THE UNIVERSITY of EDINBURGH

Practical approaches to freeing university material stockpiles

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Learn!

Blackboard Learn Original

- Used for all courses
- No major updates since 2011
- Now deprecated

Blackboard Learn Ultra

- Will be used for all courses from September 2023
- Key benefits: Mobility, Accessibility, Inclusivity, Integrations, Efficiency, Security, Functionality
  - Benefits of Learn Ultra (sharepoint.com)
- But…

Learn Ultra has no open access!

- Central Information Services provide Moodle
  - Online Distance Learning courses only!
- University's policy on Open Educational Resources – present in theory
  - But what about support for implementation?

Name	Link	Country	Whose resources	Target audience	Useful for	Functionality	Looks (quick impressi	Could we add our content?	Site is created using	Framework Double-Checked?	Lighthouse automatic benchmark
edX	edX	Free Online Courses by Harvard, MIT, & more	edX	US	Harvard, MIT, UC Berkeley, Oxford, Cambridge...	Public	MOOCs and online degrees	Open courses catalogue	Great!	Caveats: requires special contributor sign-up. Intended for complete courses, instead of partial materials. Access is	Open edX	Yes	Accessibility: 76/100 (desktop), 76/100 (mobile) Performance: 56/100 (desktop), 67/100 (mobile) SEO: 92/100 (desktop), 93/100 (mobile) Best Practices: 75/100 (desktop), 75/100 (mobile)
Open Yale Courses	Welcome	Open Yale Courses	US	Yale University	Public	MOOCs	Open courses catalogue	Okay	No	Drupal + Bootstrap	Yes	Accessibility: 88/100 (desktop), 91/100 (mobile) Performance: 96/100 (desktop), 98/100 (mobile) SEO: 67/100 (desktop), 71/100 (mobile) Best Practices: 83/100 (desktop), 83/100 (mobile)
Stanford Online Content Library	Content Gallery	Stanford Online	US	Stanford University	Public	Videos and articles	Media catalogue	Great!	No	Drupal	Yes	Accessibility: 84/100 (desktop), 89/100 (mobile) Performance: 56/100 (desktop), 51/100 (mobile) SEO: 82/100 (desktop), 83/100 (mobile) Best Practices: 83/100 (desktop), 83/100 (mobile)
MIT OpenCourseWare	MIT OpenCourseWare	Free Online Course Materials	US	MIT	Public	MOOCs and resources	Open courses catalogue; resource repository	Great!	No	Hugo	Yes	Accessibility: 100/100 (desktop), 100/100 (mobile) Performance: 87/100 (desktop), 75/100 (mobile) SEO: 91/100 (desktop), 92/100 (mobile) Best Practices: 92/100 (desktop), 92/100 (mobile)
LinkedIn Learning	https://www.linkedin.com/learning	Global	LinkedIn	Public	MOOCs	Courses catalogue	Great!	Caveats: requires special contributor sign-up. Intended for complete courses, instead of partial materials. Access is	EmberJS	Yes	Accessibility: 100/100 (desktop), 100/100 (mobile) Performance: 92/100 (desktop), 66/100 (mobile) SEO: 100/100 (desktop), 100/100 (mobile) Best Practices: 92/100 (desktop), 75/100 (mobile)
Coursera	Coursera	Degrees, Certificates, & Free Online Courses	Global	Google, Stanford, IBM, UPenn, Imperial College London, ...	Public	MOOCs	Courses catalogue	Great!	Caveats: requires special contributor sign-up. Intended for complete courses, instead of partial materials.	Contentful + React	Yes	Accessibility: 94/100 (desktop), 100/100 (mobile) Performance: 57/100 (desktop), 24/100 (mobile) SEO: 83/100 (desktop), 89/100 (mobile) Best Practices: 92/100 (desktop), 92/100 (mobile)
Udacity	Learn the Latest Tech Skills; Advance Your Career	Udacity	Global	Udacity, Stanford, San Jose State University, Google, NVidia, AT&T, ...	Public	MOOCs	Courses catalogue	Great!	No	NextJS	Yes	Accessibility: 93/100 (desktop), 93/100 (mobile) Performance: 81/100 (desktop), 75/100 (mobile) SEO: 92/100 (desktop), 92/100 (mobile) Best Practices: 100/100 (desktop), 100/100 (mobile)
Udemy	Online Courses - Learn Anything, On Your Schedule	Udemy	Global	Udemy	Public	MOOCs	Courses catalogue	Great!	Caveats: requires special contributor sign-up. Intended for complete courses, instead of partial materials. Access is	Drupal + WordPress (as CMS only)	Yes	Accessibility: 100/100 (desktop), 95/100 (mobile) Performance: 83/100 (desktop), 62/100 (mobile) SEO: 82/100 (desktop), 82/100 (mobile) Best Practices: 75/100 (desktop), 75/100 (mobile)
OpenLearn	Open Learning - OpenLearn - Open University	England	Open University UK	Public	MOOCs and resources	Open courses catalogue; resource repository	Great!	No	Moodle	Yes	Accessibility: 100/100 (desktop), 100/100 (mobile) Performance: 85/100 (desktop), 54/100 (mobile) SEO: 82/100 (desktop), 77/100 (mobile) Best Practices: 83/100 (desktop), 75/100 (mobile)

