O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Fablabs are active learning spaces for digital skilled students**
Author/s Name, Surname	Anne Lehmans and Camille Capelle
Published Title	Apprendre hors-champs : les Fablabs comme espaces de savoirs
Printing Company	Revue COSSI
Year, Volume, Issue	N°6 / 2019
Pages	
Link & date of access (if available)	https://revue-cossi.info/numeros/n-6-2019-questionner-les-manieres-d-habiter-les-espaces-documentaires-d-acces-aux-savoirs-une-approche-sensible/754-apprendre-hors-champs-les-fablabs-comme-espaces-de-savoirs-anne-lehmans-et-camille-capelle
DOI or ISBN:	
Reference Copyright:	
Citation formula	Lehmans, A., Capelle, C. (2019). Apprendre hors-champs : les FabLabs comme espaces de savoirs. Revue COSSI, n°6-2019 [en ligne].
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary and Secondary
Short description: [3- 5 sentences]	Fablabs are active learning spaces that foster autonomy, self-regulation and a more horizontal relationship between students and teachers. However, this kind of spaces and dynamics do not work equally for less digital skilled students.
Full description:	Lehmans and Capelle (2019) investigate how the reconfiguration of space and time in a Fablab can modify how students relate to learning, others and schooling. More specifically, the study aims to identify the perceptions, representations, working practices and, information and communication practices. This research also analyses the use of space by teachers, mediators and youngsters in fablabs. For two years, Lehmans and Capelle carried out an ethnographic study through the observation of 4 groups of K-12 students' school projects in two different fablabs. Students were also interviewed for the study.

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	Results show that students move around differently in fablabs from traditional classrooms. Student's possibility of movement represents their own role mobility during the learning process. Space flexibility is use by students as an "energy liberation instrument that fosters concentration, mutual aid and stress release" (p.7). The peripheric place assigned to machines in fablabs fosters human interactions. Moreover, results emphasize the importance of student's self-perception of autonomy during the learning process. As a matter of fact, autonomy in fablabs is related to a social dimension that requires skills of assertiveness and teamwork. Student's posture in a fablab is different, while in a traditional class students' role is to listen and write; in a fablab their role is to understand, illustrate and explain others. Therefore, pedagogical relations between students and teachers are modify in these spaces. However, for students that do not have the digital skills required, fablabs are more constraints and they can become escape and isolation spaces.

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Researcher's Name of the Resource	**CKBiology: An Active Learning Curriculum Design for Secondary Biology**
Author/s Name, Surname	Alisa Acosta and James D. Slotta
Published Title	CKBiology: An Active Learning Curriculum Design for Secondary Biology
Printing Company	Frontiers in Education
Year, Volume, Issue	05 July 2018
Pages	19
Link & date of access (if available)	https://www.frontiersin.org/articles/10.3389/feduc.2018.00052/full
DOI or ISBN:	doi: 10.3389/feduc.2018.00052
Reference Copyright:	Open access
Citation formula	Acosta A and Slotta JD (2018) CKBiology: An Active Learning Curriculum Design for Secondary Biology. *Front. Educ.* 3:52. doi: 10.3389/feduc.2018.00052
Educational level: [Preschool / Primary / Secondary / Higher education]	Secondary
Short description: [3- 5 sentences]	The article presents the design of an active learning curriculum and corresponding software environment called CKBiology, reporting on its implementationin two sections of a Grade-12 biology course across 3 design cycles. The authors established a design-based research methodology working closely with a high school biology teacher and a group of IT developers to co-design, build, test, implement, and revise the curriculum within a blended learning context. The two research questions set were: 1. What are the design opportunities and constraints associated with infusing a traditional Grade-12 biology course with active learning designs?

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	2. What forms of active learning can address those constraints and challenges, and what technology elements are needed to support them?
Full description, 1500-2000 signs: [best if a consistent material describing the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	The authors used Knowledge Community and Inquiry (KCI) model which allows *(1) an epistemological orientation to help students understand the nature of science and learning communities, (2) a knowledge base that is indexed to the targeted science domain, (3) an inquiry script that specifies collective, collaborative and individual activities in which students construct the knowledgebase and then use it as a resource for subsequent inquiry, and (4)student outcomes that allow assessment of progress on targeted learning goals.* CKBiology, a custom technology environment, had been earlier designed to support KCI and was used in this study. This study used a design-based research (DBR) methodology to support the creation and development of innovative learning environments through the parallel processes of collaborative design, evaluation, and theory-building. The co-design team had five members: 1 Grade-12 biology teacher, 2 IT developers, and 2 researchers. Activities took place within three settings: *(1) At home (online) using the CKBiology platform, (2) in a traditional science classroom with a "bring your own device" (BYOD)policy, and (3) in a specially-designed AL Classroom, constructed by the school with the explicit aim of fostering productive collaborations between students.* Based on the initial needs assessment, the following opportunities and constraints to implementing the AL curriculum design were identified such as adding a learning community "layer" onto the existing course structure to facilitate cooperation rather than competition; Supporting real-time formative feedback by giving the teacher an overview of the progress of the learning community to make decision on intervention and level of support needed; The students could bring their own devices and provided IT support for it; The designs of the structure were limited to theoretical part of the course and that the course designs had to confirm to the content expectations of the local educational authorities and their instructions. The study found that the work advanced a general active learning progression, where the students worked as a community to explain, connect, and review all the concepts from the unit, and then use the resulting "knowledge base" as a resource for inquiry-oriented challenge activities. It included a jigsaw group strategy for the review activities. Three successive units allowed them to refine and adapt the review activities, including new supports for student groups, for teacher and community awareness, and for teacher orchestration. The iterative design study also help to understand of the role of technologies for supporting students and teachers in AL. The role of progress bars was investigated for students' individual group and

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	community efforts as well as group process supports during review activities, including grouping strategies and a specialization recommender. Two forms of ambient technologies in an AL classroom were involved: a central “omnipresent” display, showing terms that had or had not yet been defined, whether and to what extent they had been vetted, and relationships amongst them; and a teacher dashboard, which was visible only to the teacher and was always available for reference as a source of information about specific group products and productivity.

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Researcher's Name of the Resource	**Active note-taking can mobilise high-level study abilities**
Author/s Name, Surname	Nicolas Roland and Phillipe Emplit
Published Title	Enseignement transmissif, apprentissage actif : usage du podcasting par les étudiants universitaires
Printing Company	Revue internationale de pédagogie de l'enseignement supérieur
Year, Volume, Issue	31(1), 2015
Pages	
Link & date of access (if available)	http://journals.openedition.org/ripes/932 (February 5th, 2020)
DOI or ISBN:	
Reference Copyright:	
Citation formula	Roland, N. and Emplit, P. (2015). Enseignement transmissif, apprentissage actif : usages du podcasting par les étudiants universitaires, *Revue internationale de pédagogie de l'enseignement supérieur [En ligne]*, 31(1) | 2015
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	Podcast users' students get to mobilise strategies of decomposition, comparison, information organisation and learning support creation during the course taking notes process.
Full description:	Roland and Emplit's exploratory study aims to understand why and how university students integrate (or not) podcasting within their learning strategies. Moreover, it aims to understand the impact of podcasting as a learning strategy and in the motivational process. Following a user-centred approach, 2 247 students from 12 courses recorded at the free university of Bruxelles were studied. 4 types courses support were distributed within students, some of them had access only to recordings, some others to the audio-video format, others to the audio-slides format and some others had access to the audio-video-slides format. The pedagogical context of courses, data on

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	students' attendance and their use of podcasts was gathered. Lastly, comprehensive interviews were conducted in order to understand the use and appropriation practices of podcast users. Results show that most podcast user's students declare to have new taking notes strategies and skills for creating personalised study supports. Students podcast users consider that they are more "actives" during the use of podcast than in lecture courses. Moreover, one of the differences between podcast users and non-users is that the first group completes their studying with other resources, confronting sources in order to create, at the end, a study support personalised for them. Finally, results show that students that are podcast users were able to mobilise strategies of decomposition, comparison, information organisation and learning support creation. They also declared the improvement of note-taking strategies and the stress associated with it.

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Researcher's Name of the Resource	**Epistemology or pedagogy, that is the question**
Author/s Name, Surname	Paul A. Kirschner
Published Title	**Epistemology or pedagogy, that is the question**
Printing Company	*Constructivist instruction: Success or failure?*
Year, Volume, Issue	2009
Pages	144-154
Link & date of access (if available)	https://www.academia.edu/3941293/Epistemology_or_pedagogy_that_is_the_question (access June 01, 2020)
DOI or ISBN:	
Reference Copyright:	© 2009, Routledge
Citation formula	Kirschner, P.A. (2009). Epistemology or pedagogy, that is the question. In Tobias, S. & Duffy, T.m. *Constructivist instruction: Success or failure?* 144-157. New York: Routledge. Retrieved from https://www.academia.edu/3941293/Epistemology_or_pedagogy_that_is_the_question on June 01, 2020
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary/Secondary
Short description: [3- 5 sentences]	Paul A. Kirschner argues that epistemology of a domain, i.e. "the study of knowledge and what it means to know something" in this domain, should not be substituted for a pedagogy for teaching in that domain. Consequently, the inquiry-based methods used without any guidance or scaffolding may lead students to incorrect conclusions. He bases his claim on the fact that scientific methods to which the inquiry-based learning is related stem from the false assumption that novice learners can and should acquire knowledge in the same way as experts in the given field. Kirschner gives examples to prove that novice learners possess not enough knowledge to draw adequate conclusions from experiments.
Full description:	Paul A. Kirschner attempts to answer the dilemma, whether it is better to stick to traditional, classical, sage-on-the stage didactic approaches

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	or to follow methods based on the constructivist theory. Based on the assumption that epistemology of a domain, i.e. “the study of knowledge and what it means to know something” in this domain, should not be substituted for a pedagogy for teaching in that domain, he argues that the inquiry-based learning and similar methods used without any guidance or scaffolding may lead students to incorrect conclusions and may not be as effective as more expository and didactic approaches. He bases his claim on the fact that “A student, as opposed to a scientist, is still learning about the subject area in question and, therefore, possesses neither the theoretical sophistication nor the wealth of experience of the scientist. Also, the student is learning science—as opposed to doing science—and should be aided in her/his learning through the application of an effective pedagogy and good instructional design.” (Kirschner, 2009, p. 149). According to him, the assumption that novice learners can and should acquire knowledge in the same way as experts in the given field is false. “Experts have a great deal of *accessible content knowledge* organized to reflect deep understanding of the subject matter” (Kirschner, 2009, p. 147) and, compared with them, novice learners, who have little knowledge and experience in a domain, may have trouble interpreting the newly acquired data to encode information at a deeper level. Kirschner cites Chen and Klahr, who “demonstrated that direct instruction was significantly better than discovery learning on children’s ability to design simple, unconfounded experiments, and even more important, those receiving direct instruction were also superior on a far-transfer text of experimental design administered 7 months later”. (Kirschner, 2009, p. 151)

Additional comments: Critical analysis of the effectiveness of constructivist theory

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Researcher's Name of the Resource	**Evaluation of engagement in learning within active learning classrooms: Does novelty make a difference?**
Author/s Name, Surname	May Lim Sok Mui, Guiller Augustin Cea Carpio, Chee Ming Ong
Published Title	Evaluation of engagement in learning within active learning classrooms: Does novelty make a difference?
Printing Company	Journal of Learning Spaces - University of North Carolina
Year, Volume, Issue	2019, Volume 8, Number 2.
Pages	
Link & date of access (if available)	http://libjournal.uncg.edu/jls/article/view/1791/1362
DOI or ISBN:	ISSN 21586195
Reference Copyright:	Open Access journal
Citation formula	Mui, M.L.S., Carpio, G.A.C., Ong, C.M. (2019). Evaluation of engagement in learning within active learning classrooms: Does novelty make a difference? *Journal of Learning Spaces*, 8(2).
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	The paper searches students' and faculty members' perceptions and experiences on their use of active learning classrooms in a university in Singapore.
Full description, 1500-2000 signs:	Applied and Collaborative Learning Environments (ACE) rooms in the study supports active learning. Their capacity for learners is minimum 50 and maximum 100. The furniture in each ACE room consists of individual 700mm x 500mm tables or cluster 1800mm x 600mm long tables ranging from 7 seats to 10. Learners have a mini PC with screen monitor (43 or 48 inch) mounted on a mobile cart with wireless accessories such as mouse, keyboard and stylus in these rooms. The study targeted 398 students and 6 faculty members using four Applied and Collaborative Learning Environments (ACE) rooms at Singapore Institute of Technology. Data was collected via the Active

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	Learning Classroom (ALC) Survey within second trimester of academic year 2017 to ensure learners had adequate experiences in the rooms. According to data analysis; room/course fit, cluster seating, technology, teaching methods, student-centered activities, classroom management in the ACE rooms are important components to increase students' engagements in learning activities. Especially, cluster seating and technology helps in promoting interaction, and they enhance collaboration among the students. However, only ACE rooms are not insufficient to shape learning experiences. The results emphasize that the choice of learning activities and effective use of technology are also influential.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Flexible classroom vs. traditional classroom at the university**
Author/s Name, Surname	Stern Neill, Rebecca Etheridge
Published Title	Flexible Learning Spaces: The Integration of Pedagogy, Physical Design, and Instructional Technology
Printing Company	Marketing Education Review
Year, Volume, Issue	2008; Volume 18, Issue 1: Special Issue on Teaching Innovation
Pages	47-53
Link & date of access (if available)	https://www.researchgate.net/publication/48909239_Flexible_Learning_Spaces_The_Integration_of_Pedagogy_Physical_Design_and_Instructional_Technology; 24.01.2020
DOI or ISBN:	10.1080/10528008.2008.11489024
Reference Copyright:	©Taylor & Francis
Citation formula	Neill, S., Etheridge, R. (2008). Flexible Learning Spaces: The Integration of Pedagogy, Physical Design, and Instructional Technology, *Marketing Education Review*, 18, 1, 47-53, DOI: 10.1080/10528008.2008.11489024
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	Student-centered approach in the flexible classroom results in a higher student engagement, more collaborative learning, diversity of use and enhanced teaching/learning styles of participants. Researchers noticed that changing the setting of the classroom does not change the pedagogical approach as teachers are using multiple student-centered approaches in both traditional and flexible classroom settings but it makes the perception of the learning environment more positive.
Full description:	Neill and Etherige (2008) investigated a transformation of a university classroom to see whether it had an effect on the students' engagement, collaboration and learning styles. Members of the faculty and staff collaborated with each other to develop a flexible learning space suitable for their needs. The classroom was changed taking into

