

OUTDOOR EDUCATION

IN HIGHER EDUCATION DURING THE CONTEXT OF COVID-19 IN CANADA



Pedagogical guide to support teachers



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FOREWARD

In the context of the Covid-19 pandemic, the start of the fall 2020 school year will be a challenge for all higher education establishments. Many institutions want to provide their students with some kind of campus life experience. As the success and perseverance of its students are at the heart of its mission, Sherbrooke University has chosen, in this exceptional context, to allow the greatest possible number of students to participate in as many in-person activities as possible, while respecting the sanitary rules in place.

The introduction of outdoor classrooms on the campuses of higher education institutions represents a solution for increasing in-person activities in the context of a pandemic. Outdoor classes offer an original and unique experience in learning environments which are rarely utilized in higher education and favor the implementation of strategies inspired by outdoor education. They have the potential of becoming a pedagogical resource that makes learning more concrete. When used properly, outdoor education is even known to have cognitive, physical, mental, and educational benefits (Kuo, Barnes & Jordan, 2019).

While outdoor education is mainly associated with teaching at the elementary and secondary levels, Sherbrooke University's initiative reflects an interest that is increasingly evident among higher education teachers. In June 2020, Sherbrooke University published a first guide documenting the logistical process of the first phases of implementation of outdoor classes, for the benefit of the management of other higher education institutions ([Ayotte-Beaudet, Beaudry, Bisailon & Cordeau, 2020](#)). To foster the success of such a project, it is also essential to provide pedagogical support and guidance for teachers.

The purpose of this guide is to provide support for teachers who wish to use outdoor settings in the context of university instruction. It presents the advantages and certain myths associated with outdoor education, as well as pedagogical approaches that can be used. It proposes questions to guide classroom choice and instructional planning. Finally, a few people from different backgrounds provide a brief account of their experience.

We hope this guide will help you plan your first outdoor teaching experiences or develop your expertise in outdoor education in higher education.

Enjoy your reading!

1. OUTDOOR EDUCATION

Outdoor education and the outdoor classroom

Outdoor education refers to education that takes place *in* an outdoor setting. Depending on how it is used, the outdoor setting can be an object of learning (education *about* the environment), a learning environment and pedagogical resource (education *through* the environment), or a source of problems to be prevented and solved (education *for* the environment) (Sauvé, 1997).

In the context of higher education, an outdoor classroom is an infrastructure put in place by the institution to allow teachers to make use of outdoor education practices.

Advantages of outdoor education

While interest in outdoor education has grown in popularity in recent years, the current health crisis has given it a new appeal: it increases the number of safe learning environments. Aside from this specific and immediate need, the scientific literature identifies numerous benefits to outdoor education, such as some associated with physical and mental health (Kuo, Barnes & Jordan, 2019). Above all, several benefits are directly related to the learning objectives of higher education.

- ✓ **Varied learning contexts.** Outdoor settings, both on and off campus, provide opportunities to vary the contexts in which learning is used. Varying the contexts in which learning is mobilized generally has a positive effect on learning retention (Day, Motz & Goldstone, 2015). For example, the *Act respecting land use planning and development* can be studied and its application analyzed according to different categories of buildings. Different locations on a campus can be used to apply mathematical knowledge to the real world.
- ✓ **The use of active teaching methods.** Outdoor classes usually encourage teachers to use more active teaching methods (see section 3). Active teaching methods are those that require students to do more than just listen and take notes. For example, the space provided in outdoor classrooms can be used to organize activities that promote cooperation or communication among students. An unstructured outdoor classroom can become a place for artistic performance or a large creative space that stimulates ideas in other ways.

- ✓ **Understanding social and natural phenomena where they occur and technical phenomena where they are applied.** The overall aim of pedagogical activities in higher education is to promote meaningful learning. One of the means to achieve this is to study social and natural phenomena where they occur as well as technical phenomena where they are applied. This helps to make concrete certain phenomena that might otherwise remain more abstract, in addition to reflecting their complexity, subtlety or systemic nature. For example, the behaviour of members of the university community (psychology), the interactions between living species (biology) or the infrastructure of a campus (engineering) can be studied.