20 examples in UoE Informatics

10+ examples in rest of UoE

100+ examples from around the world

What do educators at our university use?

External platforms:

The University of Edinburgh | edX
The University of Edinburgh Online Courses | Coursera
…

Blogging tools:

Centre for Open Learning Online Arts Hub (PebblePad)
The Human Factor Course Website (WordPress)
…

Custom websites:

Hugo, Jekyll, Drupal, React, Plain HTML, …

What do educators around the world use?

External platforms:	edX, Coursera, FutureLearn, Udacity, …
Open courseware sites:	OpenLearn - Open University (Moodle) MIT OpenCourseWare (Hugo) …
Custom websites:	Hugo, Jekyll, Drupal, React, Plain HTML, …

Over 40 tools/frameworks found...

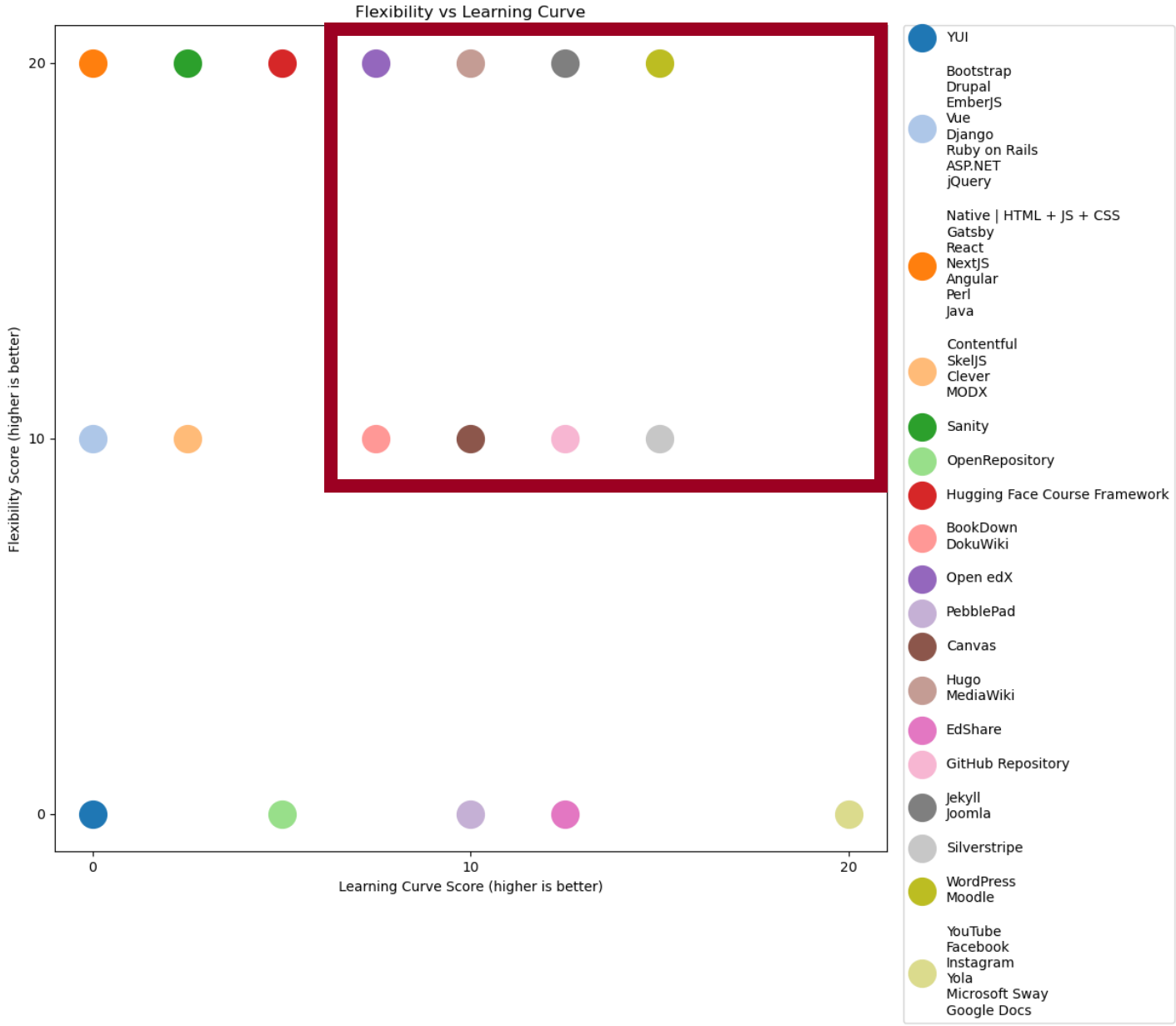
Now what?

