

Article

Translation and Transcultural Adaptation of the Universal Design for Learning Observation Measurement Tool (UDL-OMT)

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Abstract: Universal Design for Learning (UDL) is a widely accepted educational approach in the United States, and its adoption is increasingly observed in Europe and other international contexts. This growing implementation necessitates the development of standardized criteria for consistent evaluation of UDL in educational settings. This study describes the methodology for translating and cross-culturally adapting the UDL Observation and Measurement Tool (UDL-OMT), originally developed by Basham et al., into French and Italian. It also reports the results of a pretest conducted to evaluate the adapted instruments. Preliminary results indicate a high degree of adaptability of UDL-OMT for use in the French- and Italian-speaking regions of Switzerland. These results are discussed in the context of the potential for wider dissemination and validation of the instrument in French- and Italian-speaking classrooms.

Keywords: universal design for learning; instructional evaluation; classroom; translation and cross-cultural adaptation



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1. Introduction

In recent decades, education systems have progressively adopted inclusive policies to ensure that all children, without discrimination, have access to mainstream schools. In their literature review, Kefallinou et al. [1] (p. 146) highlight “that inclusive education, when successfully implemented, can ensure the provision of quality education, improve learners’ outcomes and promote long-term social inclusion”. However, the diversity of educational abilities remains a major challenge for teachers. Barriers to inclusive and equitable policies often originate within the education system itself, which often fails to meet the diverse needs of students [2]. Instructional methods, learning environments, and assessment practices sometimes hinder the evolution of school systems to become accessible to all students [2,3]. Inclusion requires teachers to be able to create flexible learning environments for all students [4,5] so that they can respond fairly and appropriately to the individual needs of each student [6]. In this context, teachers need evidence-based pedagogical approaches, professional development opportunities, and personal development tools [7]. Universal Design for Learning (UDL) provides an effective framework for improving access and progress for all students in an inclusive education system [8,9]. While UDL is established in educational practice in the United States [10,11], its more recent adoption in Europe has been steadily increasing [12]. This raises questions about the supports and tools needed to facilitate its implementation and to assess its effectiveness, as well as its adaptability to diverse European and Swiss school systems.

1.1. Universal Design for Learning

UDL is defined as a set of pedagogical principles for designing flexible teaching and learning methods that consider the diversity of students [4,13,14]. In practice, flexibility

means adapting learning objectives, assessments, and teaching methods and materials to meet different needs [15]. Its conceptual framework, defined by members of the CAST, aims to remove barriers to learning and provide different ways to respond to student variability through program and instructional adaptation [16]. Based on advances in cognitive neuroscience and learning science research, Universal Design for Learning (UDL) is based on three main principles, which are further divided into nine guidelines. These principles suggest the following: (1) multiple means of representation: information is presented in a variety of ways to accommodate the interests, motivations, sensory preferences, and learning styles of all students; (2) multiple means of action and expression: students are provided with a variety of media to acquire content and demonstrate their knowledge; (3) multiple means of engagement: instruction uses a variety of strategies to engage the interests and motivations of all students [17–19]. It should be noted, however, that UDL is a framework for designing learning environments and experiences rather than a specific pedagogical practice. Because of this multidimensional and non-prescriptive framework, its impact on learning remains difficult to measure for both researchers and teachers (see [18,20–22]). As a result, several authors have identified the need to establish observational criteria for evaluating implementation.

1.2. UDL Measuring Instruments

Few resources have been found in the literature to effectively assess the application of UDL in the classroom [23,24]. One of the first tools created for this purpose, the “Scoring rubric for the three components of UDL”, was developed by Spooner et al. [25] as part of a study of the impact of UDL training on teachers’ instructional planning skills. This tool was subsequently adapted as the “Implementation scoring rubric on the three components of UDL” and used to assess the application of UDL principles in classroom implementation [26]. Both tools use a three-component scale that provides information on the implementation of the general principles of UDL but lacks the ability to provide a detailed analysis of the application of specific guidelines. Additional measures can be found in Nelson’s [27] Teacher Success Rubric. This rubric includes two additional indicators that assess the ability to set attainable goals and overcome barriers to learning. Although more comprehensive, this scale is not optimal for capturing the complexity of systems present in a classroom group, nor for use as a tool for teacher evaluation and development. To address these limitations, Basham et al. [17] developed an observation tool called the Universal Design for Learning-Observation Measurement Tool (UDL-OMT) that measures the implementation of UDL in the classroom.