2. SOME MYTHS ABOUT OUTDOOR EDUCATION

The perception of outdoor education varies from one teacher to another. Before integrating outdoor education into their teaching practices, teachers are often curious about it, while at the same time harbouring certain fears or preconceived ideas. These are discussed in this section.

Myth #1: I need specialized training to teach outdoors.

The decision to use outdoor education simply requires a desire to teach outdoors. Many people try it without any training. While training may be beneficial, it should not be a prerequisite for going outdoors. Above all, we must seize this opportunity to learn and diversify our teaching methods.

Myth #2: If I use an outdoor classroom, my entire course must take place there.

Pedagogical decisions should generally be based on the learning objectives to be achieved. It is therefore up to you to determine the frequency and duration of using an outdoor classroom. Activities can be used judiciously as a complement to distance or indoor activities.

Myth #3: I will have to change my entire course.

If you decide to try outdoor education, it is important to respect your comfort level. It is better to give yourself small, realistic and progressive goals rather than making too many changes that could discourage you. The integration of new teaching practices requires a period of adaptation for both teachers and students.

Myth #4: My teaching activity must be related to the environment or nature.

Outdoor learning can be used for subjects that go well beyond nature and the environment. It provides an opportunity to study social and natural phenomena where they occur and technical phenomena where they are applied. The outdoor classroom can also be more conducive to certain types of activities (e.g., reading circle, collaborative work).

Myth #5: My course is too theoretical to be given outdoors.

Although outdoor education is associated with active teaching methods, this does not preclude the use of outdoor classrooms to address more theoretical concepts. During your first outdoor activities, it is preferable to give yourself a period of adaptation by transferring practices you have already mastered. Ideas for new teaching methods may emerge as you go along.

Myth #6: I need my PowerPoint presentation to give my course.

A PowerPoint presentation can support learning without being necessary for outside activities. For example, the outdoor classroom can be used before or after other indoor or remote activities (either synchronous or asynchronous).

Myth #7: The weather conditions must be perfect.

The weather conditions do not need to be perfect. It is more a question of getting into the habit of dressing according to the forecast. When you prepare your group well and make a few reminders, activities go smoothly most of the time. According to estimates in recent years, weather data in Sherbrooke indicates that about 75% of the days in September and October are favourable for outdoor classes. If the weather forecast is really unfavourable, you need only communicate a plan B, such as a remote or indoor class.

Myth #8: Group management will be more difficult.

Teachers often feel that students will be more distracted outdoors. This is not generally the case; meaningful activities that engage students may even increase their attention span (Kuo, Barnes & Jordan, 2019). What's more, your confidence level will likely increase after a few classes outdoors.

Myth #9: My students learn much more in an indoor classroom.

One of the advantages of outdoor education is that you can study phenomena where they occur or where they are applied, in a variety of real-life contexts. When learning is related to such contexts, i.e., contexts that are not strictly associated with an educational setting, this promotes better understanding among students (Giamellaro, 2017).

3. PEDAGOGICAL APPROACHES ASSOCIATED WITH OUTDOOR EDUCATION

Outdoor education is generally associated with a more active pedagogy that emphasizes both intellectual and motor activity; the degree of participation of students generally varies according to their degree of autonomy (Legendre, 2005). Here are some approaches that can inspire activities.

