



Publishing for all: Using LaTeX to help improve the accessibility of an open access journal

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Open Access (OA) Publishing at RIT?

- OA publishing provides a cost-free (to the reader...and sometimes to the author) avenue for authors to disseminate their work.
- RIT's publishes several OA journals



JSESD

- The *Journal of Science Education for Students with Disabilities (JSESD)*.
- *JSESD* is a peer-reviewed journal that was first published in the early 1990's.



JSESD- an OA Journal

- *JSESD was moved to an OA journal in 2007.*
- *Reasons for the change included:*
 - cost,
 - wide-spread dissemination,
 - publishing/printing logistics.
- *Published under Creative Commons copyright licenses.*
- *JSESD is free to both the author and reader/audience.*

Open Access does not mean Equal (nor Universal) Access

- *The goal of OA is to provide broad access to scholarly research.*
- *56 million Americans live with disabilities (National Organization of Disabilities, 2013).*
- *Digital technology and open access offer new opportunities for the education of students with disabilities, but there's still a divide.*
 - Equal access is critical for advancing educational and career opportunities for students with disabilities (a goal of JSESD).

What is Open@RIT?

Our goals are to discover, and grow
the footprint, of RIT's impact on all
things Open

Our Fellowship



Fellows run open projects at the university.



They apply to receive help to make their projects more open.



We provide a team of developers and designers to help them do that.

Accessible Open Publishing

- Dr. Pagano approached Open@RIT looking for assistance on making his journal more accessible to screen readers.
- Having a team of developers and designers, we gladly accepted him into our fellowship program.