Broad Criteria

- 1) Automatic benchmarks – accessibility / performance / search engine optimisation / best practices
- 2) Accessibility + Device Compatibility
- 3) Tracking + User Management
- 4) API + Content Types
- 5) Flexibility
- 6) Learning Curve

Framework	Possible Plugins or Themes	Publishing Site(s)	Notes	Median Lighthouse Benchmark scores	Accessibility +	Tracking + User Management	API + Content	Flexibility	Learning	Learning	Learning	Learning curv
Hugo	wowchemy (https://wowchemy.com/)	https://groups.inf.ed.ac.uk/teaching/ccs/ https://mollicaf.github.io/teaching/ https://ocw.mit.edu/ https://groups.inf.ed.ac.uk/teaching/cogsci/course/	Hugo : written with Go programming, basic text files, Markdown and static HTML pages. Fast and efficient for deploying static files with minimal effort. In-case of minimal custom-code, easier to maintain as it is a static-site generator. But, in-case of a lot of custom coding, which is the case for our project, maintainability can become a challenge. Need to rely on built-in functionality wherever possible to maximize maintainability	Accessibility: 91.5/100 (desktop), 92.5/100 (mobile) Performance: 94.0/100 (desktop), 79.5/100 (mobile) SEO: 92.0/100 (desktop), 92.5/100 (mobile) Best Practices: 92.0/100 (desktop), 92.0/100 (mobile)	Framework-independent score deductions	The number simply reflects the number of features supported in each category Assessed using given websites only, acts as a first-level filter for priority *Progress Tracking: 0-None *User Account: 0-None *Collaboration: 0-None, CogSci has links to external collaboration platforms *User Feedback: 0-Direct contact with publishers with external communication	Supports Markdown, code, LaTeX maths. Wowchemy can import from WordPress or Jekyll. Could automate content conversion to markdown, but it would need custom code	Wide range of options for customization and is highly flexible in terms of its designs. Custom templates : uses Go for custom website layouts, can be further customized with CSS and JavaScript. Also has shortcodes, helps in adding images, videos and links. Also possible to customize metadata, menus and taxonomies.	Requires writing markdown with special syntax; need code to extend functionality	Need to learn Markdown; potentially need to maintain / learn which YAML fields to include	Use of wowchemy can reduce effort, but limit the website to templates	Moderate learn curve, documen extensive and straightforward, community ava help, templating language and fo structure might some time to le possible to get in a reasonable of time
Native	HTML + JS + CSS	html5up.net template	https://www.inf.ed.ac.uk/teaching/courses/asmindex-2023.html https://www.inf.ed.ac.uk/teaching/courses/itcs/ https://uoepsy.github.io/ https://distill.pub/ https://mlpr.inf.ed.ac.uk/2022/ https://www.merlot.org/merlot/ https://archive.org/ https://www.inf.ed.ac.uk/teaching/courses/diss/ https://www.inf.ed.ac.uk/teaching/courses/mip2/ https://www.inf.ed.ac.uk/teaching/years/ug4/courses.html https://www.inf.ed.ac.uk/teaching/courses/mip1/	Native web technologies are HTML, JavaScript, and CSS. They can be used to create web applications. Pre-built components and libraries to create applications quickly and efficiently. Maintaining applications is easy because of its familiarity with standard web technologies and tools. Custom coding can be challenging, but adhering to best practices and leveraging the framework's strengths can minimize issues. In general, it's recommended to rely on built-in functionality and existing libraries to maximize maintainability.	Accessibility: 86.0/100 (desktop), 86.0/100 (mobile) Performance: 100.0/100 (desktop), 99.5/100 (mobile) SEO: 82.0/100 (desktop), 69.0/100 (mobile) Best Practices: 92.0/100 (desktop), 83.0/100 (mobile)	Framework-independent score deductions	*Progress Tracking: 1-Implementation dependent, limited to authorized users *User Account: 2-Implementation dependent, still open to guests, some only allow authorized users to sign up *Collaboration: 0-None *User Feedback: 2-Implementation dependent, some have comment sections and rating systems Overall: 5- Most sites did not choose to implement	Open ended	High level of flexibility and customization options. Can build responsive and interactive web pages.	Custom coding	Too much custom coding and direct source code interaction	Lots of coding even with the libraries and templates	Challenging as coding required need to be profi HTML + CSS +