1.3. UDL-OMT

This tool was developed by Basham et al. [17], UDL experts, CAST leadership team members, and UDL founders. Designed as a dynamic, semi-structured observational scale, UDL-OMT is intended to monitor the overall progress of a lesson and identify moments when the guidelines proposed by UDL can be applied to a whole class or smaller groups [17,28]. It consists of 47 items that measure the implementation of UDL in a learning environment and during pedagogical experiences. UDL-OMT items are aligned with the UDL 2.2 guidelines [29]. However, they are worded and written in a language that is familiar to educators [17]. UDL-OMT analyzes the design of the environment, the use of the strategies and tools that are proposed by the teacher, and the ways in which the learners interact with this environment. The detailed articulation of the tool also allows for the identification of possible areas for improvement in a program, thus initiating a process of reflection and personal development for the teacher [28]. It can be used in different educational settings, curricula, and teaching methodologies.

UDL-OMT consists of an introductory section explaining how to observe as well as presenting the five dimensions to be observed: A. Introducing and framing new material (seven items), B. Content representation and delivery (nine items), C. Expression of understanding (seven items), D. Activity and student engagement (nine items), E. Support

for expert learning (six items). Three of the dimensions (B, C, D) are divided into two subscales which assess the teacher's actions (1) and the student's experience (2). These different sections are composed of several items that relate the UDL guidelines to the constituent elements of a lesson. Observers adjust their assessment of the UDL based on data collected throughout the observation [17]. Each item is scored on a scale ranging from 0 (no evidence of UDL implementation) to 3 (dynamic and interactive implementation of UDL). The first four dimensions and their respective subscales are included in the final score, while the last dimension (E. Support for Expert Learning) is assessed but does not contribute to the final score. In addition, each section allows observers to comment on how they perceive the effectiveness of the implementation. Finally, the tool concludes with a series of questions that reflect the observers' overall impression of the effectiveness of the use of UDL principles during the lesson.

An initial field test of UDL-OMT confirms the good internal consistency of the instrument for the measurement of the effectiveness of the implementation of UDL principles [17]. Two observers assessed the presence of UDL in 11 classes at different grade levels, using different perspectives (one assuming that UDL would be present, the other assessing the presence of UDL in a more rigorous manner). Cronbach's alpha scores indicated good to excellent internal consistency despite the different perspectives of the researchers. The questionnaire can be used in research to measure the application of UDL principles and as a tool for practitioners to make independent and objective evaluations of UDL implementation in the classroom. Encouraged by these results, the translation and cross-cultural adaptation of the questionnaire will extend the observation of UDL effects in French- and Italian-speaking classrooms.

1.4. Translation and Intercultural Adaptation

A process of translation and intercultural adaptation was undertaken to improve the methodological aspects and validity of the translation of UDL-OMT [30]. A literal translation (linguistic aspects) is not sufficient; it is imperative to adapt the questionnaire to be culturally relevant and understandable, while preserving the meaning and intent of the original items [31–33]. In studies comparing different populations and cultures, it is essential to ensure the linguistic, functional, cultural, and metric equivalence of assessment instruments [30]. Intercultural adaptation facilitates the use of UDL-OMT in educational settings beyond its original context [34], a necessity that is particularly pronounced in the Swiss educational landscape, which is characterized by unique local subtleties specific to each of its four language regions [35]. As a federal state, Switzerland grants the cantons a certain degree of autonomy in the structuring of their educational systems, although they are bound by the "Accord intercantonal sur l'harmonisation de la scolarité obligatoire" [Intercantonal agreement on the harmonization of compulsory schooling] [36]. Consequently, special attention has been paid to the two translations, considering the specific conditions of education and schooling in Romandy (French-speaking part of Switzerland, a seven-canton region) and Ticino (the only Italian-speaking canton in Switzerland).

2. Method

The purpose of this study is to translate and culturally validate UDL-OMT from English to French and from English to Italian. A pretest was administered to 26 French- and Italian-speaking teachers to assess their comprehension of the items.

1.5. Translation Process

Authorization to translate see [32] was obtained from the authors of the questionnaire [28] in January 2022. The translation process involved the following eight steps see planning by [32,37]:

1. Initial translations from English into French and Italian were made by a committee of four native French or Italian translators. Each pair (consisting of two translators from French to English and two translators from Italian to English) included one of

