Ontario College of Teachers
Ordre des enseignantes et des enseignants de l'Ontario

Additional Qualification Course Guideline Technological Studies Technological Design, Grades 11 and 12

Schedule B – Teachers' Qualifications Regulation

December 2021

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Additional Qualification Course Guideline for Technological Design, Grades 11 and 12

1.   Introduction

Additional Qualification courses support educators in creating a safe, healthy, inclusive and welcoming learning environment and provide the context for educators to explore the professional knowledge and practices needed, as they strive to honour the strengths, interests and needs of every learner.

Creating inclusive learning environments requires the commitment of all partners – educators, learners, parents, families, guardians, caregivers and the community. This vision of inclusivity, as well as working to sustain it, requires ongoing effort and shared responsibility. This involves collectively and critically reflecting on the impact of policies, practices and processes on inclusive learning environments using an anti-oppression and anti-racist foundation.

The following critical reflections (Figure 1) provide one of many possible frameworks that may guide educators in creating and sustaining a vision of inclusive education:
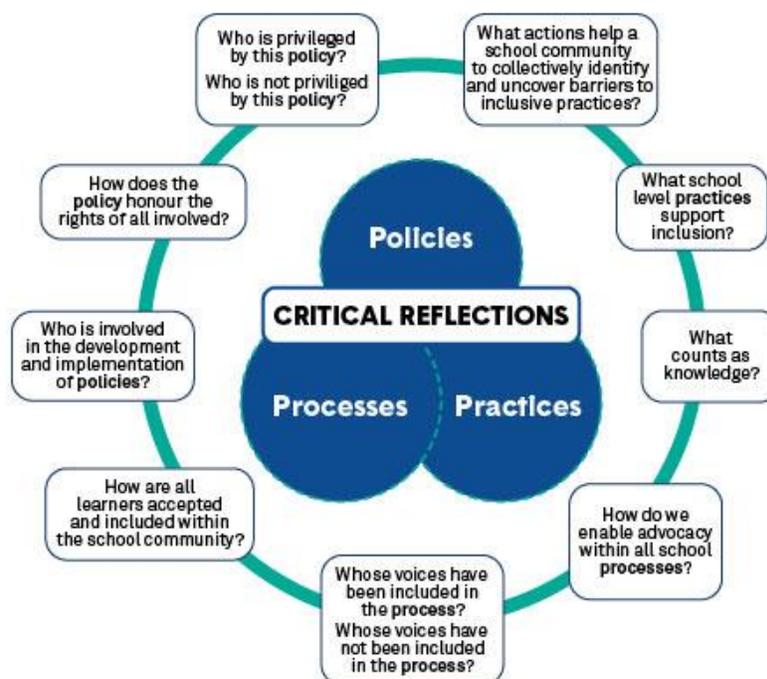

Figure 1: Critical Reflections

2. Conceptual Framework

The Schedule B *Technological Design, Grades 11 and 12* Additional Qualification course guideline provides a conceptual framework for providers and instructors to develop and facilitate the Schedule B *Technological Design, Grades 11 and 12* course. This guideline framework is intended to be a fluid, holistic and integrated representation of key concepts associated with *Technological Design, Grades 11 and 12*.

The Additional Qualification Course: *Technological Design, Grades 11 and 12* serves a diverse group of previously qualified Technological Education teachers or general studies teachers who meet the requirements of the definition of Technological Qualifications in the Teachers' Qualifications Regulation. Candidates may include teachers who want to become qualified to teach another Broad-Based Technology (B.B.T.) or obtain qualifications to enter the Honour Technological Studies Specialist course. It is beneficial for candidates to come to the Additional Qualification Course: *Technological Design, Grades 11 and 12* with background knowledge, skills and experience in this field of technology.

The Additional Qualification Course: *Technological Design, Grades 11 and 12* employs a critical, pedagogical lens to explore in a holistic and integrated manner theoretical foundations, learning theory, program planning, development and implementation, instructional design and practices, assessment and evaluation, the learning environment, research and ethical considerations related to teaching and learning within and across the divisions. Through these explorations, candidates strengthen professional efficacy by gaining in-depth knowledge, while supporting professional judgment and inclusive learning environments and generating new knowledge for practice.

Teachers qualified in *Technological Design, Grades 11 and 12* facilitate active inquiry-based learning by combining knowledge of student development and learning with knowledge and understanding of subject matter, pedagogy and technological expertise. Successful candidates of this Additional Qualification will demonstrate technical proficiency in each of the technologies identified in *Part 7 Demonstrated Competence* in *Technological Design, Grades 11 and 12*.

Additional Qualification Course Implementation

Course providers, instructors and developers will use this Additional Qualification guideline framework to inform the emphasis given to key guideline concepts in response to candidates' diverse professional contexts, knowledge, skills and understandings.

Critical to the holistic implementation of this course is the modeling of a positive learning environment that reflects care, diversity, equity and agency from an asset-based and ethical lens. This course supports the enhancement of the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* to build an inclusive learning environment.

The Ontario College of Teachers recognizes that candidates working in the publicly funded school system, independent/private institutions or First Nations schools will have a need to explore topics and issues of particular relevance to the context in which they work or may work.

Provincial Context

The French language and the English language communities will also need to implement these guidelines to reflect the unique contextual dimensions and needs of each community. Each of these language communities will explore the guideline content from distinct perspectives and areas of emphasis. This flexibility will enable both language communities to implement *Technological Design, Grades 11 and 12* as understood from a variety of contexts.

Educators in Ontario work in varied and diverse educational contexts. Educators may find themselves in a variety of educational settings such as: a rural French language school, a Catholic school, an urban public school, a First Nation school, a provincial school, a private or independent school. Educators will reflect on the unique context of each community to enhance learning and well-being.

In this document, all references to "candidates" are to educators enrolled in the Additional Qualification course. References to "learners" indicate those enrolled in school programs.

3. Regulatory Context

The College is the self-regulating body for the teaching profession in Ontario. The College's responsibility related to courses leading to Additional Qualifications includes the following:

- to establish and enforce professional standards and ethical standards applicable to members of the College

- to provide for the ongoing education of members of the College

- to accredit Additional Qualification courses and more specifically,

The program content and expected achievement of persons enrolled in the program match the skills and knowledge reflected in the College's "Standards of Practice for the Teaching Profession" and the "Ethical Standards for the Teaching Profession" and in the program guidelines issued by the College. (Regulation 347/02, Accreditation of Teacher Education Programs, Part IV, Subsection 24).