- **Cooperative approach.** The cooperative approach allows students to work in small groups on the same project or theme. It is generally recommended that small groups be created and that interdependence between team members be encouraged (Legendre, 2005).
- **Experiential approach.** The experiential approach advocates a process of knowledge creation based on the transformation of a person's experiences. According to Kolb (1984), experience is the basis for learning and subsequently promotes better conceptualization. This approach takes place in real-life situations, such as an exploration of the premises, which allows the experience to be meaningful (Legendre, 2005).
- **Problem-based approach.** The problem-based approach provides students with a problem to solve in order to encourage their involvement and autonomy in their learning. The problem should be meaningful, motivating and as close as possible to a real-life situation (Legendre, 2005).
- **Project-based approach.** The project-based approach leads students to investigate and find solutions to an initial problem or question. It generally allows them to engage in their learning and collaborate with each other. This approach leads to learning that is anchored in real life (Hasni, Bousadra & Marcos, 2011).
- **Community approach.** The community-based approach involves projects that require investigation and research with a view to transforming the environment. Projects generally require the involvement of several community stakeholders. The creation of links between different community stakeholders can lead students to gain a more nuanced understanding of their environment and develop a sense of belonging (Sauvé, Orellana, Qualman & Dubé, 2001).

These approaches may fuel reflection on other ways of approaching certain content. To help you diversify your teaching methods, you can also consult the following section of Sherbrooke University's training support service:

<https://www.usherbrooke.ca/enseigner/pedagogie/diversifier-ses-methodes-pedagogiques/#c289288-3>.

TYPES OF OUTDOOR CLASSROOMS

Sherbrooke University's outdoor education project distinguishes between four distinct types of covered and uncovered outdoor classrooms.

Uncovered outdoor classrooms with an organized layout

The presence of several agoras with stone benches on different levels on Sherbrooke University's main campus corresponds to a first type: the uncovered outdoor classroom with an organized layout. It generally lends itself well to teaching large groups. Students can easily remain on site and hold discussions in subgroups.

Uncovered outdoor classrooms without an organized layout

The uncovered outdoor classroom without an organized layout refers to a defined space where learning activities can take place, such as a grassed area with no particular facilities. It allows students to experience nature in a more immersive way. Its organization is flexible and can be adapted to the teacher's teaching methods.

Covered outdoor classroom

The covered outdoor classroom provides shelter from light rain. Depending on the space available, it generally accommodates smaller groups. The layout can vary according to its intended use (tables, chairs, etc.).

Classroom under a tent

Outdoor classrooms under a tent provide good protection against rain, wind and sun. If the tent can be opened at the sides, it offers additional protection. Closed tents will extend the period of use.

4. THE OUTDOOR CLASSROOM

In order to make decisions on how to use an outdoor classroom, it is essential to determine in advance the learning objectives to be met. These make it possible to make decisions that are consistent with the most relevant teaching methods and approaches to support and assess learning.

Once the learning objectives have been clearly identified, the major themes and the number of sessions associated with each of these themes can then be determined. Once these decisions have been made, it is much easier to determine the sessions in which it is appropriate to use an outside classroom.

When should an outdoor classroom be used?

It is strongly recommended that outdoor activities have an added value. This could be in terms of learning, organization of space, or student capacity, for example.

Here are a few important questions to ask yourself when planning your semester:

- Will all the classes take place in an outdoor classroom?
- Will the outdoor classroom be used to complement indoor or distance learning activities?
- Will the assessments reflect how learning has been achieved outdoors?

How to select and book an outdoor classroom

If you have a choice between several outdoor classrooms, it is essential to take the time to consult the technical sheets for each site ([Ayotte-Beaudet, Beaudry, Bisailon & Cordeau, 2020](#)). These provide information about the type of outdoor classroom (uncovered with organized layout, uncovered without organized layout, covered, tent), student capacity, visual supports, furniture, as well as the availability of Wi-Fi, electrical outlets, and a microphone.

Here are some important questions to ask yourself before choosing a classroom:

- Do I absolutely need a projector to present a PPT?
 - What outdoor classroom configuration would work best for meeting the learning objectives for my students?
 - If my outdoor classroom is uncovered and the weather does not allow the teaching activity to take place, am I comfortable having a Plan B, in the form of an indoor or remote activity? What is my Plan B?
 - Is it essential to have Wi-Fi in my outdoor classroom?
- ❖ At Sherbrooke University, in the fall of 2020, outdoor classrooms will be available from mid-August to the end of October. To find out how to book a classroom at Sherbrooke University, visit the following page:
<https://www.usherbrooke.ca/enseigner/alternatives-au-presentiel/classes-exterieures/>.

