

Fostering equity, accessibility and academic integrity within an LMS module

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Abstract

A mandatory learning management system (LMS) module informing students studying English as a second language (ESL) about academic integrity and university guidelines was implemented at a program level and was a success for several years. However, following a shift to online learning using both synchronous and asynchronous formats, there was an increase of reported cases of academic infractions. The LMS module previously incorporated principles of Universal Design for Learning (UDL) to target the diverse needs of language learners. The current paper reports on an analysis of the module's compliance to research recommendations related to UDL guidelines for improving student comprehension of academic integrity and the application of Web Content Accessibility Guidelines (WCAG) within the LMS module are explored. Furthermore, the introduction and ubiquitous as well as unregulated use of AI has added another concern, as the limited resources and insufficient guidelines about this type of academic infraction present a new challenge for both teachers and students. The presentation includes the impact of previous modifications and discusses potential outcomes in light of the current analysis. The results of the most recent modifications are forthcoming.

Keywords: academic integrity; UDL; WCAG; accessibility.

1. Introduction

When teachers enter a university English as a second language (ESL) classroom, it may be rare to find a completely homogenous group of students. From the outset, individual students are not equal in their knowledge, how many languages they speak, how long they have studied the English language, how at ease and how confident they are learning languages and how motivated they are to learn English. It is therefore unrealistic to expect that such a heterogeneous group would all have the same experience regarding academic integrity. And yet, many teachers expect that students should have a solid understanding of academic integrity before beginning university (Cadieux, 2024).

Students who are accused of academic infractions, including the overrepresentation of international students who are frequently not studying in their first language, often report that they didn't understand or think they were committing an infraction (Bertram Gallant, 2015; Ehrich et al., 2016; Pecorari, 2016). Considering this, the role of the language teacher (or any teacher sensitive to this challenge) includes ensuring that academic integrity materials are comprehensible and accessible for all students. This paper shares the process and results of developing an academic integrity module integrated into all ESL courses within a course learning management

system (LMS). The impact of the move to online learning combined with the introduction of ChatGPT is also explored, followed by changes that were introduced to better reflect Universal Design for Learning (UDL) guidelines (CAST, 2018), and then the current state of the project, which revisits key UDL points, specifically the area of comprehension, and analyzes the module's compliance with Web Content Accessibility Guidelines (WCAG) (World Wide Web Consortium, 2023). The purpose of this paper is to share reflections about this process and resulting modifications and to encourage teachers to consider this information when developing materials related to academic integrity.

1.1. Literature review

1.1.1. Academic integrity

The European Network for Academic Integrity (ENAI) (Tauginienė et al., 2018, p. 8) defines academic integrity as “a compliance with ethical and professional principles, standards, practices and consistent system of values, that serves as guidance for making decisions and taking actions in education, research and scholarship.” Generally, a proactive approach to academic integrity ensuring students understand university policies and guidelines is favoured over a punitive approach that focuses on fear of sanctions (Bertram Gallant et al., 2015; Davis, 2024).

With the aim of reinforcing academic integrity and preventing academic infractions among ESL learners, Dewart & Rosales (2018) developed an obligatory asynchronous learning module within the Moodle LMS allowing all English program course instructors to integrate uniform instruction into their own online course content at the outset of a semester. Module instruction focused on informing students about 1) citing sources correctly and paraphrasing information to avoid plagiarism and self-plagiarism, 2) recognizing the limitations of using external sources for help in a language class (including technological and peer assistance) and 3) understanding university regulations. Following the implementation of the academic integrity module, it was observed that the number of reported cases of academic infractions was reduced to zero (Dewart & Rosales, 2018).

The results from the initial implementation of the learning module were impressive. Reported infractions remained at zero for the following three academic years. However, in 2020, following the shift to online learning during the COVID-19 pandemic, the number of cases began to increase, and this trend has continued and has been further complicated by the introduction of the generative AI (GenAI) ChatGPT. A limited number of UDL guidelines (due to funding) were applied in response to increasing post-pandemic rates with limited impact (Rosales & Dewart, 2022).

