The
Universal Instructional Design Implementation Guide

Credits

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Funded by:

The Learning Opportunities Task Force
Ministry of Training, Colleges and Universities,
Government of Ontario
2002-03

Acknowledgements

Teaching Support Services would like to acknowledge and offer thanks to the following contributors to this project:

- The Learning Opportunities Task Force, Ministry of Training, Colleges and Universities, Government of Ontario, which provided funding during 2002-03.
- Linda Yuval, Research Assistant for the UID project, and her advisor, Professor Karen Korabik, Department of Psychology, University of Guelph.
- Personnel within the Centre for Students with Disabilities, and the Learning Commons, University of Guelph.
- Professors and TAs who participated in our course projects.
- Students who volunteered to participate in the UID project and who provided their feedback.

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Universal Instructional Design

What is Universal Instructional Design?

The term "Universal Design" originated in the physical world, where domains such as architecture and industrial design have endorsed goals for their designs that include flexibility, consistency, accessibility, explicitness, and supportiveness. UID applies these very same principles to teaching and learning. UID is not just about accessibility for persons with a disability – it's about truly universal thinking – considering the potential needs of all learners when designing and delivering instruction. Through that process, one can identify and eliminate barriers to teaching and learning, thus maximizing learning for students of all backgrounds and learner preferences, while minimizing the need for special accommodations and maintaining academic rigour.

Why Consider UID?

As we know from our own experiences, and research, a variety of factors affect a learner's ability to learn, such as a learner's preferred strategies or styles.
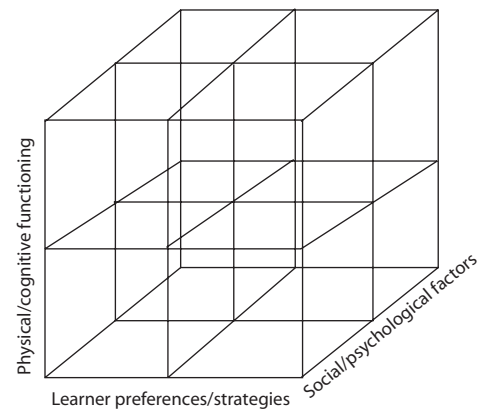
Some students learn best when:

- using visual materials
- engaging in hands-on learning
- watching or listening
- working individually
- working in groups
- using creative thinking: dealing with ambiguous problems
- using linear thinking: dealing with concrete information

Social and psychological factors that impact learning can include:

- being in an unfamiliar culture
- having major life commitments outside academic life
- anxiety or stress disorders

Physical or cognitive barriers that impact learning can include:

- physical condition such as hearing or vision loss, or mobility impairment
- a learning disability

UID as a strategy considers the potential needs of all learners in the design and delivery of instruction. While it would be undesirable, not to mention impossible, to design individual instruction for this matrix of possibilities, UID offers strategies that remove barriers and provide flexibility to enable students to access learning in ways that make sense for them.

UID is consistent with universally-recognized principles of good teaching (Chickering & Gamson) that have been proven to enhance learning for all students, and it has been demonstrated by research at the University of Guelph to create conditions conducive for learning (UID project research report). Finally, it helps us meet the spirit of emerging legislation on accessibility, and minimizes the need for special accommodations.

> Sue is visually impaired and has an assignment to critique a journal article on reserve in the library. Through her entitlement to individual accommodations, she is provided with someone to read her the article or perhaps to transcribe it so that it can be read to her through JAWS. Applying UID principles, the professor might do one or more of the following: (1) provide a link to an electronic version of the article; (2) provide an audio clip; or (3) allow students to select their own articles for the assignment. As a result, access has been improved for all students, including Joe (who is ill at home) and Mary (who is mature student away on a business trip).

We realize that in the practical world there may be limits to what you or your educational institution can do. We also recognize that some changes will take time, no matter how much you may support them. Therefore, we offer this implementation guide to help you move forward in a manner appropriate for your own working environment.