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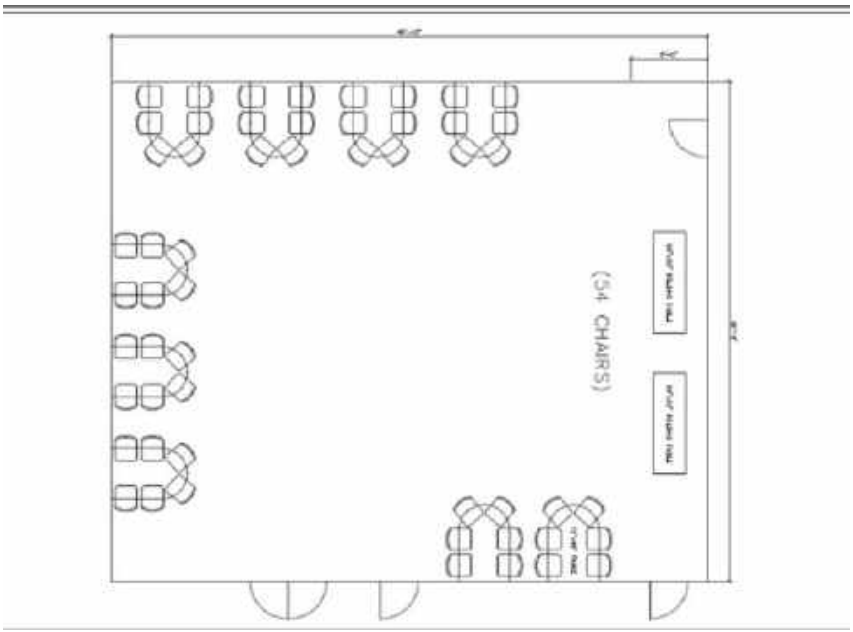
	consideration its pedagogical use (transition to a more student-centered approach), physical design (easy-to-adjust the setting), and decentralized use of information technology. The room was equipped with movable tables able to sit 6-7 students each (54 in general), PCs along the sides, white boards and projectors. Multiple and differentiated classes were assigned to learn in the space (13 in total where some teachers were assigned to the classroom and some requested it) and compared with a control group of 18 classes in a traditional setting. Data was gathered through surveys (N=180 students, n=8 faculty) and interviews. The results showed that teachers used multiple student-centered teaching approaches (ex. discussions or group activities) in both traditional and flexible classrooms, however the flexibility of the room correlated with increased student engagement, more collaborative learning, greater variety of use and enhanced teaching/learning styles of participants. When comparing the classes led by the same instructor in a traditional vs. flexible setting, the researchers concluded that the flexible classroom did not change the approaches to teaching but it changed the perception of the environment making it more positive for both students and teachers. Researchers also noticed that some of the barriers in implementing the flexible classroom were the fixed placement of the instructor's PC and making sure teachers and students feel comfortable with moving the tables and chairs to suit the instruction of the lesson.

Additional comments:

The author also presented how the room was configured during activities:



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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Flexible Seating and Flexible Learning**
Author/s Name, Surname	Jill Snape, Aaron Johnston
Published Title	Flexible Seating and Flexible Learning
Printing Company	Teachstarter.com
Year, Volume, Issue	2019; Episode 105:
Pages	
Link & date of access (if available)	https://www.teachstarter.com/podcast/flexible-seating-and-flexible-learning-gb/; 14.02.2020
DOI or ISBN:	
Reference Copyright:	©Teachstarter.com
Citation formula	J. Snape, A. Johnston. (2019). Flexible Seating and Flexible Learning. *For the Love of Teaching,* episode 105, 17 Nov. 2019. https://www.teachstarter.com/podcast/flexible-seating-and-flexible-learning-gb/; 14.02.2020
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary
Short description: [3- 5 sentences]	This episode of the *For the Love of Teaching Podcast* features an interview with Aaron Johnston, a teacher and assistant principal from Australia, who has extensive practical experience in implementing and working in flexible learning environments. Johnston shares his insight related to the process of implementing flexible learning spaces, which according to him must be accompanied by implementing flexible learning approach. He pinpoints some challenges which a teacher working in a traditional-layout classroom might encounter when trying to switch to flexible learning space. [478 characters]
Full description, 1500-2000 signs:	The idea of **flexible learning spaces (FLS)** has two sides: one is the choice of furniture and equipment, the other is "giving students choice and ownership and self-direction in finding spaces and places that work best for them to help them learning and get the most out of their learning."

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	On the other hand, **flexible learning** is the pedagogy and the teaching approach that the educator should use to "work hand in hand with the actual, physical layout of the classroom". Johnston's classroom is divided up into the areas called: **collaboration space, engine room, collaboration desks, creative space and lone zon**e. The final layout is the result of a year-long process of trial and error, during which some students had problems concentrating in an open space and needed some space away from the collaboration zones". This for example resulted in creating a closed-off room for individual work. The layout of the classroom is just as important as planning the program and units of work because if the classroom is not set up in a way that is conducive to learning, it is going to be a hindrance. In order to increase chances of success during the implementation of FLS, it is important to explain to students the purpose of each zone, the routines and procedures that help the space function in an efficient way and set clear expectations. Students should be told about "the invisible boundaries which exist between different zones in the classroom, about being considerate to other people as there is more than one class in one room at a time." Some teachers get discouraged from flexible learning because they try to implement it all at once. If we teach in a traditional-layout classroom, it is better to start with one thing at a time, and then add new features over time. Teachers should be flexible if they want to implement flexible learning. [1999 characters]

Additional comments: Videos presenting flexible classroom spaces described in the podcast can be viewed at https://www.instagram.com/stories/highlights/17948404861093615/?hl=en and at https://www.instagram.com/stories/highlights/17868852694305579/?hl=en

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Researcher's Name of the Resource	**Implementing Genius Hour in Your Classroom**
Author/s Name, Surname	Kimberley Crouch
Published Title	Implementing Genius Hour in Your Classroom
Printing Company	Minds in Bloom - Ideas for Educators with Rachel Lynette Blog
Year, Volume, Issue	May 2016
Pages	
Link & date of access (if available)	https://minds-in-bloom.com/implementing-genius-hour-classroom/ (access March 8, 2020)
DOI or ISBN:	
Reference Copyright:	© Kimberley Crouch
Citation formula	Crouch, K. (2016). Implementing Genius Hour in Your Classroom, *Minds in Bloom - Ideas for Educators with Rachel Lynette* (blog]. https://minds-in-bloom.com/implementing-genius-hour-classroom/
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary / Secondary / Higher
Short description: [3- 5 sentences]	Genius Hour is a scaffolded type of inquiry-based learning. Giving students the choice of the topic that they are going to pursue and research increases their intrinsic motivation. This method goes hand in hand with flexible classroom environments, as students choose not only whether to work alone or in groups, but also make use of the classroom environment on each of the stages of their project work. Kimberley Crouch in her blog post provides some practical tips related to implementing Genius Hour, including suggestions related to the planning stage, pitching students' ideas and keeping track of the students' work through blogs.
Full description, 1500-2000 signs:	To promote innovation among their employees, companies like 3M or Google have offered to give them 20% of their time to pursue projects related to their passions and interests, which resulted in developing such ground-breaking products as Post-it notes or Gmail. This idea can be transferred to the school ground as Genius Hour, which Kimberely

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	Crouch describes as “an inquiry-based learning project in which students work on individual projects focused on their passion.” This active learning method develops student creativity, encourages collaboration and innovation, complex problem-finding and problem-solving. Genius Hour “teaches your students life skills, responsibility, planning, overcoming obstacles, and goal settings.” To embark upon implementing Genius Hour, the teacher needs to get to know its underlying principles. This can be done by reading a book by A.J. Juliani and by researching topic-related blogs, podcasts and websites. The first step is to plan the process, e.g. by deciding on how long the classes (roughly one hour per week) are going to last. Croach suggests 10 weeks, but his time-frame depends on our students’ needs and other factors. The first phase of the actual implementation of Genius Hour is spending enough time to make sure our students understand the underlying principles of the process they are going to be involved in and what our expectations are. Genius Hour requires the teacher to hand over the control over the learning process to their students, which Croach also notes as one of the possible challenges. The teacher’s role is to provide the scaffold and set expectations, but it is the students who “plan their own process, and figure out how they are going to meet their goal.” If grades are needed, they are awarded based on the process, not only on the end product. After explaining to students what Genius Hour is about, the process of choosing the ideas for student projects starts. Depending on the students’ age, the problems that students choose to be involved with may be more or less complex. Crouch suggests teaching students the difference between “thick” and “thin” questions, i.e. problems which are complex and multi-layered as opposed to questions which can be answered simply by conducting a short google search. According to Crouch, Genius Hour cycle comprises two presentations by students. The first one is a 60-90 second presentation called “the Elevator Pitch”, during which students present their ideas and plans, whereas their classmates give them feedback. The other presentation lasts 4-6 minutes and takes place during the last phase of the project, when students present the results of their work, including information about the challenges they had to deal with and the successes. In the meantime students are expected to run a blog where they document their progress each week “to discuss their process and journey.”

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Researcher's Name of the Resource	**Innovating Pedagogy 2019: Open University Innovation Report 7**
Author/s Name, Surname	Rebecca Ferguson, Tim Coughlan, Kjetil Egelandsdal, Mark Gaved, Christothea Herodotou, Garron Hillaire, Derek Jones, Iestyn Jowers, Agnes Kukulska-Hulme, Patrick McAndrew, Kamila Misiejuk, Ingunn Johanna Ness, Bart Rienties, Eileen Scanlon, Mike Sharples, Barbara Wasson, Martin Weller, Denise Whitelock
Published Title	Innovating Pedagogy 2019: Open University Innovation Report 7
Printing Company	The Open University
Year, Volume, Issue	2019
Pages	45
Link & date of access (if available)	https://iet.open.ac.uk/file/innovating-pedagogy-2019.pdf
DOI or ISBN:	ISBN 9781473028333
Reference Copyright:	The Open University, 2019
Citation formula	Ferguson, R., Coughlan, T., Egelandsdal, K., Gaved, M., Herodotou, C., Hillaire, G., Jones, D., Jowers, I., Kukulska-Hulme, A., McAndrew, P., Misiejuk, K., Ness, I. J., Rienties, B., Scanlon, E., Sharples, M., Wasson, B., Weller, M. and Whitelock, D. (2019). Innovating Pedagogy 2019: Open University Innovation Report 7. Milton Keynes: The Open University
Educational level: [Preschool / Primary / Secondary / Higher education]	Preschool / Primary / Secondary / Higher education
Short description: [3- 5 sentences]	The Innovating Pedagogy reports are intended for teachers, policy makers, academics, and anyone interested in how education may change in the modern, technology-enabled world over the next ten years. This report involves new educational terms, theories, and practices. This report also introduces ten pedagogies as follows: • Playful Learning, • Learning with Robots, • Decolonising Learning, • Drone-based Learning,

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	• Learning through Wonder, • Action Learning, • Virtual Studios, • Place-based Learning, • Making Thinking Visible, • Roots of Empathy.
Full description, 1500-2000 signs:	This report proposes new forms of teaching, learning, and assessment to guide teachers, academics and policy makers in innovative education. 1 Playful learning: Playful learning evokes creativity, imagination, problem-solving skills and happiness both for children and adults. Play-based approaches to teaching, designing digital games for learning, and developing playful values support playful learning. 2 Learning with robots: Robots can help teachers with assessment, and they can engage in frequent conversations with learners to facilitate and enable learning. Furthermore, they can assist learners by providing a partner for conversation who is always available. So teachers can lead their energy to other tasks like judgement, emotional support, etc. 3 Decolonising learning: As education has become increasingly global, it is objected to education coming from a particular tradition. Decolonising learning is an approach that includes indigenous knowledge, and students can define their values and success on their own terms. It helps teachers to recognise, understand, and examine their professional practices. 4 Drone-based learning: Drones are used to take photographs or make videos in learning spaces beyond the classroom. Learners can use them to see inaccessible or dangerous places and a landscape from different angles. Thus they can develop new skills like planning routes and interpreting visual clues in the landscape. 5 Learning through wonder: When learners provoke interest and curiosity by questioning and investigating encounters in the everyday world, a child's desire to understand leads to learning. For example, a nature walk can reveal patterns, such as spirals, fractals, waves, bubbles, and cracks in mathematical modelling. 6 Action learning: Action learning aims to advance existing skills and to solve problems. It is a team-based approach so learners work in small groups by asking questions, sharing experiences, and reflecting on their actions with a trained facilitator. The groups consist of people with different interests and experiences. 7 Virtual studios: Virtual studios are online versions of physical studios. However, they have their own educational value and offer new possibilities apart from physical studios. 8 Place-based learning: Place-based learning considers environment as a trigger for learning, feelings and experience. It involves a local community during learning activities and uses the natural environment

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	to inspire learners. Mobile technologies can be used to support learning outside the classroom, as well. 9 Making thinking visible: Making thinking visible means leaving traces of thinking in the form of written marks and interactions with digital media. Learners can write down the steps of their thinking, make annotations or make videos. Thusteachers can benefit from seeing students' goals, concepts, and progress. 10 Roots of empathy: It is a classroom programme that is designed to teach children empathy. This program helps children to develop their emotional understanding, decrease their aggressive behaviour and improve their social behaviour.

