# CITIZEN SCIENCE 20

## THE CASE FOR INTEGRATION OF ENVIRONMENTAL SCIENCE 20 AND PHOTOGRAPHY 20

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# TABLE OF CONTENTS

# INTRODUCTION

Acknowledgment of the detrimental effects of human activity on the environment has been growing since Rachel Carson published Silent Spring in 1962. Her pivotal work brought environmental issues into the public sphere and spurred activism aimed at protecting natural habitats. Evidence suggests we are moving toward a more environmentally friendly society, with up to 86% of people globally now believing in climate change (Ritchie & Roser, n.d.). In response to this growing concern, educational curricula have evolved to include courses like Environmental Science 20.

The younger generation, increasingly aware of the climate crisis, has become more invested in taking action. Young activists such as Greta Thunberg have leveraged social media to disseminate information. With 82% of teenagers accessing their accounts daily (Summerfield, 2023), social media appears to be an effective way to engage this audience. While platforms like X (formerly Twitter) are popular among older generations, only 2.4% of individuals under 18 use text-based social media applications (Statista, n.d.). In contrast, visually based platforms such as YouTube, TikTok, Snapchat, and Instagram are most popular among teenagers (Pew Research Center, 2023). Responding to this shift toward visual communication, this interdisciplinary course aims to blend Environmental Science 20 and Photography 20 from the Saskatchewan curriculum.

The goal is to encourage students to explore and document their natural surroundings through both scientific and artistic lenses. By integrating these subjects, students will develop a deeper understanding of environmental concepts while enhancing their observational and creative skills.

# INSTRUCTIONAL DESIGN

## PEDAGOGICAL CONSIDERATIONS – CONTENT ANALYSIS

There are many advantages to these two subjects being taught in an interdisciplinary manner, but we must first acknowledge our behaviour as humans is the reason for the degradation of our natural spaces. And while some people still hold out that they are above nature (anthropocentric worldview) the push for more environmental stewardship is largely driven by Indigenous people, especially in Canada. (ICT Inc., n.d.) With this being the case, incorporating *Traditional Ecological Knowledge* (TEK) and *Indigenous Ways of Knowing* (WOK) is into this citizen science course allows for the seamless inclusion of First Nations content. Authentic inclusion of First Nations perspectives in this course is in keeping with the educational goals (#62-65) of the National Truth and Reconciliation Commission's report (Truth and Reconciliation Commission of Canada, 2015).

It has been widely reported that students need a personal connection to course material, in order to be fully engaged in learning (Edutopia, n.d.). We also know that that "(t)he world is home to 1.8 billion young people between the ages of 10 to 24 — the largest generation of youth in history. Young people are increasingly aware of the challenges and risks presented by the climate crisis and of the opportunity to achieve sustainable development brought by a solution to climate change." (United Nations, n.d.) These concepts are explored thoroughly within the Environmental Science 20 course and have the potential to spark real change driven by student action. The same article by United Nations says that "(y)oung people are not only victims of climate change. They are also valuable contributors to climate action. They are agents of change, entrepreneurs and innovators. Whether through education, science or technology, young people are scaling up their efforts and using their skills to accelerate climate action." (2015)

As for the integration of Photography 20 into this course, it has been shown that high school aged students predominantly engage with visual based social media and are quite often seen using their phones to take photos. With the proper education around how photography can be a powerful story-telling tool, this course provides a skillset that can be used in many aspects of their life. It is known among journalists that "people might decide not to read an article, or tune out the radio, but they won't be able to unsee images that are published — be it in the newspapers, websites, or social media." (Bonn Institute, n.d.). It is not only the narrative nature of photographs that make them influential with students but also what they see in those photographs. "The incredible power of nature photography lies in its ability to remind us that we're not the only ones who call this planet home, and we have a responsibility to take care of it. The images they make are not just inspiring and beautiful, they are crucial to the future of our world." (Indian Institute of Art & Design [IIAD], n.d.)

Lastly, in this design we must talk about the interdisciplinary nature of the course. Divisions such Saskatoon Public Schools (SPSD) have a history of successful courses that integrate learning such as a Biomechanics course that combined physical education and physics, grade 11 combined English and Psychology class and SAGE programming that fused English Language Arts 09 A and B as well as Social Studies 09. As such, this course would not necessarily be ground-breaking in an face-to-face classroom but would be a first for the Saskatchewan Digital Learning Centre (Sask DLC).

