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Engaging students before, during and after class

A guide to the use of digital technology in the higher education classroom

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HAUTE ÉCOLE D'INGÉNIERE ET DE GESTION HES SO VALAIS DU CANTON DE VAUD



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Introduction

This handbook is the result of two years of research on the use of digital technology in the higher education classroom. The idea behind this manual was to share with colleagues not only some of our findings, but also to provide a stepping stone for them into the world of technology enhanced learning. A world to which we can no longer turn a blind eye.

The 21st century higher education classroom is changing in many ways, but it is the advent of digital and mobile technologies that is having the most profound effect. In a recent report about the future of the university, (Ernest & Young, 2012), the authors suggest that "Campuses will remain but, digital technologies will transform the way education is delivered and accessed, and the way that 'value' is created by Higher Education providers, public and private alike" (p. 4).

Yet, rather than seeing this as a threat we should look upon this as a challenge. As with any challenge, there are opportunities and these can be seen as being directly related to Web 2.0's "emphasis on active participation, user generation of content and collaboration [which] seems to fit well with the kinds of creative and critical activities we associate with higher education, with the ways that we know students learn through multiple perspectives, and with the communication and teamwork skills we want our graduates to develop." (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012, p. 532). Being at the forefront of educational practice calls for offering students something that will bring added-value as they join the labour force. Research on industry relevant employability skills (Jackson, 2012, 2013; JISC, 2009; Lowden, Hall, Elliot, & Lewin, 2011; Tymon, 2011) continues to emphasize the importance of skills development, such as those previously mentioned, as well as the importance of being at ease in a digital world. In order to remain at the forefront of education in the 21st century, innovative instructional design is a must (Charlesworth, 2015). The WEF Future of Jobs report (World_Economic_Forum, 2016) suggests that there are identifiable skills that will be necessary to succeed in the 21st century workplace and that these skills are changing very rapidly.

Top 10 skills In 2020 ln 2015 Complex Problem Solving 1. Complex Problem Solving Critical Thinking 2. Coordinating with Others 2. Creativity 3. People Management 3. People Management 4. Critical Thinking Coordinating with Others 5. Negotiation 5. **Emotional Intelligence** 6. Quality Control 6. Judgment and Decision Making 7. Service Orientation 7. Service Orientation 8. Judgment and Decision Making 8. Negotiation 9. Active Listening 9. 10. Cognitive Flexibility 10. Creativity Source : World Economic Forum (2016) Future of Jobs Report

The World Economic Forum (WEF) paints much the same picture saying that education must now go beyond the acquisition of knowledge to include the acquisition of skills and suggesting that up to 35% of the skills needed today will be different in no less than five years' time (Thomson, 2016). This same article puts forth the view of various world leaders, with the Argentinian Minister of education saying that a country-wide survey of nearly 900 companies identified the most important skills for the future as being:

- Teamwork
- Knowledge of digital tools
- And understanding of rules and regulations
- Responsibility
- Commitment

Parallel to this we are witnessing a noticeable shift from the traditional

DON'T SEEK TO BE THE

SAGE FROM THE STAGE;

INSTEAD, BE THE

GUIDE FROM THE SIDE.

Dan Sullivan

MICHAELHYATT.COM

content-centred focus to a, now more commonly accepted, learner-centred focus. Noticeable only some twenty years after King (1993) spoke of a new paradigm for learning in higher education calling for educators to step into a new role of 'guide on the side'.

With this in mind, the question of what is happening in the world of higher education today and what the levers of paradigm change currently in operation are, can no longer be avoided. our discussions In with pedagogical innovators it became clear that change is operating largely on two dimensions: that of time and distance and that of new and changing roles for the educator.

The use of social media and technology in the students private sphere is now a part of their lives, yet these technologies are often absent from the classroom (Kukulska-Hulme, 2012). The activities

> that students engage in, at this informal level, allow for the development of competencies that educators, in the more formal classroom setting, also need to develop. However, "for education to be able to capitalise on the informal to support formal learning, teachers and HE institutions must first embrace the idea that learning is about 'social participation' 'meaning and construction' and not just about delivery

Sage on the Stage Vs. Guide on the Side



www.slideshare.net/ozi/130315

and acquisition" (Margaryan, Nicol, Littlejohn, & Trinder, 2008, p. 4264).