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Insights from the Science of Learning Can Inform Evidence-Based Implementation of Peer Instruction**
Author/s Name, Surname	Julie A. Schell and Andrew C. Butler
Published Title	Insights from the Science of Learning Can Inform Evidence-Based Implementation of Peer Instruction
Printing Company	Frontiers in Education
Year, Volume, Issue	28 May 2018
Pages	13
Link & date of access (if available)	https://www.frontiersin.org/articles/10.3389/feduc.2018.00033/full
DOI or ISBN:	doi: 10.3389/feduc.2018.00033
Reference Copyright:	Schell JA and Butler AC (2018) Insights From the Science of Learning Can Inform Evidence-Based Implementation of Peer Instruction. Front. Educ. 3:33. doi: 10.3389/feduc.2018.00033
Citation formula	
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary / Secondary
Short description: [3- 5 sentences]	Peer Instruction is considered as an easy-to-use method that fosters active learning in K-12. The use is widespread among educators because of its effectiveness, simplicity, and flexibility. However, the flexibility can cause wide differences in implementation: teachers make change often but often such without research-supported guidelines or considering of the potential impact on student learning. The article presents a framework for guiding modifications to Peer Instruction based on theory and findings from the science of learning. It presents six common modifications made by educators through the lens of retrieval-based learning and provide guidelines to support in evidence-based implementation.
Full description, 1500-2000 signs: [best if a consistent material describing	The theory section offers and overview of the Peer Instruction method, including a brief history and finally indicates the nine key features of Peer Instruction (Mazur 1997): 1. Instructor adapts instruction based on student responses

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the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	2. Students are not graded on in-class Peer Instruction activities 3. Students have a dedicated time to think and commit to answers independently 4. The use of conceptual questions 5. Activities draw on student ideas or common difficulties 6. The use of multiple-choice questions that have discrete answer options 7. Peer Instruction is interspersed throughout class period 8. Students discuss their ideas with their peers 9. Students commit to an answer after peer discussion The effectiveness of Peer Instruction is explored by drawing upon theory and findings from the science of learning, which points to that Peer Instruction forces the students to think through the arguments which fosters critical thinking in the domain of study and metacognition. Such cognitive skills are key parts of active learning and essential for monitoring and directing one's own learning. *When students receive feedback throughout each cycle of Peer Instruction on how well they "understand" the concepts, they can direct their efforts toward learning concepts they are struggling with. In sum, a clear sense of the skills and knowledge that students need to acquire is critical to selecting the learning activities and outcome measures that will be appropriate for any given group of students.* Different Peer Instruction activities are explained; effectiveness of a certain learning activity can differ pending on where students are in the process of learning, so structuring and scaffolding learning is imperative as student knowledge and skills progress. *A single cycle of Peer Instruction, which could be as short as 2–3 min, is packed with variation in learning activities. For example, students think on their own, retrieve, discuss, retrieve again, and then receive feedback on their responses.* According to the authors *Peer Instruction is an effective pedagogy because it utilizes many principles and best practices from the science of learning, while also allowing flexibility with respect to implementation.* Furthermore, through flexibility, Peer Instruction enables educators to foster active learning in ways that are optimal for their particular context. Many of the common modifications to Peer Instruction involve eliminating opportunities for retrieval practice in ways that might reduce active learning. The six Common Modifications explained by the authors are: 1: Skipping Initial Individual Thought and Response 2: Revealing the Frequency of Responses Before Peer Discussion 3: Refashioning Question Design 4: Skipping Peer Discussion 5: Skipping Final Individual Thought and Response (Step 5) 6: Skipping the Explanation of the Correct Answer

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Learner-Centered Teaching**
Author/s Name, Surname	Maryellen Weimer
Published Title	Learner-Centered Teaching
Printing Company	John Wiley & Sons, Inc.
Year, Volume, Issue	2002
Pages	
Link & date of access (if available)	https://tlap.ksu.edu.sa/sites/tlap.ksu.edu.sa/files/attach/ref17.pdf; 9.04.2020
DOI or ISBN:	ISBN 0-7879-5646-5
Reference Copyright:	© John Wiley & Sons, Inc.
Citation formula	Weimer, M. (2002). Learner centered teaching five key changes to practice. San Francisco: Jossey-Bass.
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	Student-centered approach can be challenging for the teachers. Weimer (2002) identified 5 hey challenges that teachers face and benefits of implementing changes in these five areas.
Full description:	Weimer (2008) identified 5 key changes to practice that need to be implemented in the student-centred learning approach: 1. The balance of power – for the student-centered approach to work the power needs to be re-distributed from teachers to the students. As students should be in the centre of the learning process, they need to start being in charge of the learning process, having the ability to influence what and how they are learning; 2. The function of content – following the constructivist approach where learners actively construct their knowledge by constructing the meaning and relating it to the previously acquired knowledge; 3. The role of the teacher – involving students in the process of acquiring knowledge, being active in the learning. Teachers are not

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	the only source of expertise, students should not wait for them to learn; 4. The responsibility for learning – students should be responsible for their own learning, they should be thought how to learn and become autonomous, self-regulating learners; 5. Evaluation purpose and processes – teachers need to implement assessment for learning and assessment as learning – both being formative assessment strategies to support students as learners.

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Makerspaces for Education and Training. Exploring future implications for Europe**
Author/s Name, Surname	Riina Vuorikari, Anusca Ferrari and Yves Punie
Published Title	Makerspaces for Education and Training. Exploring future implications for Europe
Printing Company	Joint Research Centre (JRC) / JRC Science for policy report
Year, Volume, Issue	2019
Pages	
Link & date of access (if available)	https://publications.jrc.ec.europa.eu/repository/bitstream/JRC117481/makerspaces_2034_education.pdf (January 2020)
DOI or ISBN:	ISBN 978-92-76-09032-8, doi:10.2760/946996, JRC117481.
Reference Copyright:	©European Union
Citation formula	Vuorikari, R., Ferrari, A., Punie, Y., Makerspaces for Education and Training – Exploring future implications for Europe, EUR 29819 EN, Publications Office of the European Union, Luxembourg, 2019
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary and Higher education
Short description: [3- 5 sentences]	The document explains how makerspaces foster active learning.
Full description:	This report shows why makerspaces are consider as active learning spaces. They are collaborative workspaces that allow making, learning, exploring and sharing. Activities at makerspaces involve personal development and self-regulation. Furthermore, "they foster knowledge production instead of only knowledge consumption" (p.7). Activities within makerspaces combine disciplines, foster learning and meaningful experiences by problem solving and informal social interaction. Based on this framework, the report proposes seven insight for policy.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Making thinking visible**
Author/s Name, Surname	David Perkins
Published Title	Making thinking visible
Printing Company	
Year, Volume, Issue	2003
Pages	
Link & date of access (if available)	https://pz.harvard.edu/resources/making-thinking-visible-article-0 ; 9.04.2020
DOI or ISBN:	-
Reference Copyright:	© 2016 President and Fellows of Harvard College | Harvard Graduate School of Education
Citation formula	Perkins, D. (2003). Making thinking visible. Retrieved from: https://pz.harvard.edu/resources/making-thinking-visible-article-0 on 9.04.2020
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	In the traditional classroom, thinking is invisible. Group of researchers from Harvard Graduate School of Education is conducting research aimed at establishing good practices we it comes to developing thinking skills in students. Culture of thinking needs to be established in the class from day one of learning, inspiring curiosity and inquiry.
Full description:	In the traditional classroom, thinking is invisible. Group of researchers from Harvard Graduate School of Education is conducting research aimed at establishing good practices we it comes to developing thinking skills in students. There are multiple ways of making thinking visible – reflecting on the language of thinking, asking questions, like "What if?" or "How else could this be done?". Another way is using thinking routines in the teaching practice which are simple protocols that can be used with students independent of their age and learning abilities. Thinking routines encourage students to provide explanations and justifications of their knowledge and understanding. For example,

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	asking two simple questions: "What's going on here?" and "What do you see that makes you say so?" – make them not only to describe a picture but also analyse it to justify the response given. There are multiple thinking routines, like “circle of viewpoints” that is aimed at identifying different perspectives on an issue, or “think, pair, share”, where students need to reflect and then discuss with a partner their standpoint on a certain topic. Culture of thinking needs to be established in the class from day one of learning, inspiring curiosity and inquiry.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Visible thinking**
Author/s Name, Surname	Ron Ritchhart, Mark Church, Karin Morrison
Published Title	Making Thinking Visible: How to Promote Engagement, Understanding, and Independence for all learners
Printing Company	Jossey-Bass
Year, Volume, Issue	2011
Pages	
Link & date of access (if available)	https://pz.harvard.edu/sites/default/files/Chapter%201%20MTV%20Ritchhart%20Sample.pdf; 9.04.2020
DOI or ISBN:	ISBN: 978-0470915516
Reference Copyright:	© Jossey-Bass
Citation formula	Ritchhart, R., Church, M., & Morrison, K. (2011). *Making thinking visible: how to promote engagement, understanding, and independence for all learners*. San Francisco, CA: Jossey-Bass.
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	The first thing that comes to teachers' minds when talking about thinking are taxonomies, like Bloom's. However, thinking is a tool that is used to achieve the main goal of learning – understanding. To develop thinking students' need to be engaged in metacognitive activities that lead to the development of thinking and make their thinking visible in the classroom.
Full description:	How would you identify thinking in education? Teachers often associate it with Bloom's taxonomy (moving from lower- to higher-thinking in knowledge, comprehension, application, analysis, synthesis, and evaluation) or a sequence created by Anderson and Krathwohl in 2001 (remembering, understanding, applying, analyzing, evaluating, and creating). However, both of them might be problematic in the school reality – they are seem out of context and they do not take into consideration the quality of thinking. There are also problems with the

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	confusing term of understanding. Nowadays, understanding is seen not as a way of thinking but as a primary goal and result of thinking and learning in general. “The Teaching for Understanding (TfU) framework (Blythe & Associates, 1998) and Understanding by Design (UBD) (Wiggins & McTighe, 1998) are two current curricular planning tools that help teachers focus on understanding” (p. 8). Although teachers should focus on understanding as the main aim in creating educational experiences, they often do not, trying to prepare students for high-stake tests. The classroom activities often focus on instruction and practice and turning the memorised facts into understanding is not planned for. There is little planning for thinking to happen in the classroom. To make the learning happen, teachers need to focus on understanding the scope of the subject they teach. “We need to be aware of the kinds of thinking that are important for scientists (making and testing hypotheses, observing closely, building explanations...), mathematicians (looking for patterns, making conjectures, forming generalizations, constructing arguments...), readers (making interpretations, connections, predictions...), historians (considering different perspectives, reasoning with evidence, building explanations...), and so on, and make these kinds of thinking the center of the opportunities we create for students” (p. 10-11). There are 8 types of thinking that are essential in aiding understanding: “1. Observing closely and describing what’s there 2. Building explanations and interpretations 3. Reasoning with evidence 4. Making connections 5. Considering different viewpoints and perspectives 6. Capturing the heart and forming conclusions” (p. 11) “7. Wondering and asking questions 8. Uncovering complexity and going below the surface of things” (p. 13). The list can be used in planning for learning. They can also be used as a part of the grading rubric or a base for a student portfolio. 1. Focusing on these types is the first step to make thinking visible. However, to make it a habit student need to be consciously aware of their thinking skills, first. Thus, a long list of thinking routines that are research- and practice-based might be a useful tool in developing the habit of thinking.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active learning must be prepared and intended**
Author/s Name, Surname	Jean-Marie Gilliot
Published Title	Pédagogie active : quelques formes emblématiques et alternatives
Printing Company	Symposium proceedings DEFI&Co "Penser la formation aujourd'hui : un nouveau paradigme"
Year, Volume, Issue	2017
Pages	39-42
Link & date of access (if available)	https://recherche.cesi.fr/wp-content/uploads/2018/03/Actes_colloque_DEFICo_10-2017.pdf Consulted on January 2020
DOI or ISBN:	
Reference Copyright:	Public domain
Citation formula	Gilliot, J-M. (2017). Pédagogie active : quelques formes emblématiques et alternatives. Communication In Blandin, B. (ed.) Symposium proceedings DEFI&Co "Penser la formation aujourd'hui : un nouveau paradigme", 39-42.
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	Contrary to the received wisdom about the spontaneity of active pedagogy, this communication underlines the preparation required and the main characteristics to be considered in order to foster active learning.
Full description:	Active learning within an active pedagogy framework must be student-centred. Based on Jouquan and Bail, Gilliot (2017) pinpoints the importance of organising student's activities in order to allow a complete association between student's actions, interactions and reflections within the learning process. In Gilliot's understanding of what active pedagogy is, a conceptual framework that accompanies activity is more important than the activity itself. Being able to experience error is one example of it.

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	Teacher's role in active pedagogy is to focus on student's learning, guide and facilitate their learning by giving them feedback. It is also important to show that teachers are also learners. Based on Jouqaun and Bail (2003), Gilliot explains that students learn through emerging and persistent problems, in an individual and interpersonal way that allows them to actively and deeply treat information. Activities must make sense to students. They must include development of expression and communication competencies, teamwork and creativity. In this framework, assessment considers the ability of students to identify the characteristics of an excellent work, including knowledge and general learning strategies. [1 219]

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active pedagogy characteristics**
Author/s Name, Surname	Marce Lebrun
Published Title	Quelques méthodes pédagogiques actives
Printing Company	Théories et méthodes pédagogiques pour enseigner et apprendre
Year, Volume, Issue	2007
Pages	123-168
Link & date of access (if available)	
DOI or ISBN:	2804154114, 9782804154110
Reference Copyright:	© De Boeck & Larcier
Citation formula	Lebrun, M. (2007). Quelques méthodes pédagogiques actives. In Lebrun, M., & De Ketele, J. (2007). *Théories et méthodes pédagogiques pour enseigner et apprendre: Quelle place pour les TIC dans l'éducation ?* (2nd edition). Bruxelles: De Boeck université.
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary and Higher school
Short description: [3- 5 sentences]	Lebrun presents an inventory of the active pedagogy elements. From his point of view, teacher's and student's roles derive from these elements.
Full description:	The author inventories the characteristics of active pedagogy from his literature review and associates it with his theoretical proposition named "pentagon of learning". For Lebrun (2007), the framework of active pedagogy is composed of 13 elements : "learning as a personal process; previous knowledge as catalyser; the motivation factors; the importance of available resources; the role of context, the learning environment and concrete experiences; the high-level abilities to be implemented; the research and questioning processes within learning; the conceptual change (awareness, imbalance and reformulation); the need of feedback in activities; the cooperative and interactive aspect of learning; the connection between personnel, professional and life

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	projects; the importance of manufacturing, creating; the reflection role on the going on learning (p. 4). For Lebrun (2007) these 13 elements draw student's and teacher's roles. On the one side, ideal teacher must have knowledge and approach expertise. He should create "enigma" among students and guide them during the learning process. On the other side, students should develop his own knowledge instead of reproducing other's. [1 192]