> Robin is hearing impaired and attends an economics class in a large lecture hall. The professor asks students to form in-class discussion groups. Robin is disadvantaged because he cannot discriminate sounds within the auditory chaos. Also marginalized is Terry, in a wheelchair in the back row, and Sherri, a student with a learning disability who needs time to formulate her ideas. Applying UID principles, the professor might instead do one or more of the following: (1) suggest questions for consideration in advance of the class; (2) provide an asynchronous electronic forum for student contributions; or (3) use class time to debrief and then give students time in class to write a one-minute reflective paper.

The History of UID at Guelph

In 2002 the University of Guelph, through Teaching Support Services (TSS), received funding from the Provincial Government's Learning Opportunities Task Force to undertake a study of Universal Instructional Design (UID) principles.

We began with the central premise of UID – that when courses are developed and presented in keeping with these principles then the learning of all students (including those with disabilities) is enhanced. We also began with these assumptions and related questions:

- Sometimes there are barriers to pursuing one's education – can these be reduced?
- People have a variety of needs and capabilities – can this be the basis for inclusion rather than exclusion?
- Diversity is good and desirable – can this be anticipated and even encouraged?
- UID principles benefits all our learners – can we systematically apply UID principles to our teaching and learning experiences?

Our methodology involved action-research, and included these major components:

- Articulate UID principles based on principles already established in the physical realm (architecture, city planning, etc.).
- Select professors and courses willing to use UID principles in making changes to curriculum, materials and delivery. Offer them financial, technical and pedagogical support.
- Assess the effect on students, professors, teaching assistants and others impacted by these changes.
- Share successes, results and lessons-learned with the broader community. This has been happening through dozens of presentations and workshops throughout North America and now through this manual.

How This Manual Has Been Designed

We do not claim to have all of the answers, to know your organization's present situation or resources, or to know your individual role. Therefore, we suggest that you use this **Implementation Manual** as a guide to assessing your current situation and to making solid, concrete plans following consultation with others.

We are also working from the premise that within your daily interactions with students (whatever your role) you are already modeling many aspects of "good practice." We encourage you to use your own strengths as your starting point.

This guide is written from the perspective of the Seven Principles of Universal Instructional Design as articulated at the University of Guelph. You will find every Principle explored through the following structure:

1. A narrative explanation of each principle, placing it within the greater context of UID as a larger discipline.

2. Guiding questions designed to help you reflect on the principle with respect to your own teaching.

3. A number of examples showing what professors, teaching assistants and others are already doing at the University of Guelph.

4. Questions to ask students and other forms of evaluation you may use to assess the impact of any changes.

5. The Appendices include two worksheets:

    a. An Implementation Worksheet that walks you through the list of questions for each principle, helping you to reflect on your course and identify problems, actions, resources, and timelines. Use this to engage in a thorough review of your course.

    b. A Quick-Start Implementation Checklist that categorizes common examples of UID strategies by difficulty of implementation, and component of instruction (design, delivery, materials, and environments). Use this if you're looking for some quick suggestions on where to start.

Principles of 7 Universal Instructional Design (UID)

Instructional materials and activities should...

...ensure a learning space that accommodates both students and instructional methods.

...be accessible and fair.

learning space

accessible

...minimize unnecessary physical effort or requirements.

...provide flexibility in use, participation and presentation.

minimize effort

flexible

supportive

consistent

...provide a supportive learning environment.

...be straightforward and consistent.

explicit

...be explicitly presented and readily perceived.

uid

open learning and **ed**ucational support

Be accessible and Fair

What does this mean?

If this principle is followed, all students ideally can use the same means to fulfill course requirements – identical if possible, equivalent when not. Instruction is designed to be useful and accessible by people with diverse abilities, respectful of diversity, and with high expectations for all students. Students find the course a fair and safe learning environment. This principle is so central to addressing student needs that it is sometimes equated with UID. At its heart is a commitment to remove barriers to accessing course materials and taking part in essential activities. You will probably find that, as you work with other UID principles, this one often underpins the others. Remedies will vary from digitizing course content to structuring alternative approaches to activities.