Making the connection

Assumptions about what education is and how to deliver it are increasing being challenged. New media and digital technologies are spurring this paradigm change along and the "shifts now occurring affect both instructional objectives and instructional processes" (Dede, 2013, p. 34).

The successful integration of technology in education is not so much a matter of choosing the right device, the right amount of time to spend with it, the best software or the right digital textbook; the key elements for success are the teachers, school leaders and other decision makers who have the vision, and the ability, to make the connection between students, computers and learning (OECD, 2015, p. 191).

Despite the numerous articles and books now available, it has become clear that the "cool tool" trend is ever-present with much being written about the various tools available to educators without referring to the pedagogical basis for their use. As the role of the educator evolves it becomes paramount to question how one is adding value to one's teaching.

This calls for educators to re-evaluate the desired learning outcomes and it is suggested that the

use of scenarized learning activities, also known as pedagogical scenarios, is one way to meet the challenge of the increased complexity that this brings to the classroom.

One way of looking at this is to imagine a pedagogical story-board and plan out the entire semester in such a manner so as to include elements of technology which can be seen to add value to the learning experience at precise moments throughout the course delivery. The scenarization process goes through 3 steps:

- 1 Definition of the learning outcomes and objectives
- 2 Construction of a time-line or sequence for the semester
- Creation of individual scenarios for each main objective including what, if any, technology, how used, by whom etc...

The process is completed by its implementation and an evaluation of the course delivery as the semester progresses. It is suggested that one vary the technologies being used and their use be examined in light of their impact on learning as well as on classroom dynamics

To help readers with the integration of new technologies and the reflection around individual scenarios we have provided empty worksheets such as shown below at the end of this handbook along with several examples.

As the role of the educator evolves it becomes paramount to question how one is adding value to one's teaching. This becomes quite apparent with the use of a pedagogical scenario the starting point of which is one's objectives for the lesson and or the course. There are empty worksheets included at the end of this guide to allow for just that. An example of how one might use the sheet is shown here:

Tool selected 👔 🥻	2 X X ² X
Definition A brief definition of what the tool is and how it can be used. Possible pedagogical scenario	Advantages Reasons for choosing this tool, advantages of the tool itself for example, ease of use, as well as how it might add value to the course.
Learning outcome : What exactly do you want the student to take away from this exercise. Competency being evaluated / developed : What competency will you evaluate or should the student be developing through the use of this technology. Timing : How and when will this be integrated in the course.	Disadvantages / Constraints Drawbacks that the tool itself might present as well as tool-related disadvantages for either the educator or the students.

How to use this guide

Suggestions are provided under four main headings :

Promoting student autonomy
Creating communities
Assessment and evaluation
Technology in the classroom

beyond cool tools

Each section has an introduction to the topic followed by a practical example of usage and closes with a list of additional references.

The four sections are independent of one another and the reader is encouraged to select the topics that they are most interested in.

Following these four sections, a final section provides four completed worksheets as well as two blank ones for the reader to use as they develop their own pedagogical scenarios.

Enjoy the journey!



Promoting student autonomy

Table II/ companion of Hameworks				
	Zimmerman (2000)	Dabbagh and Kitsantas (2012)	Charlesworth and Sarrasin (2014)	
	Phase	Stage	Level	
1	Forethought	Personal information management	Organization and searching	
2	Performance or volitional control	Social interaction and collaboration	Information exchange	
3	Self-reflection	Information aggregation and management	Co-creation and co- construction of knowledge	

Table 1: A Comparison of Frameworks

(Charlesworth & Sarrasin, 2014, p. 1970)

It would seem contradictory that in today's connected world autonomy is prized. Due to the information overload that each and every one of us is subject to, and students even more so, this quality is one that educators should be looking to develop.

Autonomy can be linked to the construct of self-regulation. First introduced by Bandura (1986, 1991) and later taken up by Zimmermann (1989), who defined students employing self-regulation strategies for learning as "students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents or other agents of instruction" (p329) and went on to define this as a three-phase process as shown in the table

above. Dabbagh and Kitsantas were the first to integrate social media use into this model. Our

Doodle' Dropbox Doodle' Dropbox Dro

suggestion (Charlesworth & Sarrasin, 2014) is that this should now move onto the use of technology on a larger-scale.