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Redesigning Learning Spaces – Practical Advice**
Author/s Name, Surname	Robert W. Dillon, Benjamin D. Gilpin, A. J. Juliani, and Erin M. Klein
Published Title	Redesigning Learning Spaces – Practical Advice (Corwin Connected Educators Series)
Printing Company	Corwin
Year, Volume, Issue	2016
Pages	
Link & date of access (if available)	
DOI or ISBN:	978-1506318318
Reference Copyright:	© 2016 by Corwin
Citation formula	Dillon, R. W, Gilpin, B. D., Juliani, A. J., Klein, E.M. (2016). Redesigning Learning Spaces, (eBook edition]. Corwin. https://www.amazon.com/Redesigning-Learning-Spaces-Connected-Educators/dp/1506318312
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary / Secondary
Short description: [3- 5 sentences]	Dillon, Gilpin, Juliani and Klein provide us not only a theoretical rationale behind the classroom redesign, but also offer numerous pieces of practical advice, starting from the need to involve students and other groups of stakeholders at the initial stage of the learning spaces redesign process, through examples of questions that we should ask, to using writable surfaces in order to continue the feedback on the changes that have been introduced. Practical advice also concerns technology and how it should be treated in a flexible learning environment. Authors also include tips related to sharing information about the redesign process with the world, including through social media.
Full description, 1500-2000 signs:	Dillon, Gilpin, Juliani and Klein focus on the practical aspects of classroom redesign. The three qualities conducive to creating the

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	optimal classroom experience are that it should be “learner-centered, engaged and dynamic”. It should be warm and welcoming and should offer flexibility, but, at the same time, the learning space should not be overloaded with stimulating decorations. Teachers should treat the classroom redesign process as a journey rather than a task to be completed. It is crucial to involve all stakeholders, including students themselves. Consequently, “the design process needs to be bathed in empathy”, which should “include student voice on the essential elements of a modern learning experience”. (loc. 357) According to Dillon et al., classroom redesign should also impact the location of the teacher, which in traditional classrooms is associated with “a central place of information dissemination [...] that sends the message that learning happens when the teacher is talking.” (loc. 779) We also need to find “sustainable ways to promote student voice” after the new classroom space is ready. One of the means of doing it is providing numerous writable surfaces in various places across the school, e.g. idea walls in classrooms or hallways, but also desks, tables and windows. “Seeing voice leads to hearing voice, so then voice can become part of natural flow of a classroom and through a school.” (loc. 363) To minimize the costs, teachers can ask students to bring items from home, while some other items could be bought at garage sales. Even without any budget at all, teachers can start with “minimizing the clutter, [...] taking items off the wall [...] or pulling open the drapes.” As for the technology used in the classroom, the question is <u>how</u> technological devices are integrated by the teacher, rather that what types of technology is used. Three key factors in this case include “strong wireless access [...] charging stations for devices and having enough power outlets to maintain classroom flexibility.” (loc. 288) .

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Redesigning Learning Spaces – Theory**
Author/s Name, Surname	Robert W. Dillon, Benjamin D. Gilpin, A. J. Juliani, and Erin M. Klein
Published Title	Redesigning Learning Spaces (Corwin Connected Educators Series)
Printing Company	Corwin
Year, Volume, Issue	2016
Pages	
Link & date of access (if available)	
DOI or ISBN:	978-1506318318
Reference Copyright:	© 2016 by Corwin
Citation formula	Dillon, R. W, Gilpin, B. D., Juliani, A. J., Klein, E.M. (2016). Redesigning Learning Spaces, (eBook edition]. Corwin. https://www.amazon.com/Redesigning-Learning-Spaces-Connected-Educators/dp/1506318312
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary / Secondary
Short description: [3- 5 sentences]	For Dillon, Gilpin, Juliani and Klein, the classroom redesign is necessary as schools find it increasingly difficult to prepare students for the challenges of modern world. What is more, this change must involve not only modifying the physical space, but also the teaching methods. Learning space redesign influences not only the learning process, but also culture of school and the entire community. On the other hand, flexible learning spaces may amplify the effects of poor pedagogy, which may result in some educators' unwillingness to change their control-based methods.
Full description, 1500-2000 signs:	Dillon, Gilpin, Juliani and Klein advocate the classroom redesign as the transformation of "learning spaces from factory model schemes to modern educational ecosystems" (loc. 741) and argument it by stating that the world outside of the school walls "continues to innovate and advance at an increasing pace", which means that "schools are

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	functioning well below the pace of society, and thus they are struggling to prepare kids in the area of career readiness without bringing a culture that is portable, flexible and agile to the forefront." (loc. 746) According to Dillon et al., "redesigning spaces to maximize learning is primarily a shift in culture and mindset." (loc. 772) Teachers who want to change their learning spaces should understand that this decision is "a commitment to student-centered learning including a shift in the locus of control." (loc 779) It is also noted that, for the change to be successful, teachers need to "see their roles in a multi-facated way": as "facilitators of deeper, quality learning, learners and positive risk-takers for kids, and as empowered change agents in the area of learning-space design". On the other hand, when talking about the introduction of flexible learning spaces, Dillon et al. warn us that they "amplify the impact of poor teaching, and this is especially true when a classroom facilitator manages throught control. [...] As students control the flow, pace and direction of the class, more and more legacy practices fail." (loc. 785) This can result in the fact that some teachers can get discouraged from learning-space design changes because "no one wants their weaknesses exposed publicly." (loc. 791) Consequently, as part of the Novigado project, we should support the teachers who participate in the project by providing "ideas and resources on how to shift their daily practices to support learning in their modern habitat." (loc. 797) .

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Reference framework for active learning in higher education**
Author/s Name, Surname	Pranav Naithani
Published Title	Reference framework for active learning in higher education
Printing Company	
Year, Volume, Issue	2008
Pages	
Link & date of access (if available)	https://www.researchgate.net/publication/282124753_Reference_framework_for_active_learning_in_higher_education
DOI or ISBN:	
Reference Copyright:	
Citation formula	Naithani P. (2008), Reference framework for active learning in higher education, https://www.researchgate.net/publication/282124753_Reference_framework_for_active_learning_in_higher_education
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher Education
Short description: [3- 5 sentences]	According to Naithani (2008), Active learning involves designing, implementing, maintaining and promoting, within and outside classroom, an environment for learning, through creating opportunities for active engagement with the subject matter. Cooperative active learning: Students' involvement amongst themselves is crucial for the successful active learning environment. Problem based learning is a self-directed effort of a student towards understanding the solution of a problem.
Full description, 1500-2000 signs:	According to Naithani (2008), Roots of active learning can be traced to Confucius (551-479 BC), who stated, "I hear and I forget. I see and I remember. I do and I understand". Students remembers 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they hear and see, 70% of what they say 90% of what they do. Students do not learn much just by sitting in classes listening to

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	teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. Active learning involves designing, implementing, maintaining and promoting, within and outside classroom, an environment for learning, through creating opportunities for active engagement with the subject matter. Cooperative active learning: Students' involvement amongst themselves is crucial for the successful active learning environment. Learning is a team effort which depends on collaboration and cooperation amongst students. In cooperative learning a class is divided into smaller groups to enhance understanding and learning of students through positive interdependence, individual accountability, continuous interaction, teamwork, to accomplish orderly thinking, problem solving, critical analysis and clear expression. Cooperative learning aims at developing a network of human brains to achieve higher levels of learning (Naithani, 2008). Problem based active learning: Problem based learning is a self-directed effort of a student towards understanding the solution of a problem. In this process the student identifies what he knows and what he needs to know to solve the problem. Problem based learning begins with a challenge of presenting a real-life problem through case studies, assignment to the students, the answer to which they have to find on their own, individually and/or collectively. In PBL the beginning is with a problem and in due course of time students acquire knowledge and skills to solve the problem. Student actively guides his own learning, individually or in a group. The selected problem should reflect real life circumstances and be contemporary to facilitate the process of learning and doing (Naithani, 2008). There are three major components of an active learning environment and they are students, instructors and institute/management. Active learning environment demands behavior modification on the part of students, instructors and institute/management. There is a need of a paradigm shift from the usual approach of 'how I like to teach' to 'how the learner wants to learn and how the learner will learn better'. active learning would start with an instructor who is an active learner and active instructor himself and who can upgrade his knowledge and skills in the time of need. He has to then identify the needs of the students with reference to changes expected in learning environment. He then has to balance the students needs with what he thinks is best for the learning environment. This would lead to the preliminary preparations in collaboration with the learners and would be followed by gradual, step by step implementation of the new methods and tools (Naithani, 2008).

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**ELI 7 things you should know about…**
Author/s Name, Surname	
Published Title	Research on Active Learning Classrooms (ALCs)
Printing Company	Educause Learning Initiative
Year, Volume, Issue	September 2017
Pages	2
Link & date of access (if available)	https://library.educause.edu/-/media/files/library/2017/9/eli7148.pdf
DOI or ISBN:	
Reference Copyright:	2017 Educause
Citation formula	Inaccessible
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	This research provides educators to implement active learning pedagogies, supports learners in ALCs and promotes institutions to invest time, money, space, design and human resources in the development of these classrooms.
Full description, 1500-2000 signs:	It is critical to understand what environments and features best support active learning. Research on ALCs contributes to deeper inquiries on pedagogy, learning, and student success and retention. Future research will likely sort out particular dimensions of active learning and ALCs by emerging research on classroom acoustics, temperature, and lighting. ALCs are designed to help students work together and move freely around the room for learning. Furniture in the ALCs let team projects, group problem sets, structured discussions and debates, experiments with manipulables, and various forms of collective presentation. In addition, ALCs have robust AV/IT capacity, including screen displays linked to one another and to the campus network and the Internet.

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	Downsides • Many ALCs enroll too few students for research purposes. • Collecting controlled comparative data can be difficult. • Students, educators and institutions may have minimal experience with the different types of interactions in ALCs. • This kind of research can be expensive because of multiple control groups, designing space and training educators over long periods of time. The implications for teaching and learning • Findings of the research on ALCs can influence curriculum development and instructional design. • They can lead to change longstanding paradigms of pedagogy, learning, and classroom design.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Discussion protocols**
Author/s Name, Surname	Usable Knowledge
Published Title	Starting the Conversation
Printing Company	
Year, Volume, Issue	2017
Pages	
Link & date of access (if available)	https://www.gse.harvard.edu/news/uk/17/05/starting-conversation; 14.04.2020
DOI or ISBN:	-
Reference Copyright:	© 2020 President and Fellows of Harvard College
Citation formula	Usable Knowledge. (2017, May 9). Starting the Conversation. Retrieved from https://www.gse.harvard.edu/news/uk/17/05/starting-conversation
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	Usable Knowledge (2017) created a list of discussion protocols teachers can use to stimulate engaging discussion in the classroom. The protocols offer a structure that helps the students progress through discussion in the organised manner.
Full description:	Based on the research done by the Teaching and Learning Lab at the Harvard Graduate School of Education, Usable Knowledge (2017) created a list of discussion protocols teachers can use to stimulate engaging discussion in the classroom. The protocols offer a structure that helps the students progress through discussion in the organised manner. They often assign roles so that all the students have an equal chance of participating in the discussion. Protocols are especially helpful when we are discussing a topic that raises controversy or when our students are reluctant to participate in the discussion. Protocols not only allow the teachers to scaffold the discussions but also allow to promote critical and creative thinking, interact, analyse data and adopt

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	different perspectives at looking at a certain topic. The full list of discussion protocols can be found here: https://www.gse.harvard.edu/sites/default/files//Protocols_Handout.pdf

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Teacher feedback during active learning**
Author/s Name, Surname	Linda van den Bergh, Anje Ros and Douwe Beijaard
Published Title	Teacher feedback during active learning: Current practices in primary schools
Printing Company	British Journal of Educational Psychology
Year, Volume, Issue	2012
Pages	341-362
Link & date of access (if available)	https://drive.google.com/open?id=1gpetfsGmFgVG1E7LcNTketCA4hiT8Kvl ; 9.04.2020
DOI or ISBN:	10.1111/j.2044-8279.2012.02073.x
Reference Copyright:	© John Wiley & Sons, Inc.
Citation formula	Bergh, L. V. D., Ros, A., & Beijaard, D. (2012). Teacher feedback during active learning: Current practices in primary schools. *British Journal of Educational Psychology*, 83(2), 341–362. doi: 10.1111/j.2044-8279.2012.02073.x
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary
Short description: [3- 5 sentences]	Active learning feedback should be process-oriented and encourage students to reflect on their current understanding and strategies implemented. The feedback should play a facilitative role.
Full description:	Active learning requires feedback that is not only task-related but also stimulates the development of meta-cognitive and social skills. This kind of feedback may be process-oriented and needs to inform students about their current understanding of performance in relation to the learning goals. Feedback must answer 3 questions: Where am I going? How am I going? And Where to next? It should play a facilitative role. Vermunt and Verloop (1999) distinguish between 3 types of feedback: - Cognitive – information about the task and the process of the task

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	- Meta-cognitive – urges student to reflect and evaluate on their own performance, understanding and strategies used for problem-solving - Affective – focuses on motivation, effort and engagement with the process The most effective feedback engages student in the reflection on their performance and is facilitative rather than directive. Bergh et al.. (2012) conducted a study on the role of feedback in the context of the active learning process. They examined the practices of 32 Dutch primary school teachers (6-8 grade) who practices active learning by analysing videos of their active learning lessons. The results showed that about half of the interactions with students contained feedback that was focused on the process the students were undergoing and the task itself (cognitive level). The feedback was also very directive rather than facilitative. Only 5% of the feedback related to the learning goals. The authors concluded that feedback is a major problem that needs to be addressed by the professional development.