What do I do after I choose my classroom?

Physically visiting your outdoor classroom and its surroundings is a key step in properly planning each outdoor class. This will allow you to visualize yourself in the classroom in a real-life teaching situation, and help inspire activities and better anticipate how they will unfold. The better you are able to plan your classes, the more confident you will be.

If you are unable to visit the location before your first outdoor class, you should consult the technical sheet and available photo(s).

Fictional cases for choosing an outdoor classroom

Nicole, anatomy

Nicole teaches anatomy to groups of sixty students. In the context of COVID-19, the indoor space allocated to her allows for only 30 people. This means that she has to conduct two 90-minute sessions with half her group or do 3-hour sessions with some students on campus and others at home. To provide a learning experience for her entire group at the same time, she has decided to use an outdoor classroom in September and October. She is trying to find a site that can accommodate 60 people at the same time. Since she will be asking students to do preparation work at home (flipped learning), she does not need a PPT projector. For face-to-face teaching, she wants to rely on short lectures and collaborative work in subgroups. If weather conditions make it difficult for her to use the outdoor classroom, she will inform her group of the procedures to be followed. She can therefore use an uncovered classroom with organized layout.

>> Sherbrooke University Recommendation: [uncovered classroom with organized layout](#) *Le Théâtre*

Seydou, artistic creation

Seydou gives a course in artistic creation to 20 people. For him, the outdoor classroom is a place of creation that can inspire literary writing, become a dance studio or serve as a landscape for the study of different painting techniques. He doesn't need a projector, but he would like to have a whiteboard to record some of the key ideas that come out of his classes. His ideal solution would be to find a large outdoor classroom that provides contact with nature. He can therefore opt for an uncovered classroom without organized layout.

>> Sherbrooke University Recommendation: [uncovered classroom without organized layout](#) *La Voltigeuse*

Camilia, engineering

Camilia is an engineering professor. She is known for her attention-grabbing demonstrations. During the classroom allocation process, due to the reduction in space caused by COVID-19, she was unable to obtain her usual locale. As a result, she will have to teach at a distance unless she can find an outdoor classroom that meets her needs. She needs a site that can hold about 50 people, that allows the use of a PPT presentation and that can accommodate demonstration equipment that cannot be damaged by rain. She must therefore choose a covered classroom or a classroom under a tent with a projector.

>> Sherbrooke University Recommendation: [classroom under a tent](#) *L'Éducative*

SANITATION RULES TO RESPECT



Disinfect your work equipment when you arrive and, if there is furniture, ask students to disinfect their workspace. Disinfection supplies will be available on site.



Wear a facial covering when entering any building.



Enforce the 2m distance between each person on the site.



Wash your hands frequently with soap and warm water for at least 20 seconds.



Use an alcohol-based disinfectant if you do not have access to soap and water.



Observe proper hygiene rules when you cough or sneeze; cover your nose and mouth with your arm or elbow in order to reduce the spread of germs.



If you use a paper tissue, discard it as soon as possible and wash your hands afterwards.



If you are sick, please stay home. Call 1 877-644-4545 and follow the instructions given to you.



Avoid direct contact with others through handshakes and prioritize practical alternatives.



Avoid sharing objects.

5. INSTRUCTIONAL PLANNING

As with indoor and distance learning, instructional planning is crucial for the smooth running of outdoor teaching and learning activities. Here are a few tips that may help.

Constructive alignment

The principle of constructive alignment, i.e. consistency between learning objectives and the methods used to help students meet those objectives, is useful for ensuring that a course is coherent. The following questions can help ensure constructive alignment (Gagnon, 2014):

- How does my course fit in with the program?
- What are the learning objectives that students should meet in my course?
- What evaluation methods should I put in place to assess the achievement of learning objectives?
- What learning activities will best help students meet the learning objectives?