Additional Qualifications for educators are identified in the *Teachers' Qualifications Regulation* (Regulation 176/10). This regulation includes courses that lead to Additional Qualifications, the Principal's Development Qualification, the Principal's Qualifications, the Primary Division, the Junior Division and the Supervisory Officer's Qualifications. A session of a course leading to an Additional Qualification shall consist of a minimum of 125 hours as approved by the Registrar. Accredited Additional Qualification courses reflect the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession* and the *Professional Learning Framework for the Teaching Profession.*

The Additional Qualification course developed from this guideline is open to candidates who meet the entry requirements identified in the *Teachers' Qualifications Regulation.*

Successful completion of the course leading to the Additional Qualification Course: *Technological Design, Grades 11 and 12*, listed in Schedule B of the *Teachers' Qualifications Regulation*, is recorded on the Certificate of Qualification and Registration.

4. Foundations of Professional Practice

The *Foundations of Professional Practice* conveys a provincial vision of what it means to be an educator in Ontario. This vision lies at the core of educator professionalism. The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* (see Appendix 1) are the foundation for the development and implementation of the Additional Qualification course. These nine standards, as principles of professional practice, provide the focus for ongoing professional learning in the Additional Qualification Course: *Technological Design, Grades 11 and 12*. In addition, the *Professional Learning Framework for the Teaching Profession* is underpinned by the standards, articulates the principles on which effective educator learning is based and acknowledges a range of options that promote continuous professional learning.

The ongoing enhancement of informed professional judgment, which is acquired through the processes of lived experience, inquiry and critical reflection, is central to the embodiment of the standards and the *Professional Learning Framework for the Teaching Profession* within this Additional Qualification course and professional practice.

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* serve as guiding frameworks that underpin professional knowledge, skills and experiences that educators require in order to teach effectively within and contribute to an environment that fosters *respect*, *care*, *trust* and *integrity*.

Teacher Education Resources

The College has developed resources to support the effective integration of the standards within Additional Qualification courses. These teacher education resources (see Appendix 2) explore the integration of the standards within professional practice through a variety of educative, research and inquiry-based processes. These resources can be found on the College web site.

These teacher education resources support the development of professional knowledge, judgment and efficacy through critical reflective praxis. The lived experiences of Ontario educators are illuminated in these teacher education resources and serve as key supports for Additional Qualification courses.

5.   Pedagogical Inquiry Framework

The pedagogical inquiry framework (Figure 2) for *Technological Design, Grades 11 and 12* supports a holistic, integrated, experiential and inquiry-based Additional Qualification Course. This pedagogical inquiry framework supports the professional knowledge, judgment, critical pedagogies, anti-oppression, anti-racism and culturally responsive and relevant processes and practices of course candidates.
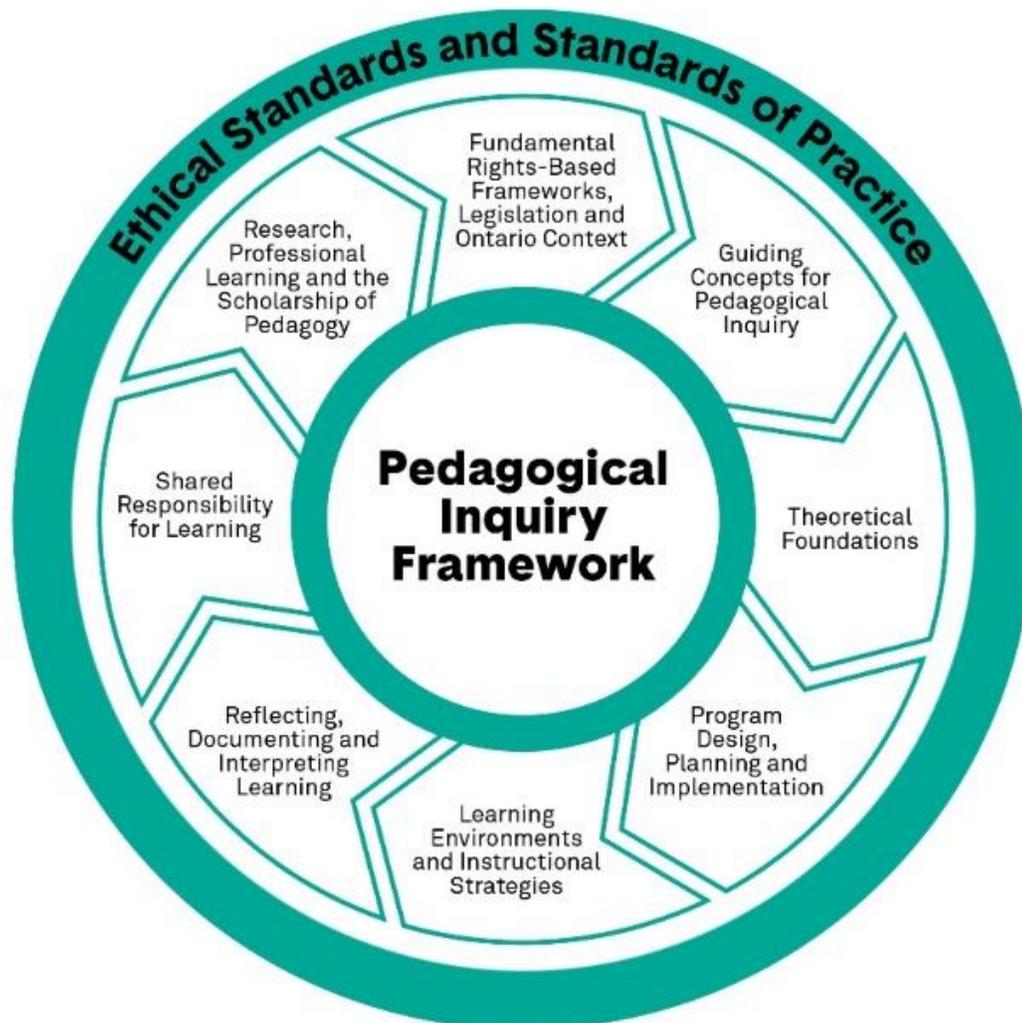
Figure 2: Pedagogical Inquiry Framework for
Technological Design, Grades 11 and 12

A. The Ethical Standards for the Teaching Profession and the Standards of Practice for the Teaching Profession

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* represent a collective vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to learners and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with learners, parents, families, caregivers, guardians, educational partners, colleagues, other professionals, the environment and the public.

