Moodular

Use Typst's HTML export to generate content for your Moodle courses

v0.0.1

https://github.com/SillyFreak/typst-moodular

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I Introduction

This package allows you to use Typst's HTML export to generate content for your Moodle courses, but preview them faithfully in Tinymist or the webapp, or target PDF in addition to Moodle.

This package is somewhat opinionated, as it contains features tailored towards specific Moodle plugins used at our own school:

- Components for Learning (C4L) (Atto/TinyMCE plugin): Moodular recreates the HTML structure of C4L blocks, and also renders them for PDF export.

I.a HTML preview and export

one of Moodular's main features is setting up your document for HTML-equivalent preview. This includes using a single unlimited-height page, using a sans serif font for text, and showing links in blue and underlined. Other aspects of this include the display and blockquotes and raw blocks, which are styled to match Moodle's Boost theme's default style.

To get started apply Moodular's settings like this:

```typ
#import "@preview/moodular:0.0.1" as moodular: c4l

#show: moodular.preview()
// or
#show: moodular.export()
```

`preview()` is the right choice if you only want HTML export, and use "regular" mode only to preview. If you want to instead target both HTML and PDF exports, `export()` is what you want: it won't change the page setup, but apply other styles. Both are just wrappers around `setup()` the exact behavior is documented there.

I.b Components for Learning (C4L)

A huge part of this package is providing the Components for Learning (C4L) features. Most but not all components are currently supported:

Contextual components

- ✅ Do/Don't Cards
- ✅ Example
- ✅ Figure
- ❌ Inline Tag
- ✅ Key concept
- ✅ Quote
- ✅ Reading Context
- ✅ Reminder
- ❌ Tag
- ✅ Tip

Procedural components

- ✅ Attention
- ❌ Due Date
- ❌ Estimated time
- ✅ Learning Outcomes
- ✅ Procedural Context

Evaluative components

- ✅ Expected Feedback
- ❌ Grading Value

Helper components

- ✅ All-purpose card

The gallery has a document previewing some components, and you can klick on the implemented components above to go to their docs, including rendered examples. Please open an issue at https://github.com/SillyFreak/typst-moodular/issues if you need one of the missing components.

C4L components generated by the C4L Moodle plugins start with `<p class="c4l-spacer"></p>`, which seems to actually have a negative effect on spacing. By default, Moodular does not remove the spacer to remain consistent with the official plugins, but provides the `c4l.remove-spacer()` function in case this affects you. See that function for details.

I.c Show rules for specific elements

There are some Typst elements that are transformed by Moodular to either ensure they look like Moodle when exporting to PDF, or that they are picked up correctly by Moodle when exporting to HTML (the latter category may shrink as Typst's HTML support matures).

I.c.a Blockquotes

Blockquotes can e.g. created by using Markdown syntax in Moodle:

```md
> quote
```

Moodle displays these with lighter colored text and a left gray bar. To make sure a Typst blockquote is displayed the same in both HTML and PDF, Moodular styles them with a show rule when outputting to PDF:

```typ
#quote(block: true)[#lorem(20)]
```

> Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

I.c.b raw code blocks

Code blocks can be syntax-highlighted by Moodle if the language is specified. The correct markup for this are nested `<pre class="language-...">` `<code>` tags. Typst will get these (see typst#6701 and typst#6702), but for now Moodular transforms raw blocks to the correct shape.

When exporting to PDF, Moodular matches Moodle's background color for code blocks:

~~~typ
```py
print("Hello, world!")  # this is an example
```
~~~

```
print("Hello, world!")  # this is an example
```

I.c.c Images

Typst's HTML export does not support outputting multiple files, so it can't support images yet. There are two ways in which Moodular can handle this:

I.c.c.a `frame()`

```typ
#moodular.frame(image("..."))
```

Using `frame()`, the contained content is embedded in the output HTML as SVG. Images within that content are base64-encoded. Note that base64 is an inefficient encoding, but for very small images like icons it may be a convenient option.