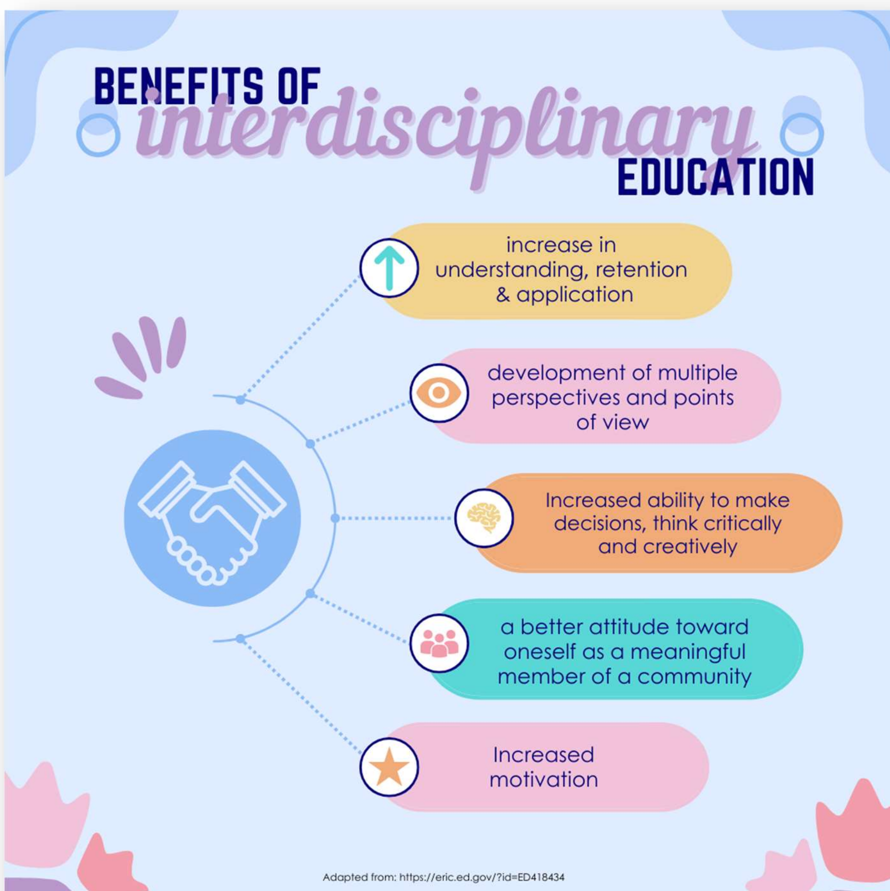




*Figure 1. Benefits of interdisciplinary Education. Created by Samantha Roberts*

# PEDAGOGICAL CONSIDERATION – LEARNER ANALYSIS

The target audience for this course are online high school students in Saskatchewan, ages 15 – 19. Both Environmental Science and Photography bring a diverse range of learning styles to education, creating opportunities for dynamic and engaging instruction. Many students thrive in visually stimulating environments, responding well to tools like photographs, diagrams, and videos that bring concepts to life (Puppetry, n.d.). A significant number are kinesthetic learners who excel in hands-on activities, such as conducting fieldwork, experimenting with environmental testing, or practicing photography techniques (Dunn & Dunn, 1993). Additionally, auditory learners within the group benefit from discussions, podcasts, and collaborative sessions that emphasize verbal communication and idea exchange (Listening.com, n.d.). This diversity in learning styles underscores the importance of incorporating a variety of instructional methods into this course to cater to all students effectively.

The strengths seen by most groups of teenagers complement these varied learning preferences, creating a solid foundation for interdisciplinary learning. Students will have a chance to demonstrate their creativity, particularly with the photography projects. Citizen Science 20 aims to foster strong collaboration skills that will enable students to work effectively in teams, exchanging ideas during fieldwork or group projects. There will also be a goal towards technological proficiency and helping students become adept at using digital tools such as cameras, editing software, and data collection apps to enhance their work. Above all, student curiosity about real-world environmental challenges will drive genuine engagement with the subject matter, inspiring students to use their photography skills to tell compelling, impactful stories. Working toward building these strengths present a valuable opportunity to design activities that integrate creativity, teamwork, and technology to foster deeper learning.