Converting PDF → HTML



Tested a variety of tools

Pandoc

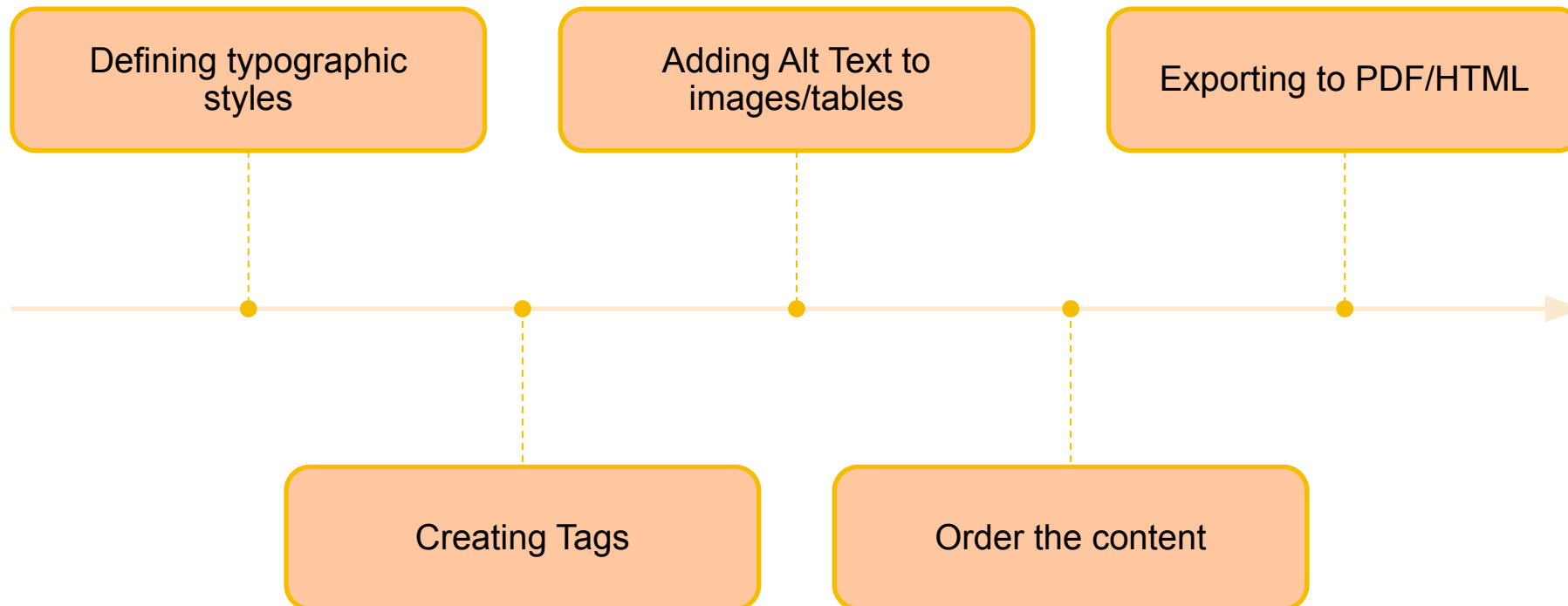
ConvertApi

Pdf2htmlEX



End-result HTML extremely inaccessible due to PDF format

Adobe InDesign Accessibility Features



Defining typographic styles for text elements on the page.