1.1.2. Artificial Intelligence

Artificial Intelligence (AI) is used frequently in language teaching and language learning, such as the use of grammar correction software or using GenAI like ChatGPT to provide writing topics or identify pertinent research articles. However, because these technologies can do many of the tasks requested of students, such as produce an essay on a given topic or summarize a text, the use of AI has brought new challenges for teachers evaluating student progress in a language class. If these technologies are not authorized or acknowledged, it is an academic infraction which may lead to serious consequences.

To inform students about the limitations of the use of AI in the classroom, the ENAI published guidelines for the ethical use of artificial intelligence (Foltynek et al., 2023). The guidelines state that GenAI should not be listed as an author or co-author, yet they strongly suggest acknowledging the use of GenAI, including an indication of how it was used for an assignment along with the prompt input (when possible). The guidelines also emphasize the importance of recognizing the limitations and biases of GenAI. Sharing these guidelines with students is one step toward a more equitable policy that includes AI.

1.1.3 Equity and accessibility

In the Global Education Monitoring (GEM) Report, UNESCO (2020) defines equity as “a process or actions aimed at ensuring equality (all members of a group enjoy the same inputs, outputs or outcomes in terms of status, rights and responsibilities)”. In order to refine the design of the learning module for equity, it is essential to understand which students are considered to be most at risk of accusations of academic infractions. Researchers have identified factors that make some students more vulnerable than others (Bertram Gallant et al., 2015; Ehrich et al., 2016; Davis, 2024), and of particular interest is students having international status, as they are often studying in another language. If materials explaining academic integrity are not adapted for the needs of international students or students studying in an additional language, these students are at a disadvantage regarding academic integrity policies because it is inaccessible. By making resources comprehensible and accessible, both linguistically and digitally, all students can succeed.

1.1.4. Universal Design for Learning (UDL)

UDL offers suggestions to ensure that learning is meaningful, engaging and equally accessible for all students. It presents guidelines that address how students **access**, **build**, and **internalize** information in an academic context to optimize student **engagement**, vary **representation**, and diversify **action and expression** (Figure 1). In the LMS module, student engagement is addressed by clearly stating the goals of the activity and by providing resources for students to develop their skills and learning strategies. Representations of the information provided in the LMS module are provided in both text and audio formats, and French language resources are linked for additional support. To diversify action and expression, scheduling for in-person support is available.