- the authors of this study, a trilingual expert in teaching methodology and UDL (one French-Italian-English and the other Italian-French-English), and a bilingual master's student in special education who was proficient in French to English or Italian to English;
2. Synthesis of the two French and the two Italian translations was performed. Two translators for each language analyzed the translations, highlighted differences, and reached a consensus synthesis;
 3. The French and Italian translations were compared and discussed to produce an initial version in each language;
 4. The French and Italian versions of the questionnaire were back-translated. Two native English translators unfamiliar with the original English version [38] back-translated the French questionnaire, while two other translators with similar language skills back-translated the Italian version. Analysis of the four back-translations revealed issues with the understanding and application of specific items in French and/or Italian;
 5. Review by a committee of experts. A report identifying errors, inconsistencies, or unusual wording was submitted to the questionnaire designers for clarification. The back-translations revealed problems of idiomatic, semantic, functional, and construct equivalence in some of the items. Items that presented difficulties were completely rewritten with the agreement of the designers, while maintaining the construct of the original version. As Peña [30] (p. 1257) points out, "translation from one language to another can result in incongruity in meaning, threatening content validity of a study's methods. Functional equivalence addresses some of these threats by ensuring that the instrument and elicitation method allow examination of the same construct". The French and Italian questionnaires were revised for administration to teachers;
 6. A pretest was conducted. The comprehension of the questionnaire items was evaluated by 26 people working in different levels of general, specialized, and academic education. The participants rated the translated items on a Likert scale (from 1 to 10) based on four principles (unambiguity, unidimensionality, economy, and accuracy) to improve the formal quality of the items [39]. A score of 1 represents the extreme negative value, while a score of 10 represents the extreme positive value;
 7. Pretest results were analyzed quantitatively and qualitatively. Considering the principles of intercultural equivalence, items reported as challenging by the participants were reformulated see [37,40];
 8. UDL-OMT was finalized in French and Italian. The translation of the questionnaire was submitted to the designers for final approval. Both translations were approved after some terms were corrected to improve their interpretability in the French- and Italian-speaking Swiss educational context;
 9. Statistical validation of UDL-OMT is underway.

1.6. Pretest Sample and Data Collection Characteristics

UDL-OMT was administered to a target population of teachers ($N = 26$). The French-speaking ($n = 12$) and Italian-speaking ($n = 14$) pretest participants were recruited from the networks of the translators. The sample included general education teachers ($n = 15$), special education teachers ($n = 7$), university academics ($n = 3$), and school psychology professionals ($n = 1$). There was representation from all levels of compulsory education. Women ($n = 19$) were more strongly represented than men ($n = 3$), which reflects the reality in the field. As matter of fact, 95% of primary school teachers and 84% of secondary school teachers are women [41]. The participants had a teaching experience of between 2 and 35 years. They received the materials either in person or by e-mail (test protocol, French or Italian version of the OMT-UDL, personal data sheet, and table for the analysis of item comprehension). The pretest was given between April and June 2023.

1.7. Pretest

The purpose of the pretest was to assess the comprehension and intelligibility of the items. To improve the formal quality of the items, each item was analyzed using four principles adapted from Bernaud (2014):

1. Principle of unambiguity (P1): the wording of the statements and the terms used in the items should be unambiguous (1 = very ambiguous; 10 = not ambiguous at all);
2. Principle of unidimensionality (P2): items are of better quality if they measure only one construct. Two conditions are required: (1) they must be accessible to everyone, i.e., they must contain a sufficiently simple vocabulary; (2) they must avoid items that require the simultaneous evaluation of several pieces of information (1 = does not meet both conditions at all; 10 = meets both conditions);
3. Principle of economy (P3): Items should be written in a simple and direct manner for clarity. Every item should have only one correct answer. Use of negations, especially double negations, should be minimized (1 = not at all clear; 10 = completely clear);
4. Principle of precision (P4): The items should be written in French or Italian that is grammatically and orthographically correct (1 = not at all correct; 10 = completely correct).

Lauzier et al. [42] recommend the setting of a lower threshold of clarity at which the items rated by the participants should be revised. It is easier to identify ambiguities in different items by setting a strict clarity threshold. For the pretest of the experimental version of UDL-OMT, the clarity threshold was set at 8. In addition, participants were given the opportunity to add a comment to each statement that they had rated. The general structure and the introduction of the questionnaire were also submitted for a qualitative analysis by the participants. The participants were able to write down their comments or to highlight any elements of the introduction that were not clear to them.

2. Data Analysis

Participants in the pretest rated the comprehension and intelligibility of 47 items, eight dimensions headings (A, B1, C1, D1, E) and sub-dimensions (B2, C2, D2). They also checked four sentences introducing the items in the three sub-dimensions (B2, C2, D2) and dimension (E) in accordance with the four principles above. Statements with a score of less than 8 were identified and revised in accordance with the principles to improve their formal quality. Consideration was also given to qualitative comments from participants. To increase the fidelity of the items from the original version, they were reformulated to achieve semantic, idiomatic, functional, and/or experiential equivalence [37,40]. These principles had already been applied in steps 4 and 5 of the translation process.

3. Result

Analysis of the results shows that most of the mean scores ($n = 53/59$) were equal to or greater than 8 (see Table 1). This is likely due to the wide range of teaching experience (2 to 35 years) and the participants' knowledge of UDL principles and their application to their teaching. As shown in Table 1, only a few items ($n = 3$), headings ($n = 2$), and an introductory sentence ($n = 1$) in the French version had mean scores below 8. In the Italian version, none of the items had a mean score below the threshold value. In both language versions, no item or sentence scored below 8 on the precision principle (P4). French and Italian items were grammatically and orthographically corrected.