Students in this combined Photography and Environmental Science class will face a range of learning challenges that require targeted instructional strategies to ensure their success. Critical thinking is a key hurdle, as students often struggle to interpret complex environmental data or evaluate the artistic and technical aspects of photography compositions. The overwhelming volume of information in Environmental Science further compounds these difficulties, making it challenging for students to identify key insights and focus their efforts effectively. Additionally, many students grapple with time management, particularly when balancing the dual demands of project deadlines and assignments spanning both disciplines. These challenges highlight the need for clear guidance and structured supports to help students manage workloads and develop analytical skills.

Resource limitations and skill disparities add another layer of complexity to this interdisciplinary class. Limited access to advanced photography equipment and environmental testing tools restricts the quality of student projects, particularly for those in under-resourced settings. Meanwhile, a wide range of skill levels in both photography and environmental science often creates inequities in group work and individual performance. While some students will already possess advanced technical or scientific expertise, others will still be developing foundational skills, which can widen achievement gaps. Thoughtful instructional design, such as scaffolding assignments and fostering peer collaboration, coupled with equitable resource allocation, is essential to address these challenges and support all learners effectively.

To enhance learning experiences Citizen Science 20 educators should integrate cross-subject activities that encourage students to apply knowledge from both disciplines in meaningful ways. For instance, students could investigate local environmental concerns and translate their findings into compelling photographic narratives, fostering interdisciplinary connections while building critical thinking skills. Scaffolding activities, such as guided discussions or step-by-step analysis of environmental data and photography compositions, can further help students develop the analytical skills needed to synthesize complex information. Providing hands-on, visual, and kinesthetic learning opportunities, such as fieldwork or experiments paired with photographic documentation, engages diverse learning styles and deepens understanding of both subjects.

Equitable access to resources and technology is also critical for ensuring student success (ISTE, n.d.). Educators can leverage affordable or readily available tools, such as smartphone apps for environmental measurements and photo editing, to mitigate resource limitations. Differentiating instruction by tailoring assignments to students' varied skill levels helps bridge gaps between advanced learners and those developing foundational skills, while promoting peer learning fosters collaboration and mutual growth (Al-Sada, 2021). To address time management challenges, educators can provide structured timelines and project checkpoints, enabling students to balance their workloads effectively. By thoughtfully addressing these recommendations, educators can create a dynamic and inclusive learning environment that maximizes student engagement and outcomes within both disciplines.

## PEDAGOGICAL CONSIDERATIONS – LEARNING THEORY TO GUIDE DESIGN

There are many learning theories that would fit the design goals of Citizen Science 20. This course design explores four of those theories; Constructivist, Experiential Learning, Situated Learning and Culturally Relevant Pedagogy.

***Constructivist Learning Theory:***

Constructivism emphasizes learning as an active, student-centered process where learners build their own understanding based on experiences and prior knowledge (McLeod, 2023). When looking at planning for the environmental portion of this Citizen Science course, this approach would use project-based learning where students explore real-world environmental issues, gather data, and form conclusions. As for photography, students could develop portfolios documenting ecological changes, allowing them to construct knowledge through practice and critique.

**Key Pedagogy**: Scaffolding complex tasks into smaller, manageable units while gradually increasing student autonomy.

## ***Experiential Learning***

Kolb's experiential learning cycle is ideal for integrating hands-on science experiments and creative photography projects (McLeod, 2023).