The holistic integration of the standards within all course components supports the embodiment of the collective vision of the teaching profession that guides professional knowledge, learning and practice. The following principles and concepts support this holistic integration within the Additional Qualification course:

- understanding and embodying care, trust, respect and integrity

- fostering commitment to students and student learning

- integrating professional knowledge

- enriching and developing professional practice

- supporting leadership in learning communities

- engaging in ongoing professional learning.

Course candidates will continue to critically inquire into professional practices, pedagogies and ethical cultures through professional dialogue, collaborative reflection and the lenses of the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession.*

B. Fundamental Rights-Based Frameworks, Legislation and Ontario Context

Local, provincial, national and international rights-based frameworks and legislation are paramount to the development and implementation of Additional Qualification courses. These highlighted the requirements and responsibilities for sustaining human rights, social justice, liberatory practices and accessibility for all.

AQ Providers, course developers and course candidates are entreated to engage in critical reflection and dialogue related to these frameworks and legislations and explore the significance for professional practice.

The list below, though non-exhaustive, provides a starting point for exploration within the context of the AQ course:

- Ontario curriculum and related Ministry of Education policies and resources

- Ontario Human Rights Code

- Accessibility for Ontarians with Disabilities Act, S.O., 2005, c. 11

- Ontarians with Disabilities Act, S.O., 2001, c. 32

- *Canadian Charter of Rights and Freedoms* Part 1 Schedule B Constitution Act 1982

- Canadian Human Rights Act of 1977

- Truth and Reconciliation Commission of Canada: Calls to Action

- United Nations Convention on the Rights of the Child

- United Nations Declaration on the Rights of Indigenous Peoples

- United Nations Convention on the Rights of Persons with Disabilities

These documents inform the design, development and implementation of the Additional Qualification Course: *Technological Design, Grades 11 and 12.*

C. Guiding Concepts for Pedagogical Inquiry

The following theoretical concepts are provided to facilitate the holistic design and implementation of this Additional Qualification course through pedagogical and professional inquiries.

This Additional Qualification course supports critical reflective inquiry and dialogue informed by the following concepts which will be critically explored through equitable, holistic and interrelated processes framed within an anti-oppression and anti-racism foundation:

- critically exploring biases, assumptions, beliefs, understandings, power and privilege associated with teaching and learning within the context of this Additional Qualification

- critically exploring the professional identity and practices associated with the vision of educators as co-inquirers, scholars and researchers working alongside empowered learners in the co-creation of democratic, inclusive, knowledge-rich learning environments

- critically exploring and interpreting Ontario's curriculum and related Ministry policies and resources, frameworks, strategies and guidelines informed by evidence-based practices

- critically exploring and developing a shared understanding of the significance of safety related resources, guidelines and standards from school boards and subject associations

- collaboratively examining and integrating the meaningful and respectful inclusion of First Nations, Métis, and Inuit ways of knowing, cultures, histories and perspectives in teaching and learning processes as valid means to understand the world

- critically exploring the concepts of cultural appropriation and cultural appreciation
- critically exploring multiple ways of knowing and being in community
- applying critical pedagogy as a theoretical foundation for the design, assessment and implementation of practices and/or programs
- critically exploring pedagogical processes, including assessment and evaluation practices, that link curriculum to learners' interests, strengths, inquiries, needs and well-being
- critically examining processes, practices and policies to create and sustain holistic learning environments that develop and nurture the agency and identities of learners and their intellectual, social, emotional, physical, linguistic, cultural, spiritual and moral development
- engaging and collaborating with school personnel, parents, families, caregivers, guardians, the community, local business and industry as it relates to *Technological Design, Grades 11 and 12*
- critically exploring engagement processes and practices intended to foster collaboration with learners, in-school personnel, parents, families, caregivers, guardians and the community to support the learning, identities and well-being of the school community
- critically exploring and integrating a variety of resources, including technological and communication resources, to enhance professional knowledge and facilitate innovative assessment and evaluation practices in support of learning, independence, well-being and agency
- critically exploring professional practice through ongoing collaborative inquiry, dialogue, reflection, innovation and critical pedagogy and learner engagement
- critically examining the ethical principles, ethical knowledge and ethical actions that contribute to collective ethical pedagogy and leadership
- critically exploring and integrating environmentally sustainable practices, policies and pedagogies
- critically examining processes to foster responsible and active environmental stewardship, ecological consciousness, social justice and active, responsible citizenship within local, national and global contexts
- critically exploring and integrating pedagogical practices that honour the *Truth and Reconciliation Commission of Canada: Calls to Action*

- collaboratively exploring the co-construction of communities of inquiry committed to critical pedagogy, ongoing professional learning and collective professional efficacy

- critically reflecting on the ethical use of technology to support learners' safety, privacy and well-being

- critically exploring innovative practices for integrating information and communication technology to enhance teaching and learning

- critically examining the processes involved in creating and sustaining safe, healthy, equitable, holistic and culturally responsive, relevant and inclusive learning environments that honour and respect diversity, facilitate learning, foster learner voice and perspectives, encourage critical thinking and promote social justice

- critically examining qualitative and quantitative research associated with professional practices, policies and pedagogies in support of learning, empowerment and agency

- critically exploring and integrating educational processes, practices and policies that support learners' well-being and efficacy

- critically exploring the relationship between learners' diverse perspectives, identities, agencies and experiences and educators' professional judgement

- critically exploring and integrating inclusive processes for fostering interprofessional collaboration that support the collaborative development and implementation of Individual Education Plans (IEP) and Transition Plans for learners that include the voices and perspectives of all those involved

- critically examining processes, practices and policies that contribute to a school and/or system culture of inquiry that promotes openness to innovation, change, culturally-inclusive pedagogies and the democratization of knowledge so that learners' perspectives and expression drive educators' practice

- critically exploring practices to challenge dominant discourses and assumptions related to *Technological Design, Grades 11 and 12*

- critically analyzing systemic manifestations of power and privilege and their implications for teaching, learning and well-being

- critically analyzing colonialism and the implications for teaching, learning and well-being

- critically exploring and integrating emerging technologies that support *Technological Design, Grades 11 and 12*

- critically reflecting on health and safety risks associated with *Technological Design, Grades 11 and 12*

- critically applying knowledge and skills to create and maintain a safe learning environment that addresses program needs: curriculum, material handling, tool handling and equipment storage, supervision, safety standards and practices that are respectful of the environment

- collaboratively exploring and integrating technological literacy and mathematical literacy related to *Technological Design, Grades 11 and 12*

- collaboratively exploring business management and entrepreneurial practices related to *Technological Design, Grades 11 and 12*

- collaboratively and critically inquiring into practice through reflection, active engagement and innovation

- critically reflecting on the various professional practices and career opportunities associated with *Technological Design, Grades 11 and 12*

- critically exploring and integrating differentiated instruction, universal design and experiential learning to support learner growth and development.