The revision of the three items in the French version with a mean score of less than 8 is shown in Table 2. The wording of the first item was found to be too ambiguous (Item B2.2, mean P1 = 7.83) and was simplified syntactically. The term "multiplication" was also changed to "diversification" to better convey the idea of varying the means. The principle of unidimensionality was not followed in the second (item C1.6, mean P2 = 7.58) and third (item D1.8, mean P2 = 7.58) items. They contained too much information, which led to interpretation difficulties for the participants. Their syntax was simplified, and the focus was on "means of skill development" (items B2.2 and C1.6) and "formative assessments" (item D1.8). The term "intentionally" was removed from

Item C1.6 because it was a source of confusion for participants who were unsure whether they were measuring intentionality or the provision of means of skill development. To harmonize the language versions, the three items in the Italian version were aligned with the revisions made to the French items.

Table 1. Pretest results: summary of means for the four principles.

| | French Version | | | Italian Version | | |
|-----------------|----------------|---------------------|---|-----------------|---------------------|---|
| | General Mean | Items with Mean < 8 | Headings and Introductory Sentences with Mean < 8 | General Mean | Items with Mean < 8 | Headings and Introductory Sentences with Mean < 8 |
| Total means < 8 | | 3 | 3 | | - | - |
| P1 | 9.13 | 1: (7.83) | 2: (6.25–7.92) | 9.20 | - | - |
| P2 | 9.11 | 2: (7.58–7.83) | 2: (7.75–7.83) | 9.08 | - | - |
| P3 | 9.31 | - | 2: (7.42–7.67) | 9.34 | - | - |
| P4 | 9.74 | - | - | 9.41 | - | - |

Note. P1 = principle of unambiguity, P2 = principle of unidimensionality, P3 = principle of economy, P4 = principle of precision.

The revision of the other wordings in the French version is shown in Table 3, where the means are also less than 8. First, the wording of the B2 heading (mean: P2 = 7.83) contained several pieces of information. Second, the wording of the introductory sentence to B2 items (means: P1 = 7.92 and P3 = 7.63) showed signs of ambiguity and lack of clarity. In addition, the term “representation” caused interpretation problems for the participants in both cases, so it was replaced by “presentation”. Interpreting heading C2 (mean: P1 = 6.25, P2 = 7.75, P3 = 7.42) showed several comprehension problems: the statement was ambiguous, contained several pieces of information, and was convoluted. To make these three statements clearer, the wording was simplified, and certain terms were removed, such as “achieving goals”, which unnecessarily overloaded the sentence. The terminology used in this document is based on the translations of the UDL Principles (French version 2.2, 2018). The revisions made in the French version were extended to the Italian questionnaire. The only exception was the term “representation”, which was not changed because it did not pose the same problems for Italian-speaking participants.

Their wording seemed clear to the French- and Italian-speaking participants. The analysis of the other items led to their revision following comments from participants indicating difficulties of interpretation. As Peña [30] (p. 1258) notes “cultural interpretations may affect the ways individuals respond to instructions and research”. Revision of these items therefore relies on decentralization to identify equivalence inconsistencies between original and translated versions in five areas: semantic, idiomatic, functional, and experiential [30,40]. Some examples can be found in Table 4.

Table 2. Critical items and modification.

| N° Item | Original Version | Experimental Version: Pretest | | MP1 | MP1 | Revision | Final Revision of Items | | |
|---------|--|---|---|-------------------------------|------------------------------|-------------------|--|--|---------|
| | | French | Italian | MP2 | MP2 | | Principle | French | Italian |
| | | | | MP3 | MP3 | | | | |
| | | | | MP4 | MP4 | | | | |
| B2.2 | Build options to understand language and symbols needed to accomplish the goals. | La multiplication des moyens pour comprendre le langage et les symboles nécessaires pour atteindre les objectifs. | La moltiplicazione di opzioni per comprendere il linguaggio e i simboli necessari per raggiungere gli obiettivi. | 7.83 8.25 8.58 10.00 | 9.14 9.14 8.93 9.36 | unambiguity | La diversification des moyens qui facilite la compréhension du langage et des symboles | Diversificazione dei mezzi che permettono di capire il linguaggio e i simboli | |
| C1.6 | Intentionally provides supports for students' problem-solving and critical-thinking abilities. | Fournit intentionnellement des moyens pour permettre la résolution de problème et la réflexion critique des apprenants. | Fornisce intenzionalmente supporto alla risoluzione dei problemi e alle capacità di pensiero critico degli allievi. | 9.67 7.58 8.83 9.92 | 9.00 8.43 9.14 9.29 | unidimensionality | Fournit des moyens pour développer des compétences de résolution de problème et de réflexion critique chez l'apprenant | Fornisce supporto alla risoluzione dei problemi e alle capacità di pensiero critico degli studenti | |
| D1.8 | Provides formative progress monitoring and content checks. | Propose des évaluations formatives pour le suivi des progrès et vérifie l'acquisition des contenus d'apprentissage | Fornisce valutazioni formative dei progressi e verifica l'acquisizione dei contenuti d'apprendimento | 9.75 7.83 9.42 9.92 | 9.29 8.71 9.50 9.43 | unidimensionality | Propose des évaluations formatives pour le suivi des progrès qui permettent de vérifier l'acquisition des contenus d'apprentissage | Fornisce valutazioni formative dei progressi che permettono di verificare l'acquisizione dei contenuti d'apprendimento | |

Note. MP1 = mean of the principle of unambiguity, MP2 = mean of the principle of unidimensionality, MP3 = mean of the principle of economy, MP4 = mean of the principle of precision.