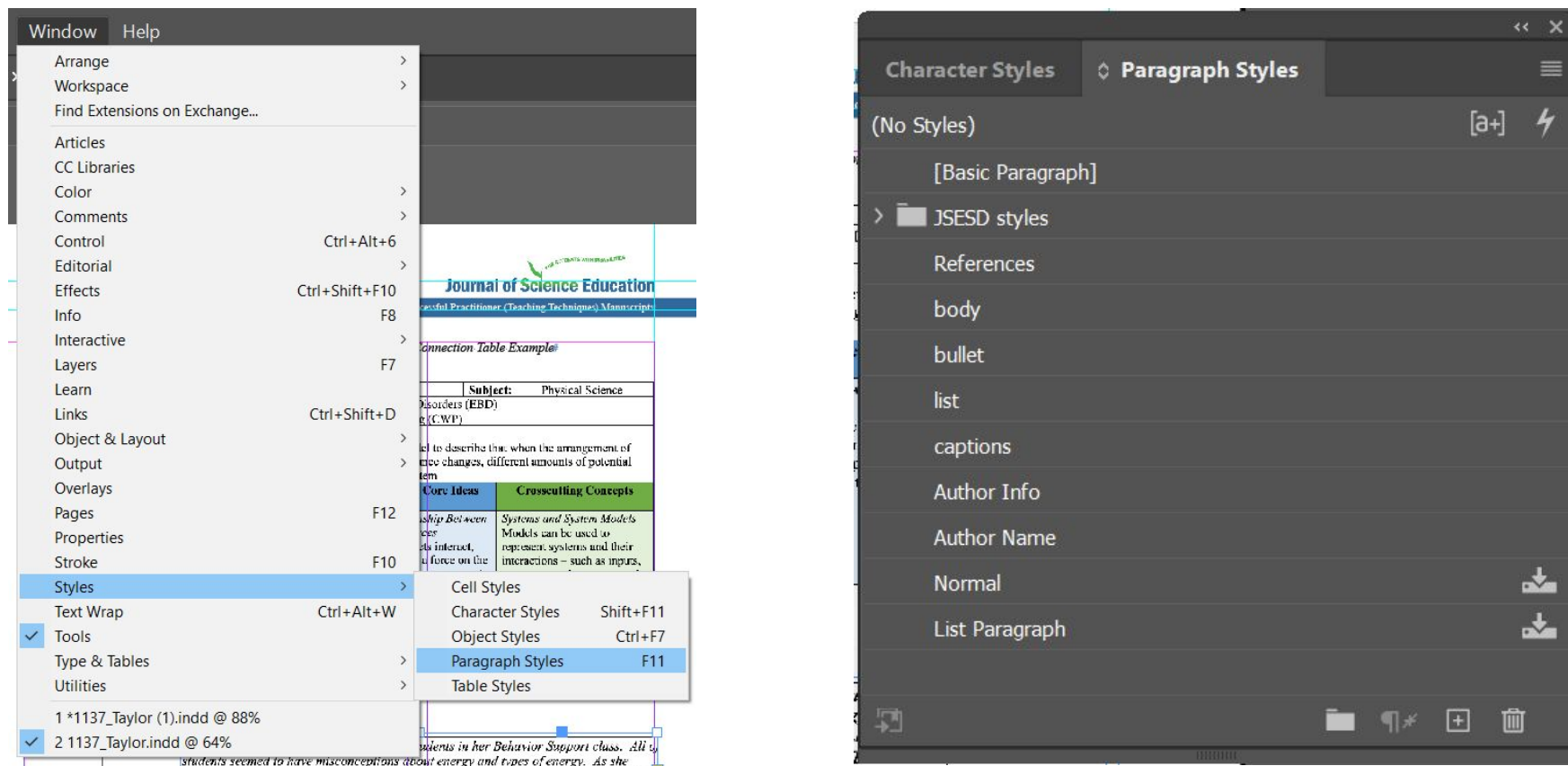


Figure 1 : Paragraph style tab in Indesign.

Defining typographic styles for text elements on the page.