Additional references:

Vermunt, J. D., & Verloop, N. (1999). Congruence and friction between learning and teaching. Learning and Instruction, 9, 257–280.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Discussion strategies**
Author/s Name, Surname	Jennifer Gonzalez
Published Title	The Big List of Class Discussion Strategies
Printing Company	
Year, Volume, Issue	2015
Pages	
Link & date of access (if available)	https://www.cultofpedagogy.com/speaking-listening-techniques/ 14.04.2020
DOI or ISBN:	-
Reference Copyright:	© 2020 Cult of Pedagogy
Citation formula	Gonzalez, J. (2015, October 15*). The Big List of Class Discussion Strategies*. Retrieved April 14, 2020, from https://www.cultofpedagogy.com/speaking-listening-techniques/
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	Jennifer Gonzalez (2015) presents 17 class discussion strategies which aim to engage all students in the lesson. They oppose to a technique she calls Fisheye Teaching where only a couple of the most courageous students take part in the discussion. She divided the strategies into 3 groups: high-prep which require more teacher preparation, low-prep which can be used any time without the special preparation, and ongoing strategies which can be integrated into the instruction. [479 signs]
Full description:	Jennifer Gonzalez (2015) presents 17 class discussion strategies which aim to engage all students in the lesson. They oppose to a technique she calls Fisheye Teaching where only a couple of the most courageous students take part in the discussion. She divided the strategies into 3 groups: high-prep which require more teacher preparation, low-prep which can be used any time without the special

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	preparation, and ongoing strategies which can be integrated into the instruction. High-prep strategies: - Gallery Walk – firstly student work in small groups on a certain topic assigned by a teacher. Then, they are divided into new groups and rotate between the stations teaching each other about the content they were working on. https://www.youtube.com/watch?v=pSt5echeRrM&feature=youtu.be - Philosophical Chairs – this is a form of a debate. The debatable statement is read aloud and students divide into positions based on whether they agree or disagree with the statement. It may also take a form of a continuum. Where students stand in a half-circle. Students take turns to defend their position. https://learn.teachingchannel.com/video/reading-like-a-historian-taking-positions - Pinwheel discussion - students are divided into 4 groups – 3 of them represent a certain standpoint whereas the 4th one plays a role of a devils advocates and keeps the discussion going. Each group has an assigned time to prepare. The name comes from the way they are seated. Students take turns in speaking for their group. https://learn.teachingchannel.com/video/high-school-literature-lesson-plan - Socratic seminar – for this discussion activity students need to prepare beforehand by reading a text or a couple of texts related to the topic and annotating them. The discussion starts with a leader who asks an open-ended question like “What do you think this text means?”. The discussion follows naturally with the aim to gain a deeper understanding of the text presented. Socratic seminar can have a form of a Fishbowl activity where only a couple of students discuss the topic and the others act as abservers. https://www.facinghistory.org/resource-library/teaching-strategies/socratic-seminar - TQE - it is a discussion technique that is split into 4 stages. Before the class students prepare by reading an assigned text. During the class, they are split into groups where they firstly discuss their Thoughts, Questions and Epiphanies (TQE) for 15 minutes. Stage 3 is choosing up to 2 TQEs that will be written down and shared with other students on the board. The last stage is a whole-class discussion of the chosen TQEs. https://www.cultofpedagogy.com/tqe-method/ Low-prep strategies: - Affinity mapping – firstly, students brainstorm answers to a very broad question, like “What are the implications of the WWII?” which they write down on post-its. After they gathered lots of ideas, they start to arrange them in groups. https://www.youtube.com/watch?v=UynxDyr0lAo&feature=youtu.be

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	- Concentric circles (Speed Dating, Onion) – Each student in the outer circle is paired with a student in the inner circle. The teacher asks a question which they need to discuss. After that they rotate and a new discussion question is asked. https://www.youtube.com/watch?v=8x5NlIeySp4&feature=youtu.be - Cover-stations – students are split into groups of 4-6. They are assigned a question to discuss. After that, 2 students from each group are asked to move to another group where they share the key ideas from the previous discussion and the whole group is asked another, related question. https://learn.teachingchannel.com/video/conver-stations-strategy - Fishbowl discussion – all the students sit in a circle but 2 students who sit in the centre of the circle facing each other. The students who sit in the centre discuss the topic and the others observe, make notes. The variation of this activity is when a student from the circle can switch with a student from the centre and continue the discussion. https://www.youtube.com/watch?v=xkWl9b0FZSE&feature=youtu.be - Hot Seat – one student sits in a "hot sit" where he impersonates a character from a novel, historical figure or a concept. The other students ask questions for which the person in the hot sit needs to respond staying in the role. https://www.youtube.com/watch?v=q2dId0rlrMs&feature=youtu.be&t=12s - Snowball discussion – students start with discussing the topic in pairs, they are joined in 4s, 8s and so on, until reaching the whole class discussion. Ongoing strategies: - Asynchronous voice – this is an asynchronous discussion technique with the use of technology (like Voxer or Flipgrid) where students can discuss topics by sending each other voice messages. https://www.youtube.com/watch?v=oyHv62md24c&feature=youtu.be - Backchannel discussion – this is a type of discussion that may accompany another activity like watching a film or lecture. Students have a separate channel (ex. Using Socrative or Mentimeter) to discuss the topics or note down the most important statements without interrupting the flow of the presentation. - Talk moves – these are the beginning of sentences that students can use, made to model the discussion, ex. I agree with what you said… because…" https://learn.teachingchannel.com/video/teaching-ells-to-participate-in-discussions-ousd

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	Speaking cards: https://docs.google.com/presentation/d/1ST9v6p43M8gZqtZPg-A3FInvSZ7PUGd7NbelmZQ4Mn4/edit#slide=id.g4294babcfa_0_78 - Teach-OK – this technique allows students to explain the concepts to one another after the teacher gave a whole class presentation related to the topic. https://www.youtube.com/watch?v=8yDGMr-B1Ag - Think-Pair-Share – is a thinking routine where students firstly reflect on the question asked by themselves, then talk about it in the pair and share it with the whole class https://www.youtube.com/watch?v=vxMOl2Vnw54&feature=youtu.be - Ongoing Conversations – this strategy involves keeping track of all the conversations student has with other classmates. The student is given a tracker sheet that he needs to fill in and meet the goal set by the teacher. This simple technique works as a supplement to other techniques as well. https://www.cultofpedagogy.com/ongoing-conversations/

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**The ICAP (Interactive, Constructive, Active and Passive) Active Learning Framework**
Author/s Name, Surname	Benjamin L. Wiggins, Sarah L. Eddy, Daniel Z. Grunspan, Alison J. Crowe
Published Title	The ICAP Active Learning Framework Predicts the Learning Gains Observed in Intensely Active Classroom Experiences
Printing Company	https://journals.sagepub.com/doi/full/10.1177/2332858417708567
Year, Volume, Issue	April-June 2017, Vol. 3, No. 2,
Pages	pp. 1–14
Link & date of access (if available)	https://journals.sagepub.com/doi/full/10.1177/2332858417708567, 4/02/2020
DOI or ISBN:	DOI: 10.1177/2332858417708567
Reference Copyright:	Creative Commons
Citation formula	Wiggins B. L., Eddy S. L., Grunspan D. Z., Crowe A. J. (2017), The ICAP Active Learning Framework Predicts the Learning Gains Observed in Intensely Active Classroom Experiences, http://ero.sagepub.com
Educational level: [Preschool / Primary / Secondary / Higher education]	
Short description: [3- 5 sentences]	The ICAP Active Learning Framework predicts that as students become more involved with learning materials, from passive to active to constructive and interactive, their learning will increase. The purpose of this study is to discover if interactive activities are more effective than constructive activities to promote student learning in a large undergraduate STEM classroom. Students in interactive classrooms demonstrate significantly better learning outcomes in relation to students in constructive classrooms.
Full description, 1500-2000 signs:	The ICAP (interactive, constructive, active and passive) framework that defines students' cognitive learning activities can be classified and differentiated in one of four modes: interactive, constructive, active and passive. The ICAP predicts that as students become more involved

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	with learning materials, from passive to active to constructive and interactive, their learning will increase (Wiggins, et all, 2017). According to Wiggins, et all, (2017), The ICAP framework describes four levels of activity, ranging from the most committed to the least committed: interactive, constructive, active and passive. In a passive activity, students receive information but do not openly engage with the learning material. Active learning activity require a focused motor movement, such as underlining or copying selected text passages. Construction learning activities go beyond the active, by requiring students to synthesize their own ideas and generate a novel output, such as a concept map. Finally, an interactive activity is one in which students participate in a substantial exchange of ideas that leads to a new level of understanding. In interactive activities, students cooperatively create a tangible product that incorporates the ideas of each student. For example; While reading the content of a lesson, students can show the following levels of commitment: if they read text passages without interacting, they are passive learners; 2) If they perform actions such as underlining important sections of the text, they are active learners, 3) if they generate novel results such as notes in their own words that synthesize sections of text, they are constructive learners and 4) if they discuss the results of an article with other students, they are interactive learners. The purpose of this study is to discover if interactive activities are more effective than constructive activities to promote student learning in a large undergraduate STEM classroom. STEM postsecondary education (science, technology, engineering and mathematics) at the classroom level has largely focused on the opportunities provided by instructors for student participation with the course content. As a result, Students in interactive classrooms demonstrate significantly better learning outcomes in relation to students in constructive classrooms. Student results improved in a STEM classroom when they were taught interactively versus constructively (Wiggins, et all, 2017).

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	Educational Research and Innovation
Author/s Name/s, Surname/s	OECD
Published Title of the Resource	The OECD Handbook for Innovative Learning Environments
Where it was published (Name)	OECD publishing
Year, Volume, Issue	22 Jun 2017
Pages <that correspond to the finding>	Istance, D. and L. Stoll (2013), "Learning Leadership for Innovative Learning Environments: The Overview", in OECD 2013b, http://dx.doi.org/10.1787/9789264205406-3-en.
Link & date of access (if available)	
DOI or ISBN:	https://read.oecd-ilibrary.org/education/the-oecd-handbook-for-innovative-learning-environments_9789264277274-en#page1
Reference Copyright:	the Creative Commons Attribution-NonCommercial-NoDerivatives 3.0 IGO license
Citation formula	OECD (2017), *The OECD Handbook for Innovative Learning Environments*, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/9789264277274-en.
Educational level: [Preschool / Primary / Secondary / Higher education]	
Short description: [3- 5 sentences]	The Handbook is divided into four chapters: The Principles of Learning to design learning environments, The OECD "7+3" framework, Learning leadership and evaluative thinking, Transformation and change in learning ecosystems. Each chapter presents a concise summary of international reflection on learning and innovation. In addition, it offers practical tools, promoting through practical action Innovative Learning Environments' key conclusions by shaping educational leadership, self-review and professional development.

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Full description, 1500-2000 signs: [best if a consistent material describing the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	-The Principles of Learning to design learning environments – Learning principles for innovative learning environments (ILE): 1. ILE should strengthen the learners' active engagement in learning. 2. ILE should encourage well-organized co-operative / collaborative learning. 3. ILE should be in harmony with the learners' emotions and motivations. 4. ILE should be sensitive to the individual differences, needs and their background. 5. ILE should arrange programs demanding hard work without excessive overload. 6. ILE should use broad assessments and formative feedback to support learning. 7. ILE should promote "horizontal connectedness". -The OECD "7+3" framework – "7+3" framework combines the 7 Learning Principles (listed above) with 3 fundamental arenas of innovation (listed below). 1. The pedagogical core: Learners, educators, content and learning resources are the elements comprising the pedagogical core to innovate. 2. Learning leadership: It is essential for positive change. The learning is achieved through different strategies and innovations. 3. Learning partnerships: Working with partners (families and communities, other schools, learning environments, higher education, cultural institutions, media and businesses) collaboratively shapes the pedagogical core and the learning leadership. -Learning leadership and evaluative thinking – Istance and Stoll (2013) define different dimensions of learning leadership as follows: • It is essential for reform and innovation. • It is about maintaining the design, implementation and sustainability of powerful innovative learning environments. • It puts creating the conditions for 21st century learning and teaching at the core of leadership practice. • It needs creativity and courage. • It models and raises 21st century professionalism. • It is social and connected.

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	• The more learning environments innovate, the more learning leadership will come from diverse partners often viewed as “external” to education. • Transformative learning leadership involves complex multi-level chemistry. • It is needed at the system level. Evaluative thinking is necessary to successful innovation. Evaluative thinking is produced as a series of steps with feedback loops: defining the innovation; multiple stakeholders, different contexts; identifying the purpose(s) of evaluation; getting on with it; framing evaluation questions; collecting fit-for-purpose evidence; organizing and analyzing the evidence; making sense of it all; interpretation as building knowledge; and capturing and mobilizing the new knowledge. -Transformation and change in learning ecosystems – Learning ecosystems are re-thought at different levels: micro level, more holistic level, meso level and meta level. The micro level is learning resources and spaces, teaching and learning episodes, pedagogical relationships. The more holistic level means integrating the micro elements around organic units like a pedagogical core and learning leadership. Learning environments need not be schools at this level. The meso level is critical for growing and sustaining innovative learning, and includes the many compounds of networks, communities, chains and initiatives. The meta level is a summary umbrella for all the learning environments. Furthermore, different strategies and formal or non-formal initiatives supply innovative learning growing. This chapter also presents a set of scenarios for the future of the teaching profession.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**The role of feedback in classroom instruction**
Author/s Name, Surname	Binu Pathippallil Mathew
Published Title	The role of feedback in classroom instruction
Printing Company	
Year, Volume, Issue	2020
Pages	
Link & date of access (if available)	https://www.researchgate.net/publication/341001451_The_role_of_feedback_in_classroom_instruction 5.05.2020
DOI or ISBN:	
Reference Copyright:	-
Citation formula	Binu, P.M. (2020). The role of feedback in classroom instruction. Retrieved on 5.05.2020 from https://www.researchgate.net/publication/341001451_The_role_of_feedback_in_classroom_instruction
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher
Short description: [3- 5 sentences]	Binu (2020) differentiates between formal and informal feedback, teacher-led and student-led feedback. He pays particular attention to the effectiveness of feedback when it is timely, of a high quality and engages students to implement correction strategies.
Full description:	According to Binu (2020) feedback can be informal or formal, and the former one is more effective than the later as it is immediate and allows to correct the mistakes during the progress of work. "In the words of Marzano (2010), "The best feedback appears to involve an explanation as to what is accurate and what is inaccurate in terms of student responses. In addition, asking students to keep working on a task until they succeed appears to enhance learning" (p.96)." This kind of feedback can be given during the lesson and should not be used as a summative grade.

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	Formal feedback, on the other hand, should serve a different purpose – feedback conferences usually provide information to students on their level of achievements based on set criteria and should be used to set individual goals for the future. The feedback provided should be timely and of a high quality so that students can actively engage with it. Those sessions can be a 1on1 interaction with a students or a whole-class sessions. In addition to teacher feedback we also have peer-feedback and self-feedback. Student to student feedback is an essential part in the collaborative, student-centered classroom. Giving feedback to others allows the student to gain understanding of the assessment criteria and quality of work that is expected. Self-assessment also plays a vital role in the development as a life-long learner. It engages students in valuable reflection over the quality of their work and allows the implementation of correction strategies.