D. Theoretical Foundations of Technological Design, Grades 11 and 12

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring various theoretical frameworks underpinning this Additional Qualification, the principles fundamental to these frameworks and their practical applications in supporting learning within an inclusive environment

- critically exploring and integrating theories of development and identity formation to inform practice that support learner well-being, identities, efficacy and agency

- critically exploring the relevance of critical and culturally responsive and relevant pedagogy, as well as socio-constructivist theories as theoretical foundations for this Additional Qualification

- critically exploring current theoretical research, literature and scholarship related to this Additional Qualification

- critically exploring the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* as theoretical foundations for educator professionalism within the Additional Qualification Course: *Technological Design, Grades 11 and 12*

- critically reflecting on teaching practice and engaging in professional dialogue regarding the relationship between theory and practice, as well as between practice and theory

- critically exploring critical pedagogy that is committed to curriculum design using learners' inquiry questions, passions, interests identities and lived experiences

- critically exploring Ontario curriculum and related Ministry policies and resources, government policies, frameworks and strategies related to *Technological Design, Grades 11 and 12*

- critically exploring and integrating learning theories and the individual learning strengths, profiles and needs of learners to build agency and identities

- critically and collaboratively inquiring into the dimensions associated with creating and sustaining safe, healthy, equitable, inclusive, accepting and engaging learning environments

- critically exploring and integrating holistic and inclusive educational programs that build on learners' abilities, interests and experiences and empower them to reach their learning goals

- critically exploring the significance of relevant legislation at the municipal, provincial, federal and international levels and associated responsibilities of professional practice

- critically exploring educators' legal obligations and ethical responsibilities according to current provincial legislation and practices

- critically exploring provincial legislation and policies that support accessibility for all

- critically exploring provincial legislation and policies that support human rights for all

- critically exploring provincial legislation and policies that support privacy for all

- critically exploring the significance of relevant health and safety legislation related to project based use of tools, equipment and materials

- critically exploring innovative practices for integrating artistic expression to enhance teaching and learning

- critically exploring and integrating problem-solving processes, methods and approaches as they relate to *Technological Design, Grades 11 and 12*

- critically exploring and integrating the fundamental technological concepts associated with *Technological Design, Grades 11 and 12*

- critically exploring and integrating strategies that engage students in problem solving and critical and creative thinking as the core of learning and innovation

- critically exploring instructional strategies that involve an open, collaborative, activity-based approach to teaching that accommodates students' interests, aspirations and learning profiles

- critically exploring and integrating the fundamental concepts that inform design and production in various areas of technology.

E. Program Design, Planning and Implementation

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring and deepening understanding of how the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* can inform a program planning framework

- critically exploring the influence of society's diverse and changing nature on learning and well-being

- critically exploring and deepening understanding of program design, planning, development and implementation strategies and frameworks related to *Technological Design, Grades 11 and 12*

- critically exploring the transferable skills and the philosophical underpinnings that strengthen educators' professional efficacy to support curricular and interdisciplinary integration

- critically exploring various approaches to curricular integration through diverse planning models, content and resource development, pedagogical practices and the implementation of equitable, anti-oppressive, anti-biased assessment and evaluation practices that are fair, transparent and equitable

- critically exploring and deepening understanding of differentiated instruction, universal design and the tiered approach in program planning development and implementation

- critically exploring research-based, leading-edge and culturally-inclusive learning resources that support learning, engagement, self-identities, safety and well-being

- critically exploring the types of secondary school pathways (including apprenticeship, college, university and workplace) and their relationship to learners' post-secondary goals and career opportunities

- critically exploring program pathways leading to a Specialist High Skills Major

- critically exploring a variety of assistive technologies to support learning and well-being

- critically designing programs that reflect the ethical use of technology in support of learners' safety, privacy and well-being

- critically exploring and planning learning opportunities and programs that support various educational pathways and goals

- critically exploring how learners' lived experiences, identities, narratives, development, strengths, inquiries, interests and needs can inform program planning, development and implementation

- critically exploring the integration of experiential learning opportunities such as job shadowing, field trips and work experience

- critically exploring the integration of culturally-inclusive pedagogies within program design, planning and development

- critically exploring strategies that support learners' well-being and self-regulation

- critically exploring planning and instructional processes that honour the learning profiles, identities, voices, perspectives, strengths and experiences of learners

- critically exploring practices that promote deeper engagement and understanding of course inquiries through understanding the learner's own curiosities and leveraging the learner's own context and experience

- critically exploring pedagogical documentation and utilizing a variety of assessment processes to inform program planning, support learning and foster engagement

- facilitating shared leadership in the implementation of local and provincial guidelines and policies that support safe and effective learning environments

- critically inspecting and reporting on the learning environment, facilities, equipment needs, resources and state of maintenance and repair for delivering *Technological Design, Grades 11 and 12*

- critically applying the theoretical foundations of *Technological Design, Grades 11 and 12* by incorporating the broad-based pedagogical approach that embeds problem solving and fundamental technological concepts

- fostering leadership and shared responsibility for the safe, ethical and legal use of technology in *Technological Design, Grades 11 and 12* programs.