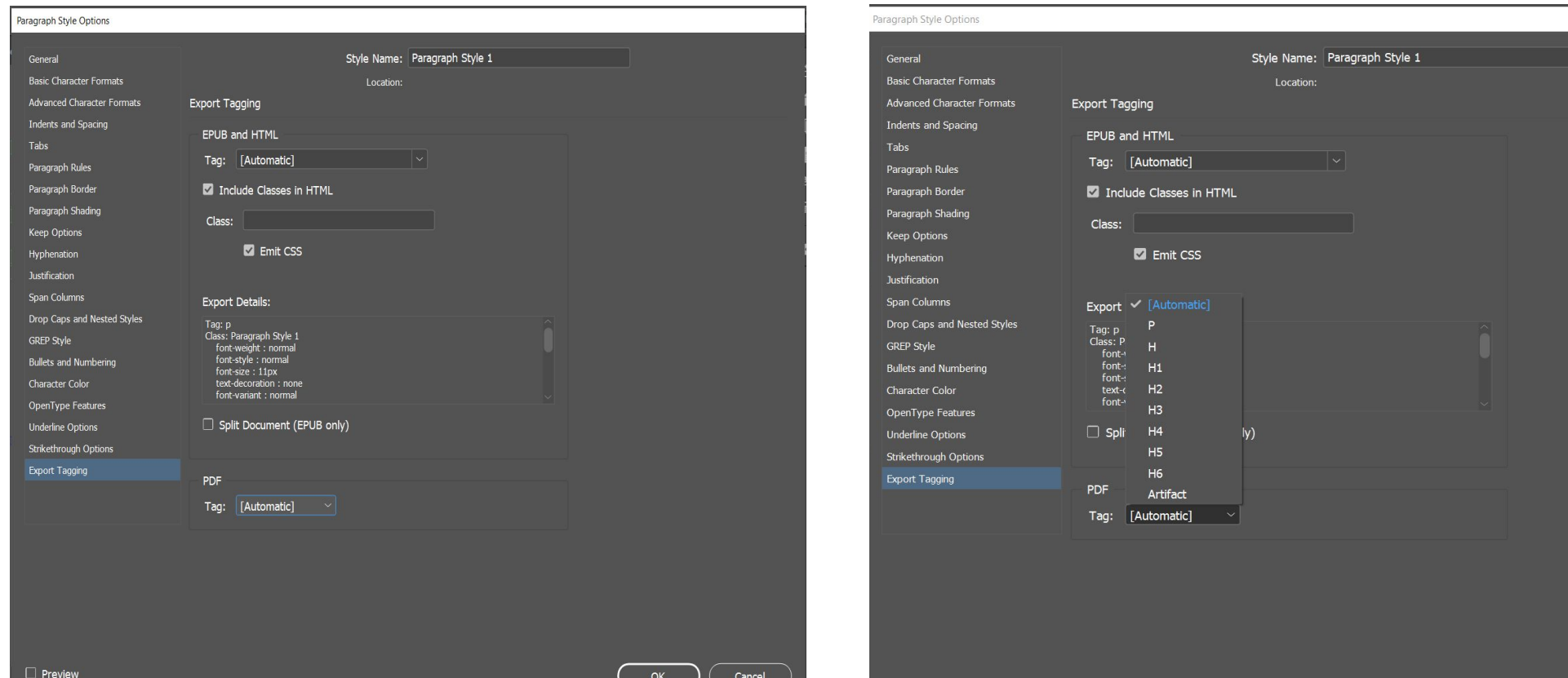


Figure 2 : Export tagging option on edit paragraph styles.

Creating tags.