Table 3. Critical headings and modification.

| N° Item | Original Version | Experimental Version: Pretest | | MP1 | MP1 | Revision | Final Revision of Items | | |
|---------|--|---|--|------------------------------|------------------------------|------------------------------|--|--|---------|
| | | French | Italian | MP2 | MP2 | | Principle | French | Italian |
| | | | | MP3 | MP3 | | | | |
| | | | | MP4 | MP4 | | | | |
| B2 | Content Representation and Delivery Supporting Learner Ability | Représentation et transmission du contenu soutenant le niveau de compétences des apprenants | Rappresentazione e trasmissione dei contenuti a supporto delle competenze dello studente | 8.00 7.83 7.92 9.75 | 9.50 8.64 9.21 9.43 | unidimensionality economy | Soutien à la présentation et la transmission du contenu d'apprentissage. | Rappresentazione e trasmissione dei contenuti a supporto delle competenze dello studente | |

Table 3. Cont.

| N° Item | Original Version | Experimental Version: Pretest | | MP1 | MP1 | Revision | Final Revision of Items | | |
|---------|--|---|--|------|------|---------------------------------------|--|--|---------|
| | | French | Italian | MP2 | MP2 | | Principle | French | Italian |
| | | | | MP3 | MP3 | | | | |
| | | | | MP4 | MP4 | | | | |
| | Content representation and delivery supported the learners' ability to ... | La représentation et la transmission du contenu soutiennent le niveau de compétences des apprenants grâce à ... | La rappresentazione e la trasmissione dei contenuti supporta le competenze degli studenti grazie a ... | 7.92 | 9.36 | unambiguity economy | Présentation et transmission du contenu d'apprentissage soutenant les compétences des apprenants par | La rappresentazione e la trasmissione dei contenuti hanno supportato le competenze degli studenti grazie a ... | |
| | | | | 8.00 | 8.79 | | | | |
| | | | | 7.67 | 9.50 | | | | |
| | | | | 9.83 | 9.57 | | | | |
| C2 | Expression of Understanding Supporting Learners' Action and Expression | Expression de la compréhension soutenant l'action et l'expression des apprenants | Espressione della comprensione a supporto dell'azione e dell'espressione degli studenti | 6.25 | 8.43 | unambiguity unidimensionality economy | Soutien à l'action et l'expression | Supporto all'azione e all'espressione | |
| | | | | 7.75 | 8.43 | | | | |
| | | | | 7.42 | 8.50 | | | | |
| | | | | 9.33 | 9.14 | | | | |

Note. MP1 = mean of the principle of unambiguity, MP2 = mean of the principle of unidimensionality, MP3 = mean of the principle of economy, MP4 = mean of the principle of precision.

Table 4. Revision according to equivalence.

| N° Item | Original Version | Experimental Version: Pretest | | Participants' Comments | | Final Revision of Items | |
|----------------------|--|--|--|------------------------|-----------------------------|---|--|
| | | French | Italian | French | Italian | French | Italian |
| Semantic equivalence | | | | | | | |
| A1.4 | Highlights what is important for students to learn and/or do. | Met en évidence ce qui est important d'apprendre et/ou de faire pour les apprenants. | Evidenzia ciò che è importante per gli studenti imparare e/o fare. | Pas clair. | Poco chiaro. | Indique ce qui est important pour les apprenants d'apprendre et/ou de faire | Indica ciò che è importante che gli allievi facciano o apprendano. |
| D1.7 | Provides for self-reflection and self-assessment. | Permet l'autoréflexion et l'auto-évaluation. | Permette auto-riflessione e auto-valutazione. | De quelle manière? | Incentiva anziché permette? | Encourage la réflexion et l'auto-évaluation | Incentiva la riflessione e l'autovalutazione |
| B2.3 | Internalize comprehension associated with accomplishing the goals. | L'intériorisation du sens des objectifs qui permet l'accomplissement de la tâche. | L'interiorizzazione del senso degli obiettivi da parte dello studente che permette la realizzazione del compito. | Non mesurable | Frase lunga e complicata. | L'appropriation du sens des objectifs qui permet l'accomplissement de la tâche. | L'appropriazione del senso degli obiettivi che permette la realizzazione del compito |

Table 4. Cont.