> Pintrich (2000) offers insight into what it means to be an active participant in one's own learning when he writes that in academic contexts self-regulation can be understood as a "process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment" (p. 453). From these definitions, one can identify

several features that the two constructs seem to have in common, such as concerns with goalsetting, monitoring learning, and control." (Murray, 2014, pp. 321-322).

The idea of the active participant is in line with a change that, despite having begun well over two decades ago, is only now beginning to have a real impact. A shift in paradigm which sees the emphasis on teacher-centred learning taking a back seat, leaving room for an increased focus on the student. Students or learners are now expected to be proactive in their learning, take part in the construction of their own knowledge and to a certain extent to manage the learning process (Charlesworth, Sarrasin, & Murphy, 2016; Conole & Alevizou, 2010; Goulao & Menedez, 2015). This calls for competencies that go far beyond time-management, calling on students to be autonomous in their learning and associated activities whilst the educator takes on a role of guide or coach.

As students take on increasing responsibility for their learning, they need to go beyond simply compiling the lecturer's presentations. The encouragement of note-taking, self-quizzing, information compilation and document organization are but some of the skills to be developed as a student gains autonomy. Learner autonomy can also contribute to the development of the competency of critical thinking as the student can no longer rely on the educator to provide all the answers.

The levels presented above have organisation at the base. The majority of students today are competent in that area but once they enter into the realm of information searching and exchange many still need support. Technology can provide help with a plethora of curating tools, such as Storify, Scoopit, and Evernote among others, all now available to help students find and compile research portfolios. Going past information exchange, the autonomous learner moves on to knowledge construction and cocreation. Technology has a role to play here as well, with the likes of Google Drive and the associated Google Docs, Sheets and Slides.

Example : "Driver's Licence"

Type of tool

• Moodle test, Google forms or any tool allowing for the repetition of a quiz within a given time frame

Pedagogical objective(s)

Acquisition of core subject concepts & theory

Competency(ies) being developed

• Time management

Topic quizzes can be posted online for the students to take in order to check their knowledge of or to consolidate their learning of selected material. A quiz can be repeated as often as the student would like until they have to take the final quiz – much as in the preparation for a driver's licence.

• For future reading



1

Creating communities

One area that has not only been highlighted as desirable in the skills palette of future graduates, but also offers plenty of possibilities for the use of digital technology, is that of collaborative learning. Collaborative communities and the co-creation / co-construction of knowledge is not only exciting but allows for the addition of real value to the learning experience.

As previously mentioned, the impact of digital technologies on the time & space element is having a real impact on course design and delivery. Collaboration can now occur: synchronously and asynchronously; over a variety of time-spans from a few hours to one or more semesters; between groups of varying size; and for projects that tackle simple problems to those addressing more complex ones.

The use of digital technology for the creation of a learning community, goes past just the development of collaborative skills allowing for what Weinberg et al (2013) call "expressive individuality", meaning that the student is allowed to choose the manner in which they wish to participate and thus is not drowned in the collective (Charlesworth, 2015). Earlier research in the area of collaborative learning focused on the individual, however since the 1990's this has shifted to include work done at the level of the group (Dillenbourg, Baker, Blaye, & O'Malley, 1996; Roschelle, 1996).

More recent research (De Corte, 2012; Järvelä, Näykki, Laru, & Luokkanen, 2007; Lee & Tsai, 2011; Leinonen, Järvelä, & Häkkinen, 2005; Li, Ingram-El Helou, & Gillet, 2012) suggests a symbiotic relationship between self-regulation and collaborative learning.

Seen in light of skills development. this would suggest support that for individual learning and self-regulation, combined with structured collaboration, should encourage the development of strategies for the co-creation and co-construction of knowledge. (Charlesworth, 2015)

Ideally, a learning community aims to have its members contribute, share ideas, collaborate and move forward together. In the classroom, this is easier said than done, which is why an underlying structure to promote collaboration is necessary. It is extremely important that the students understand the reasons for using such a community and the outcomes expected. Once this is communicated, the community can start to take shape and develop. In order to encourage this, the educator can also choose to have a grading rubric for the community, to be applied to the group and not the individual.