Preparing students

Most students are not accustomed to participating in outside learning activities. It is therefore important to prepare your group, which could positively influence students' interest and perception of learning (Ayotte-Beaudet & Potvin, 2020; Ayotte-Beaudet, Potvin & Riopel, 2019).

Students should be aware of the purpose of using an outdoor classroom, any essential preparatory activities, what is expected of them once they are on site, etc. If the use of an outdoor classroom is occasional, it should be explained how this class is complementary to the activities that precede and follow it. Poor communication of your expectations could lead to student resistance (Dubé, 2018).

Outdoor kit for students

Outdoor classrooms have different teaching and learning conditions than indoor classrooms. In your course outline, it is strongly recommended that you include a list of essential items students will need in an outdoor setting. Some of the following suggestions are directly related to the context of COVID-19.

- Face covering (access to bathrooms and in cases where distancing of 2m is not respected)
- Weather-resistant notebook
- Clipboard, if necessary for the activity
- Fully charged electronic devices
- 2 m x 2 m blanket to mark out their space on the ground (classrooms without organized layout)
- Appropriate clothing for the day's weather
- Wide-brimmed hat
- Sunglasses
- Water bottle
- Sunscreen
- Raincoat

What to do if the case of bad weather

Even if the weather conditions are not optimal, sometimes activities can still take place in the outdoor classroom. On such occasions, the teacher's attitude usually influences the reaction of students. You should therefore prepare your group for outdoor learning activities in different types of weather conditions from the beginning of the semester.

Sometimes the weather simply does not allow a teaching activity to take place outdoors. It is strongly recommended that you communicate a clear procedure to your group in advance. For example, you may decide to confirm or cancel the session 24 hours in advance. In the event of a cancellation, students should be aware of the alternative (in-person indoor class, synchronous or asynchronous remote class).

Accommodations for students with disabilities

In recent years, people with visible and non-visible disabilities have become more integrated into the post-secondary environment. Outdoor classrooms may pose challenges for some of these individuals. Considering the diversity of disability situations and accommodations, it is recommended that you encourage such individuals to discuss these issues with you early on, prior to the first outdoor class, to ensure that these classrooms meet the needs and characteristics of all students in your groups.

- ❖ At Sherbrooke University, students may, for example, use the services of an interpreter, note-taker, reader, or mobility assistant. To learn more about disability support services, please consult the following page:
<https://www.usherbrooke.ca/etudiants/sante-et-aide-a-la-personne/etudiantes-ou-etudiants-en-situation-de-handicap-ou-de-trouble-dapprentissage/informations-pour-le-personnel-enseignant-et-facultaire/#c118688-1>.

6. TESTIMONIALS

Anne Nadeau, lecturer in art didactics, postdoctoral fellow, Sherbrooke University

“When teaching content related to the arts, literature or culture outdoors, the first challenge is that of resources (material and space). You have to make strategic choices. Going outside can allow you to experiment with approaches you have seen beforehand (in class or on video), such as doing voice projection exercises or testing a photography technique with natural light. You can also use nature or urban walking as inspiration for discussion or creation. Many cultural venues have outdoor spaces available to accommodate groups, and we rarely think to use them. They can easily be used for a conference or seminar discussion. Sometimes it is even possible to visit outdoor cultural facilities or to enjoy an outdoor artistic experience (artistic performance, garden tour, public reading, etc.)”

Olivier Arvisais, professor in didactics of humanities and social sciences, UQAM

“The teaching of theories, concepts or techniques specific to the humanities and social sciences can be done through the study of living sources such as people or environments and through concrete experiences. Accompanying students to authentic places is an effective way to contextualize the role of the humanities and social sciences in interpreting the world around us. Campuses hold a lot of potential. For example, we can observe social behaviours and interactions to exemplify theories or concepts in sociology. Buildings, the environment or organizational structures can also be very relevant to the application of analytical or design approaches in urban studies, architecture or environmental design. In political science, a campus survey can provide a better understanding of certain power relations or intersecting systems of oppression or privilege. Most campuses also have immense potential for introducing students to historical work.”