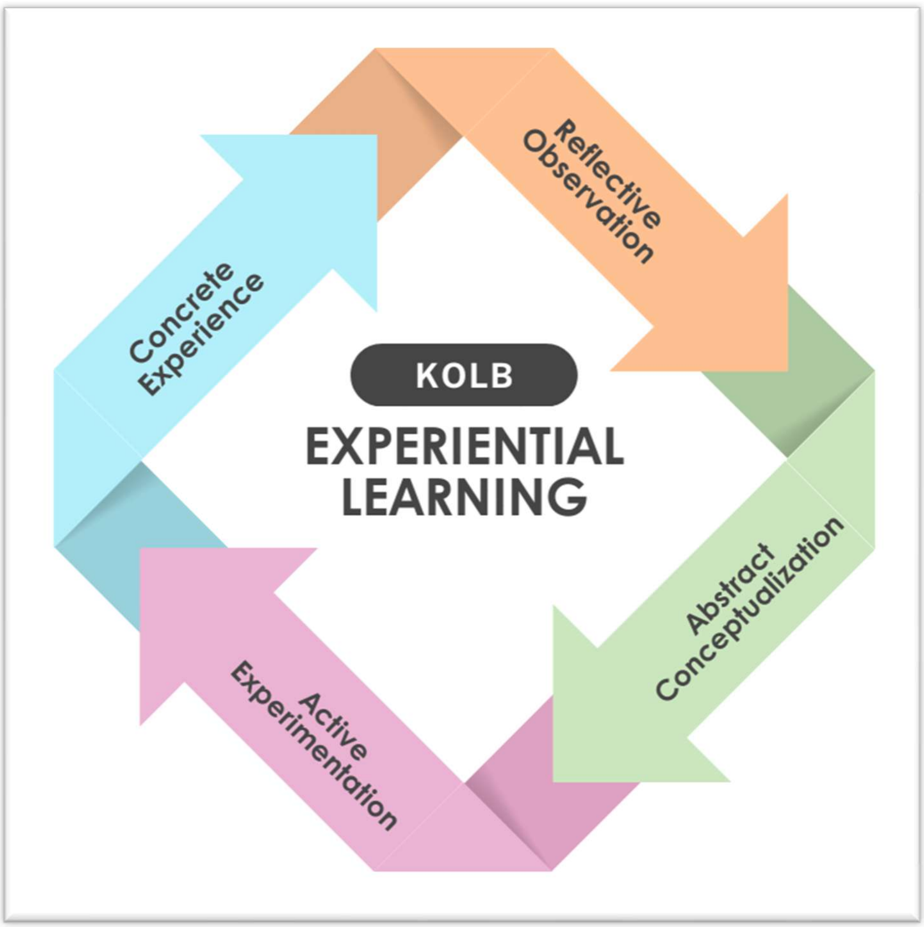


*Figure 2. Kolb's Experiential Learning Cycle. Created by Samantha Roberts*

Field trips, experiments, and simulations provide concrete experiences. While reflecting on outcomes and documenting the process through photography ties the experience to real-world applications.

**Key Pedagogy**: Encourage cycles of action and reflection to deepen understanding.

## ***Situated Learning***

Situated Learning emphasizes learning in authentic contexts through participation in communities of practice. For this course, engaging students in local environmental advocacy or photography competitions will help to develop skills in meaningful, situated activities (Lave & Wegner, 1991). Collaboration with community scientists (ex. University of Saskatchewan) or professional photographers fosters real-world learning.

**Key Pedagogy**: Focus on apprenticeships, mentorships, and collaborative projects that simulate professional environments.

## ***Culturally Relevant Pedagogy***

Culturally relevant pedagogy recognizes and incorporates students' cultural backgrounds to make learning more engaging and relevant. This is an approach that most easily allows for the inclusion of First Nations perspectives and the inclusion of TEK and WOK (Huston, Kamenawatamin, Beardy, & Francis, 2024).

Utilizing the First Nations, Inuit and Metis (FNIM) Elders and other Knowledge Keepers can be included in all these learning theories but fits best within this learning style. Classes could incorporate environmental and social justice topics tied to local issues and diverse perspectives. This also provides an opportunity to showcase photography from various cultures to explore different environmental narratives.

**Key Pedagogy**: Use inclusive content and facilitate discussions that empower students to connect learning to their lived experiences.

## PEDAGOGICAL CONSIDERATIONS—GOAL ANALYSIS

Citizen Science 20 is being designed to utilize the criteria set by the Saskatchewan Curriculum combining both Environmental Science 20 (ESC 20) and Photography 20 (PHOTO 20) outcomes (Curriculum, Government of Saskatchewan, n.d.). There are five units outlined within ESC 20 but none in the PHOTO 20 course as it is a more skill based, practical and applied arts course. This allows flexibility in how those indicators are met.

There will be consideration and focus given to the cross curricular competencies (CCC) that have been developed for K-12 students within Saskatchewan. The four CCCs outlined are to develop thinking, develop identity and interdependence, develop literacies and to develop social responsibility (Curriculum, Government of Saskatchewan, n.d.).

## DESIGN AND STRATEGY – ENVIRONMENTAL SCIENCE 20

This interdisciplinary course is being designed to be an all-year course, spanning both semesters 1 and 2. The increased time frame not only allows for the time to develop relationships with the students, but also allows for the environmental exploration of 3 full seasons.