Among the more current options available for creating a collaborative community one finds: Facebook groups, Google+ communities, Google Hangout, LinkedIn, Moodle Forum and Slack, however there are a multitude of other options available depending on one's needs.

One can also choose to look at creating communities on a much larger scale and turn towards social media platforms such as Pinterest or Instagram where it is possible to join or create one's own community. Yet another option, along the same lines, would be to use a curating tool such as Storify and have students go through the curating, informationseeking process before creating a community of their own.

The most important element, however, is that of the pedagogical objective(s), but there is no limit to the number of ways in which communities can be brought into the classroom to add value to the learning experience.

Example: The Learning Community

Type of tool

• A social networking platform such as Google+, Facebook groups, Facebook Workplace, Moodle forum, Slack, etc..

Pedagogical objective(s)

• Co-creation of knowledge through peer feedback

Competency(ies) being developed

Critical thinking, giving feedback, collaboration

Calls for the development of a community-specific grading rubric, a clear assignment for the students and, an explanation of what the co-creation of knowledge entails. For example, the posting of a subject-specific infographic for comments by those in the community prior to an in-class presentation for assessment. The manner in which the assignement is presented to the students is extremely important and can make the difference between failure and success.



For future reading

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- http://www.olapic.com/resources/7-ways-to-build-an-instagram-community/

Assessment and evaluation

Assessment, along with much else in education, has also evolved. A typical, yet rather narrow, definition sees assessment only as summative allowing for student learning to be measured against previously identified goals and, in most instances, providing a grade or evaluation. Frequently, this occurs at the end of the semester and the amount of feedback that a student receives can vary from none to a considerable amount. None-the-less, endsemester assessments often lack the feedback component.

Yet for assessment and evaluation to be successful feedback is necessary.

The key question here is what exactly does one mean by assessment? Several definitions are shown below. "Assessment for Learning is the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there."

http://www.assessmentforlearning.edu.a u/professional_learning/intro_to_afl/intro duction_key_questions.html

- 2 In education, the term assessment refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students. http://edglossary.org/assessment/
- 3 Assessment is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences; the process culminates when assessment results are used to improve subsequent

learning. http://web2.uconn.edu/assessm ent/what/index.html In light of the above, it is clear that breaking assessment down into categories can increase its effectiveness. Frequently one speaks of formative and summative assessment where formative is seen as ongoing and summative usually at the end of a chapter or section, course unit, module or semester. Taking this one step further, as shown below, this allows one to speak of assessment FOR, OF, and AS learning which, in turn brings us back to the basics of the pedagogical objectives and the learning scenario.



http://www.education.vic.gov.au/school/teachers/support/Pages/advice.aspx

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Further to this, one can distinguish between on-line evaluation within the institutional framework of a Learning Management System (LMS) such as Moodle, Edmodo, Claroline etc.. or, through the use of an open-source platform (Sarrasin & Charlesworth, in print). An LMS is more official and its use throughout the students' course of study allows both the students and educators alike to familiarize themselves with the various tools available and gives rise to a certain level of homogeneity across the curriculum. Additionally, there is institutional support available to educators who wish to adapt the LMS to their needs. Students are identified when using the LMS, allowing for the use of learning analytics to help the educator with the future development of the course in question. One final advantage is that there is no need to create a new account or login to access the LMS.

An open access platform, on the other hand, calls for the creation of a new account and along with that another password and yet another space to watch. What is important here is not the platform itself but how its use adds value to the learning experience. Three elements to take into account are: the user-friendliness of the platforms, what will be evaluated and how. Whereas most open access platforms are easy to use, visual, and colourful, their use for evaluating individual projects can be difficult as the students are not identified in the same manner as with an LMS. For group evaluation, this tends not to be a problem.