F. Learning Environments and Instructional Strategies

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring processes for the creation of inclusive and vibrant learning environments that reflect the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*

- creating and sustaining ethical, positive, equitable, accepting, inclusive, safe, healthy and engaging learning environments for learners and parents, families, caregivers and guardians

- critically exploring safe and ethical learning environments, practices and policies that honour learner identities, assets, interests and agency

- critically exploring processes for engaging all members of the community, supporting dialogue and collegiality and nurturing a sense of belonging

- critically exploring project-based community partnerships that promote and foster resource-sharing and collaboration

- critically exploring processes for fostering a collaborative community of empowered and engaged learners

- fostering engaging, trusting and inviting learning environments that consider learners' identities and promote learner voices, perspectives, leadership, critical inquiry and self-regulation

- critically exploring a variety of instructional strategies to support learning and well-being

- cultivating safe, ethical, legal and respectful practices in the use of different technological tools that support pedagogical practices

- critically exploring inclusive and innovative learning environments that integrate a variety of instructional strategies to respond to the interests and needs of all learners (for example, universal design, experiential learning, differentiated instruction, inquiry and the tiered approach)

- critically exploring processes that engage learners as active, democratic and global citizens in supporting environmental, social and economic sustainability

- critically exploring the professional identity, knowledge and leadership practices of educators as described in the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession*, the *Professional Learning Framework for the Teaching Profession* and the *Foundations of Professional Practice*

- exploring methods for consensus-building, participatory democracy and empowerment at the school and community levels

- fostering shared leadership and responsibility for the safe and effective management of a variety of technical learning environments

- promoting a shared commitment and responsibility towards planning, organizing and implementing effective health, safety, sanitation and environmental standards in the *Technological Design, Grades 11 and 12* facility

- cultivating a culture of safety consisting of shared values, beliefs, practices and attitudes that includes policies, guidelines and procedures, and is reflected in responsibilities and accountability of all stakeholders

- cultivating a culture of shared leadership and responsibility towards facility design and maintenance practices as per industry standards

- fostering a culture of collective understanding and compliance with workplace health and safety legislation and standards related to *Technological Design, Grades 11 and 12*.

G. Reflecting, Documenting and Interpreting Learning

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring fair, equitable, transparent, valid and reliable assessment and evaluation methods that honour the dignity, emotional wellness, identities and development of all learners

- critically exploring feedback processes that empower and inspire learners to positively reflect on and identify goals for their learning

- fostering an examination of feedback that engages learners in the critical analysis and interpretation of the learning process

- critically exploring equitable and inclusive processes for reflecting, documenting and interpreting learning

- critically exploring and integrating assessment, evaluation and reporting practices that align with the principles and processes of Ontario's curriculum and related Ministry policies and resources

- critically exploring assessment practices for the following three purposes: to provide feedback to learners and to adjust instruction (assessment *for* learning); to develop learners' capacity to be independent, autonomous learners (assessment *as* learning); to make informed professional judgments about the quality of learning (assessment *of* learning).

H. Shared Responsibility for Learning

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring a variety of effective communication and engagement strategies for authentic collaboration with parents, families, caregivers, guardians, school/board personnel and community agencies

- fostering open and transparent partnerships with parents, families, caregivers and guardians that honour and value shared decision-making, confidentiality, advocacy and leadership

- critically and creatively exploring processes to encourage and honour learners' voice, perspectives and identities in the learning process through shared decision-making and leadership

- critically exploring strategies and opportunities for professional collaboration that support learning, well-being and leadership

- critically exploring and openly addressing biases, discrimination and systemic barriers in order to support learning, well-being and inclusion

- critically exploring and analyzing positive, inclusive educational and professional cultures in which voices and perspectives are freely expressed and critically analyzed

- understanding and respecting the importance of shared responsibility and partnership that promotes social and ecological justice as conveyed in the *Foundations of Professional Practice*

- critically exploring professional collaboration within interdisciplinary teams to support learning, well-being, self-advocacy and transitions

- collaboratively designing strategies for establishing links between the school community, industry and the *Technological Design, Grades 11 and 12* program

- critically exploring and integrating sector-specific learning opportunities in other curriculum areas.

I. Research, Professional Learning and the Scholarship of Pedagogy

The exploration of the following guiding concepts will be facilitated through equitable, holistic and interrelated inquiry processes framed within an anti-oppression and anti-racism foundation:

- critically exploring and reflecting on past, current and evolving practices in *Technological Design, Grades 11 and 12*

- critically exploring professional practice through ongoing inquiry into theory and pedagogy/andragogy

- engaging in transformational professional learning through research, scholarship and leadership

- critically exploring pedagogy that integrates research and the scholarship of pedagogy/andragogy into teaching practice

- engaging in research and the scholarship of critical pedagogy/andragogy to advance communities of practice

- critically exploring knowledge-creation and mobilization to enhance professional practice and leadership

- critically exploring ethical responsibilities in research and scholarship that honour and embody the *Ethical Standards for the Teaching Profession*

- critically exploring theories and pedagogies about multiple forms of oppression, power and privilege.

6. Demonstrated Knowledge and Skill in Technological Design, Grades 11 and 12

Successful candidates will be able to demonstrate technical knowledge and skill in the following:

Design Process Fundamentals:

- completing a systematic approach to problem solving (for example, engineering design process, universal design, agile development, design thinking)

- identifying strategies for communicating and collaborating with clients, inspectors, contractors, suppliers and other stakeholders (for example, creating a client profile, using digital communication).

Research and Project Management

Research

- identifying a variety of research tools and resources (for example, professional archives, websites, professional handbooks, personal and environmental context) used to generate design ideas

- interpret data of essential design criteria from various sources (for example, applicable codes, laws and regulations, sustainability, environmental impact).

Project Management

- identifying a variety of project management tools, techniques and strategies (for example, a Gantt chart, cost analysis software, time management strategies).

Developing and Representing Design Ideas

Design Development

- identifying ways to conceptualize design choices (for example, 3D modeling presentations, describing intentions, written proposals).

Drafting Standards and Conventions

- listing and describing drawing tools and techniques (for example, 3D modeling software blueprint reading, data analysis)

- listing and describing drawing types and specialized views (for example, elevations, exploded assembly drawings)

- recognizing and choosing from regional, national and international standards (for example, Canadian Standards Association [CSA] versus International Standards Organization [ISO] and Ontario Building Code versus Canadian Building Code).

Making and Testing Models

- comparing and choose from a variety of model types (for example, 3D virtual model, prototype model, prototyping software, online simulations)

- comparing and choose from a variety of materials and methods of construction (for example, foam board versus Balsa Wood, hot glue versus epoxy)

- analyzing and advocate for specific methods of testing models (for example, reverse engineering, cost analysis, voltage test).

Reporting and Presenting

- comparing and choosing from a variety of reports (for example, cost analysis report, billable hours report)

- comparing and choosing from a variety of presentation (for example, concept board, sales pitch)

- comparing and choosing from portfolio types (for example, design portfolio, digital portfolio, construction permit drawings).

