their state in response to the user's action" (Laurillard 2002, p. 126). The game may contain both what she refers to as "intrinsic" and "extrinsic" feedback; "intrinsic" being "feedback that is internal to the action that cannot be helped once the action occurs, and "extrinsic" being external to the action, which "may occur as a commentary on the action"(Laurillard 2002, p. 126). Games and simulations have both. The intrinsic is the factual response the game or simulation will provide the viewer/gamer upon e.g. moving objects (like police cars, fire fighters, etc.). The extrinsic; the response that come from the actions (when putting up a command center too close to a land slide area, it may (or may not) be involved in the very incident it is supposed to be in command of). As feedback represent a critical part of the learning process, this feedback that the game/game master/fellow gamers can provide will aid the learning process.

In the University setting, the students are adults. This implies a take on the teaching process that is modified to the fact that adults (mostly) learn because they have an intention or need for learning, in contrary to what may be observed in children that learn because their role model/teacher says it is important to learn (Knowles 1990). Knowles claim that adults learn best by being included, involved and engaged (Knowles 1990, Knowles et al. 2005). They need the learning to have an (immediate) relevance to their area of interest (e.g. work). They also learn by experiencing and by working with problems.

Using reflection in order to extend the learning process is important, as we need the students to become what Donald Schön calls "the reflective practitioner" (Schön 1987). Reflection can according to Tony Ghaye be described as ""structured" or organized thinking" (Ghaye 2011). Although not all thinking is reflecting, according to John Dewey (1910), utilizing reflection as an integrated part of a study program can only aid the process of educating reflective practitioners for the public.

Reflection both before action (Cowan 2006), reflection in and on action (Schön 1987, Schön 1991, von der Oelsnitz and Busch 2006) should be followed up when using games and simulations for learning purposes. Similar to debrief and the After Action Reviews (von der Oelsnitz and Busch 2006) in the Military, it is important to reflect upon the actions. David A. Kolb has described this in his "experiential learning cycle" (Kolb 1984). Here he explains (in the extended model) how reflections will aid the learning process. To maximize the learning outcome of the gaming, reflections should be made longer after the action as well as the experience and our memories of the experience deepens over time (Hafting et al. 2006, Vold 2011).

Based on this insight, the gaming sessions should involve the students in the making of scenarios to make it relevant for them in their job situations, and it would start the reflective processes. It is important to do reflections during, after and longer after the gaming sessions. The game should provide both intrinsic and extrinsic feedback to reflect upon.

This approach implies a different role for the teacher. From being a communicator and lecturer, it is now important to assume a quite different role as a facilitator of bringing the students experiences forward, organizing them (together with a game master), quality assure them, and facilitate the reflection processes in order to co-generate relevant knowledge for the students. We are then moving from one paradigm (one way

communication only with students input as examples or as questions) to a very different paradigm of students as co-producers.

“Flipped classroom” is a concept that has gotten a lot of attention and that embraces the recognition of the students’ knowledge and encourages co-generation (Nematollahi et al. 2015, Vold 2014). When using “Flipped classroom” the students are activated and are encouraged to use their own backgrounds and experiences into the learning setting. They are sometimes also content producers regarding assignments and exams (Vold et al. 2016).

3. Methodological approach to data collection

The data is mainly qualitative and consists of observations and interviews. The interviews are both on a group level but also with individuals (Dalen 2011, Schensul et al. 1999). The researchers record observations during the process of developing scenarios and playing the scenarios developed by the students. Researchers observe that they are teachers and the focus has been twofold; how can the students contribute to the study program with their experiences, and how does this change the teachers’ role. In this paper, we focus on the changes in the teachers’ role. It is then important to note that the background of the researchers will influence the way the data is interpreted (Denzin and Lincoln 2005, O’Dwyer and Bernauer 2013). This can be compared to Action Research methods when doing action research in your own organization, only this research is mainly on students and your peers (Coghlan and Brannick 2014). The closeness to the material and the study objects, both provide challenges and opportunities. The challenges may consist of the researchers’ background and view on the changing roles, as the changes are perceived, as threats to one’s own status as a teacher and superior. The opportunities are within the potential richness of the experiences of the students. Co-generating knowledge with the students provide opportunities of learning for the teachers as well.

As this is the first year this has been undertaken, a further study will be executed including also quantitative data in the form of surveys. It will also be possible to extract data from the execution of the gaming.