Example: "Trip advisor"

Type of tool

• Moodle test, Google forms or any tool allowing for the creation of a short questionnaire using a Likert scale

Pedagogical objective(s)

• Have students test their understanding of a specific topic

Competency(ies) being developed

• Evaluation and rating skills

Mini-questionnaires composed of a few questions along set criteria. For example, in the case of an oral presentation: clarity, content, complete, discussion. The rating by each individual in the class provides a score for the presentation. In the case of a series of presentations, the ratings can range from $2^* - 5^*$.

• For future reading



3

Technology in the classroom: beyond cool tools

> The use of tools to enhance teaching goes back as far as 3000BC with the introduction of the abacus (Mills & Douglas, 2004) and has progressed through the use of books, calculators, computers and now digital technology. What is changing though it that it is not just the tool that is adding value to the learning experience but the way in which it is being used.

> Digital technology opens up vistas never-before imagined and there is no end to what the creative educator can put into palce. In this section, we are looking at the in-class use of digital tools. There are a number of reasons for using such tools during class-time, however, often the main reason is to add variety to the lesson.

Possibly tools include quiz or questionnaire type tools such as:

- Moodle quiz to which one can add links or images
- Moodle questionnaire
- Google forms
- Socrative
- Any e-voting tool

The advantages of using such a tool can include:

- The use of a quick, simple activity which allows for a measure of student comprehension
- Such quizzes can be used at the beginning and end of a session to show what has been learned during class time
- The anonymous nature of many such quizzes allows for the results to be graphically displayed for all to see.

Another tool that can add value to course delivery is the use of videos, advantages of which include:

- Downloaded straight from YouTube, videos can be used to provide clear examples, introduce current affairs, allow for debate, add to the information already available, etc...
- The possibility to create your own video by either the educator or the students, individually or in a group for use in class.





These can be presented with or without annotation. Here too, there are creative ways to use YouTube from having the students create a course-related play list to filming a service encounter to annotating a video for in-class discussion, etc... Many of these tools call for some trial and error but, the end result is generally worth the effort.

Group project / Information search:

- Use of curation tools previously mentioned under promoting student autonomy can do double-duty by allowing the students to hone their information-seeking skills as well as presenting the subject that they have been developing.
- Depending on the tool used this can include slides, pictures and videos.









Example: "Snapshot"

Type of tool

• Any tool that allows the creation of a poll that can be accessed on either a mobile device or a laptop.

Pedagogical objective(s)

• Provide a visual representation of the class understanding of a specific topic to assess whether further explanation is necessary or to provide material for discussion and allow students to move up the learning curve on their own

Competency(ies) being developed

• Group dynamics

A poll generally allows students to select one out of several possibly answers as in a multiplechoice question. Many poll tools are anonymous and show live display as the answers arrive. This provides a snapshot of understanding at a specific moment and can be used any time during the class; for example, at the start and finish of a class to see if there has been a change in response; or as the start of a group discussion.

• For future reading



4

Worksheets

The following section includes four, pre-completed, worksheets provided as examples for each of the sections described earlier.

Each worksheet calls for the identification of the tool that is to be used, a description of what it is, followed by the planned pedagogical scenrio which may include the desired learning activity, outcome and competency development. All tools have a variety of uses and therefore each worksheet is individualized as it is completed.

The examples provided are generic. Pedagogical objectives and competency development sections have not been included as the instructional design and desired outcomes are very different from one course to another.

On the right side of the sheet there is space to note the advantages and disadvantages of the protocol.



Along the top of the worksheet is the key, which identifies the following elements:



The way to use the worksheets is to start by selecting the type of activity desired for example: collaborative. Once the activity has been described, the most appropriate tool or tools can be selected. The link between the pedagogical scenario for the semester, the specific pedagogical objectives and the competencies being developed for the inclusion of technology in the course delivery then remain to be spelled out.

Evernote 🖹 🔓 🚍



Definition

Evernote is a platform which allows note-taking, task organisation, on-line information collation and sharing, and archiving. Users create a document or a "note" which can take a variety of forms from a "hand-written" note to text, photos or even voice memos. Additionally, "notes" may have linked files. A series of "notes" can be compiled into a notebook along with annotations and comments.

The information is saved in an on-line platform and can be synchronised between devices.

The on-line platform allows labelling and filing of information and is linked to a very advanced research motor.