Technology and the Environment

- advocating for energy and waste conservation, sustainability and other resource conservation when designing a product or process (for example, LEED® [Leadership in Energy and Environmental Design] certified buildings, Energy Star-rated appliances).

Professional Practice and Career Opportunities

- identify health and safety regulations and standards that must be considered when designing products and/or processes (for example, regulations and standards from the Canadian Standards Association, Ontario Building Code and Workplace Hazardous Materials Information System [WHMIS])

- list and identify a number of professional associations and unions for technical designers (for example, Professional Engineers of Ontario [PEO], Ontario Association of Chartered Industrial Designers of Ontario [OACID], Ontario Association of Certified Engineering Technicians and Technologists [OACETT], Ontario Association of Architects [OAA] and Association of Registered Interior Designers of Ontario [ARIDO]) and describe how these organizations affect jobs in technological design (for example, working conditions, job security).

Successful candidates will be able to demonstrate technical skills and proficiencies in:

Design Process Fundamentals:

- developing and producing products/processes using the design process (for example, use the design process to produce an accessibility ramp)
- supporting design choices referencing codes, regulations and other research data (for example, pitch house plans to client referencing Ontario Building Code).

Research and Project Management

- utilizing a variety of research tools and resources used to generate design ideas (for example, professional archives, websites, catalogues, printed and online user manuals, professional handbooks)
- describing strategies for organizing, planning and managing the human, material as well as financial resources for a design project, with an emphasis on advocacy of design ideas and rationales, diplomacy in dealing with clients and suppliers and marketing of design solutions (for example, establishing roles for project team members, advocating for environmentally sound materials, promoting and marketing innovative designs).

Developing and Representing Design Ideas

Design Development

- demonstrating various methods for conceptualizing and advocating for design choices (for example, producing 3D model presentations, conveying intentions with written proposals).

Drafting Standards and Conventions

- using industry standard drawing tools and techniques (for example, 3D modeling software blueprint reading, data analysis)

- producing presentations and production quality drawings to represent ideas using a variety of industry standard drawing types and specialized views (for example, creating elevations, exploded assembly drawings)

- integrating regional, national and international standards into production of design and product (for example, Canadian Standards Association [CSA] versus International Standards Organization [ISO] and Ontario Building Code versus Canadian Building Code).

Making and Testing Models

- choosing, safely and appropriately, to use a variety of tools and equipment to create physical models and functional prototypes (for example, using a 3D printer to create a functional prototype).

Reporting and Presenting

- creating reports and presentations in formats found in technological design related industry (for example, mechanical technical report on material properties).

Technology and the Environment

- applying and advocating for best practices in environmental and sustainability considerations through the development of design ideas and models (for example, choosing project material that is recyclable).

Professional Practices

- adhering to and promoting personal and environmental health and safety standards and procedures with respect to processes, materials, tools, equipment and facilities throughout the design process and when performing related activities (for example, use protective equipment, follow safe operating procedures, dispose of wastes properly)

- fostering awareness of and knowledge of workplace harassment policies and processes as components of workplace health and safety to support well-being.

7. Instructional Design and Practices in the Additional Qualification Course: Technological Design, Grades 11 and 12

The instructional design and practices (Figure 3) employed in this Additional Qualification course reflect adult learning theories, effective andragogical processes and experiential learning methods that promote critical reflection, dialogue and inquiry.

Candidates collaboratively develop with course instructors the specific learning inquiries, learning experiences, holistic integration processes and forms of assessment and evaluation that will be used throughout the course.

In the implementation of this Additional Qualification course, instructors **facilitate** andragogical processes that are relevant, meaningful and practical to provide candidates with inquiry-based learning experiences related to program design, planning, instruction, pedagogy, integration and assessment and evaluation. The andragogical processes include but are not limited to: experiential learning, role-play, simulations, journal writing, self-directed projects, independent study, small group interaction, dialogue, action research, inquiry, pedagogical documentation, collaborative learning, narrative, case methodologies and critical reflective praxis.
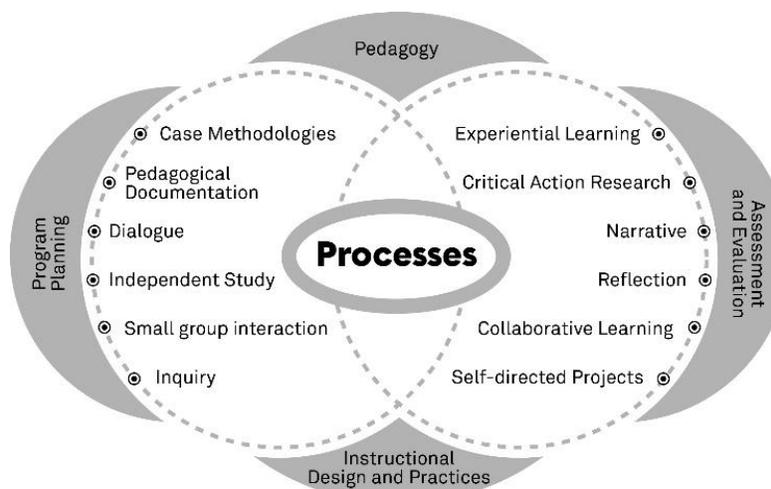

Figure 3: Instructional Processes

Instructors **embody** the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*, honour the principles of adult learning, respect candidates' experience, recognize prior learning, integrate culturally-inclusive practices and respond to individual inquiries, interests and needs. Important to the course are opportunities for candidates to create support networks, receive feedback from colleagues and instructors and share their learning with others. Opportunities for professional reading, reflection, dialogue and expression are also integral parts of the course.

Instructors **model** critical inquiry, universal design, differentiated instruction and assessment practices that can be replicated or adapted in a variety of classroom settings.

Experiential Learning

Candidates will be provided with opportunities to engage in experiential learning related to key concepts and aspects of *Technological Design, Grades 11 and 12* as collaboratively determined by both the instructor and course candidates. The intent of the experiential learning opportunities is to support the application and integration of practice and theory within the authentic context of teaching and learning. Candidates will also engage in critical reflection and analysis of their engagement in experiential learning opportunities and inquiries related to *Technological Design, Grades 11 and 12*.

The professional judgment, knowledge, skills, efficacy and pedagogical practices of candidates will be enhanced and refined through experiential learning and critical inquiry.