Jean-Marc Poulin, director general, Le Salésien school

“Le Salésien High School in Sherbrooke set up two outdoor classrooms for the beginning of the 2019 school year. One is of the agora type (rows of tables) and the other has a more collaborative layout (tables of 6). Based on this first year of exploration, the implementation of outdoor educational environments is without a shadow of a doubt an added value for both staff and students. These new environments bring pedagogy to the forefront of teaching work. While a small number of teachers immediately felt at ease in these new environments, others gradually adapted to them and slowly changed their way of teaching. Initially, with the presence of electrical outlets, we believed that the teachers would use their usual projection equipment. In practice, very few took advantage of this possibility, seeking instead to change their practices for sharing their teaching materials. This is good news for pedagogical innovation! Among our students, we have seen an increase in interactions that promote positive collaboration. We also seem to observe improved concentration and motivation. In the future, we anticipate collaborations between students in different cycles.”



Photo 1 - Example of a collaborative-style outdoor classroom at Le Salésien high school (photo: Jean-Philippe Ayotte-Beaudet).

Pascale Côté-Deschênes, former student and elementary school teacher

“When I was a bachelor's and master's student, I was lucky enough to have access to outdoor education. When I'm outside, I feel freer and less preoccupied with life's problems. Nature, fresh air and sunshine also help me feel good. Obviously, there can be distractions like an insect landing on a book or a bird singing during class. But these distractions can also serve as moments for relaxation or discovery. I also feel that an outdoor classroom creates more connection between students than an indoor one. There's more close contact, you can choose where you want to be, it's less disturbing when you talk. Depending on the type of outdoor classroom, it may be necessary to have a clipboard or other rigid object to write on. In fact, it may be easier to take notes by hand, since it can be hard to see the computer screen in the sun. You also need to be prepared for the wind! Above all, you have to be open-minded and take advantage of these moments that are beneficial for the body and mind.”



Photo 2 - Photo of the students taking part in an instructional activity, summer 2019, ENS888 *Enseignement des sciences à l'extérieur* (photo: Jean-Philippe Ayotte-Beaudet).

CONCLUSION

The context of the pandemic has led Sherbrooke University to develop original solutions for continuing to provide as many face-to-face educational activities as possible as well as a dynamic campus life. This pedagogical guide, which was written within a very limited time frame, is intended to support teachers who wish to use our outdoor classrooms in the current social and health context. In the longer term, our university's objective is to continue to support initiatives associated with outdoor education by implementing permanent outdoor facilities.

Outdoor education and the introduction of outdoor classrooms enrich the range of teaching activities offered at Sherbrooke University and are complementary to the activities offered indoors and at a distance. The experience gained over the next few years will bring together a community of practice for the development of expertise in the field. At Sherbrooke University, outdoor classrooms are destined to become an important legacy of the pandemic, in terms of both infrastructure and pedagogical practices, while at the same time revealing new avenues of research on the subject.

It is our aim to set up a research program to answer several important questions. How can outdoor learning promote inclusiveness in higher education? What needs does outdoor education meet in the various college and university disciplines? What teaching methods are most conducive to outdoor learning in higher education? How does outdoor education influence the sense of belonging to an institution? All those interested are invited to join us.