Additional references:

Marzano, R. J. (2010). *Formative assessment & standards-based grading*. Bloomington, IN: Marzano Research Laboratory.

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Understanding innovative pedagogies - Key themes to analyse new approaches to teaching and learning**
Author/s Name, Surname	Amelia Peterson, Hanna Dumont, Marc Lafuente and Nancy Law
Published Title	Understanding innovative pedagogies: Key themes to analyse new approaches to teaching and learning (OECD Education Working Papers)
Printing Company	
Year, Volume, Issue	2018
Pages	134
Link & date of access (if available)	https://www.oecd-ilibrary.org/education/understanding-innovative-pedagogies_9f843a6e-en
DOI or ISBN:	https://doi.org/10.1787/9f843a6e-en
Reference Copyright:	© OECD 2018
Citation formula	Peterson, A., et al. (2018), "Understanding innovative pedagogies: Key themes to analyse new approaches to teaching and learning", *OECD Education Working Papers*, No. 172, OECD Publishing, Paris, https://doi.org/10.1787/9f843a6e-en
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	Despite of "pockets of innovation", schools are still seen mostly as very resistant places for innovation. The paper presents views from experts highlighting different pedagogical dimensions that together form a conceptual, more holistic, framework for action. The dimensions brought to the forefront are adaptive pedagogy (as a cross-cutting concept over a range of pedagogical approaches); combinations of pedagogies; subjects domains and their relation to pedagogies; and the change offered by technology-enhanced pedagogical innovations.
Full description, 1500-2000 signs: [best if a consistent	**The purpose of pedagogy (Amelia Peterson, Harvard University)** Developing and selecting pedagogies involves more than working out what is "effective" as indicated by impact on diverse measures of

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material describing the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	learning. Pedagogies are based on theories of learning which entail different views of psychology and philosophy regarding what is most important in learning. The pedagogical innovation can be evaluated by considering all the things the pedagogies are trying to achieve. *This means it is necessary to give attention to intentions when evaluating pedagogies rather than assume that all have the same purpose. Pedagogical approaches allow the pursuit of multiple purposes simultaneously; they provide reliable ways of organising learning; and they offer ways of bundling practices. An advantage in thinking about approaches as bundles of discrete practices is to aid communication across contexts, where different labels may well be attached to similar bundles of practices. For example, support for project-based learning within teacher education is impeded by the plethora of different notions of what "PBL" entails. By focusing on specific practices, teachers can move beyond the buzz words to really understand the how and the why of a particular pedagogical approach.* **Adaptive teaching: Students' differences and productive learning (Hanna Dumont)** *This chapter discusses the concept of "adaptive teaching" as a way to meet the challenge of student heterogeneity in the classroom and discusses its effectiveness in terms of increasing student performance and equality of opportunity.* The concept of adaptive learning is presented as well as related concepts: Differentiation, Individualised instruction, Personalised learning, Open instruction, Formative assessment, Self-regulated learning. *Adaptive teaching does not favour a specific pedagogy or instructional method; in fact, it incorporates all sorts of pedagogies such as direct instruction, specific interventions, motivational enhancements, cooperative learning, modelling guided practice, peer tutoring, independent study, and discovery learning (Randi and Corno, 2005). Which of those pedagogies should best come into play, will depend on the specific characteristics and needs of each learner. The scarcity of empirical evidence on adaptive teaching could be explained by the fact that adaptive teaching is still not very widespread, however there are empirical evidence from research relevant to adaptive teaching: in fact related research makes a strong case for its potential to increase student performance.* *The main challenge for an empirical investigation of adaptive teaching as an overarching pedagogical approach lies in studying classroom instruction in a more holistic way than is typically done. More specifically, instead of analysing the effectiveness of specific teaching methods, we need to further identify and study the underlying principle of adaptive teaching, namely the degree of adaptivity within and across classroom.* **Attuning pedagogies to the context of 'new learners' and technology (Marc Lafuente)**

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	The chapter presents the notion of "new learners" as they have been depicted in the literature, discussing possible trends, analysing their implications for pedagogy, and examining their potential benefits and drawbacks for learning. *Teachers can profit from technology when it helps diagnose the student's progress and difficulties, and accordingly provide tailored assistance to encourage moving forward. The applications that yield encouraging results are those that activate the complex cognitive processes involved in deep and meaningful learning such as interacting with simulations, communicating and discussing with peers and educators, and solving complex tasks. Technology has also a capacity to promote learning engagement and motivation. Over-estimating digital competence can result in omitting digital literacy from the curriculum, and/or leaving students to work with technology on their own ("because they already know how to use it").* *Existing meta-analyses support an optimistic view of the use of computers and other technologies in the classroom, the utilisation of multimedia materials, video gaming, and collaborative activities. Those studies also tend to conclude that outcomes improvements are small and that multi-tasking has negative effects. Leveraging new learning trends can activate educational areas associated with innovative learning eco-systems.* **Technology-enhanced innovative pedagogy: The challenge (Nancy Law)** The chapter looks first into the research made on technology-enhanced pedagogical innovations (TEPI) and particularly its scalability. Then it reviews some key theories of change and educational innovation to examine what insight these might bring to understanding the conditions for scaling TEPIs. It presents the multi-level multi-scale (MLMS) model of learning for scalable TEPIs. *Empirical studies of TEPIs can show that agency for change can be various and sometimes multiple, depending on specific contexts. Socio-political and education systems differ, and change strategies should pay attention to the local ecological contexts to build "architectures for MLMS learning".*

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Why Is Active Learning So Difficult to Implement: The Turkish Case**
Author/s Name, Surname	Fisun Aksit, Hannele Niemi, Anne Nevgi
Published Title	Why Is Active Learning So Difficult to Implement: The Turkish Case
Printing Company	Minds in Bloom - Ideas for Educators with Rachel Lynette Blog
Year, Volume, Issue	April 2016, Vol. 41, Issue 4
Pages	94-109
Link & date of access (if available)	https://core.ac.uk/download/pdf/157586698.pdf (access April 26, 2020)
DOI or ISBN:	10.14221/ajte.2016v41n4.6
Reference Copyright:	© Aksit, Niemi, Nevgi
Citation formula	Aksit, F., Niemi, H., & Nevgi, A. (2016). Why is active learning so difficult to implement: The Turkish case. Australian Journal of Teacher Education, 41(4). https://ro.ecu.edu.au/ajte/vol41/iss4/6/
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher
Short description: [3- 5 sentences]	A study conducted among the group of teacher students in Turkey which asked them about their attitude towards active learning. The article provides interesting conclusions regarding the consistency between the teaching content at university which educates would-be teachers and the teaching methods employed by the professors. It also points out major obstacles which students view as factors that would prevent them from employing active learning methods when they become teachers themselves.
Full description, 1500-2000 signs:	The 2005 Turkish national education reform, which focused on the transition from traditional approach towards "student-centred learning and a constructivist approach" (p. 94) resulted in a consequent reform in teacher education as well. It is interesting how the would-be teachers view active learning 10 years after the reform, including their reflections regarding the possible barriers which could impact the implementation of those methods at school. According to Aksit and Niemi (2016), the

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	transition from traditional to active learning is a complex issue as it requires the shift in the teacher role as well as the change in attitudes and power structure in the classroom. Students were found to see "active learning as an encouragement to experiment with new methods" (p. 98) and they surmised that this new way of learning enabled them to directly experience the pros and cons of each method. According to Aksit and Niemi (2016), the main problem reported by students was related to the attitude and lack of skills among the educators who tried to employ active learning. Teachers may be resentful about losing control over the class as they fear that having less control is synonymous with ineffective class management. Another obstacle is the overcrowded classrooms, as it is much harder to manage discussions and to put students into groups if one teaches in a class which has more than 30 students. Insufficient time and time pressure related to covering subsequent items of the curriculum were also found to be major barriers which could discourage teachers from employing active learning methods, as "the use of active learning increased the required amount of time" (p. 100). Students also pointed to the lack of necessary equipment, e.g. the one required for laboratory exercises or computer-based classes. Lack of resources for active learning resulted in the increased workload for teachers who need to prepare them on their own. Inflexibility of the existing classrooms was also cited as one of the obstacles, as students realized that in order to effectively engage in autonomous learning, they need a comfortable working environment. Another problem was students' own passivity, lack of motivation as well as lack of self-confidence. Listening to a lecture seems easier than active participation in the class. Students also pointed out that they "were raised with a tradition of behavioral training model [...], so it is easy to continue this tradition[...]. (p. 101). Presenting their own material in front of their peers requires more self-confidence than just passive participation in the backseat. The final barrier mentioned by the students was the system of standardised examinations, as "getting a high score in these tests generally requires memorised information. [...] Students mentioned that when they started their career as teachers, they did not believe they would use these innovative methods in their class because of the examination system and students' and parents' expectations". (p. 101)

Additional comments: Critical approach to the practical implementation of active learning with possible barriers and obstacles which educators need to deal with.

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching**
Author/s Name, Surname	Paul A. Kirschner, John Sweller, Richard E. Clark
Published Title	Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching
Printing Company	Educational Psychologist
Year, Volume, Issue	2006, 41(2)
Pages	75-86
Link & date of access (if available)	https://www.tandfonline.com/doi/abs/10.1207/s15326985ep4102_1 (access April 26, 2020)
DOI or ISBN:	1532-6985
Reference Copyright:	© 2006, Lawrence Erlbaum Associates, Inc.
Citation formula	Kirschner, P. A., Sweller, J. & Clark, R. E. (2006) 'Why minimal guidance during instruction does not work: an analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching', Educational Psychologist, 41 (2) pp. 75–86. https://www.tandfonline.com/doi/abs/10.1207/s15326985ep4102_1
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	Having examined recent findings related to human cognitive architecture as well as the results numerous studies, the authors of this study argue that minimal guidance associated with modern pedagogical theories like the constructivist approach, problem-based and inquiry-based teaching might be less effective than direct instructional guidance. They also point out to the fact that unguided instruction may have negative results if students acquire incomplete knowledge or misconceptions. This effect seems to be most easily visible in case of novice to intermediate learners.
Full description:	In their critical study of constructivist, discovery, problem-based, experiential, and inquiry-based teaching, and especially their aspect

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	related to the amount of guidance that students receive, Kirschner, Sweller, and Clark compare effectiveness of the aforementioned pedagogical approaches with direct instructional guidance (Kirschner et al., 2006). According to the authors of this research, the said methods, which are associated with unguided or minimally guided learning environment, in the light of recent advances in human cognitive architecture, might be less effective in comparison with methods offering direct instructional guidance. This effect seems to be most easily visible in case of novice to intermediate learners and in cases where learners were not offered any scaffolding. Considering those findings, we can ascertain that the methods which learner-centered should be chosen less frequently when dealing with students who are only starting to learn a given subject area. This results from the fact that novice learners have no experience in integrating the new information with their prior knowledge. “Controlled experiments most uniformly indicate that when dealing with novel information, learners should be explicitly shown what to do and how to do it.” (Kirschner et al, 2006, p. 79). Special importance should also be put on providing additional scaffolding and more guidance in order to avoid situations where students become lost or frustrated and could “acquire misconceptions or incomplete or disorganised knowledge.” (Kirschner et al, 2006, p. 84) This scaffolding proved effective when used by teachers when their students had problems with making progress with minimal guidance. The four stages of the scaffolding process include: (a) demonstrating to students how to identify and self-check important information… (b) showing students how to reduce paraphrase the information they receive (c) asking students to make notes which would be useful in developing collaborations and routines, and (d) recommending that students collaborate with one another and have discussions when solving problems.

Additional comments: Critical analysis of the effectiveness of Constructivist, Discovery, Problem-Based, Experiential and Inquiry-Based Teaching in comparison with guided teaching.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active Learning and Classroom Design**
Author/s Name, Surname	James Sparks
Published Title	Your Active Learning Classroom
Printing Company	https://activelearner.ca/author/admin/
Year, Volume, Issue	December 2013
Pages	
Link & date of access (if available)	30.01.2020
DOI or ISBN:	
Reference Copyright:	Public Domain
Citation formula	Sparks J. (2013), Your Active Learning Classroom, https://activelearner.ca/author/admin/
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary
Short description: [3- 5 sentences]	Active students experience a deeper understanding because they are cognitively involved with what they are studying. An active learning teacher often asks the question, "How can I get my students to discover this?" The teacher's pedagogical mission is to design and implement activities that motivate the discovery of students. Active learning activities involve collaboration.
Full description, 1500-2000 signs:	According to Sparks (2013), active students experience a deeper and lasting understanding because they are cognitively involved with what they are studying: they learn by doing and thinking about what they are doing. Active students try to apply, analyze, evaluate and create by moving to the highest levels of Bloom's taxonomy. In the traditional view, teaching is the transmission of information. Traditional teacher is like a radio transmitter transmitting data to be received by any student whose receiver is tuned to the correct frequency. The information, received correctly or incorrectly, is recorded by the student's receiver so that it can be transmitted later as

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	proof of receipt. An active learning teacher often requires some effort. It requires both a change in philosophy and in practice. An active teacher stop asking the question, "How can I explain this to my students?" And start asking, "How can I get my students to discover this?" Only students can learn, and only when they get involved with the material they can learn. Only students can change their own knowledge as a means to integrate new knowledge. Teachers can only support students while they actively explore the new educational content. Teacher's pedagogical mission is to design and implement activities that motivate the discovery of students, provide support and evaluate achievements (Sparks, 2013). Active learning activities involve collaboration. Active learning arises from social constructivism, a theory generally attributed to the Swiss psychologist Jean Piaget and the Russian psychologist Lev Vygotsky. Active Learning teachers see the double importance of collaboration between students and the guiding role of teacher. The effective collaboration of students depends on the ability of group members to recognize and adopt various roles. Students should be able to recognize the behavior that may be impeding the group. They should also be able to adopt roles that help the group with their task, as well as those that promote harmony among the members (Sparks, 2013). According to Sparks (2013), the creation of an active learning classroom within existing school buildings is often a challenge. It is probably true that the ideal space is square and free of pillars. Each student can be provided with a computer to allow the room to also serve as a traditional computer lab. Access to the network can be via WiFi. Power is supplied to the table sockets through cuts in the concrete floor. Adjustable tables can be provided to this class to accommodate students who may need more space for their wheelchair and who simply prefer the standing mode of study.