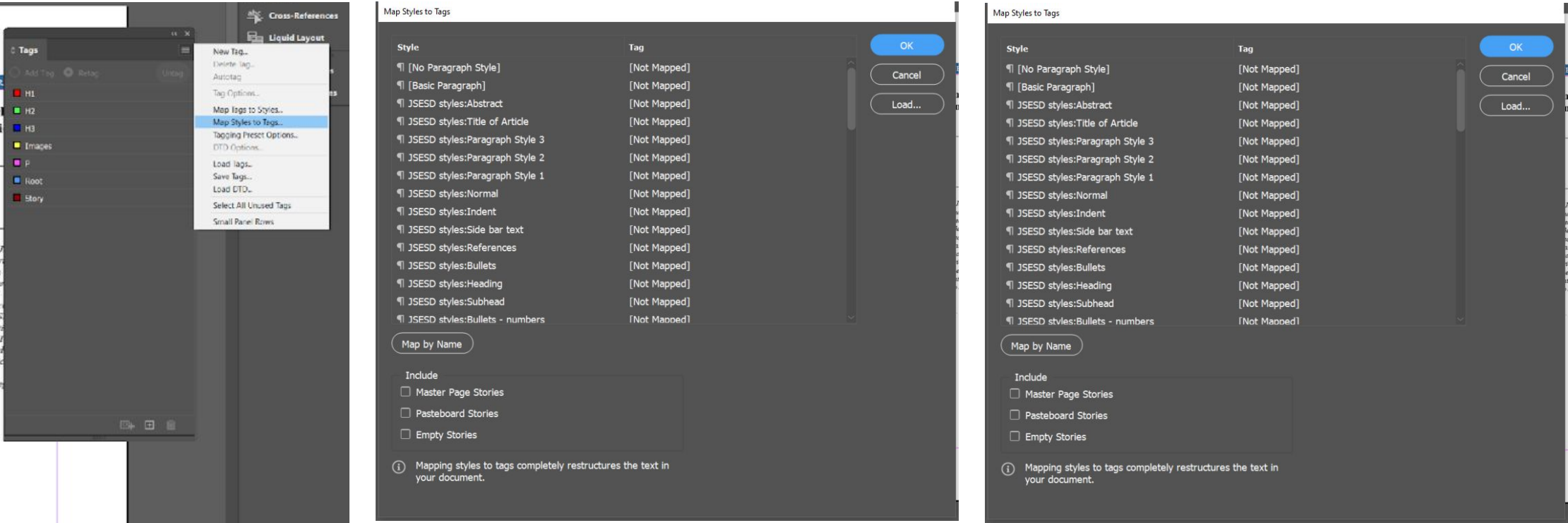


Figure 3 : Mapping your style to the corresponding tags in Indesign.

Ordering the content.