GitHub Repository		https://github.com/solegga/blockchaincourse https://github.com/maziarraissi/Applied-Deep-Learning	Using GitHub's website, maintainability is straightforward because of robust features, custom coding is also straightforward, viable option for building a website as it supports custom domains, SSL encryptions and other development features. Again it is designed for static website, so not suitable for very complex dynamic websites	Accessibility: 96.0/100 (desktop), 95.0/100 (mobile) Performance: 95.0/100 (desktop), 76.0/100 (mobile) SEO: 92.0/100 (desktop), 90.5/100 (mobile) Best Practices: 100.0/100 (desktop), 100.0/100 (mobile)	Framework-dependent score deductions However: still a pretty high score, no major accessibility concerns	*Progress Tracking: 0-None *User Account: 1-Integrated GitHub account *Collaboration: 0-None, possible but not implemented *User Feedback: 0-None, possible but not implemented Overall: 1- Collection of materials in GitHub repo	Supports code, PDFs, images, and markdown. Could automate uploading content, would need custom code.	Provides version control, collaboration tools, hosting options, developers can choose from variety of frameworks, languages and tools. Biggest benefit is its versatility and integration with other development tools making it one of the powerful choice for many users. Users can host directly their website	Regular markdown and uploading files using Git	GH-flavoured markdown; file-upload via GitHub website possible so not git knowledge required	Requires knowledge of git	Need to know h use markdown also prior exper working with ve control system
Jekyll	Jekyll-theme-minimal http://jekyllthemes.org/themes/midnight/	https://plfa.github.io/ https://jillymackay.github.io/RatRDSVS/ https://kennysmithed.github.io/cels2022/ https://cs-uob.github.io/	Jekyll is a static site generator(SSG), generates content like a traditional content management system (CMS). Faster load times, improved security and better performance under heavy traffic-loads. hosting websites with Jekyll is straightforward. Maintainability is also doable as the content and site structure are defined in simple text files. This makes it easy to version control and collaborate on website projects using Git and GitHub. Plus, there is no need for server side processing. Custom coding still a challenge , however, developers have flexibility to create their own tools and extensions to tailor the workflow. One such extension is AnchorJS which helps in deep linking functionality for headers and sections of a webpage.	Accessibility: 90.0/100 (desktop), 91.0/100 (mobile) Performance: 92.0/100 (desktop), 85.5/100 (mobile) SEO: 95.0/100 (desktop), 92.0/100 (mobile) Best Practices: 100.0/100 (desktop), 100.0/100 (mobile)	Framework-independent score deductions	*Progress Tracking: 0-None *User Account: 0-None *Collaboration: 0-None *User Feedback: 0- direct contact with publishers via external communication Overall: 0- Open materials	Supports code, PDFs, images, and markdown. Could automate uploading content, would need custom code.	Support for multiple content types, like markdown, HTML, and liquid templates. Built in support for syntax highlighting and code formatting. Can be integrated with GitHub pages for website development. Quite flexible and reason to choose it over others : its simplicity and ease of use make it a popular choice. Liquid, templating language used by Jekyll, can be	Markdown with special syntax	Need to learn Markdown	Less coding needed	Plugins availabl advance functio pre-built templa stylesheets ava which make it e customize quic plugins can be ruby so would n know ruby as we


Flexibility vs Learning Curve
Flexibility Score (higher is better)
Learning Curve Score (higher is better)
0
10
20
YUI
Bootstrap
Drupal
EmberJS
Vue
Django
Ruby on Rails
ASP.NET
jQuery
Native | HTML + JS + CSS
Gatsby
React
NextJS
Angular
Perl
Java
Contentful
SkelJS
Clever
MODX
Sanity
OpenRepository
Hugging Face Course Framework
BookDown
DokuWiki
Open edX
PebblePad
Canvas
Hugo
MediaWiki
EdShare
GitHub Repository
Jekyll
Joomla
Silverstripe
WordPress
Moodle
YouTube
Facebook
Instagram
Yola
Microsoft Sway
Google Docs


Flexibility vs Learning Curve
Flexibility Score (higher is better)
Learning Curve Score (higher is better)
0
10
20
YUI
Bootstrap
Drupal
EmberJS
Vue
Django
Ruby on Rails
ASP.NET
jQuery
Native | HTML + JS + CSS
Gatsby
React
NextJS
Angular
Perl
Java
Contentful
SkelJS
Clever
MODX
Sanity
OpenRepository
Hugging Face Course Framework
BookDown
DokuWiki
Open edX
PebblePad
Canvas
Hugo
MediaWiki
EdShare
GitHub Repository
Jekyll
Joomla
Silverstripe
WordPress
Moodle
YouTube
Facebook
Instagram
Yola
Microsoft Sway
Google Docs

Narrowed down to 7 candidates...