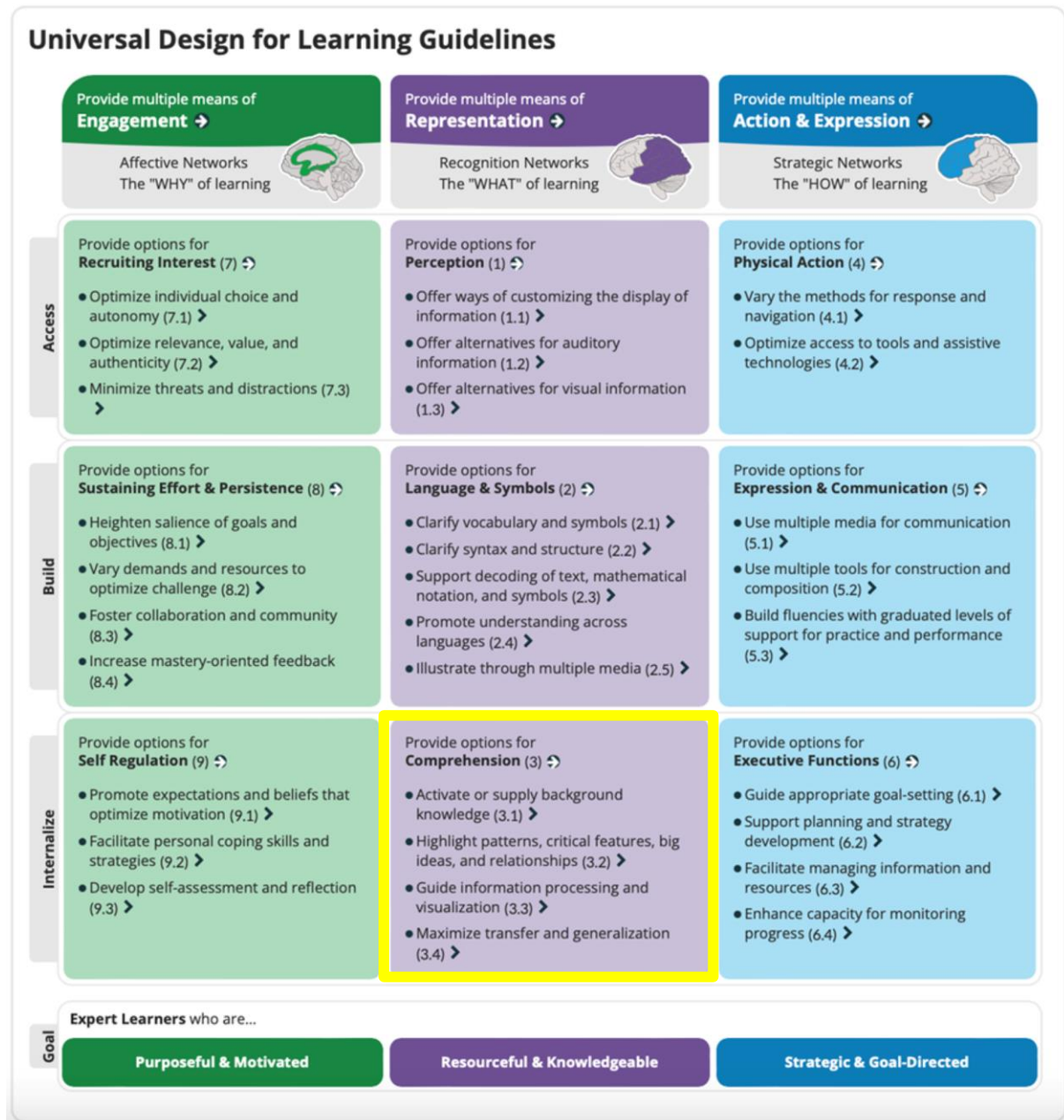


Figure 1. Universal Design for Learning Guidelines. CAST (2018). <https://udlguidelines.cast.org>.

Davis (2023, 2024) demonstrated a model for applying UDL guidelines for comprehension to improve clarity of academic integrity information for students. Addressing the four checkpoints of comprehension in the UDL model (under Representation and Internalize), Davis advises how following these suggestions can create more inclusive content and resources. The UDL guidelines state in Checkpoint 3.1 that “barriers and inequities exist when some learners lack the background knowledge that is critical to assimilating or using new information” (CAST, 2018). It is therefore essential to either prime this awareness or provide access to this information. Consequently, the first checkpoint, 3.1, draws students’ attention to what they are already familiar with, which might include good study habits, the name of the university’s academic integrity policy or even some basic definitions. This will ensure an equitable starting point for all students. The second checkpoint, 3.2, focuses on how to best present and organize concepts and new information to facilitate understanding. This might include highlighting key concepts or using graphs or diagrams. Of particular importance is the use of illustrative examples for unfamiliar or confusing definitions. Following this, checkpoint 3.3 refers to selecting information to guide the presentation and integration of new information by making it more cognitively manageable; the guidelines suggest chunking or progressively

releasing information. Davis suggests consistent formatting (such as font style, numbering etc.) and limiting detailed explanations. Finally, checkpoint 3.4 advises providing ways to transfer the acquired knowledge to new situations, which is key to success. This might include checklists, opportunities for review and case studies. These adjustments ensure that the material is more readily understood and as a result, more accessible for all students.

Because it is possible to apply UDL principles and not be accessible for everyone, Greene (2022) suggests a two-fold approach to attain equity by applying both UDL and WCAG.

1.1.5. Web Content Accessibility Guidelines

The WCAG framework is commonly used by web designers and content editors as the standard for determining the degree of digital accessibility of web content for people with disabilities. WCAG conformance success criteria are identified on a three-point scale of A, AA, AAA.

According to the four principles of the WCAG Guidelines 2.1, web content should be **perceivable** by more than one sense; **operable**, so that different users should be able to use the interface and its navigational components; **understandable**, the interface and its content should be easy to master; and **robust**, with the content compatible with different types of assistive technologies and tools.

1.2 Research Questions

The purpose of the current study was thus to verify that the UDL improvements reported in Rosales & Dewart (2022) attain a minimum of AA or higher according to WCAG 2.1 conformance and to determine which improvements are to be made in the next round of development to achieve a rating of AA or higher in relation to the comprehension set forth in UDL.