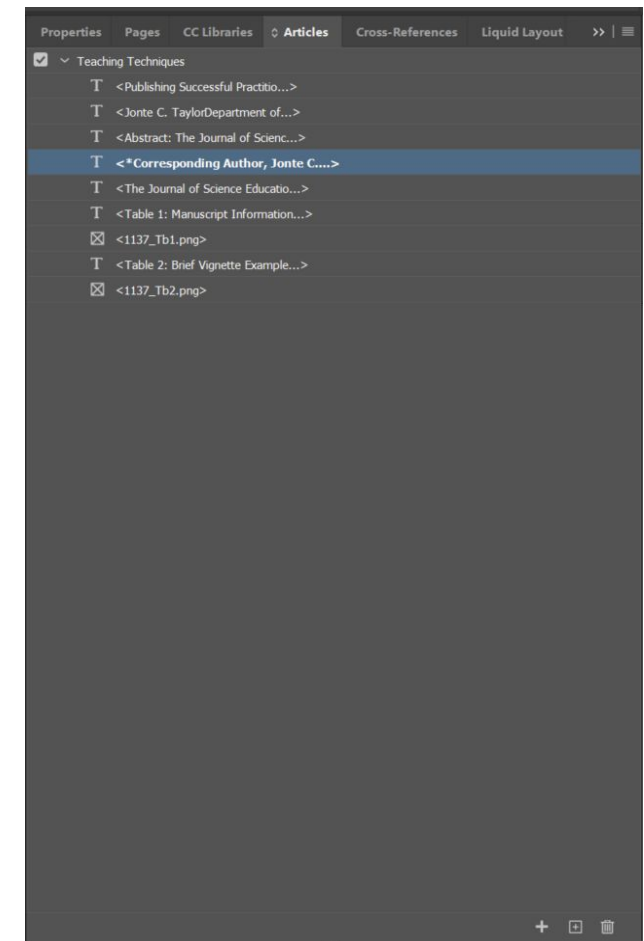
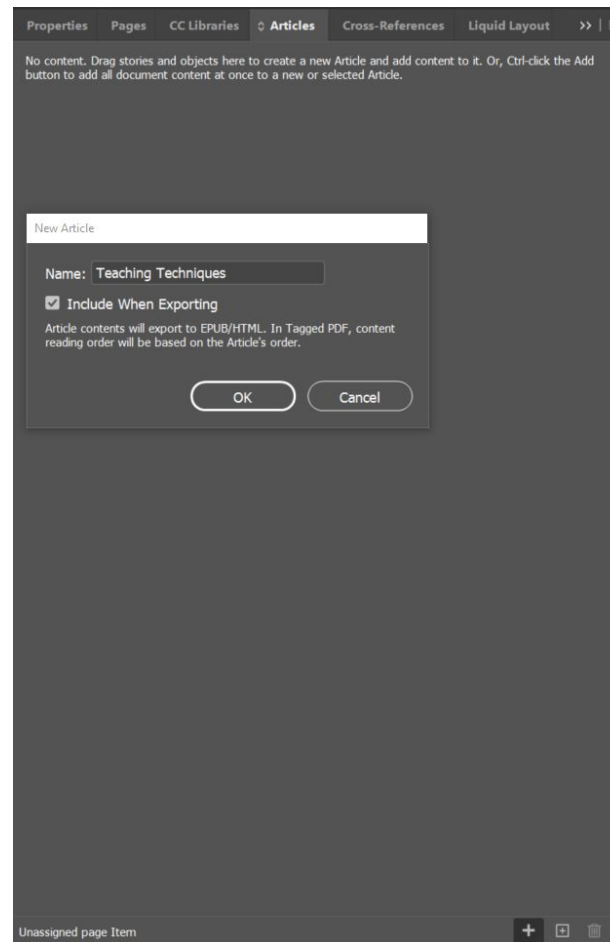
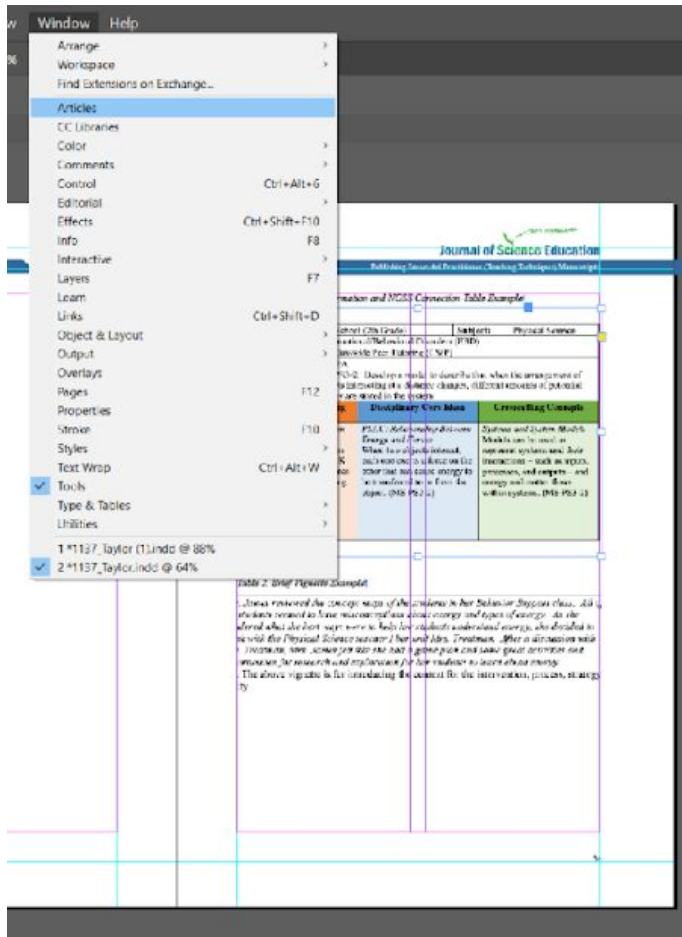