| N° Item | Original Version | Experimental Version: Pretest | | Participants' Comments | | Final Revision of Items | |
|------------------------|--|--|---|---|--|---|---|
| | | French | Italian | French | Italian | French | Italian |
| D1.9 | Provides closure that reiterates big ideas and instructional purposes. | Propose une synthèse qui reprend les idées principales et les objectifs pédagogiques | Fornisce una conclusione che ribadisce le principali idee e gli obiettivi pedagogici. | Le terme "synthèse" n'est pas clair | - | Propose une conclusion qui reprend les idées principales et les objectifs pédagogiques. | Propone una conclusione che ribadisce le principali concetti e obiettivi. |
| Idiomatic equivalence | | | | | | | |
| A1.5 | Supports understanding of big ideas and critical concepts. | Facilite la compréhension des idées principales et des concepts essentiels | Facilita la comprensione di grandi idee, concetti fondamentali. | Le terme "concepts essentiels" est vague | Il termine "grandi idee" non è chiaro | Facilite la compréhension des idées principales et des relations entre les notions essentielles | Facilita la comprensione dei concetti principali e della relazione tra le nozioni essenziali |
| E3 | Resourceful in learning. | Débrouillards dans les apprentissages | Pieni di risorse nell'apprendimento. | Le terme "débrouillard" est un peu ambigu. Remplacer par "autonome" | - | Autonomes dans les apprentissages | Pieni di risorse nell'apprendimento. |
| Functional equivalence | | | | | | | |
| B1.1 | Supports multiple levels of content understanding (e.g., novice, intermediate, expert). | Soutient plusieurs niveaux de compréhension du contenu (par exemple, débutant, intermédiaire, expert). | Supporta più livelli di comprensione dei contenuti (ad esempio, principiante, intermedio, esperto). | À part l'exemple difficile d'élargir? | Si capisce solo tramite gli esempi nelle parentesi | Adapte le contenu au niveau de compréhension (p. ex.: débutant, intermédiaire, expert) | Adatta il contenuto ai livelli di comprensione (es.: principiante, intermedio, esperto) |
| D1.1 | Promotes learner choice and self-determination while engaging with the content. | Encourage le choix et l'autodétermination des apprenants tout en l'impliquant dans le contenu de la leçon d'apprentissage. | Promuove la scelta e l'autodeterminazione dello studente implicandolo nel contenuto della lezione. | L'item demande d'évaluer plusieurs informations à la fois. | Non è chiaro il focus. Il termine implicazione non è noto a tutti i docenti. | Encourage le choix et l'autodétermination chez les apprenants | Incoraggia la scelta e l'autodeterminazione dello studente |
| C1.6 | Intentionally provides supports for students' problem-solving and critical-thinking abilities. | Fournit intentionnellement des moyens pour permettre la résolution de problème et la réflexion critique des apprenants. | Fornisce intenzionalmente supporto alla risoluzione dei problemi e alle capacità di pensiero critico degli allievi. | Pas clair, plusieurs informations à juger à la fois. . . | - | Fournit des moyens pour développer des compétences de résolution de problème et de réflexion critique chez l'apprenant. | Fornisce supporto alla risoluzione dei problemi e alle capacità di pensiero critico degli studenti. |

Table 4. Cont.

| N° Item | Original Version | Experimental Version: Pretest | | Participants' Comments | | Final Revision of Items | |
|--------------------------|---|--|--|--|---|--|--|
| | | French | Italian | French | Italian | French | Italian |
| Experiential equivalence | | | | | | | |
| B1.8 | Clarifies content-based syntax and structure. | Clarifie la syntaxe et la structure propres au contenu. | Chiarisce la sintassi e la struttura del contenuto. | Difficile à comprendre. Le terme "structure propre au contenu" n'est pas clair | - | Clarifie la syntaxe (p. ex.: les règles grammaticales ou orthographiques, les expressions mathématiques, etc.) et la structure du contenu de la leçon l'apprentissage. | Chiarisce la sintassi (es: regole grammaticali, espressioni matematiche) e la struttura dei contenuti della lezione. |
| D1.1 | Promotes learner choice and self-determination while engaging with the content. | Encourage le choix et l'autodétermination des apprenants tout en l'impliquant dans le contenu de la leçon d'apprentissage. | Promuove la scelta e l'autodeterminazione dello studente implicandolo nel contenuto della lezione. | Le terme "en l'impliquant" demande d'évaluer deux 'information à la fois. | Il termine "Implicandolo" non è noto a tutti i docenti. | Encourage le choix et l'autodétermination chez les apprenants | Incoraggia la scelta e l'autodeterminazione dello studente |