1. To what extent does the LMS module comply with UDL guidelines for comprehension?
2. Does the LMS comply with WCAG guidelines?
3. What are the current research recommendations regarding artificial intelligence relating to academic integrity?

2. Method

2.1 Context and participants

Credited undergraduate ESL courses are offered at a university in Montreal, Canada. The courses range in level from beginner to high intermediate, and the student population ranges in age from early 20's to mid 60's. Some students take English courses as part of another program (as a requirement or an elective), others are completing an English language program, and a minority of students are independent students (unassociated with a program).

The programs include courses that focus on linguistic notions including grammar, pronunciation and syntax; communication skills in combined and separate formats including writing, reading, speaking and listening; and culture-specific courses such as literature, the history of English and sociolinguistics.

Since 2017, a learning module about academic integrity has been integrated into all ESL courses. However, before 2019, all classes were offered on campus, and that year three courses were introduced in two formats (two asynchronous and one synchronous). The following year, because of the global pandemic starting in March 2020, all classes were offered in an online format.

To date, student comprehension of academic integrity has been measured using test results from the ten-question LMS module as well as investigating the number of infractions reported to the university's committee of academic infractions.

2.2. UDL comprehension guidelines

Referring to the four checkpoints for the UDL sub-point of comprehension, the academic integrity module content was analyzed using the explanations and examples from the UDL website: activate or supply background knowledge (3.1); highlight patterns, critical features, big ideas, and relationships (3.2); guide information processing and visualization (3.3); and maximize transfer and generalization (3.4). Each checkpoint provides an explanation and suggestions for different types of content, which were used to assess the resource and its delivery method. Using a yes/no scale, each of the four checkpoints was either deemed to be completed successfully (if no additional adjustments needed to be made) or unsuccessfully (if improvements could be made).

2.3. WCAG checklist

The official website of WCAG Guidelines was consulted as well as other simplified checklists. A 10-page checklist (WEBAIM), available at <https://webaim.org/standards/wcag/checklist>, was chosen to evaluate the module's WCAG 2.1 conformance to the success criteria. The decision to use this checklist was based on its easy-to-use checkbox format for each criterion and its rating of accessibility (A, AA, AAA).

The first principle, **Perceivable** has four guideline subgroups, each containing one or more criteria (the total number is in parentheses): text alternatives for any non-text content (7); time-based media (7), adaptability (10) and distinguishability (19). The second principle, **Operable**, has five subgroups: keyboard-accessibility (5) and navigability (16), time to complete tasks (7), seizure prevention (3), and format for inputting information (8). The third principle, **Understandable**, determines the readability of the content (6) and predictability of the formatting (6) and the availability of input assistance (10). The only subgroup of the fourth principle, **Robust**, concerns the compatibility of the web content with other technologies.

The Moodle LMS adopted by the university is version 4.1.9+ (Build: 20240402). Moodle 4.0 already achieved WCAG 2.1 AA Accessibility Compliance (Moodle, 2024), so it is safe to assume that this university's later version of Moodle is already AA compliant. Again, using a yes/no scale for each criterion within the control of content editors, two judgments were possible: "Yes" for pedagogical decisions made by the content editors at the time of creation, and "No" for aspects of the content that were not WCAG compliant.

2.4 Academic integrity guidelines for the use of artificial intelligence

The LMS module does not currently address the use of artificial intelligence as it is left to the instructor's discretion. Three reputable international organizations for academic integrity were consulted (*International Center for Academic Integrity (ICAI)*, *European Network for Academic Integrity (ENAI)* and *Partnership on University Plagiarism Prevention (PUPP)*) and while there are several checklists for both teachers and students available, the ENAI recommendations (Foltynek et al. 2023) were selected because of their concision and scope in addressing pedagogical issues without imposing on the instructor's independence.