4. The project

The testing of students developing scenarios is a part of a larger project called “Seed corn project 2017”. This is locally funded by the University and support research activities that provide new insight to teaching methods. This part of the project has been about testing the new platform and its facilities as a complimentary tool for learning purposes. The expansion with student provided scenarios has been particularly interesting as this opens up a different take on the usage of the simulation tool. It is now possible utilize the students’ experiences, and at the same time expand the available scenario library.

For this particular part of the project, the learning objective preparedness training and –practice. This means managing staff within the scene of a crisis and communicate with staff in order to limit damages and perform rescue operations.

The students were divided into two groups where the students played the other group’s scenario. Whilst one of the groups played, the group “owning” the scenario played separate roles as visitors, relatives, reporters etc.

The outline of the project with the simulation was as described in the following table:

Table 1: Outline of the project

Presentation of curriculum in a classroom	Facilitation of scenario building process	Scenario is developed into gaming session (by the game master)	Gaming/ Simulation (incl. refection processes during gaming)	Reflection on Action (After action review)
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This also brought some challenges regarding the teacher’s role and the change from being the subject master expert to being one of the subject master experts and a facilitator for supporting the process of making the students to utilize their experiences towards developing scenarios that are interesting, useful and something for peer students to learn from.

5. Results and discussion

The preliminary results from the interviews and observations indicate that the role of the teacher is undergoing a change within this particular part study program (the simulations). From being the one providing the scenarios or the one ordering a scenario, the teacher is now facilitating a process of making the students produce the scenarios.

Data from the observations are clear about the engagement of the students. There are all engaged either in moving units in the game based environment or handling “press”, “family”, or similar. The opposing team are equally engaged in playing roles to support the video gaming. The students played different roles than their background (an ambulance driver acted police officer, etc.) The student reported on this to provide an enhanced understanding of the different actors in an incident, and they claim it will support their work in a future incident as they now have an increased understanding of the different parts in a rescue operation.

This also changes the role of the students from being receivers to content providers. With the necessary support by the teacher, this is a process that can be compared to a reflection process (Schön 1987). This reflection can be viewed as two processes: firstly, the students need to bring forward some experiences tied to a subject; secondly, these need to be processed in order to make up a scenario that can be played. This coheres with what Cowan (2006) refer to as “reflection before action” and with what Schön (1991) refers to as reflective processes.

In the process of developing the scenario, the teacher’s role has so far been to explain the limitations of the simulation game platform, and direct towards the theme of the learning objective. The learning objective for this setting was preparedness training and –practice, as previously mentioned. In addition, the teacher needed to remind the students of the curriculum they were to test out during the gaming.

Since the teacher in this case has a background from crisis management issues, it was natural to assume the role of a facilitator. However, the training a teacher receives is not necessarily focused on utilizing student input for other than examples that demonstrates the curriculum. To recognize the knowledge within each student and utilize the fact that some of the students have more extensive knowledge than what may have been presented in a classroom setting, requires a special kind of humility with the teacher. This humility must not be confused with subservience. The recognition and acceptance of the students’ knowledge and experience is well known within the area of adult learning (Knowles 1990, Knowles et al. 2005, Rogers 2007). Even Dewey has advocated using the students own experiences as a backdrop for learning (Dewey 1938).

The teacher also paused the gaming session in order to make the students aware of important facts, similar to what Schön describes as “reflection in action on action” (Moon 2004, Schön 1987). This requires some insight into how a simulation/gaming session is undertaken, as it easily can interrupt the *flow* of the gaming and thus disturb also the learning process (Csikszentmihalyi 1990). The students experienced some problems with the verbal communication tool connected to the system. It did not resemble the real-life system and since all parties could talk to everyone at the same time, they reported this as confusing and towards the end of the gaming session, they only watched and played with what was shown on the screens. This could easily have obstructed the learning outcome (Kember et al. 1999).

The reflection process that the students had *after* the training session bore (Schön 1987) evidence of the end of *flow*. The students seemed to be “done” with the gaming. However, the teacher then pointed to what happened *during* the gaming session. This seemed to trigger more reflection processes and both technical issues and game play issues were discussed. The reflection upon the technicalities were important for the game master and the lecturer as these are practical issues that can be improved for the next sessions. The reflections upon lessons learned resembles what Schön describes as “reflection on action” (Schön 1987, Schön 1991). We also find this type of reflection in Kolb’s experiential learning cycle (Kolb 1984). After the experiencing the reflection starts and to be able to articulate the reflection and discuss how this could have been handled differently is a part of the learning process. Again, this requires a facilitator role (Brockbank and McGill 2007) with the teacher, similar to what Raelin describes with how managers can facilitate dialogue at a workplace (Raelin 2012).