I.c.c.b `<img>` elements

Images not inside a `frame()` are transformed by Moodular into `<img>` tags during HTML export. Specifically, an image like

```typ
#moodular.frame(image("example.png", alt: "Example"))
```

is transformed into the following:

```html
<img src="@@PLUGINFILE@@/example.png" alt="Example" class="img-fluid">
```

Here, `@@PLUGINFILE@@` is a prefix internally used by Moodle to identify attachments referenced inside rich text editors. What you should know about this is:

- When you are first transferring your HTML to Moodle, the image will naturally not be found. You will need to create an `<img>` by uploading the image through the rich text editor's "insert image" option. That should create an element like this:

  ```html
  <img class="img-fluid"
    src=".../draftfile.php/.../user/draft/.../example.png"
    alt="Example" width="4884" height="1422">
  ```

- Moodle can now (after uploading the image; saving is not necessary) identify the image using the `example.png` filename. In fact, when saving the resource, the rest of the URL is removed by Moodle and replaced by `@@PLUGINFILE@@` because Moodle only needs this part for editing.
- When you replace that image by what Moodular created, the preview will no longer display the image (since the `src` changed from a working draft URL on your Moodle site to a placeholder containing `@@PLUGINFILE@@`), but this does not impact how the image is saved when saving the whole resource. So, upon saving, you should see your content, including the uploaded and properly referenced image.
  - Note that the `width` and `height` attributes of the `<img>` tag have not been preserved; Moodular currently doesn't offer a solution for this, but these missing attributes should mostly affect page layout while an image is still loading and not much more.
- When you now edit the same resource again, all images will be shown (the placeholder has been replaced by a draft URL again). Assuming your new content does not contain previously unknown images, you can simply replace the whole HTML by what Moodular produced again, and all uploaded images will be preserved.

II Module reference

II.a `moodular`

- `setup()`
- `preview()`
- `export()`
- `frame()`

`setup(mode: string) -> function`

Moodular's main template function, to be called as a show rule:

```typ
#show: setup(mode: "preview")  // or "export"
```

If you don't need flexibility of the `mode`, you can use `preview()` or `export()` instead.

The function applies the following settings for PDF export:

- if `mode` is `"preview"`, sets the page height to `auto` so that all content appears on a single continuous page, like on the web

- sets a sans serif font (Noto Sans is currently hardcoded and therefore needs to be present) and displays links blue and underlined
- shows blockquotes with a gray left border
- show raw blocks with a light beige background

which is a best-effort recreation of Moodle's Boost theme's default style.

For HTML export, the following settings are applied:

- raw blocks are wrapped in `<pre class="language-...."><code>` tags to apply Moodle's syntax highlighting
- `image` elements are transformed into `<img src="@@PLUGINFILE@@/..." class="img-fluid">` tags. The `@@PLUGINFILE@@` prefix is used internally by Moodle to indicate references to uploaded files.

Parameters:

`mode` (`string` = `none`) – the mode to use for the document; either `preview` (simulate a non-paged run of HTML content) or `export` (don't change the page setup, as to produce a paged PDF document).

`preview() -> function`

Sets up the document for HTML preview, i.e. simulating a non-paged run of HTML content. Call this as a show rule:

```typ
#show: preview()
```

This is a wrapper around `setup()`, see that function for details.

`export() -> function`

Sets up the document for PDF export, i.e. producing a paged PDF document. Call this as a show rule:

```typ
#show: export()
```

This is a wrapper around `setup()`, see that function for details.

`frame(body: content ) -> content`

Conditionally puts content into an `html.frame`, i.e. rendering it as an `<svg>` tag. When exporting to PDF, the content is simply displayed as-is.

Parameters:

`body` (`content`) – the content to put into a frame

II.b c4l

- `remove-spacer()`
- `key-concept()`
- `tip()`
- `reminder()`
- `quote()`
- `do-dont()`
- `reading-context()`
- `example()`
- `figure()`
- `attention()`
- `procedural-context()`
- `learning-outcomes()`
- `expected-feedback()`
- `card()`
- `blockquotes-as-c4l()`
- `figures-as-c4l()`

`remove-spacer(value: bool ) -> content`

Enables or disables the removal of `<p class="c4l-spacer"></p>` elements from the output when exporting to HTML. By default, these elements are rendered to be consistent with the C4L editor moodle plugins (for Atto and TinyMCE), but this looks bad according to my testing on a clean Moodle install; see also https://github.com/reskit/moodle-tiny_c4l/issues/20.

The default of this setting can be overridden by compiling with `--input moodular-remove-spacer=true`.