3. Results

Verifying the UDL comprehension guidelines, only one of the four checkpoints was done successfully (checkpoint 3.3). Checkpoint 3.1 (activate or supply background knowledge) was deemed unsuccessful. Even though there was a definition of plagiarism, it was acknowledged that additional background information would benefit students, particularly those who are not already familiar with the term "academic integrity" or the official name of the school policy. Furthermore, a glossary was added with linked definitions throughout the module providing additional context for students for whom this is a new concept. For Checkpoint 3.2 (highlight patterns, critical features and big ideas and relationships), illustrative examples were added for each definition integrated in the new glossary. Checkpoint 3.3 (guide information processing and visualisation), which reflects consistent use of tools to emphasize key points, was already addressed consistently as was the approach of "chunking information" by addressing one point with a clear heading followed by two to three questions on each page. Checkpoint 3.4 (maximize transfer and generalization) is perhaps the most significant improvement: the inclusion of a bank of

randomly generated case studies providing an opportunity for students to apply their knowledge. Because students see this module in all ESL courses, they will review the concepts and will transfer their knowledge to a new case study question each time they complete the module.

While many of the WCAG guidelines are already met by virtue of being a module within Moodle, which is WCAG 2.1 compliant at level AA, the focus of this analysis was further limited to content development. Some criteria of the first principle, **Perceivable**, also went beyond the scope of content development. For example, Moodle limits the use of colour and line spacing. However, the criterion of the subsection 1.3.1 Adaptable: Info and Relationships, prompted adjustments. Adaptability was ensured by verifying that bolding was used consistently, and the coding for enlarged text was reflected in the appropriate HTML heading size (h5).

Under the **Operable** guidelines, the module has no time limit and does not use animations, so the criteria were met by default. However, under the guideline of the subsection 2.4.4 Navigable: Link Purpose, the links directing to university resources were changed to reflect the content of the page rather than simply using the name of the website. For example, rather than repeating the name of the page, *Infosphère*, a more descriptive text is now used for the link description: “*Infosphère*: citing sources” and “*Infosphère*: paraphrasing” as they direct to two separate sections on the website.

The **Understandable** guidelines in section 3.1.1. Language of Page suggest forcing the language in the settings to prevent automatic translation and any resulting mistranslations of text by adaptive technology. This will need to be addressed by teachers as they integrate the module in their courses. Furthermore, section 3.1.3 Unusual Words suggests a glossary for ambiguous vocabulary, which was also mentioned and suggested in the UDL guidelines and was added as a result. Finally, section 3.1.5 Reading Level suggests addressing a grade 9 level of reading proficiency. Because the module was created with all learners’ needs in mind, it is suitable for low proficiency language learners.

The criteria for **Robust** was not relevant as it went beyond the scope of content development.

4. Discussion

The goal of this project was to determine if UDL and WCAG could be used together to improve equity of an LMS academic integrity resource among diverse student populations. Analysis of the module reflects the efficacy of Moodle as a strong starting point for equity, but the teacher plays an important role developing content to ensure comprehensibility, equity and accessibility.

As research (Davis, 2023; Eaton et al., 2017) has suggested, academic integrity is a skill to develop and must begin with meeting the students where they are and providing information that is accessible to promote a more equitable learning environment. For example, because of the generative nature of artificial intelligence and its ability to mimic human language, additional training in a language classroom about how to use ChatGPT ensures that students are informed about what is expected of them regarding AI (as a cited source and including prompts used).

While the development of this module was intended to address the specific needs of language learners and had been effective for several years, this analysis pointed out several areas where it could be improved to promote a more equitable and accessible learning environment. Furthermore, because the module informs students about academic integrity, the integration of information about AI in language classes is essential for clarifying its use and limitations, and further ensures that students begin their courses in an equitable way.

Additional strategies for enhancing academic integrity underscore the importance of educative over punitive approaches (Davis, 2022; Eaton, et al., 2017), such as clarifying objectives and scaffolding activities (Pecorari, 2016), revisions in the academic writing process (Peters, 2021), and the inclusion of honour codes (Béland et al. 2020; Konheim-Kalkstein et al., 2008).

5. Conclusions

UDL and WCAG provided two approaches for improving comprehensibility and accessibility, and the additional information reflecting the ENAI guidelines raises awareness about AI and academic integrity. As previously stated, research promotes preventative approaches to academic integrity, and because it is a skill that is developed over time (Davis, 2023), it is acknowledged that this module is one step in a much larger process. It is also acknowledged that the revisions reported in this paper may not resolve all instances of academic infractions, as a successful preventative approach must include ongoing support in the classroom. Future research will report on the improvements made and issues that persist. However, to date, it is worth noting that the development of this module has brought an institutional awareness and support to the specific needs of students studying in an additional language and their use of AI.

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