Now what?

Detailed Criteria

- How is information formatted?
- What skills are required to use this?
- Can information be organised hierarchically?
- Can different pages be styled differently?
- Are embedded PDFs supported?
- Can we track page visits?
- … and many more

Canvas

Canvas is a web-based learning management system (LMS). It is used by learning institutions, educators, and students to access and manage online course learning materials and communicate about skill development and learning achievement.
Canvas includes a variety of customizable course creation and management tools, course and user analytics and statistics, and internal communication tools.
Institutions may provide users with a Canvas account, or individual users can try the free version by signing up for their own account. Instructure (the creators of Canvas) offer hosting, setup, and support as a service, but the LMS is open source and can be self-hosted as well.

Example sites

- All courses (instructure.com)
- Canvas Network | Free online courses | MOOCs

Example screenshots

Figure 9. List of courses, with a search bar and filters on top, and navigation bar on the left. All courses (instructure.com)

Figure 10. Course home page with tabular overview, open for anonymous access. Intro to Skateboarding (Hybrid) (instructure.com)

Figure 11. MOOC that requires an account to enroll and see content. Integrating STEM: From Beginning to End (K-12) - Canvas Network | Free online courses | MOOCs

Figure 12. Course modules of a MOOC that act as buckets for grouped course content. Course Modules: Implementing UDL on Canvas

Content structure

How is content formatted?	What skills are required for content creators to use this?
Rich-text format content pages and files, organised into modules	There is a built-in WYSIWYG editor, only some basic training may be required for navigating the user interface

Styling

Flexible / fixed?	Themes / templates available?	How does customisation work?	Can sub-pages be styled differently?
Flexible	Some template themes available How do I manage themes for an account? - Instructure Community (canvaslms.com)	Themes are customisable using built-in variables and toggles. Custom changes can be made by uploading CSS and JS.	Themes apply site-wide, it does not seem to be possible to configure multiple themes.

Layout / navigation

Has hierarchy	Search bar	Has landing page	Has timeline / announcements	Has deep Linking support
Both flattened resource list and hierarchical layout are possible	Limited built-in search available. Can extend with custom embeds or ~~plugins~~ • Solved: Good way to search content within a course? - Instructure Community (canvaslms.com) • Atomic Search for Canvas | Atomic Jolt	Yes (course list)	Courses include announcement list out of the box; users have personal calendars that ~~pick up~~ course TODOs	Yes (uses URL queries, doesn't seem to be customisable). See How do I link to other Canvas pages in a course? - Instructure Community (canvaslms.com)

Content type support

Embedding PDF	Code highlighting	Maths formatting	Pictures	Videos / audio	Interactive elements	Export/print support
Yes Embedding a pdf in the rich content editor - Instructure Community (canvaslms.com)	Yes, requires loading custom JS library	Yes, built-in support for LaTeX	Yes	Yes, supports inline embeds	Yes, supports quizzes and assignments	Yes, requires loading custom JS ~~code~~ Print page in Canvas - Instructure Community (canvaslms.com)

Analytics

Page visits (who and where from)	Resource views	Resource downloads
Yes, built-in ~~support~~ Analytics Page Views and Participations - Instructure Community (canvaslms.com)	Yes, built-in support	Possible to configure tracking via button or link shortener. Not really needed, because other resource interactions are tracked

Usage

- Canvas Guides - Instructure Community (canvaslms.com)
- Supports importing course content directly from a Blackboard Learn export: How do I import content from Blackboard 6/7/8/9 in... - Instructure Community (canvaslms.com)
- Self-hosting instructions: Home · instructure/canvas-lms Wiki (github.com)

API

- Canvas LMS REST API Documentation (instructure.com)
- There is both a REST and a GraphQL API
- Allows searching for, uploading, modifying, or deleting resources, users, settings, files, analytics
- Supports integration with LTI and xAPI tools