Parameters:

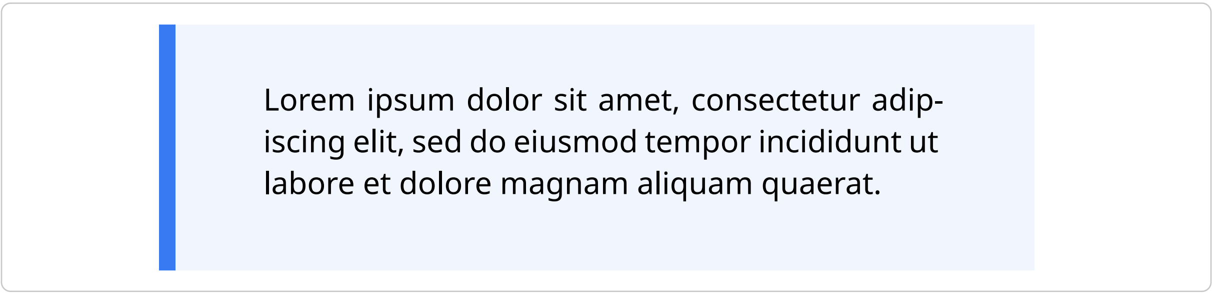
`value` (`bool`) – whether to remove spacer elements or not.

`key-concept(body: content , full-width) -> content`

See https://componentsforlearning.org/components/key-concept/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.key-concept[#lorem(20)]
```



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

`tip(body: content , full-width) -> content`

See https://componentsforlearning.org/components/tip/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.tip[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

`reminder(body: content, full-width) -> content`

See https://componentsforlearning.org/components/reminder/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.reminder[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

`quote(body: content, full-width, attribution) -> content`

See https://componentsforlearning.org/components/quote/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.quote[#lorem(20)]
```

> *“ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat. ”*

```typc
c4l.quote(attribution: lorem(5))[#lorem(20)]
```

> *“ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat. ”*

Lorem ipsum dolor sit amet.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

`attribution` (= `none`) – the attribution associated with the quote

```
do-dont(do: content, dont: content, full-width) -> content
```

See https://componentsforlearning.org/components/do-dont-cards/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.do-dont[#lorem(20)][#lorem(20)]
```

✓

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

✗

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
reading-context(
  body: content,
  full-width,
  attribution,
  comfort-reading,
) -> content
```

See https://componentsforlearning.org/components/reading-context/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.reading-context(comfort-reading: true)[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

```typc
c4l.reading-context(attribution: lorem(5))[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Lorem ipsum dolor sit amet.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

`attribution` (= `none`) – the attribution associated with the quote

`comfort-reading` (= `false`) – whether to display the context in a serif font

```
example(title: content, body: content, full-width) -> content
```

See https://componentsforlearning.org/components/example/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.example[Title][#lorem(20)]
```

TITLE

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
figure(..args, full-width) -> content
```

See https://componentsforlearning.org/components/figure/ for details and examples rendered in HTML.

This is rendered as a regular figure in PDF preview:

```typc
c4l.figure(rect())
```

```typc
c4l.figure(rect(), caption: lorem(5))
```

Lorem ipsum dolor sit amet.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
attention(body: content, full-width) -> content
```

See https://componentsforlearning.org/components/attention/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.attention[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
procedural-context(body: content, full-width) -> content
```

See https://componentsforlearning.org/components/procedural-context/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.procedural-context[#lorem(20)]
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
learning-outcomes(title: content, body: content, full-width) -> content
```

See https://componentsforlearning.org/components/learning-outcomes/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.learning-outcomes[Title][
  - #lorem(5)
  - #lorem(10)
]
```

TITLE

▶ Lorem ipsum dolor sit amet.

▶ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

typc