Additional comments: Author also presented an example Active Learning Classroom configured with information technologies:

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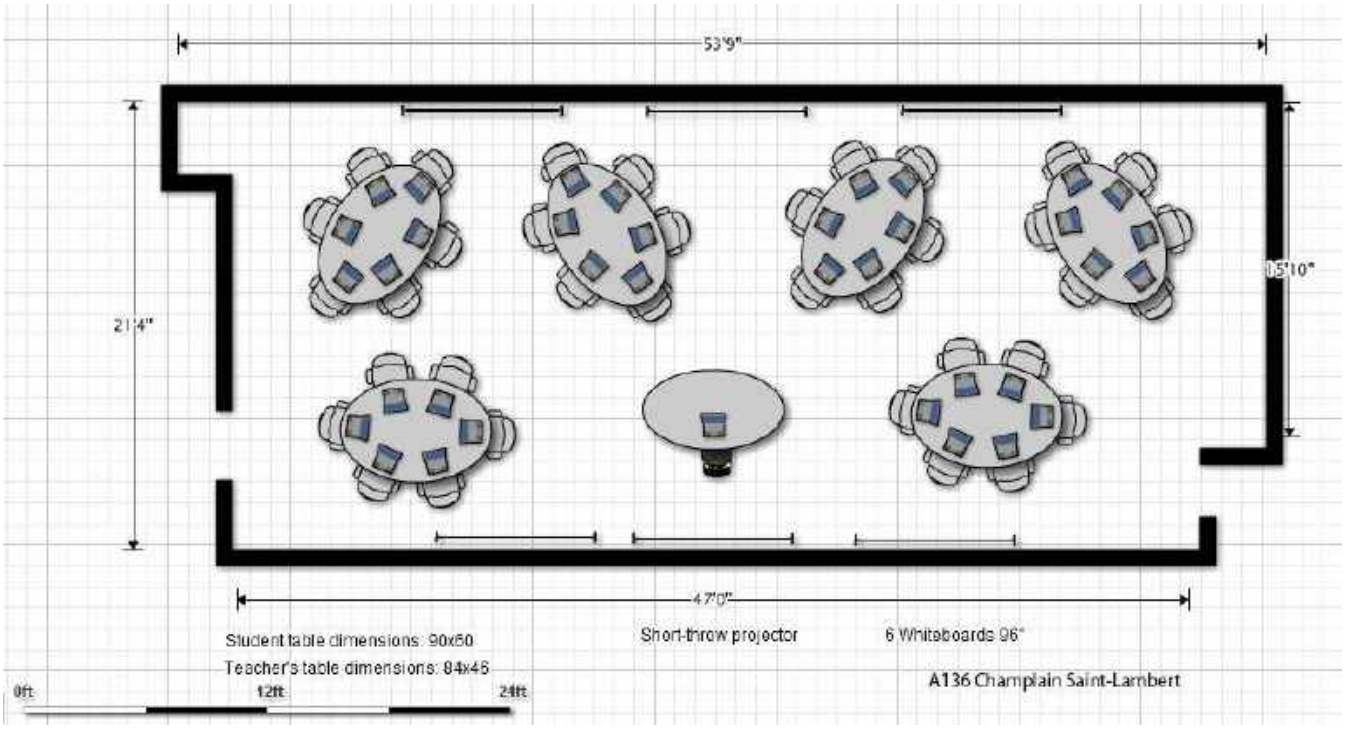

source: https://activelearner.ca/sample-active-learning-classroom/

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**20 formative assessment strategies**
Author/s Name, Surname	Multiple authors
Published Title	n/a
Printing Company	n/a
Year, Volume, Issue	n/a
Pages	n/a
Link & date of access (if available)	
DOI or ISBN:	
Reference Copyright:	©
Citation formula	Guido, M. (2018). 20 Formative Assessment Examples to Try. Retrieved on 7.05.2020 from https://www.prodigygame.com/blog/formative-assessment-examples/#list Watanabe-Crockett, L. (2020, February 3). 21 Quick Formative Assessment Tools That Make Learning Fun. Retrieved on 7.05.2020 from https://wabisabilearning.com/blogs/assessment/21-formative-assessment-tools Formative Assessments Strategies. (n.d.). Retrieved on 8.05.2020 from http://www.rcsthinkfromthemiddle.com/formative-assessments-strategies.html colport100. (n.d.). Formative Assessment Strategies. Retrieved on 8.05.2020 from https://www.tes.com/en-us/teaching-resource/formative-assessment-strategies-6114719
Educational level: [Preschool / Primary / Secondary / Higher education]	All
Short description: [3- 5 sentences]	

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Full description:	Formative assessment is an essential part of active learning. As Hattie noticed it is not only the feedback teacher gives to students but also feedback the teacher receives from students that informs his further practice and instruction depending on the level of understanding by the students. Below is a compiled list of various formative feedback strategies: 1. Four Corners: When discussing the correct answer to the multiple choice test students move between the corners which represents what they think is the correct answer. Teacher can ask the students to justify their answers. 2. Three Summaries: Teacher asks students to write three summaries of the text or lesson: one between 10 to 15 words, second one between 30 to 50 words and the third between 75 to 100 words. This allows the students to refine their understanding and choose only the important elements for the first description. 3. Hand It In, Pass It Out: Teacher poses a question that's possible to be explained in a couple of sentences. Anonymously, students write down their answers and hand them in to the teacher who then quickly distributes them back to students at random. Students provide feedback to their peers. 4. Self-Evaluation: When completing an assignment, students hand in a self-reflection sheet when they grade themselves according to the rubric criteria. 5. Partner Quiz: The teacher pairs students and poses them some questions. They discuss it and afterwards each student can work independently on the answer. 6. Highlighter: The teacher gives the students the same text or resources asking them to highlight sentences that seem most important to them. Then, divides the class into groups and asks them to discuss the text's main idea or theme based on the sentences highlighted. 7. Think-Pair-Share: Firstly, the teacher asks students to reflect on the question individually, then discuss it in pairs and share it with the class. 8. Jigsaw: The teacher assigns parts od a text or task to different students in the group. Each student becomes an expert in his part and then explains it to the other students. 9. Stop and Go: The students can use the double-sided card to show whether they understand the lesson (green) or when they need a clarification (red). 10. Illustrations: The teacher asks the students to summarise the students to summarise the text they read through an illustration. 11. Headline: The teacher asks the students to summarise the students to summarise the text they read through an newspaper headline. 12. Entry and Exit Tickets: The teacher asks the students to reflect on the initial understanding, previous or current lesson.

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	13. Two Roses and a Thorn: The teacher can assign each student with writing two topics or concepts they enjoyed learning about, and another they didn't like or understand. 14. 3-2-1: Students must create three lists, (a) 3 ideas or concepts they learned, (b) 2 ideas or concepts that surprised them and (c) 1 thing they want to do based on what they learned or question they have about the content. 15. One-Minute Papers: The teacher can assign a brief paper on the question addressed during the lesson. 16. Metacognition Sheet: to check for understanding before the summative assignment, the teacher can ask students the following questions (a) "Can you summarize the topic?", (b) "How can you apply the topic?" and (c) "What questions do you still have about the topic?" 17. Roll the Dice: The teacher can roll a die with each side representing the beginning of a sentence that must be addressed by the students, like "I learned today that …" or "I'm still confused about …" 18. KWL (Know, Want, Learn) Chart: lets the students organize and analyze information from a lesson by answering 3 questions: What do you know already? What do you want to know? What did you learn? 19. Carousel Brainstorm: The teacher puts large sheets of paper with questions or topics in different places in the classroom and divides the class into the groups equal to the number of sheets. Each groups gets 5-10 minutes to brainstorm ideas on the topic. When the time is up, they move to another poster. 20. 3 minute pause: the teacher pauses the lesson at any time and asks questions that students need to respond to on a half of the sheet of paper (ex. I was surprised about… I became more aware of…I want to know more about…). The feedback is used to adjust the next lessons. 21. Confidence and Use Lines: a simple activity in which students place themselves on the continuum taking into consideration their knowledge and skills. The teacher prepares the posters and places them on the walls, each student puts a dot in the place they see themselves on the continuum. 22. Misconception Check: a quick True or False activity – the students can use thumbs up/down, coloured paper or stand up/sit down to indicate their answer. 23. Stirring the Mix: students discuss the topic in small groups under the supervision of the teacher, then one student moves to another group to explain what they have learned. 24. Walk About, Talk About (CAROUSEL): Students discuss questions set by the teacher on different stations and take notes of the answers on the poster. When changing to the new question, they read the responses of the previous groups, tick the ones they agree

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	with and put a cross against those they disagree with. After discussion, they add any new ideas. 25. Talking Partners: Students discuss the topic in pairs but instead of summarising the answer in their own behalf, they answer on behalf of their partner. 26. Show of hands: quick assessment strategy – the teacher asks students to raise their hands in response to a yes/no question. 27. Index Card summaries: the teacher distributes index cards to the students and asks them to jot down the big ideas related to the topic on one side and the questions they still have on the other. 28. Analogy prompt: the teacher gives the students the sentence to finish: The (concept) is like….. because… 29. Mindmap or Venn diagram: the teacher asks the students to prepare the mindmap of the main ideas related to a topic or a comparison of 2 concepts (Venn diagram) 30. Quiz: short quiz to check for understanding (not graded!) – True/False, Multiple choice, matching, short answer questions 31. Journal entry – students record their reflections on the topic in the journal 32. Idea Spinner – the teacher prepares a spinner with 4 questions: predict, explain, summarise, evaluate. After the introduction of the topic, the teacher can choose a question at random to check for understanding. 33. One sentence summary – students answer the following questions with one sentence: who? What? Where? When? Why? How?

Additional references:

Vermunt, J. D., & Verloop, N. (1999). Congruence and friction between learning and teaching. Learning and Instruction, 9, 257–280.

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NOVIGADO
ACTIVE LEARNING AND INNOVATIVE TEACHING IN FLEXIBLE LEARNING SPACES

O2 - Desk Research Framework Template

Researcher's Name of the Resource	**A Multi-disciplinary Empirical Investigation of Active Learning Classroom's Effects on Student Learning**
Author/s Name, Surname	Xiaoshan Zhu Gordy, Lei Zhang, Amy L. Sullivan, Lisa Haynie, La'Toya Richards-Moore, and Jessica H. Bailey
Published Title	A Multi-disciplinary Empirical Investigation of Active Learning Classroom's Effects on Student Learning
Printing Company	Gordy et al. Interdisciplinary Education and Psychology.
Year, Volume, Issue	February 5, 2018
Pages	8
Link & date of access (if available)	http://riverapublications.com/assets/files/pdf_files/a-multi-disciplinary-empirical-investigation-of-active-learning-classrooms-effects-on-student-learning.pdf
DOI or ISBN:	
Reference Copyright:	2018 Gordy et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
Citation formula	Gordy, X.Z., Zhang L., Sullivan, A.L., Haynie, L., Richards-Moore, L., Bailey, J.H.(2018). A Multi-Disciplinary Empirical Investigation of Active Learning Classroom's Effects on Student Learning. Interdisciplinary Education and Psychology, 2(1):3.
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	In this research, it is investigated whether teaching and learning in the Collaboratory yielded better student learning outcomes through comparing course grades earned in the Collaboratory that means learning in motion and traditional classrooms (TCs) respectively.
Full description, 1500-2000 signs:	In 2014, a school within a U.S. southeastern academic medical center transformed traditional classrooms (TCs) into technology-rich active learning classrooms (ALCs) called the Collaboratory to engage students and facilitate learning. Collaboratory was equipped with 12 large interconnected flat screens, a large wall projector, rectangular and semicircular movable tables with

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	access points to power outlets and smart device hookups, individual swivel chairs with built-in work surfaces and storage in the tripod base, both large and small portable white boards on rollers. This innovative space has offered instructors opportunities to quickly switch from one mode of teaching (e.g. lecturing) to another (e.g. individual or group work). This space also has allowed connectivity and mobility, and enabled dynamic collaboration and interactive learning for students. Data was collected via surveys by comparing 275 students' perceptions regarding ability to focus, classroom interaction, group work, and the development of creativity in the ALC and TCs respectively. In addition, course grades of two consecutive courses taught by the same instructor in both the new ALC and TCs were described by comparing four-year TC grades with one-year ALC grades. The results show that the ALC gained higher mean scores than TCs in all aspects (focus, classroom interaction, group work, and the development of creativity). Moreover, the mean scores increased between grades earned in the ALC and TCs but the differences were not significant. Several factors may have contributed to this result such as limited participants, limited data collection (for just one year in the ALC), standard class content, teaching styles and tests in TCs and ALCs (inappropriate for both classes). Future educators are encouraged to employ appropriate teaching approaches for ALCs to optimize student learning and to design ALC appropriate tests in order to evaluate student learning effectively.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**A Qualitative Research on Active Learning Practices in Pre-school Education**
Author/s Name, Surname	Serpil Pekdoğan, Mehmet Kanak
Published Title	A Qualitative Research on Active Learning Practices in Pre-school Education
Printing Company	Journal of Education and Training Studies Vol. 4, No. 9; September 2016 ISSN 2324-805XE-ISSN 2324-8068 Published by Redfame Publishing URL: http://jets.redfame.com
Year, Volume, Issue	2016
Pages	8
Link & date of access (if available)	https://files.eric.ed.gov/fulltext/EJ1113000.pdf
DOI or ISBN:	doi:10.11114/jets.v4i9.1713
Reference Copyright:	Creative Commons Attribution 3.0 License.
Citation formula	
Educational level: [Preschool / Primary / Secondary / Higher education]	General
Short description: [3- 5 sentences]	Educational environments based on the active learning method support children to learn with interest and pleasure, doing and experiencing. The paper is based on the idea that pre-service pre-school teachers' views about active learning create a difference in the progress of the education system from the traditional model to the modern model and in providing children with better learning experiences. The study explores the use of active learning practices in pre-school education based on pre-service pre-school teachers' views. The findings indicate that the pre-service teachers think that active learning practices should be carried out in well-equipped classrooms that provide children with an area of movement.