Material searching & tags

Search results	Possible search scopes	User bookmarks / private tags
Default search for files is available. With Atomic Search plugin, search is possible for pages, assignments, syllabi, discussions, modules, and URLs. Can search within uploaded PDF/Word/PowerPoint/Excel contents. Collects analytics about search usage.	Search is within each course and can be scoped to type of resource.	Students can bookmark pages: How do I bookmark content in the Student app on my... - Instructure Community (canvaslms.com) Hypothesis integrates with Canvas for private/shared tagging: Using the Hypothesis LMS App With Assignments in Canvas : Hypothesis

Accessibility and device compatibility

Median Lighthouse scores	Mobile Support	Dark / Light mode	Multi-lingual content	Supports anchor links
Accessibility: 97.0/100 (desktop), 97.0/100 (mobile) Performance: 50.0/100 (desktop), 47.5/100 (mobile) SEO: 85.5/100 (desktop), 86.5/100 (mobile) Best Practices: 91.5/100 (desktop), 91.5/100 (mobile)	Canvas has dedicated apps for both Android and iOS	High contrast UI option is built in. Mobile has dark/light support: [Theme Editor] Dark Theme/Dark Mode for Canvas - Instructure Community (canvaslms.com) But on desktop this needs to be theme-defined	Separate courses can be created in different languages. UI language is configured by each user.	Yes, see: Solved: Links to headers within pages - Instructure Community (canvaslms.com)

Collaboration

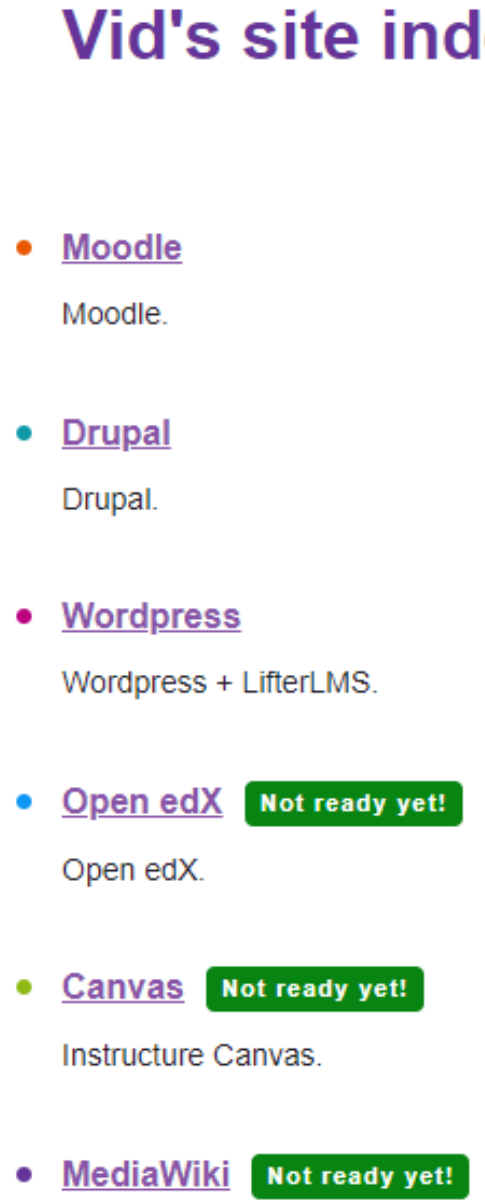
Simultaneous editing	Comments/likes	Progress tracking	Discussion board/forum	Registration needed?
Integrates with Google Docs and MS Word for real-time simultaneous editing:	Supported for discussions: How do I allow students to like replies in a discu... -	Built-in	Built-in	Yes, for posting on discussions or tracking progress