The College's standards-based resources help to support experiential learning through various professional inquiry processes. These resources can be found on the College web site.

8.   Assessment and Evaluation of Candidates

At the beginning of the course, candidates will collaboratively develop with course instructors the specific learning inquiries, experiences and forms of assessment and evaluation that will be used throughout the course. Instructors will provide opportunities for regular and meaningful feedback regarding candidates' progress throughout the course.

A balanced approach to candidate assessment and evaluation is used. It includes the combination of self, peer and mutual (instructor and candidate) assessment, as well as instructor evaluation. The assessment and evaluation strategies reflect effective, collaborative and inquiry-based practices. A variety of assessment approaches will be used that enable candidates to convey their learning related to course inquiries. The course provides opportunities for both formative and summative assessment and evaluation.

Central to candidates enrolled in Additional Qualification courses is the opportunity to be engaged in relevant and meaningful inquiries. Assignments, artefacts and projects enable candidates to make connections between theory and practice. At the same time, assignments also allow candidates flexibility, choice and the opportunity to design individual inquiry opportunities.

Learning processes support an in-depth exploration of concepts and inquiries. These processes occur over the duration of the course and are reflective of critical thinking and reflection as the candidate gains knowledge and skills over the duration of the course

The evaluation practices will also support significant and in-depth critical inquiries utilizing a variety of processes over the duration of the course. These inquiry-based assessment processes provide opportunities for candidates to illustrate a depth of professional knowledge, skills, pedagogies, ethical practices and instructional leadership.

A final culminating experience in the course is recommended. This synthesis experience will reflect the in-depth knowledge and understanding gained as a result of engagement in this Additional Qualification. It will also include critical reflections and an analysis of a candidate's learning over time.

The following processes are provided to guide practices associated with assessment and evaluation within this Additional Qualification course and are reflective of experiential learning and critical pedagogies. This list is not exhaustive.

a) **Pedagogical Leadership:** co-constructing, designing and critically assessing culturally-inclusive learning opportunities that integrate voice and perspectives, strengths, interests and needs. The learning opportunities will incorporate a variety of technologies and resources and are reflective Ontario curriculum and related Ministry policies

b) **Pedagogical Documentation:** assembling visible records (for example, written notes, photos, videos, audio recordings, artefacts and records of learning) that enable educators, parents, families, caregivers, guardians and learners to discuss, interpret and reflect upon the learning process

c) **Critical Reflection:** critically analyzing educational issues associated with this Additional Qualification utilizing scholarly research through multiple representations (for example, narratives, written documentation and images or graphics)

d) **Critical Action Research:** engaging in individual and/or collaborative action research that is informed by the critical exploration of various action research approaches

e) **Case Inquiry:** critically reflecting on and inquiring into professional practice through case writing and/or case discussion

f) **Transition Plan:** critically reflecting on and analyzing a transition plan and generating recommendations for enhancement

g) **Narrative Inquiry:** collaboratively and critically analyzing narratives of teaching and learning through a number of lenses (for example, professional identity, professional efficacy, ethical leadership and critical pedagogies) utilizing the processes of narrative writing and/or narrative discussion

h) **Pedagogical Portfolio:** creating a professional portfolio that critically analyzes teaching and learning philosophies, assumptions, practices and pedagogies designed to inform ethical and democratic learning environments

i) **Innovative Learning Experience:** designing and facilitating an engaging, innovative learning experience that reflects differentiated instruction, universal design and the tiered approach

j) **Partnership Plan:** designing a comprehensive plan that engages learners, parents, families, caregivers, guardians and the school and local communities in collaborative partnerships that support learning, growth and well-being

k) **IEP Development:** collaboratively developing an IEP with parents, families, caregivers, guardians, learners and the school team

l) **Visual Narrative:** creating a visual narrative (for example, digital story) that helps to support the collective professional identity of the teaching profession and advances professional knowledge and pedagogy.

Appendix 1

The Ethical Standards for the Teaching Profession

The *Ethical Standards for the Teaching Profession* represent a vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to students and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with students, parents, guardians, colleagues, educational partners, other professionals, the environment and the public.

The Purposes of the Ethical Standards for the Teaching Profession are:

- to inspire members to reflect and uphold the honour and dignity of the teaching profession

- to identify the ethical responsibilities and commitments to the teaching profession

- to guide ethical decisions and actions in the teaching profession

- to promote public trust and confidence in the teaching profession.

The Ethical Standards for the Teaching Profession are:

Care:
The ethical standard of *Care* includes compassion, acceptance, interest and insight for developing students' potential. Members express their commitment to students' well-being and learning through positive influence, professional judgment and empathy in practice.

Trust:
The ethical standard of *Trust* embodies fairness, openness and honesty. Members' professional relationships with students, colleagues, parents, guardians and the public are based on trust.

Respect:
Intrinsic to the ethical standard of *Respect* are trust and fair-mindedness. Members honour human dignity, emotional wellness and cognitive development. In their professional practice, they model respect for spiritual and cultural values, social justice, confidentiality, freedom, democracy and the environment.

Integrity:
Honesty, reliability and moral action are embodied in the ethical standard of *Integrity*. Continual reflection assists members in exercising integrity in their professional commitments and responsibilities.

The Standards of Practice for the Teaching Profession

The *Standards of Practice for the Teaching Profession* provide a framework of principles that describes the knowledge, skills and values inherent in Ontario's teaching profession. These standards articulate the goals and aspirations of the profession. These standards convey a collective vision of professionalism that guides the daily practices of members of the Ontario College of Teachers

The Purposes of the Standards of Practice for the Teaching Profession

- to inspire a shared vision for the teaching profession
- to identify the values, knowledge and skills that are distinctive to the teaching profession
- to guide the professional judgment and actions of the teaching profession
- to promote a common language that fosters an understanding of what it means to be a member of the teaching profession.

The Standards of Practice for the Teaching Profession are:

Commitment to Students and Student Learning:
Members are dedicated in their care and commitment to students. They treat students equitably and with respect and are sensitive to factors that influence individual student learning. Members facilitate the development of students as contributing citizens of Canadian society.

Professional Knowledge:
Members strive to be current in their professional knowledge and recognize its relationship to practice. They understand and reflect on student development, learning theory, pedagogy, curriculum, ethics, educational research and related policies and legislation to inform professional judgment in practice.