Possible pedagogical scenario

It can be helpful to allow students to evaluate themselves in order to determine whether or not they have reached the required level of knowledge to pass related course evaluations.

The « test » resource allows for self-evaluation and can be configured to allow the student to repeat the test as often as required.

Additionally Evernote allows information to be hidden until such time as the required (previously set) level is reached.



Advantages

Students are able to evaluate their knowledge at a pace set by the educator.

Tests can be evaluative or not.

The resource can be configured in many ways.

Disadvantages / Constraints

Once a question has been used in the test resource, students are able share it and one might want to have a separate quiz versus final exam test bank.

Google + 🕱 🍃 🛱 🕺

Definition

Google+ is the social networking service arm of Google. It is integrated with all Google services and access is through a Google account (g-mail by default, but with the option of using a different e-mail address). This network allows the creation of either public or private communities and provides a platform for discussion as well as sharing of resources including images, videos, or hypertext links.

Possible pedagogical scenario

The use of a social networking platform for discussion and exchange can have interesting applications for education.

During their studies, students regularly have to do research. Although much of this is at the level of the individual, the idea of exchange and co-creation is one of the skills that students are being increasingly called upon to demonstrate, and is an element intrinsic to the digital world that we are now living in.

A Google+ community can be created by the educator, who can then invite students to join the community or ask that they request becoming a member. Once a member is confirmed, they can post, share, contribute and help the community to develop. If the community is "private", only members have access and can be active in the community.

A Google+ community can accompany a group of students through a short- or long- term project, through a semester or through the entire cursus. The objective is to develop a learning community and as with any community having a "wall" the information is delivered in a continually updated feed. Although it is possible to scroll up and down and search for information this is not the ultimate purpose, rather the content should be commented on soon after it is posted. In addition, it is possible to include categories for posts and, select a specific category for display.



Advantages

Many students already have a g-mail account and therefore the use of this platform does not call for signing up to something new nor having yet another login to keep track of.

The Google+ platform is very user-friendly visually and inviting to use whether on a computer or a handheld device

It is very easy to post comments, exchange links and videos with others in the community.

Can replace a more formal forum.

Disadvantages / Constraints

Members of the community must have a google account (not necessarily a g-mail address, a school e-mail can also be used).

In general, the educator must create the community.

PDF documents cannot be shared.

Moodle quiz 🕈 🔛 🛛 🎗



Definition	Advantages
The quiz activity in Moodle allows the creation of a wide variety of question types including the most frequently used: multiple choice; short answer; matching; missing words, and, true-false.	Once a question bank has been created, this resource can be adapted to a number of situations and can be used for both formative and summative assessment.
A question bank allows the compilation of all the course-related questions whether for use in this activity or not. New questions can be created for a course or copied from a previous, or related, course on Moodle or imported from a separate file.	Once the quiz activity has been configured it is very easy to administer. The quizzes are scored automatically but this can be overridden manually.
Possible pedagogical scenario Quizzes are essentially for the evaluation of understanding, but there are a number of ways to do this. The educator controls the quiz settings and can choose whether a quiz is available for one or more attempts, whether there is a time limit on it, whether to restrict it to a particular group of students, etc	Disadvantages / Constraints Once a question has appeared in a quiz this needs to be noted or separate 'formative' and 'summative' quiz banks need to be created to avoid re-using questions that the students are already familiar with.

eVoting 🖹 🔓 🛛 🖄	
Definition The e-voting tool is a quick and easy way to ask students a multiple-choice question that can be answered with a mobile device or even a laptop. The votes can be displayed live as they are made. They are compiled graphically for the four responses possible and are completely anonymous.	Advantages E-voting is simple to put into place and to use. This resource works very well with all class sizes, even large groups.
Possible pedagogical scenario During a class it is sometimes of interest to get input from the students concerning a particular issue, either to see how they interpret something, whether something has been understood or what the class preference is etc The use of e-voting is ideal for this. If used with Moodle, e-voting allows the educator to follow up with a time-delayed repeat of the original question and see whether any change has taken place, for example prior and subsequent to a lesson, a project, etc	Disadvantages / Constraints Limited impact on the learning experience.

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Notes