Pursuing the theory on the experiential learning cycle, the “reflection after action” ends in articulating how this could be done differently regarding set up, info, learning objective, etc. This also serves as important feedback to the game master and the teacher. This provide them with the opportunity of adjusting the scenario so that

an improved scenario is stored for later gaming sessions. This benefit became apparent in this project and proved to be valuable insight for all involved parties.

Regarding the experienced learning outcome, the students claimed to have learned a lot from both the process of making a scenario, the gaming session and the reflection processes. They were required to think somewhat differently when making a scenario as they are used to just playing. Now they had to think of what to play AND how this would be in a gaming sessions. This required something different and challenged them in their reflection process, which they found intriguing and interesting. They were rather exhausted when the day was over, but also excited about the new insights both about feedback on their “own” scenario and also on their execution of the scenario from “competing team”.

The teacher claimed to have learned something during the process. Not only about the curriculum; crisis communication and crisis management, but also about the facilitation process. To get the students to start sharing knowledge can be hard, but not impossible. The teacher in this project also saw it as an advantage that they had studied together for a while and knew each other rather well. In a first term class, this may have been more difficult, particularly with a large number of students. More research is needed to establish if this is a correct observation as other research (Vold et al. 2005) states that even if the students meet for the first time it is possible to organize student input that provide the basis for scenarios to be solved (not as games, but as assignments).

6. Conclusion

The teacher’s role in this undertaking changes from being a “superior” subject matter expert that use student input to illustrate examples, to a “peer” that facilitate presentation of knowledge and combination of knowledge to create and co-create new insights. This facilitation requires a different approach with the teachers as they in their new roles will need to acknowledge that the students are the “subject matter experts” and that their “job” now is to make the students put forward their existing knowledge, as well as aid in the construction of scenarios based on the students’ knowledge. The teachers’ background will thus be a support more than the knowledge base for the scenarios. However, the competencies within pedagogical issues like advising, and facilitation. The teacher will here have the role of the process manager and the students are the ones providing and responding to feedback as they themselves are the “subject matter experts” within their fields.

The scenario building provides opportunities for reflective processes and prolongs a learning process that started during the lectures. Also, the teacher can use the feedback from the reflective processes to modify and improve on the scenarios handed in by the students. These scenarios can be used for gaming sessions for the students in the first year of their study program.

The teacher also need to secure that the scenarios provide for the learning objectives, that the scenarios are playable (together with the game master), and quality assure the results from the gaming session.

However, the facilitation of Flipped Gaming, has in our case proved positive, both for the teacher and for the students. This inspires to testing it out on a broader scale, including more curricula and courses.

6.1 Further research

We will continue doing research on this topic and will e.g. send out a questionnaire to the students, investigating further the role of the teacher. We also need to establish if the initial assumptions are correct; that the target audience should be on the second year of their study program. We also need to see how we can educate more teachers to enter this changed role and see if it is possible to utilize the gaming AND the students experience and background in different courses and parts of the study program. We need to investigate the opportunities of drawing connections between academia and work life in order to strengthen the operational relevance throughout the study program in order to support all the chosen educational methods, including Flipped Gaming.

References

- Bergeron, B. (2006) *Developing Serious Games*, Hingham: Charles River Media, Inc.
BohemialInteractiveSimulations (2016) *BohemialInteractiveSimulations*, Available: <https://bisimulations.com/> [Accessed 29.04. 2016].