Below is a chart that is a guide to integration of topics using the ESC 20 outcomes and indicators (Curriculum, Government of Saskatchewan, n.d.).

| CITIZEN SCIENCE 20 | | |
|---|---|---|
| **Learning Outcomes** | | **Possible Delivery Methods** |
| **Career Exploration** | | |
| ES20-CE1 | Analyze and explore environmental science related career paths in Saskatchewan, Canada and the world. | - Interview with professional in photography or science<br>- Tours of post-secondary learning institutes and/or environmental agencies whether private or government based<br>- Documentary style photography showcasing an environmental professional |
| **Student-Directed Study** | | |
| ES20-SDS1 | Create and carry out a plan to explore one or more topics of personal interest relevant to Environmental Science 20 in depth. | - Student-led inquiry that can be presented in multiple ways<br>- Portraits, studio vs. natural lighting<br>- Website building using free hosting sites such as WordPress and Wix for student portfolios |

| | | |
|---|---|---|
| **The Nature of Environmental Science** | | |
| ES20-ES1 | Examine the methods, mindsets and purposes of environmental science. | - Lecture-based notes and diagrams to highlight crucial vocabulary and discover local issues<br>- Hands-on demonstrations of camera operations, whether they be DSLRs or phone cameras |
| **Atmosphere and Human Health** | | |
| ES20-AH1 | Assess the impact of human activities on indoor and outdoor air quality and the need for regulations and mitigating technologies to minimize risks to human health. | - Examine through case studies ideas such as sick building syndrome<br>- Explore historical attitudes towards air pollutants<br>- Ex. Industrial revolution and acceptance of smoking in previous generations<br>- Photographic exploration of cloud formations and extreme weather |
| ES20-AH2 | Analyze the production, reliability and uses of geoscience data to investigate the effects of a changing climate on society and the environment. | - Gallery walk of air quality graphs from around the world, especially during COVID lockdown<br>- Exploration of current air quality conditions using Weather Canada website<br>- Land of Living Skies – Landscape Photo Assignment |
| **Human Population and Pollution** | | |
| ES20-HP1 | Investigate technologies and processes used for mitigating and managing resource use, waste generation and pollution associated with a growing human population. | - Study environmental photographers and their impact on policy and public opinion<br>- Produce environmental photos to highlight local issues<br>- Study the waste chain of production<br>- Discuss obsolescence in today's consumer society<br>- Use photos to highlight local opportunities for object re-use |

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| | | (Thrift shops, Library of Things, recycling facilities, etc.)<br>- Discussion of human population growth and the Earth's carrying capacity |
| **Aquatic Systems** | | |
| ES20-AS1 | Analyze the function and condition of freshwater aquatic systems such as rivers, streams, lakes, wetlands and watersheds. | - Possible underwater photo exploration (lens exploration)<br>- Photo scavenger hunt of various aquatic systems<br>- Storytelling to examine oligo-, eu- and mesotrophic using Robin Wall Kimmerer's book "Braiding Sweetgrass"<br>- Virtual labs examining the structure and importance of watersheds<br>- Lectures and notes on ocean biology and composition |
| ES20-AS2 | Assess the importance of maintaining healthy water for humans and the environment. | - Case studies of remote First Nations lack of access to fresh drinking water<br>- Analyze the frequency of fresh water on Earth and our responsibility to its importance to human health<br>- Use inexpensive water quality testing kits (aquarium) to test and compare composition in various waterways<br>- Research ways of cleaning water for human consumption<br>- Notes and virtual labs on waterborne diseases |
| **Terrestrial Systems** | | |
| ES20-TE1 | Analyze the importance of soils as an integral component of terrestrial ecosystems. | - Use local resources provided by Agriculture in the Classroom to learn about soil composition<br>- Bring in an Elder to discuss the importance of earth in relation to First Nations teachings |