```
c4l.learning-outcomes[Title][
  + #lorem(5)
  + #lorem(10)
]
```

TITLE

1. Lorem ipsum dolor sit amet.
2. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

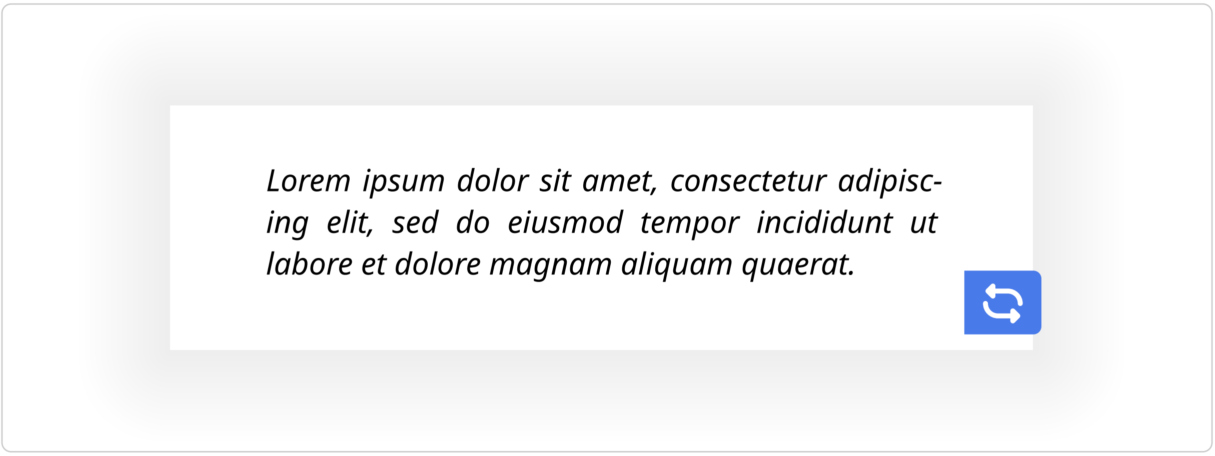
```
expected-feedback(body: content, full-width) -> content
```

See https://componentsforlearning.org/components/expected-feedback/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

typc

```
c4l.expected-feedback[#lorem(20)]
```



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

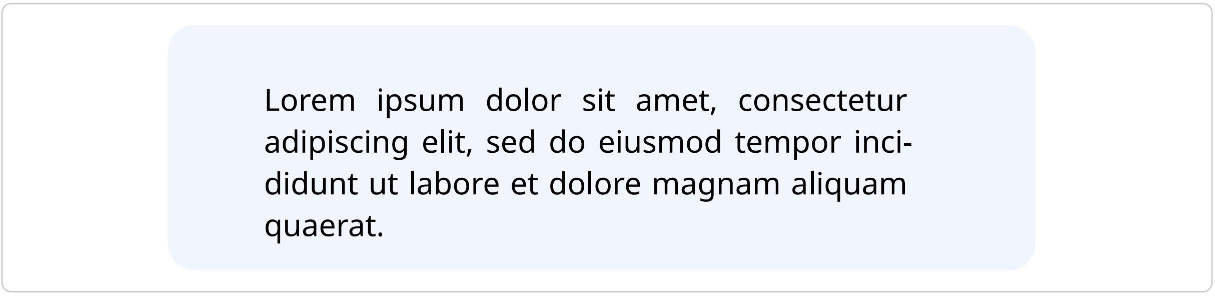
`full-width` (= `false`) – whether the component should take up the full text width

```
card(body: content , full-width) -> content
```

See https://componentsforlearning.org/components/all-purpose-card/ for details and examples rendered in HTML.

This is how the component looks in PDF preview:

```typc
c4l.card[#lorem(20)]
```



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Parameters:

`full-width` (= `false`) – whether the component should take up the full text width

```
blockquotes-as-c4l(full-width: bool ) -> function
```

An optional show rule that transforms all regular Typst blockquotes into C4L quotes:

```typ
#quote(block: true)[before ...]
#show: c4l.blockquotes-as-c4l()
#quote(block: true)[... after]
```

> before ...
>
> > “… *after* ”

Parameters:

`full-width` (`bool` = `false`) – whether blockquotes should take up the full text width

`figures-as-c4l(full-width: bool ) -> function`

An optional show rule that transforms all regular Typst figures into C4L figures:

```typ
#figure(image("example.png"), caption: [before ...])
#show: c4l.figures-as-c4l()
#figure(image("example.png"), caption: [... after])
```

Note that C4L figures are displayed as regular figures when exporting to PDF, so there is no difference to show here. The generated HTML would look roughly like this:

```html
<figure>
  <img src="@@PLUGINFILE@@/example.png" class="img-fluid">
  <figcaption>Figure 1: before …</figcaption>
</figure>
<p class="c4l-spacer"></p>
<figure class="c4lv-figure" aria-label="Figure">
  <img src="@@PLUGINFILE@@/example.png" class="img-fluid">
  <figcaption><em class="c4l-figure-footer">Figure 2: … after</em></figcaption>
</figure>
```

Parameters:

`full-width` (`bool` = `false`) – whether figures should take up the full text width