3.1. Semantic Equivalence

Because conciseness is a hallmark of scientific writing in English [43], it can be difficult to find the exact word or phrase in French or Italian that reflects the intended meaning in the original version. Therefore, certain French and Italian verbs (e.g., items A1.4 and D1.7, see Table 4) were replaced with more precise and measurable synonyms to assist participants who were struggling to interpret them correctly. For example, the verb “highlight” was replaced by “indiquer/indicare” [indicate], a more operational verb. Similarly, the verb “permet/permets” [provide], which has a very broad definition, was replaced with “encourager/incentiver” [encourage], a term with a more action-oriented meaning. In addition, the English term “internalization” (item B2.3), which is part of the pedagogical lexicon in the sense of the integration of concepts, attitudes, or cultural values through learning, socialization, or identification [44], was initially translated literally. However, for many participants, the French or Italian translation of the term referred more to the psychotherapeutic lexicon and was therefore less observable in a classroom context. After discussions with the questionnaire designers, this term was replaced by “appropriation/appropriazione” [appropriation] as it better conveyed the idea of acquiring academic knowledge/skills in the French/Italian educational context.

3.2. Idiomatic Equivalence

During the initial stages of translation, the search for equivalent terms for certain colloquial or idiomatic English expressions has been a challenge. The pretest confirmed these equivalence problems. For example, the participants had a difficult time interpreting the expression “big idea”, which does not have a direct equivalent in either French or Italian. Therefore, it was translated (e.g., item A 1.5, see Table 4) as “idées principales” in French and “concetti principali” in Italian. Another term for which there is no equivalent in the French language is “resourceful”. It was originally translated as “débrouillard” according to the UDL guidelines of the French version [29], Québécois French translation. However, this term is not in common use in European French in the field of education, as it is too informal for participants. Subsequently, after discussions with UDL-OMT designers, it was translated as “autonomous” (item E3, see Table 4).

3.3. Functional Equivalence

Due to differences in grammatical structures between languages, the translation of certain phrases favored conveying a meaning like the original rather than a literal translation that would not be meaningful to participants. For example, the statement “supports multiple levels of content comprehension (e.g., novice, intermediate, expert)” was changed from “soutient plusieurs niveaux de compréhension du contenu/supporta più livelli di comprensione dei contenuti” to “adapte le contenu au niveau de compréhension/adatta il contenuto ai livelli di comprensione” [adapts content to comprehension level] (see Table 4, item B1.1). When translating the introductory sentence of items B2.1, B2.2, and B2.3 (see Table 3, line 2), the grammatical structure was also modified to make sense in French and Italian. This meant that these three items began with a noun-based form instead of a verb-based form (see Table 2), as in the following items. In addition, participants reported that some of the items seemed to measure more than one construct. Consequently, these items were simplified to focus only on the main construct (e.g., item D1.1).

3.4. Experiential Equivalence

Some statements were flagged as ambiguous by participants. They were unable to identify objective criteria for evaluating UDL principles in the classroom. Specific examples were included to avoid confusion. In item B1.8 (see Table 4), the following examples were included: grammatical or spelling rules, mathematical expressions, to illustrate the term “syntax” in a concrete way. In the educational context of French-speaking Switzerland and Italy, the term “syntax” is mainly used in initial teacher training in the sense of the structuring of learning content. As Van der Veer et al. [45] show in their study, its use

decreases with professional experience. Certain items or statements may have a different meaning in different cultural and linguistic groups, even if they meet the criteria of linguistic and functional equivalence.

After specific item revision, a comprehensive evaluation of the structure and first part of the questionnaire was conducted. To improve clarity, two corrections were made in the “Description” and “Observation Procedure” sections. The item numbers were not consistent and were renumbered. These changes were not the result of the pretest. They were discussed with the design team and incorporated into the English version as well as the French and Italian translations.

4. Discussion

Initial tests of the original (English) edition of the UDLOMT showed its internal consistency [17]. Encouraged by these findings, UDL-OMT was translated and cross-culturally adapted to extend observations of UDL effects to French- and Italian-speaking classrooms. The translation process resulted in two culturally adapted versions of UDL-OMT. These were tailored to the challenges of an increasingly inclusive Swiss school system characterized by regional and linguistic specificities. To ensure optimal equivalence, two translators and two back-translators were employed for each language [31,32]. Particular attention was paid to linguistic and cultural differences [32] that might have an impact on the understanding of certain pedagogical concepts. If a pedagogical concept presented difficulties, a culturally appropriate translation that was in line with the item was preferred by refining the choice of terminology. Bias resulting from personal interpretation was reduced through consensus among translators and discussions with questionnaire designers. Throughout the process of translating UDL-OMT, efforts were made to harmonize the French and Italian versions of UDL-OMT.

During the pretest, the analysis of the items from the professionals revealed that most of the statements followed the four principles of Bernaud [39], facilitating the assessment of the understanding and comprehension of the items. However, errors in semantic, idiomatic, functional, and empirical equivalence [37] were revealed in the interpretation and applicability of the items in practice. Participants’ comments played a crucial role in highlighting the gap between the means intended to be measured by UDL-OMT and those perceived by practicing teachers. To correct such errors, the problem statements were revised based on the synthesis of participants’ feedback and the UDL guidelines of the French version [29]. As noted by Peña [30], the consideration of additional aspects of equivalence, such as functional, cultural, and experiential, can help reduce potential methodological bias.