| | | |
|---|---|---|
| | | - Discuss pesticide and fertilizer use in local agriculture and the effects on soil<br>- Photo/Lab investigation of germination in different soil types using plexiglass box |
| ES20-TE2 | Examine the role plants play in an ecosystem, including the ways in which humans use plants. | - Notes, lecture and labs (both virtual and online) to teach about the importance of photosynthesis<br>- Elder or Knowledge Keeper lessons about and plant use in First Nations culture (traditional medicines, 3 sisters garden)<br>- Community garden planting and/or individual plant growth experiments to understand the needs of plants (nutrients, sunlight, water)<br>- Community outreach for elderly who would like help with their gardens<br>- Lecture and notes on the importance of fungi in ecosystems |
| ES20-TE3 | Recognize the need for intact habitat to support animal populations and biodiversity. | - Planet Earth videos that show the interdependence of species on one another<br>- Lecture and notes on types of ecological relationships (commensalism, mutualism, parasitism, keystone species, etc)<br>- Case study on habitat rebuilding in Yosemite National Park once wolves were introduced<br>- Interviews and/or animal tagging with authorized scientists<br>- Stories from Elders and Knowledge Keepers about how they used animal movements and populations as indictors of environmental health |

## NATURE JOURNAL

Keeping a Nature Journal is an ideal year-long assignment for a combined Environmental Science and Photography course, offering students a dynamic way to engage with their surroundings while fostering creativity and critical thinking. By using photography to document natural spaces and organisms that live within them, students create a visual record that highlights ecological patterns and changes over time. This process encourages close observation, scientific inquiry, and artistic expression, allowing students to develop a deeper understanding of environmental systems. Paired with written reflections and detailed scientific notes, the journal becomes a living record of their learning journey, showcasing growth in both technical skills and ecological awareness (Al-Rawahi & Al-Balushi, 2015).

Beyond individual learning, the Nature Journal promotes community involvement and meaningful connections to local environments. As students explore nearby ecosystems and collaborate with peers, they align with UNESCO's call for schools to act as hubs of community engagement (UNESCO, 2023). This assignment provides opportunities for partnerships with local environmental groups, enabling students to contribute to shared stewardship efforts while enhancing their educational experience. By merging scientific documentation, creative storytelling, and community collaboration, the Nature Journal empowers students to become active participants in environmental care, leaving them with a tangible record of their evolving understanding and contributions to the world around them

## Interface Design

The interface design of Citizen Science 20, which integrates Environmental Science and Photography, utilizes a combination of digital tools to create a cohesive and engaging learning experience. The *Moodle* Learning Management System (LMS) serves as the organizational hub, offering intuitive navigation for accessing course materials, discussions, and submissions. Complementing this, Scribe provides step-by-step instructions for complex tasks, such as analyzing environmental data or creating photographic compositions, ensuring students receive clear and consistent guidance throughout their learning journey. Together, these tools streamline course organization, allowing students to focus on exploring the connections between environmental science and photography.

Central to the course is the Nature Journal, crafted through Canva, where students combine photographs, data, and reflections into a living record of their learning. Mobile phones serve as essential tools, enabling students to capture high-quality images of plants, animals, and ecosystems in their local environments. Apps such as iNaturalist, PictureThis, Google Lens, and Merlin enhance this process by assisting with species identification and contributing to global citizen science databases. This integration of tools bridges classroom learning with real-world application, fostering deeper environmental awareness and empowering students to actively participate in scientific inquiry while developing their creative and observational skills.

## ETHICS

Ethical guidelines are essential in when engaging in citizen science, serving as a foundation for responsible and respectful engagement with the environment, communities, and scientific data. They help students navigate critical issues such as respecting privacy, ensuring that data collection does not infringe on individuals’ or property owners' rights, such as photographing private property without consent. These guidelines also promote accuracy and integrity, emphasizing the importance of honest data collection and reporting to maintain the validity of scientific findings. Furthermore, they cultivate impact awareness, encouraging students to consider how their actions might affect wildlife, ecosystems, or local communities. For instance, disturbing a habitat for a photograph could have unintended consequences on the species being observed.

A particularly important ethical consideration for this course is to always seek permission from First Nations people before photographing spaces, ceremonies, or activities that may hold sacred or cultural significance. Such spaces may be tied to spiritual practices or historical narratives and capturing them without consent risks disrespecting their cultural importance. Frameworks like those from SciStarter (SciStarter, n.d.) provide clear principles that underscore respect for the data, subjects, and communities involved in citizen science. By adhering to these ethical principles, students not only contribute to reliable scientific research but also grow as responsible citizen scientists who positively impact society and the environment.