Professional Practice:
Members apply professional knowledge and experience to promote student learning. They use appropriate pedagogy, assessment and evaluation, resources and technology in planning for and responding to the needs of individual students and learning communities. Members refine their professional practice through ongoing inquiry, dialogue and reflection

Leadership in Learning Communities:
Members promote and participate in the creation of collaborative, safe and supportive learning communities. They recognize their shared responsibilities and their leadership roles in order to facilitate student success. Members maintain and uphold the principles of the ethical standards in these learning communities.

Ongoing Professional Learning:
Members recognize that a commitment to ongoing professional learning is integral to effective practice and to student learning. Professional practice and self-directed learning are informed by experience, research, collaboration and knowledge.

Appendix 2

Accessibility for Ontarians with Disabilities Act (AODA) Text:
Figure 1: Critical Pedagogical Stance from page 4 of this PDF

Figure 1 is a graphic representation describing critical reflections. At the centre of the image is a Venn diagram of Policies, Practices and Processes. Surrounding this Venn diagram are critical inquiries related to these policies, practices and processes.

In terms of policies, reflections include:

- Who is privileged by this policy?

- Who is not privileged by this policy?

- How does the policy honour the rights of all involved?

- Who is involved in the development and implementation of policies?

In terms of practices, reflections include:

- What school level practices support inclusion?

- What actions help a school community to collectively identify and uncover barriers to inclusive practices?

- What counts as knowledge?

In terms of processes, reflections include:

- Whose voices have been included in the process?

- Whose voices have not been included in the process?

- How are all learners accepted and included within the school community?

- How do we enable advocacy within all school processes?

Appendix 3

Accessibility for Ontarians with Disabilities Act (AODA) Text:
Figure 3: Instructional Design and Practices from page 26 of this PDF

Figure 3 is a graphic representation of the possible andragogical instructional processes implemented in Additional Qualification courses. At the centre is a Venn diagram. In the right side of the Venn diagram, candidates are invited to explore the use of Experiential Learning, Critical Action Research, Narrative, Reflection, Collaborative Learning and Self-directed projects. In the left side of the Venn Diagram, candidates are invited to explore the use of Case Methodologies, Pedagogical Documentation, Dialogue, Independent Study, Small group interaction and Inquiry. These inquiry-based learning experiences interconnect at the centre to form a multiplicity of multifaceted processes that can enhance professional practice. The inquiry-based learning experiences outlined in the Venn diagram are related to the following four areas: Pedagogy, Assessment and Evaluation, Instructional Design and Practices and Program Planning, which surround the Venn diagram in an outer circle.

Appendix 4

College Standards-Based Resources

Information pertaining to the following standards-based resources, which support learning through professional inquiry, is available through the College web site.

Ontario College of Teachers. (2003). *Standards in practice: Fostering professional inquiry.* [Resource kit]. Toronto, ON: Author.

Ontario College of Teachers. (2006). *The ethical standards and the standards of practice for the teaching profession.* [Poster]. Toronto, ON: Author.

Ontario College of Teachers. (2008). *Living the standards.* [Resource kit]. Toronto, ON: Author.

Ontario College of Teachers. (2009). *Learning from experience: Supporting beginning teachers and mentors.* [Resource kit]. Toronto, ON: Author.

Ontario College of Teachers. (2010). *A self-reflective professional learning tool.* Toronto, ON: Author.

Ontario College of Teachers. (2010, December 8). *Voices of wisdom.* [Video]. YouTube. https://www.youtube.com/watch?v=AbxCtmteQ-U&feature=emb_logo

Ontario College of Teachers & College of Early Childhood Educators. (2014). *Exploring interprofessional collaboration and ethical leadership.* Toronto, ON: Ontario College of Teachers.

Ontario College of Teachers. (2014). *Exploring ethical professional relationships.* Toronto, ON: Author.

Ontario College of Teachers. (2014). *Inquiring into the ethical dimensions of professional practice.* Toronto, ON: Author.

Ontario College of Teachers. (2014). *Knowledge keepers discussion guide.* Toronto, ON: Author.

Ontario College of Teachers. (2016, July 6). *Acting on our ethics: Caring for Anishinaabe children.* [Video]. YouTube. https://www.youtube.com/watch?v=6D4m-7p05Ws

Ontario College of Teachers. (2016, July 8). *Acting on our ethics: Caring for Haiti.* [Video]. YouTube. https://www.youtube.com/watch?v=aWM4ygXisbQ

Ontario College of Teachers. (2016). *Foundations of professional practice.* Toronto, ON: Author.

Ontario College of Teachers. (2016). *Professional learning framework for the teaching profession.* Toronto, ON: Author.

Ontario College of Teachers. (2017). *Exploring the ethical standards for the teaching profession through Anishinaabe art.* [Discussion guide]. Toronto, ON: Author.

Ontario College of Teachers. (2017). *Exploring the ethical standards for the teaching profession through Anishinaabe art.* [Posters]. Toronto, ON: Author.

Ontario College of Teachers. (2017). *Exploring the standards of practice for the teaching profession through Anishinaabe art.* [Discussion guide]. Toronto, ON: Author.

Ontario College of Teachers. (2017). *Exploring the standards of practice for the teaching profession through Anishinaabe art.* [Posters]. Toronto, ON: Author.

Ontario College of Teachers. (2017). *Strengthening a vision: A critical discourse on the ethical standards for the teaching profession.* Toronto, ON: Author.

Ontario College of Teachers. (2018). *Acting on our ethics: Exploring caring for Haiti.* [Discussion guide]. Toronto, ON. Author.

Ontario College of Teachers. (2018), *Anishinaabe vision of the learner and the educator.* [Poster]. Toronto, ON: Author.

Ontario College of Teachers. (2018). *Exploring leadership practices through case inquiry.* Toronto, ON: Author.

Ontario College of Teachers. (2020). *A Rotinonhsyón:ni representation of the ethical standards for the teaching profession*. Toronto, ON. Author.

Ontario College of Teachers. (2020). *A vision of the educator and learner*. [Poster]. Toronto, ON: Author.

Ontario College of Teachers. (2020). *Exploring ethical professional practice*: *Ecological consciousness and eco justice.* [Posters]. Toronto, ON: Author.

Ontario College of Teachers. (2020). *Exploring ethical professional practice: Ecological consciousness and eco justice.* [Resource Cards]. Toronto, ON: Author.

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