Figure 4 : Arranging the sections in the order panel

Exporting to PDF/HTML

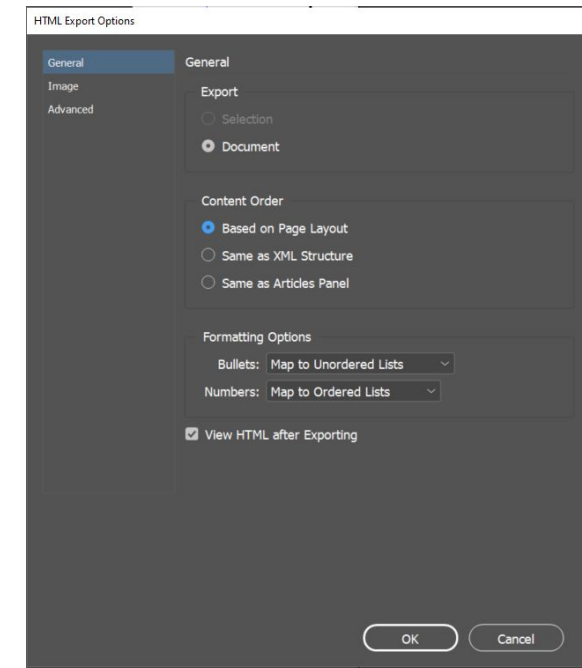
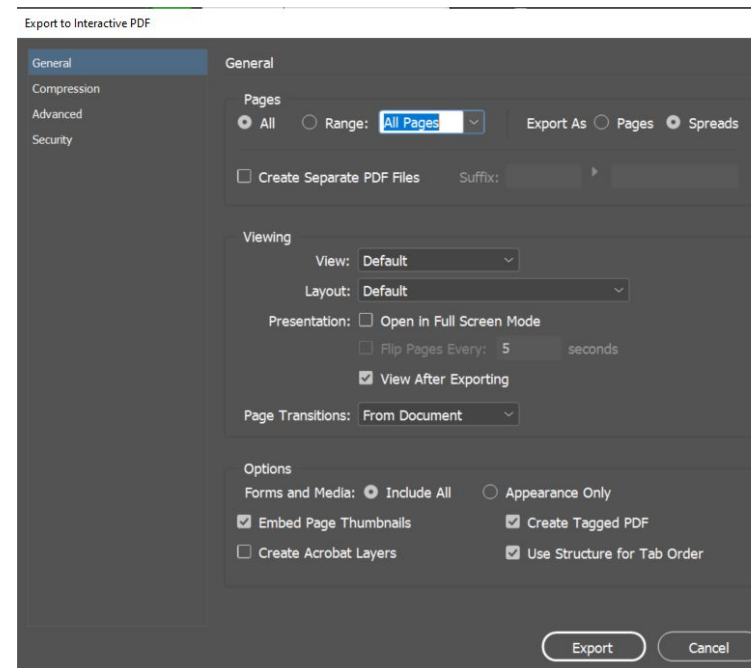
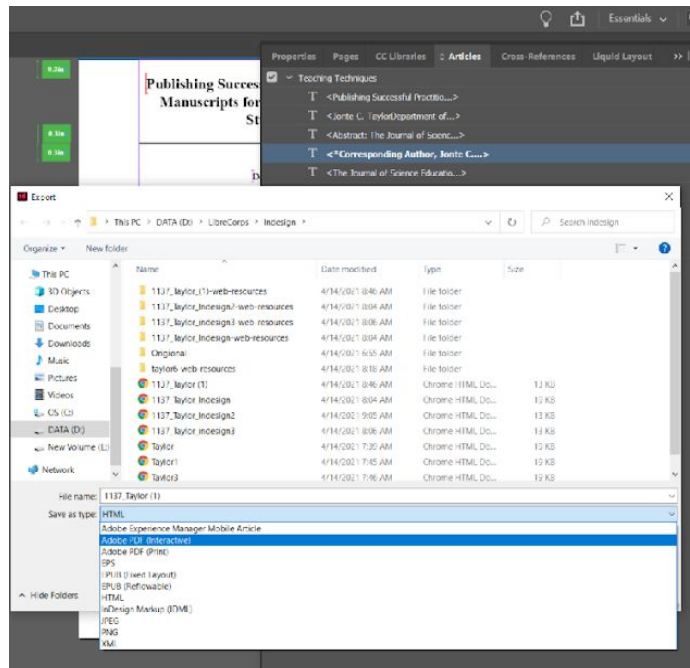


Figure 4 : Figure 5 : Exporting the document.

LaTeX Publishing Template

Using the 5E Instructional Model in an Online Environment with Pre-service Special Education Teachers

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Abstract: *In this practitioner article, we describe the innovative way the 5E Instructional Model was used in an online, hybrid special education undergraduate course to prepare pre-service teachers to teach academic content to their students with disabilities. We provide a rationale for the use of the model in the course, describe how we implemented the model in the course, pre-service teachers' perceptions about the model as a way to facilitate and model the process of learning for themselves and students, and discuss implications for practice.*

Keywords: *5E Instructional Model, Online learning, Inquiry, Teacher preparation, College teaching*

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INTRODUCTION

The National Council for Accreditation of Teacher Education (2010) state that faculty and instructors in preservice teacher education programs should model instructional practices to enhance learning and best prepare preservice teachers for their future classrooms. Explicit modeling with reflection and connection to theory is a way for teacher educators to intentionally structure their instruction so that preservice teachers (1) attend to the model used, (2) model the practice appropriately, (3) explicitly connect the model to theory, and (4) allow for reflection as to how the model may affect them and the application to their future classrooms (Moore & Bell, 2019). The use of explicit modeling in connection to theory and reflection can encourage student growth in practice while leveraging the affordances of already known best practices (Lunenburg, Korthagen, & Swennen, 2007). Given this recommendation and the challenge we were recently faced with of creating a hybrid course focused on teaching methods in science and social studies for pre-service special education teachers at a large research university, we decided to use the 5E Instructional Model as our form of explicit modeling.