## LEARNER ASSESSMENT

In this Citizen Science 20 course, early and frequent feedback is essential for fostering student growth. Providing feedback early in the course helps students establish a clear understanding of expectations, allowing them to refine their observational and photographic skills from the outset. Using photographs as part of the initial assessments offers a dual benefit: students gain practice in visually documenting their surroundings while instructors can use these early submissions to clarify assessment standards. By engaging students in reflective discussions about their work, the teacher will create opportunities for continuous improvement, helping students bridge the gap between their initial abilities and the desired competencies.

As the course progresses, assessments should evolve to emphasize both skill development and content mastery. Early evaluations can focus on honing students' observational skills, such as identifying patterns in nature or understanding the nuances of light and composition in photography. This foundational practice sets the stage for more complex tasks later in the course, where assessments shift to analyzing scientific data, drawing conclusions from photographic evidence, or creating compelling narratives about environmental phenomena. This phased approach ensures that students are equipped with the tools they need to succeed while fostering a deeper connection between their technical skills and the environmental science content, ultimately promoting a holistic learning experience.

## AEIOU EVALUATION

The course evaluation will follow the AEIOU evaluation format (Simonson, Smaldino, & Zvacek, 2015).

### ***Accountability***

The Citizen Science 20: Environmental Science and Photography course emphasizes transparency in achieving its objectives and meeting stakeholder expectations. Accountability is ensured by aligning the course with curriculum standards for environmental science and photography while integrating ethical guidelines for citizen science activities. Surveys and focus groups with students, educators, and community partners will be conducted to track alignment with these standards, assess the ethical handling of data, and confirm that all participants understand and uphold shared responsibilities throughout the program.

### ***Effectiveness***

The course combines hands-on fieldwork, citizen science apps, and digital photography to promote active, interdisciplinary learning. Students gain practical skills in biodiversity observation and documentation while contributing to real-world citizen science projects. Effectiveness will be assessed through pre-and post-course evaluations measuring growth in scientific literacy, technical photography skills, and problem-solving abilities. Regular feedback loops with educators and students will help refine instructional methods and ensure teaching strategies remain relevant and engaging.

### ***Impact***

The course aims to inspire environmental stewardship, creative expression, and scientific engagement. By documenting local ecosystems and contributing data to citizen science platforms, students develop a deeper connection with their communities and the natural world. Impact will be measured by students' reflective journals, photographic portfolios, and their reported ability to analyze and address environmental challenges. Surveys of community stakeholders will also capture the program's broader influence, such as its role in fostering public awareness or conservation efforts.

### ***Organizational Context***

This course aligns with the Saskatchewan Curriculum mission to support interdisciplinary learning, ethical inquiry, and community partnerships. It also adheres to educational mandates promoting digital literacy, environmental responsibility, and active citizenship. Surveys and interviews with school administrators and community partners will determine how well the course supports institutional goals, ensuring sustained collaboration and resource sharing for future iterations of the program.

### ***Unanticipated Consequences***

As students and stakeholders engage deeply with the course, unintended yet positive outcomes may arise, such as increased advocacy for local conservation efforts, creative environmental campaigns, or strengthened school-community ties. Focus groups and surveys will capture these developments to inform future course enhancements. Addressing unexpected challenges, such as managing the ethical complexities of community-based projects, will also guide revisions to ensure the course continues to meet evolving educational and community needs.

# INSTITUTION OVERVIEW

## ADMINISTRATIVE AFFAIRS

Citizen Science 20 is engineered to fit into the Saskatchewan Curriculum where divisions such as Saskatoon Public Schools already exemplifies a progressive approach to educational administration by integrating interdisciplinary courses such as Biomechanics, Collective Voice, and SAGE 09 (Saskatoon Public Schools, n.d.-a, n.d.-b). These courses foster critical thinking and real-world application of knowledge across diverse subject areas.

These initiatives align with the Canada's response to the Truth and Reconciliation Commission’s Calls to Action #62 to #65, emphasizing the incorporation of Indigenous perspectives and histories into the curriculum (Truth and Reconciliation Commission of Canada, 2015). By utilizing outdoor environments close to students' homes and embedding learning experiences of First Nations, Inuit, and Métis, this course has the structure to create immersive educational opportunities that honor Indigenous knowledge systems and promote environmental stewardship. This holistic approach demonstrates a commitment to inclusive education, fostering academic excellence while addressing broader societal imperatives for reconciliation and sustainability.