Recommendation for testing

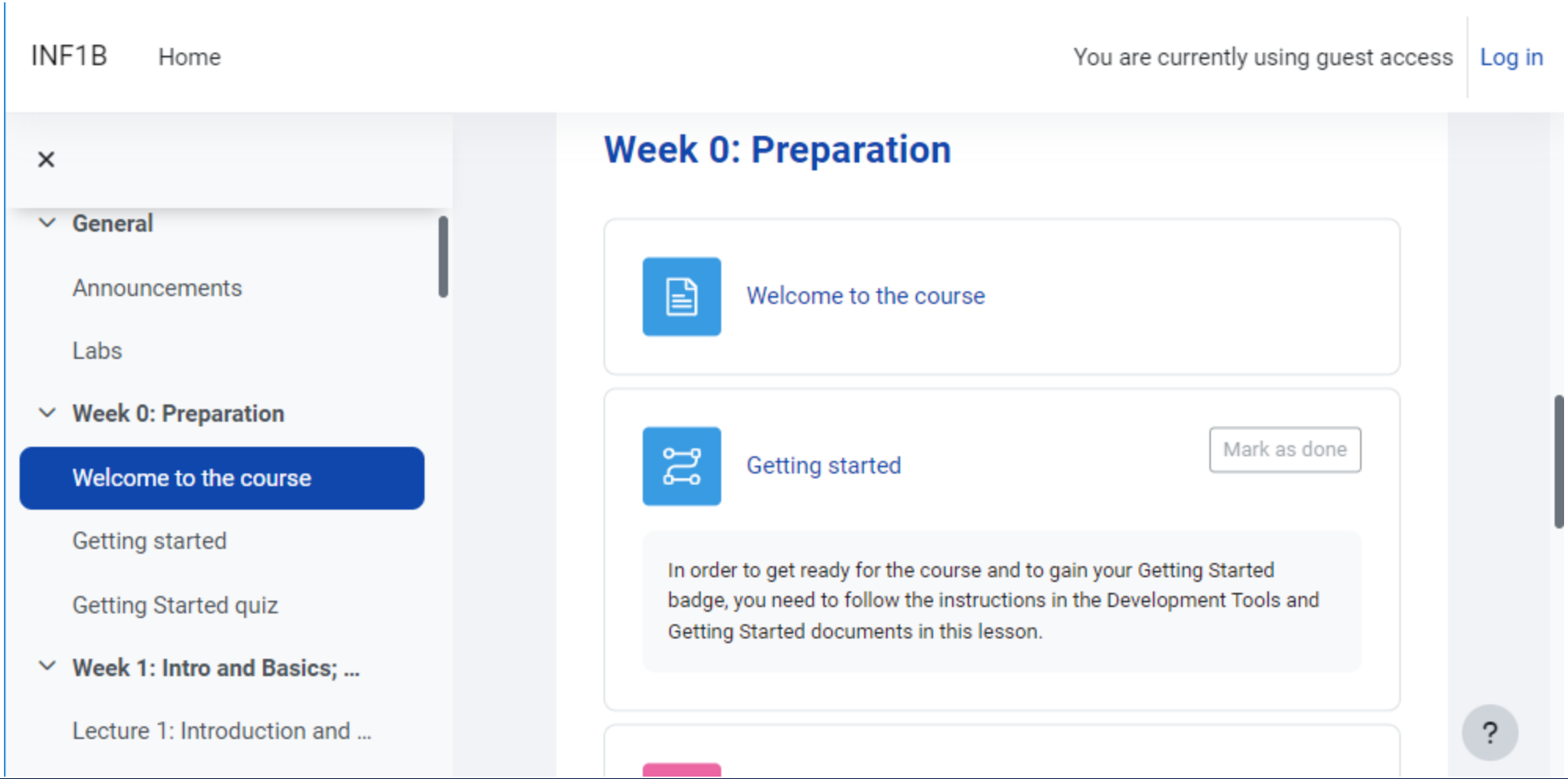
Ranking 1	Ranking 2	Ranking 3	Ranking 4	Sum ranking
1. Canvas 2. Moodle 3. WordPress 4. MediaWiki 5. Open edX 6. MODX 7. Hugging Face	1. Moodle 2. MediaWiki 3. Open edX 4. WordPress 5. Canvas 6. Hugging Face 7. MODX	1. Canvas 2. Open edX 3. MediaWiki 4. Moodle 5. WordPress 6. MODX 7. Hugging Face	1. Open edX 2. Moodle 3. MediaWiki 4. WordPress 5. Canvas 6. MODX 7. Hugging Face	**9. Moodle** **11. Open edX** **12. Canvas** **12. MediaWiki** **16. WordPress** **25. MODX** **27. Hugging Face**

Implemented 3 prototypes

- Usability evaluation with undergraduate students
- Organised 3 focus groups on Teams:
  - Group 1: 3 non-informatics students
  - Group 2: 3 informatics students
  - Group 3: 1 non-informatics, 1 informatics student



Moodle


INF1B
Home
You are currently using guest access
Log in
General
Announcements
Labs
Week 0: Preparation
Welcome to the course
Getting started
Getting Started quiz
Week 1: Intro and Basics; ...
Lecture 1: Introduction and ...
Week 0: Preparation
Welcome to the course
Getting started
Mark as done
In order to get ready for the course and to gain your Getting Started badge, you need to follow the instructions in the Development Tools and Getting Started documents in this lesson.
?

Drupal

Pair programming: you will be doing some pair programming in your tutorial sessions, and we also encourage you to use pair programming as much as possible for your lab exercises. It is a great way to develop your practice and mirrors the working situation for software engineers much more closely than working on your own. When you go along to drop-in sessions, the lab instructors will encourage you to work in pairs if you would like to. Don't worry if you would rather not - this is not compulsory.