REFERENCES

- Ayotte-Beaudet, J.-P., Beaudry, M.-C., Bisailon, V. & Cordeau, P. (2020). *Outdoor classes in higher education during the context of COVID-19 in Canada, Guide to support management during the first phases of implementation*. Université de Sherbrooke. 20 p. <http://hdl.handle.net/11143/17164>
- Ayotte-Beaudet, J.-P. & Potvin, P. (2020). Factors related to students' perception of learning during outdoor science lessons in schools' immediate surroundings. *Interdisciplinary Journal of Environmental and Science Education*, 16(2), 13 pages. doi.org/10.29333/ijese/7815
- Ayotte-Beaudet, J.-P., Potvin, P. & Riopel, M. (2019). Factors related to middle-school students' situational interest in science in outdoor lessons in their schools' immediate surroundings. *International Journal of Environmental and Science Education*, 14(1), 13-32. www.ijese.net/makale/2100.html
- Day, S. B., Motz, B. A. & Goldstone, R. L. (2015). The cognitive costs of context: The effects of concreteness and immersiveness in instructional examples. *Frontiers in Psychology*, 6(1876), 1-13. doi.org/10.3389/fpsyg.2015.01876
- Dubé, J.-S. (2018). *Données probantes : la résistance étudiante aux pédagogies actives*. Université de Sherbrooke, Service de soutien à la formation. <https://www.usherbrooke.ca/ssf/veille/perspectives-ssf/numeros-precedents/octobre-2018/le-ssf-veille/donnees-probantes-la-resistance-etudiante-aux-pedagogies-actives/#c262155>
- Gagnon, L. (2014). *Quatre questions pour mieux planifier un cours*. Université de Sherbrooke, Service de soutien à la formation. <https://www.usherbrooke.ca/ssf/veille/perspectives-ssf/numeros-precedents/decembre-2014/avec-classe/>
- Giamellaro, M. (2017). Dewey's yardstick: Contextualization as a crosscutting measure of experience in education and learning. *SAGE Open*, 1-11. doi.org/10.1177/2158244017700463
- Hasni, A., Bousadra, F. & Marcos, B. (2011). L'enseignement par projets en sciences et technologies : de quoi parle-t-on et comment justifie-t-on le recours à cette approche? *Nouveaux cahiers de la recherche en éducation*, 14(1), 7-28. doi.org/10.7202/1008841ar
- Kolb, D.A. (1984). *Experiential learning*. Englewood Cliffs : Prentice-Hall.
- Kuo, M., Barnes, M. & Jordan, C. (2019). Do experiences with nature promote learning? Converging evidence of a cause-and-effect relationship. *Frontiers in Psychology*, 10(305), 1-9. doi.org/10.3389/fpsyg.2019.00305
- Legendre, R. (2005, 3rd edition). *Dictionnaire actuel de l'éducation*. Montréal : Guérin.
- Sauvé, L. (1997). *Pour une éducation relative à l'environnement*. Montréal : Guérin.
- Sauvé, L., Orellana, I. Qualman, S. & Dubé, S. (2001). *École et communauté : une dynamique constructive*. Montréal : Hurtubise HMH. <http://www.espace-ressources.uqam.ca/images/Documents/Pedagogique/Monographies/ecole-communaute-dynamique-const.pdf>

ADDITIONAL RESOURCES

Constructive alignment

<https://www.usherbrooke.ca/ssf/veille/perspectives-ssf/numeros-precedents/decembre-2014/le-fin-mot-alignement-pedagogique/#:~:text=On%20schématise%20parfois%20cet%20alignement,évaluation%20et%20les%20activités%20pédagogiques.>

Learning through nature

<https://www.childrenandnature.org/research-library/>

Flipped learning

https://www.usherbrooke.ca/ssf/fileadmin/sites/ssf/Face_et_pile/face_pile_app-inversee_version_finale.pdf

Universal Design for Learning

<https://www.usherbrooke.ca/ssf/veille/perspectives-ssf/numeros-precedents/mars-2018/le-fin-mot-cua-conception-universelle-de-lapprentissage/>

Teaching methods

<https://www.usherbrooke.ca/enseigner/pedagogie/diversifier-ses-methodes-pedagogiques/#c289288-3>

Learning scenarios

<https://www.usherbrooke.ca/ssf/veille/perspectives-ssf/numeros-precedents/decembre-2014/le-ssf-veille/le-scenario-contre-attaque-pourquoi-scenariser/>