## ACADEMIC AFFAIRS

The Citizen Science 20 course exemplifies an interdisciplinary approach by blending the analytical rigor of environmental science with the creative expression of photography, facilitated by a collaborative teaching model. Instructors with a passion for both disciplines, potentially co-teaching, provide diverse perspectives and expertise to enrich the learning experience. Instruction is streamlined through the use of the Moodle LMS (Moodle, n.d.), which could be shared to future instructors as a ready-made ("canned") resource to support new and experienced educators alike. Standard Operating Procedures (SOPs) created with Scribe ensure consistency and clarity in teaching practices, fostering a cohesive learning environment. To enhance practical skills, instructors will produce engaging instructional videos on camera use and editing techniques, empowering students to apply their knowledge in real-world contexts while maintaining the course's innovative and hands-on focus.

## STUDENT AFFAIRS

For students seeking an alternative to traditional classroom environments, the Citizen Science 20 course provides a dynamic and engaging learning experience that blends hands-on exploration with creative expression. Designed to cater to diverse learning styles, particularly visual and kinesthetic learners, the course emphasizes independent learning, encouraging students to take an active role in their education. While this approach can be empowering, it may also present challenges for students who struggle with self-direction or time management. To address these potential hurdles, the course integrates structured resources and regular check-ins, helping students develop the skills necessary for success. By balancing independence with support, the course creates a transformative educational opportunity, offering a pathway for nontraditional learners to thrive while fostering creativity and scientific inquiry.

## FUNDING ISSUES

The success of the Citizen Science course, which integrates environmental science and photography, hinges on addressing key funding needs that ensure its full potential is realized. While the students, as online learners, should have access to computers, securing cameras specifically for this program remains a significant hurdle. These cameras are vital tools, allowing students to document environmental changes, create visual narratives, and contribute meaningful data to Citizen Science initiatives. One way to address this issue is to adapt the photography outcomes to use phone photography as there are various applications that can mimic filters, lens, etc. (Rowse, n.d.)

Additionally, funding is necessary to support a skilled instructor with expertise in both environmental science and photography, who can guide students in combining scientific inquiry with creative expression.

Another critical funding consideration is the provision of honorariums for guest speakers, such as local elders, photographers, and environmental scientists, who bring invaluable perspectives to the course. These experts enrich the curriculum by connecting students to traditional ecological knowledge, advanced photographic techniques, and cutting-edge environmental research.

## MANAGEMENT

Effective management of a Citizen Science course that integrates environmental science and photography requires a dynamic and adaptable approach to ensure its relevance in an ever-evolving field. Assignments should be designed to accommodate emerging data and new discoveries, allowing students to engage with current environmental issues and technological advancements. Flexibility is also essential for fostering partnerships with institutions like the University of Saskatchewan or SaskPolytech, which can enrich the curriculum with collaborative projects and access to expert resources. By maintaining a structure that supports adaptability and encourages interdisciplinary collaboration, the course can remain a vibrant, forward-thinking platform for student engagement and community impact.

## CONCLUSION

The Citizen Science course integrating environmental science and photography represents a transformative educational opportunity, empowering students to explore the natural world through both scientific inquiry and creative expression. By combining rigorous environmental science principles with the artistic power of photography, students not only deepen their understanding of pressing ecological issues but also develop the skills to communicate their findings in compelling ways. The course fosters a sense of personal responsibility and community engagement, equipping students to become active participants in addressing environmental challenges while building a deeper connection to the world around them.

Through a dynamic, interdisciplinary approach, this course emphasizes adaptability, collaboration, and real-world application. By integrating flexible assignments, engaging field experiences, and partnerships with academic and community organizations, students are exposed to a range of perspectives and expertise. Whether analyzing environmental data, capturing impactful images, or contributing to larger scientific initiatives, participants leave the program with valuable skills and a renewed appreciation for the intersection of science, art, and community. This innovative approach to Citizen Science not only prepares students for future academic and career opportunities but also inspires them to be lifelong advocates for environmental stewardship.

## ACKNOWLEDGMENT OF AI USE

This paper was edited with the assistance of OpenAI's ChatGPT, which was used to enhance clarity, refine structure, and ensure coherence. The use of AI was limited to editing and did not involve content creation, analysis, or interpretation. All final decisions regarding the content were made by the author, ensuring that the work reflects their original ideas and contributions.

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