- Brockbank, A. and McGill, I. (2007) *Facilitating reflective learning in higher education*, Maidenhead: Society for Research into Higher Education & Open University Press.
- Casey, S., Kirman, B. and Rowland, D. (2007) The gopher game: a social, mobile, locative game with user generated content and peer review. In Paper Presented to the Proceedings of the international conference on Advances in computer entertainment technology, Salzburg, Austria.
- Coghlan, D. and Brannick, T. (2014) *Doing action research in your own organization*, 4th ed. ed., London: Sage.
- Cowan, J. (2006) *On becoming an innovative university teacher: reflection in action*, Buckingham: Society for Research into Higher education & Open University Press.
- Csikszentmihalyi, M. (1990) *Flow: The Psychology of Optimal Experience*, New York Harper & Row.
- Dalen, M. (2011) *Intervju som forskningsmetode*, Oslo: Universitetsforl.
- Denzin, N. K. and Lincoln, Y. S. (2005) *The Sage handbook of qualitative research*, Thousand Oaks, Calif.: Sage.
- Dewey, J. (1902) *The Child and the Curriculum Including , The School and Society*, New York: Cosimo Publications.
- Dewey, J. (1910) *How we think*, Boston: Heath.
- Dewey, J. (1938) *Experience & Education*, New York: Touchstone.
- Gee, J. P. (2003) *What Video Games Have To Teach Us About Learning And Literacy*, New York: Palgrave MacMillan.
- Ghaye, T. (2011) *Teaching and learning through reflective practice: a practical guide for positive action*, London: Routledge.
- Hafting, T., Ree-Lindstad, N. and Vold, T. (2006) Being Prepared for Action: Simulation of Crisis as a Learning Context. In Paper Presented to the Online Educa 2006, Berlin, Germany.
- Kember, D., Jones, A., Loke, A., McKay, J., Sinclair, K., Tse, H., Webb, C., Wong, F., Wong, M. and Yeung, E. (1999) Determining the level of reflective thinking from students' written journals using a coding scheme based on the work of Mezirow. *International Journal of Lifelong Education*, 18(1), pp. 18-30.
- Knowles, M. S. (1990) *The adult learner: a neglected species*, Houston: Gulf Pub. Co.
- Knowles, M. S., Holton, E. and Swanson, R. A. (2005) *The adult learner: the definitive classic in adult education and human resource development*, Amsterdam: Elsevier.
- Kolb, D. A. (1984) *Experiential learning: experience as the source of learning and development*, Englewood Cliffs, N.J.: Prentice-Hall.
- Laurillard, D. (2002) *Rethinking Univeristy Teaching - a framework for the effective use of learning technologies 2nd edition*, Madison, New York: RoutledgeFalmer.
- Michael, D. and Chen, S. (2006) *Serious Games: Games That Educate, Train and Inform*, Boston, MA: Thomson Course Technology PTR.
- Moon, J. A. (2004) *A handbook of reflective and experiential learning: theory and practice*, London: RoutledgeFalmer.
- Nematollahi, S., St John, P. A. and Adamas-Rappaport, W. J. (2015) Lessons learned with a flipped classroom. *Medical Education*, 49(11), pp. 1143-1143.
- O'Dwyer, L. and Bernauer, J. A. (2013) *Quantitative Research for the Qualitative Researcher*, Thousand Oaks: SAGE Publications.
- Raelin, J. A. (2012) The manager as facilitator of dialogue. . *Organization*, 20(6), pp. 818-839.
- Rogers, J. (2007) *Adults learning*, 5th ed. ed., Maidenhead: Open University Press.
- Salen, K. and Zimmermann, E. (2004) *Rules of Play: Game Design Fundamentals*, Cambridge, Mass.: MIT Press.
- Schensul, S., Schensul, J. J. and LeCompte, M. D. (1999) *Essential ethnographic methods: observations, interviews, and questionnaires*, Walnut Creek, Calif.: Altamira Press.
- Schön, D. A. (1987) *Educating the reflective practitioner*, San Francisco, Calif.: Jossey-Bass.
- Schön, D. A. (1991) *The reflective practitioner : how professionals think in action*, Aldershot: Avesbury.
- Vold, A. T., Kiøng, L. and Ranglund, O. J. S. (2005) Students as content producers – how activating students can enrich an online course. in *International Conference for E-learning*, Orlando, USA: Academic Conferences LTD.
- Vold, A. T., Lundesgaard, D. D., Braun, R. and (2016) Flipped Classroom - Students as Producers. in *15th International Conference on Information Technology Based Higher Education and Training (IETHET)* Istanbul, Turkey: Vold, Aud Tone; Lundesgaard, Daniela D; Braun, Robin. Flipped Classroom - Students as Producers. I: 2016 15th International Conference on Information Technology Based Higher Education and Training (IETHET), IETHET 2016, September 8-10, 2016, Istanbul, Turkey. IEEE conference proceedings 2016 ISBN 978-1-5090-0777-6. HIHM
- Vold, T. (2011) Being ready for emergencies- innovative approaches to fostering learning in and between organizations. in Sience, S. f. D. a. P., (ed.) *SDPS*, Jeju Island, South Korea: SDPS.
- Vold, T. (2014) How can the concept of Flipped Classroom support the development of reflective practitioners in higher education? in *Information Technology Based Higher Education and Training (IETHET)*, 2014. pp. 1-3.
- von der Oelsnitz, D. and Busch, M. W. (2006) Teamlernen durch After Action Review. *Personalführung*, (2), pp. 54-62.