In this practitioner article, we will (a) explain why we used the 5E Instructional Model and its benefits for students with disabilities, (b) describe the way we implemented the 5E Instructional Model in an online format as a part of a hybrid course, (c) share the pre-service teachers' perceptions about the use of the 5E Instructional Model as a way to facilitate and model the process of learning for themselves and students with disabilities, and (d) wrap up the article with final thoughts and implications for practice.

5E Instructional Model for Teaching and Learning for ALL Learners

Within science education a well-researched and widely cited instructional model is the 5E Instructional Model (Bybee, 2015). (Table 1 provides an overview of the 5E Instructional Model.) The 5E Instructional Model has been demonstrated to be grounded in sound educational theory about learning (Bransford, Brown & Cocking, 1999; Bybee, 2015). As a result, a central argument, among a few (see Abell & Volkmann, 2015), for the use of the 5E Instructional Model is that the structure facilitates learning in a meaningful and powerful way (Abell & Volkmann, 2006; Bybee, 2015). This type of "learning" is one that is focused on developing understanding as opposed to just learning facts; where facts are connected and organized around important concepts that can support transfer of ideas rather than only recall (Bransford, Brown, & Cocking, 2000).

An implication to learning with understanding is the recognition that this type of learning is constructed from experiences and that students should be actively involved in that process (Bybee, 2015). This does not mean, however, that there is no teacher involvement or guidance in that process as has been suggested by some (e.g., Rizzo & Taylor, 2016). Rather, the teacher plays an integral and critical role in ensuring that systematic and carefully designed learning experiences are provided. The strength of the 5E Instructional Model is that it provides a structure and function (for each component of the instructional model) for teaching to generate learning experiences to enhance student inquiry (Bybee, 2015).

Findings from research supports the effectiveness of an instructional model such as the 5E specifically for improved student (at any

LaTeXML

- LaTeXML is an open-source Latex to XML/HTML/MathML Converter.
- Fixing minor errors and enhancing the accessibility of HTML file with client-side JavaScript.

```
let footnotes = document.getElementsByClassName("ltx_note ltx_role_footnote");
let footnote;
for(let i in footnotes){
    footnote = footnotes[i];
    footnote.innerHTML =
        `
```

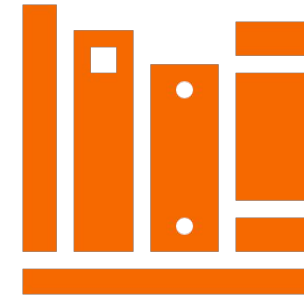
Challenges

- Transferring Content from “docx” to “LaTeX”.
- Styling Content.
- Formatting Layout.
 - 2 different end-product formats.
- Reading Order in LaTeX.
- Adding accessible images and tables.

Future Hopes



Ensure all open access journals at RIT are equal access.



Provide infrastructure for an accessible publishing pipeline for others to use.

Thank You !

Abstract

A screen reader is a vital tool that helps individuals who are blind or low-vision read digital text. Unfortunately, not all file formats receive the same level of support from screen readers. For example, while PDF files have accessibility features that can be used, they are often not the preferred file format for screen reader users. Between line breaks, multiple columns, symbols, and images, screen readers often struggle with academic journal articles in certain file formats. We will discuss the collaboration of the Open@RIT project with an open access journal and their combined goal of improving accessibility and readership for all. We will explore the difficulties that journals face on their journey towards accessibility, why this journey is worth making, and show how using LaTeX to publish both to our traditional PDF format as well as a more accessible HTML format allowed us to make a big leap towards becoming a more accessible journal.