Tutorial

Attachment	Size
inf1b-gettingstarted.pdf	929.44 KB
inf1b-tools.pdf	397.41 KB

Back to course

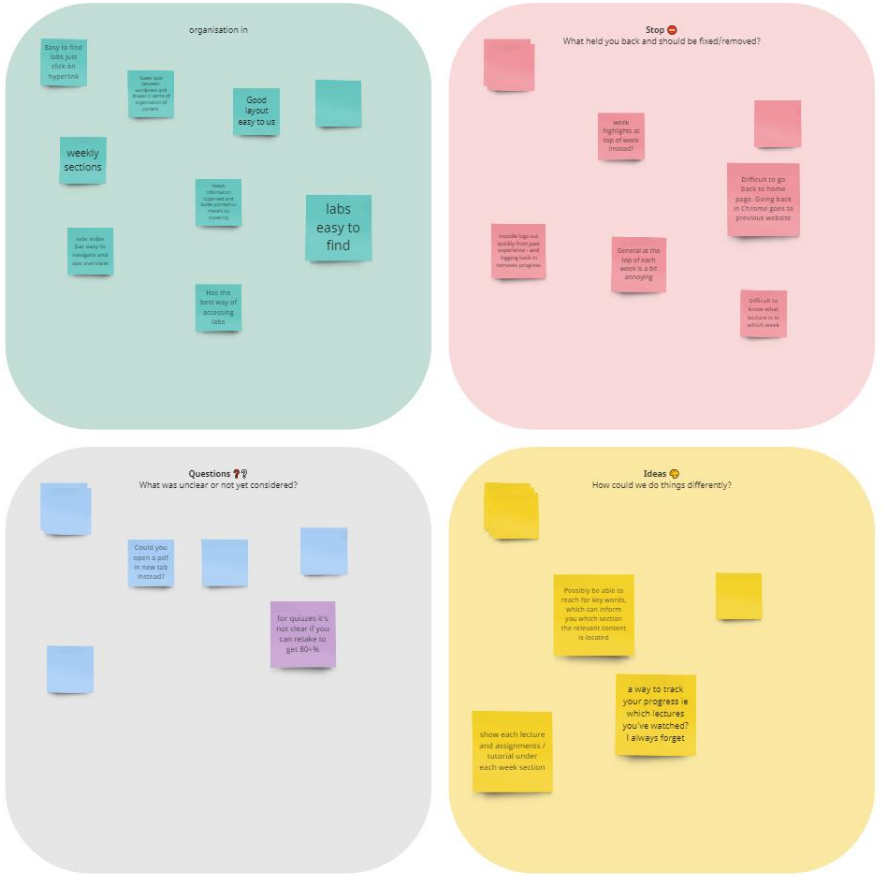
INF1B 2023-2024

WordPress


Home
Dashboard
Setting up the development tools
Leave a Comment / By user / May 12, 2023
Back to: INF1B 2023-2024
1
of 10
Informatics 1: Object Oriented Programming
Development Tools
Adapted from IPPO* course by Paul Anderson
Week 0:
Preparation
Welcome to the course
Setting up the development tools
Using the development tools

Feedback for each prototype

- Like 👍 ⏭
  - What was helpful and should be kept going forward?
- Stop ⛔
  - What held you back and should be fixed/removed?
- Questions ❓❓
  - What was unclear or not yet considered?
- Ideas 🎨
  - How could we do things differently?



Highlights

From student perspective:

- 👍 Moodle/WordPress: navigation sidebar
- 👍 Drupal: search bar
- 👍 WordPress: dark / light mode
- 👍 All: no login - no time out
- 👎 WordPress: too many animations
- 👎 Drupal/WordPress: too many page loads when information is granular

From developer perspective:

- Moodle works out of the box, easy set up. Contention with Learn Ultra?
- WordPress requires lots of plugins, easy to use afterwards for flexible content
- Drupal requires some plugins, setup is difficult, easy to add structured content afterwards, limited flexibility

What's next?

- Informatics Learning Technology Service (ILTS) team ➞ informatics school-wide Drupal site
- Opencourse.inf.ed.ac.uk (not available yet; work-in-progress)

- What about you?

Resources

- Course materials website examples
- Broad evaluation spreadsheet
- Detailed evaluation document
- Visualisation code
- Instructions for recreating prototypes
- Focus group study documents
- Focus group outputs

https://uoe.sharepoint.com/sites/INF1B2023PTASproject

THE UNIVERSITY of EDINBURGH

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Informatics Learning Technology Service team:

Alex Burford, Meredith Corey, Fiona Hale

All focus group participants

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EDINBURGH
Extraordinary futures await