This study also found that certain terms in the UDL guidelines of the French version [29], as translated into Quebec French, did not have equivalents in European French and did not evoke observable behaviors in the classroom for some participants. Examples include qualifiers for expert learners such as “purposeful”, “resourceful”, or “strategic”. These differences are due to lexical differences that result from the distinct evolution of Quebec French, which often adopts terms and expressions that have been translated directly from North American English into French [46]. These French words may appear identical. However, they have different meanings or are not used in the same context in Europe. Consequently, alternative terms had to be identified in UDL-OMT questionnaire to maintain the meanings intended by the questionnaire designers and UDL founders. Conversely, when the questionnaire was aligned with the Italian guidelines, there were fewer discrepancies.

As a result of this preliminary testing, UDL-OMT was adapted for the French and Italian context. The French and Italian versions are currently undergoing a validation process to determine if they have psychometric properties that are like those of the original version. In the future, it would be beneficial to assess the applicability of UDL-OMT in other French-speaking regions as well as in Italy. The diversity of educational systems in different countries, as well as the different policies and approaches that characterize

inclusive education in Europe [47], should be carefully considered when evaluating the scalability of the questionnaire. However, the inherent flexibility of the UDL approach allows this tool to adapt to the different structures of educational systems.

4.1. Involvement in Practice and Research

Once validated, the use of UDL-OMT will facilitate coaching French- and Italian-speaking professionals in implementing and evaluating UDL principles in the classroom [17]. This questionnaire serves as a practical tool for operationalizing UDL guidelines. It provides concrete examples of how various checkpoints can be integrated into the classroom. UDL has become widely accepted as one of the most effective evidence-based practices for promoting inclusion [48]. However, challenges to its implementation and measurement persist, as highlighted in the existing body of research, e.g., [22,49]. The literature review and pretest participant feedback underscore the lack of consensus regarding how to define UDL and related terms. Therefore, developing an instrument with precise definitions and concrete examples for each instrument component could be useful [17].

In terms of research, UDL-OMT (both original and translated versions) can document the application of UDL in classrooms through the generation of scores for longitudinal and cross-curricular comparisons. This standardized approach could establish benchmarks for measuring the implementation of UDL practices and encourage the use of more rigorous research designs and procedures [50]. In the medium term, the comparison of these results could assess the consistency of the implementation of UDL at the international level and thus promote its adoption in European countries where UDL is emerging. In addition, UDL-OMT can be used for training purposes to bridge the gap between theory and practice in the classroom. It supports pre-service teacher evaluation and self-assessment practices, thus enhancing reflective practice [17].

Clearly, the mere provision of tools for the assessment of UDL is not sufficient to promote the widespread adoption of universal pedagogic practices across Europe; this requires systemic development capable of adapting to different local policies and cultures. However, given the growing importance of inclusion as an imperative at the European level [51] and the recognition of Universal Design as an effective strategy to support this goal [52], the introduction of practical tools can make a significant contribution to this process.

4.2. Strengths and Limitations

This study concludes by discussing its strengths and limitations. The translation process adhered to approaches and procedures recommended in the literature, e.g., [32,40], and was conducted with meticulous methodological rigor. Collaborative efforts involving multiple translators and back-translators, combined with input from the tool designers, resulted in assessment tools in French and Italian that drew on collective expertise [53]. The methodological limitations are primarily related to the sample size. While the small number of participants allowed for an in-depth qualitative analysis of the problematic statements, a larger sample size would have strengthened the analysis of the quantitative data [32,37]. A more comprehensive collection of information on the practices of the participants, such as the role of the teacher in the learning session and the familiarity with UDL, could have clarified the influence of certain variables on the interpretation of the questionnaire. Furthermore, given the specificities of Swiss education, the French and Italian questionnaires may require further linguistic adaptation if they are to be used beyond Switzerland.

5. Conclusions

Several meta-analyses suggest that UDL-based pedagogical practices facilitate access to the general education curriculum, promote student and teacher engagement and motivation, and have positive effects on academic outcomes, e.g., [10,13,50]. However, findings for students with special needs are more mixed, with some studies reporting positive effects

and others showing more mixed findings [10,50]. The implementation and planning of programs based on the principles of UDL requires a range of skills, experience, and collaboration [15]. The dissemination of observational tools, such as UDL-OMT, can increase understanding of the UDL conceptual framework and thereby promote improvements in inclusive educational practices.

Due to the diversity of approaches to inclusive education in European countries [52,54], the dissemination of practices and tools aligned with UDL should be accompanied by a reflection on the inclusiveness of the cultures, practices, and policies [55] that shape the different educational systems in Europe.

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