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Full description, 1500-2000 signs: [best if a consistent material describing the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	Active learning process in which children are active and teachers are guiding has a positive influence on children's holistic development areas. It also points out that a child's healthy development requires him to be in a stimulus-rich environment and necessitates offering him new learning opportunities. *Considering the contributions of the active learning method and the educational environments designed based on it to children's development, it can be said that determining pre-service pre-school teachers' views about this topic will create a difference in the progress of the education system from the traditional model to the modern model and, most importantly, in providing children with better learning experiences.* The research data got obtained via semi-structured interview form and analysed through content analysis: 30 pre-service teachers (3rd grade of pre-school education). Questions asked to the pre-service teachers: 1. How should a classroom environment supporting the active learning process be prepared? 2. What kind of a position should the teacher have in the educational practices taking the active learning process as a basis? 3. What kinds of activities are to be carried out to support the active learning process? The conclusions point that: • The importance of classroom size and the functionality of learning centers in the classroom for effective active learning practices • the importance of children's interests and needs for active learning practices, the physical (i.e. equipment) characteristics of the classroom, and the sufficiency, usage, and accessibility of the materials in the classroom. • Children's interests and needs: learning domains and materials have a big importance for this approach, which surpasses traditional methods and takes learning as a development process, to maintain its vitality for especially pre-school children as children always tend to discover in curiosity and creativity. The authors suggest further studies on • Qualitative research taking active learning practices as a basis conducted on different sample groups • Experimental studies taking active learning practices for pre-school children as basis • Exploring relationships between children's active learning processes and different variables, thereby making a contribution to the literature.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active Learning and Innovative Teaching**
Author/s Name, Surname	Isabelle D. Cherney
Published Title	Active Learning
Printing Company	ResearchGate
Year, Volume, Issue	2015
Pages	7
Link & date of access (if available)	https://www.researchgate.net/publication/283081159_Active_Learning
DOI or ISBN:	
Reference Copyright:	All rights reserved
Citation formula	Cherney, Isabelle (2015), Active Learning, ResearchGate, https://www.researchgate.net/publication/283081159
Educational level: [Preschool / Primary / Secondary / Higher education]	Higher education
Short description: [3- 5 sentences]	During active learning, students actively participate (rather than passively) in their learning by discovering, processing and applying information. In an active learning paradigm, the instructor strives to optimize learning through multiple aspects of the student-centered approach. There are several active learning strategies that favorably influence student performance. These are discussions and participation in class, "learning by teaching." and cooperative learning.
Full description, 1500-2000 signs:	According to Cherney (2015), active learning developed from the work of theorists who promote learning by discovery. During active learning, students actively participate (rather than passively) in their learning by discovering, processing and applying information. They are dedicated to higher order thinking tasks, such as analysis, synthesis and evaluation. Active learning is derived from the assumption that learning is an active effort and that people learn in different ways. The discovery oriented active teaching methods for the student ensure greater student motivation, more learning at higher cognitive levels and greater

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	retention of knowledge. Because active learning encourages students to think more deeply about the material, that is, in a more meaningful way, it is effective in improving student learning. In an active learning paradigm, the instructor strives to optimize learning through multiple aspects of the student-centered approach. Classes focus on student learning, not on teacher instruction. Instructors become facilitators of learning by transferring learning responsibility to the students, who in turn must actively participate in the learning process with their instructors and peers. Learning is a process of creating meaning. New learning occurs when students make connections between their existing concepts, knowledge and experience. These new connections can only be created by the student (Cherney, 2015). There are several active learning strategies that favorably influence student performance. Class discussion and participation is among the common strategies that promote active learning. Some of the discussion activities include; open discussion, response cards, surveys, discussion of subgroups, learning partners, whips, panels, fishbowl, games and visits to the next speaker. These strategies have in common that they divide students into subgroups, awaken the energy and participation of all students. Another efficient instructional strategy of active learning is "Learning by teaching." Students choose their own methods and didactic approach to teach the content to their peers. Other effective active learning pedagogy of instructors include cooperative learning, debates, drama, role-playing games and simulations (Cherney, 2015).

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active Learning**
Author/s Name, Surname	Cynthia J. Brame
Published Title	Active Learning
Printing Company	https://facultyforum.blog/2018/08/02/refresh-reset/
Year, Volume, Issue	2018
Pages	6
Link & date of access (if available)	https://cft.vanderbilt.edu/wp-content/uploads/sites/59/Active-Learning.pdf
DOI or ISBN:	
Reference Copyright:	All rights reserved
Citation formula	Brame C. J. (2018), Active Learning, https://cft.vanderbilt.edu/wp-content/uploads/sites/59/Active-Learning.pdf
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary
Short description: [3- 5 sentences]	
Full description, 1500-2000 signs:	Active learning can be defined as instructional activities that involve students in doing things and thinking about what they are doing. Approaches that promote active learning focus more on the development of student skills and require students to do something (read, discuss, write) that requires higher order thinking. Activities to promote active learning vary from very simple (for example, to pause a conference to allow students to clarify and organize their ideas by discussing with neighbors) to more complex ones (for example, to use case studies as a focal point for taking of decisions). Active learning involves the efforts of "students" to actively build their knowledge. For example; working with other students on projects during class; making a presentation; asking questions or contributing to discussions; participate in a project as part of a course; working with

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	other students out of class on homework; discuss ideas of a course with others outside of class; peer tutoring. Active learning techniques to use: The pause procedure: The teacher pauses instruction for every 12 to 18 minutes, encourage students to discuss and review the notes in pairs. The teacher has students write everything they can remember from the previous class segment. Demonstrations: the teacher asks students to predict the outcome of a demonstration. Students briefly discuss their expected outcome in groups. After the demonstration, the teacher asks them to discuss the observed result and how it may have differed from their prediction; Think-pair-share: the teacher asks students a question that requires higher order thinking (for example, levels of application, analysis or evaluation within Bloom's taxonomy). The teacher asks students to think or write about an answer, then discuss their answers in groups. Then, the teacher asks the groups to share their answers and follow up with his or her explanation of the solution. Concept maps: they are visual representations of the relationships between concepts. Concepts are placed in nodes (often, circles), and the relationships between them are indicated by labeled arrows that connect the concepts. The teacher has students create a concept map, identify the key concepts for mapping in small groups or as a complete class. The teacher asks students to determine the general relationship between the concepts and organize them two by two, drawing arrows between the related concepts and labeling with a short phrase to describe the relationship. Team-based learning (TBL): This is a structured form of small group learning that emphasizes student preparation outside of class and application of knowledge in class. Students are strategically organized into various teams of 5-7 students working together. Problem-based learning (PBL): The teacher asks students to address complex and challenging problems and work collaboratively to solve them. PBL is about students who connect disciplinary knowledge with real-world problems.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Cambridge Assessment International Education**
Author/s Name, Surname	Inaccessible
Published Title	Active learning
Printing Company	University of Cambridge Local Examinations Syndicate (UCLES)
Year, Volume, Issue	October 2019
Pages	5. Getting Started with Active Learning, Getting Started with Evaluating Impact and Getting Started with Metacognition are available at: www.cambridgeinternational.org/gettingstarted
Link & date of access (if available)	https://www.cambridgeinternational.org/Images/271174-active-learning.pdf
DOI or ISBN:	
Reference Copyright:	Copyright © UCLES October 2019
Citation formula	Inaccessible
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary, Higher Education
Short description: [3- 5 sentences]	The paper reveals definition of active learning, theories behind it, benefits and misconceptions of it and practical tips for schools to implement it.
Full description, 1500-2000 signs: [best if a consistent material describing the active learning issue in a form of a ready article; **please pay attention to copyright**! – do not copy without quoting]	What does active learning mean? Learners take part in their own learning process actively by making links with existing knowledge and new information. Active learning requires students to think hard, creatively and to practise using new knowledge and skills in order to develop long-term recall and a deeper understanding. What is the theory behind active learning? Active learning is based on some theories such as constructivism, social constructivism, schemas or schemata, scaffolding, Bloom's Taxonomy, child-centred approach, inquiry-based, problem-based or discovery learning and experiential learning.

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	• Constructivism roots in the cognitive theories of Piaget, and learners construct their own understanding individually. • According to Vygotsky (1896–1934), learning happens primarily through social interaction in social constructivism. • Schemata can be thought of as categories we use to classify incoming information (Wadsworth, 1996, p.16). • Bruner (1915–2016) describes scaffolding as supporting a student or group of students in their learning of new language or skills. • The revised Bloom's Taxonomy (Anderson, Krathwohl et al, 2001) offers a classification of affective and cognitive skills. Active learning approaches will help students develop at every stage of Bloom's Taxonomy (creating, evaluating, analysing, applying, understanding, remembering). • Maria Montessori (1870–1952) advocates a child-centered approach. Students play an active role in their learning while teachers are activators of learning in student-centered, or learner-centered learning. • Inquiry-based, problem-based or discovery learning, where learners learn by addressing and posing questions, analyzing evidence, connecting such evidence to preexisting knowledge, drawing conclusions and reflecting upon their findings. • Experiential learning describes someone learning from direct experience. What are the benefits of active learning? • Active learning builds both knowledge and understanding which students can then apply to new contexts and problems. • Active learning fosters students' learning and their autonomy, give them skills of life-long learning and allow them to develop their metacognitive thinking. • Small classes or high resource input are not necessary for active learning. Active learning is possible to apply through learner-focused questioning and instruction with well-focused pair and group discussion in larger groups without high cost. • Active learning approaches help learners to develop higher-order thinking skills to achieve high grades in high-quality examinations. What are the misconceptions of active learning? • Misinterpreting the role of the teacher. Active learning requires activator teachers. As an activator, teachers are key agents in leading strategies which will include direct instruction and teaching metacognition apart from facilitator role which works better in strategies such as simulations and gaming, and problem-based learning.

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	Hattie (2009) reports that the effect size is greater when the teacher acts as an activator. • Misconceptions about active learning strategies. Active learning strategies (i.e. carefully planned direct instruction, whole-class interactions) involve learners thinking hard and relating their new learning to existing ideas to make progress rather than moving around the room or undertaking group work. • All learners need the same approach at the same time. The needs and capabilities of learners within a classroom will be so diverse that activities should be well pitched and scaffolded to make sure all students make progress. • It is always easy to know what a student has learnt. The use of assessment for learning strategies such as high-quality questioning is very useful to identify whether students have learnt or not. Practical tips How can schools make the best use of active learning? • Encourage teachers to develop professionally and update their subject knowledge and pedagogical content knowledge as appropriate for the age group(s) they teach (Coe et al, 2014; Rowe et al, 2012). • Develop a school ethos which focuses on student learning, enjoyment and ownership of their own learning, as well as good examination results across a broad curriculum. • Evaluate the impact of active learning strategies, and share the findings. How can teachers make the best use of active learning? • Teachers should review and activate students' previous information, and help them to make links with new knowledge. In addition, they should continually elicit feedback on all students' learning through use of effective questioning and design plans for future teaching correspondingly. • New knowledge should be presented in small steps, with opportunities for well-scaffolded practice and review (Rosenshine, 2012). • Learners need adequate time to process new information. • Teachers should encourage learners to be conscious and strategic to develop skills of planning, monitoring and evaluating their learning. • Teachers should enable learners to build knowledge through speaking, listening, reading and writing. The use of focused and high-quality dialogue, paired discussion and group work is important in processing new learning and fostering understanding.

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O2 - Desk Research Framework Template

Researcher's Name of the Resource	**Active Learning Handbook**
Author/s Name, Surname	Daniel Bell, Jahna Kahrhoff
Published Title	Active Learning Handbook
Printing Company	
Year, Volume, Issue	
Pages	
Link & date of access (if available)	https://admin.umt.edu.pk/Media/Site/UMT/SubSites/ctl/FileManager/GetStarted_ActiveLearningHandbook.pdf
DOI or ISBN:	
Reference Copyright:	Copyright Webster University (2006)
Citation formula	Bell D. and Kahrhoff J. (2006), **Active Learning Handbook**, https://admin.umt.edu.pk/Media/Site/UMT/SubSites/ctl/FileManager/GetStarted_ActiveLearningHandbook.pdf
Educational level: [Preschool / Primary / Secondary / Higher education]	Primary, Secondary, Higher Education
Short description: [3- 5 sentences]	According to Bell and Kahrhoff (2006), Any type of activity that involves students in the learning process is called as Active Learning Activity. According to Bell and Kahrhoff (2006), choosing the appropriate active learning strategy is vital for successful student learning. Four important factors for selecting active learning strategy are listed as Continuity of Task Complexity, Continuous Course Objective, Continuous Classroom Interaction and Continuous Student Experiences.
Full description, 1500-2000 signs:	According to Bell and Kahrhoff (2006), active learning is a process in which students actively participate in the construction of the understanding of the facts, ideas and skills through the completion of tasks and activities directed by the instructor. Any type of activity that involves students in the learning process is called as Active Learning Activity. In constructivist theory, learning occurs when students engage in an activity that uses the content and skill they are learning. Any new

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	information introduced during the activity that is consistent with current knowledge is easily assimilated. Any new information that is not consistent with the past experiences is rejected as incorrect or incorporated into the new knowledge. New knowledge is built when students combine new information with existing knowledge through the reflection process (Bell and Kahrhoff, 2006). According to Bell and Kahrhoff (2006), choosing the appropriate active learning strategy is vital for successful student learning. The typical method for selecting an appropriate active learning strategy has been based on teaching experience or adapting what has worked for others. Four important factors for selecting active learning strategy are listed as Continuity of Task Complexity, Continuous Course Objective, Continuous Classroom Interaction and Continuous Student Experiences. Instructors should be able to select the types of active learning strategies that match their teaching styles, course objectives and student characteristics. The Task Complexity Continuum examines a particular active learning strategy to determine its complexity. The continuum varies from simple to complex. Activities that require little time and minimal instructions are on the simple side of the continuum. Activities that contain many steps, take a long time and require detailed instructions are on the complex side of the continuum. The Continuous Course Objective answers the question of whether students acquire a knowledge, a skill, an attitude or some combination. This is the most important question that must be answered before selecting an active learning strategy. The answer to this question determines the place of the goals or objectives of the course in the continuum. The Continuous Classroom Interaction reflects the general level of interaction that an instructor prefers or feels comfortable with. The two extremes are the limited interaction on the left side of the continuum and the extensive interaction on the right side of the continuum. An instructor's teaching style, willingness to change and personality characteristics impact his comfort level by using interactive strategies. This continuum helps instructors combine an active learning strategy with the appropriate level of interaction. Student Experience Continuum measures students' background experience with the content or skills necessary to successfully participate in the active learning strategy. For example, students who are very familiar with the course content may participate in activities that require extensive content, while new students may not participate in the same activity (Bell and Kahrhoff, 2006).

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