To further explore this principle, ask yourself:

- ☐ Might students have any difficulties accessing course materials or participating in any essential activities related to this class?
- ☐ Will the design or requirements for this class or course cause any group of students to feel especially unsafe or threatened?
- ☐ Do any essential activities for this course, course goals or objectives represent insurmountable barriers to any group of students?
- ☐ Does the design of this course attempt to eliminate the possibility of bias, impartiality, or unjust treatment?
- ☐ Do I create an environment in which persons with a disability feel welcome to come forward and speak with me about it?
- ☐ Are the design and expectations of this course logical, ethical and consistent with University rules and regulations?

Examples from U of G

- instructors who provide a course website with online resources so students can access materials in electronic formats as needed
- instructors who review course websites with an accessibility checker to ensure that all students can access the materials and that they could be used with screen-reading software such as the following:
    - JAWS: http://http://www.freedomscientific.com/jaws-hq.asp
    - Web Content Accessibility Guidelines (WCAG 2.0): http://www.w3.org/WAI/WCAG20/quickref
- instructors who put advance organizers, lecture outlines, or key points online to help students stay more engaged in lectures
- instructors who invite any students with a disability to meet with them individually to review their specific needs

Evaluation

After implementing this UID principle, ask your students: Did you have difficulties accessing course materials or participating in any essential activities related to this class?

2

Provide flexibility in use, participation and presentation

What does this mean?

Learning is most effective when it is multimodal – when material is presented in multiple forms, and when students have multiple means of accessing and interacting with material and demonstrating their knowledge (being evaluated). Instruction is designed to meet the needs of a broad range of learner-preferences.

Universal Instructional Design involves offering options to enable physical access, fuller participation, and suitable demonstration of mastery of course requirements. This principle, perhaps more than any other, requires some creativity. The result, however, can create richer learning for all involved, allowing students to exercise their options, a benefit to themselves, their classmates and the instructor. Options include alternative formats for reading materials, online conferencing in lieu of in-class discussions, portfolio-based assessment, etc.

To further explore this principle, ask yourself:

☐ Does the course offer enough choice so that students can, to a reasonable extent, demonstrate their competency in a way that suits their needs and abilities?

☐ Am I choosing the most effective medium/media to communicate information?

☐ Can I better support different learner preferences, either by meeting their needs or by supporting their transition to a different learning approach?

Examples from U of G

- instructors who use a variety of strategies during lecture such as discussion or problem-solving
- instructors who present information using a variety of media inside and outside of class (e.g., verbal, text and images, audio, video, etc.), and who design resources so they can be reused in a number of ways (e.g., in class, online)
- instructors who use online discussion and group work to foster peer-to-peer learning.
- instructors who post exercises and quizzes on a website so that students can learn on their own outside of class
- instructors that offer a choice in assignment format (e.g., report, presentation, project, etc.), topics, and sometimes due dates

Evaluation

After implementing this UID principle, ask your students: Does the course offer enough choices in how it is presented so that you could, to a certain extent, approach learning in a way that suited your needs and abilities?

Be straightforward and consistent

What does this mean?

Instruction is designed in a clear and straightforward manner, consistent with user expectations. Tools are intuitive. Unnecessary complexity or distractions that may detract from the learning material or tasks are reduced or eliminated.

UID involves overcoming confusion, coordinating all parts of the curriculum, and clarifying communications. This principle itself, perhaps deceptively simple to understand, can be difficult to implement. However, what we know about learning from study skills professionals in general is a tremendous help. Remedies will vary from detailed proofreading to examining the relationship between learning objectives and the actual curriculum.

To further explore this principle, ask yourself:

☐ Are there major areas of confusion or inconsistency among course objectives, your own expectations, and/or how the course is presented?

Examples from U of G

- instructors who confirm that every question on the final examination related directly to information covered in class or within the written materials.
- instructors who use mid-semester course feedback to rectify any major areas of confusion in the course
- instructors who check all written materials and presentations for consistent formatting; and provide visual and cognitive cues

Evaluation

After implemtning this UID principle, ask your students: Are there major areas of confusion or inconsistency among course objectives, your expectations, and/or how the course is presented?

4

Be explicitly presented and readily perceived

What does this mean?

Universal Instructional Design does not presume that all students are physically or cognitively able to access all media equally. Therefore, it seeks to (1) maximize the clarity of each chosen medium of communication, and also (2) present information through multiple channels.

At first glance, "explicitly presented" seems to imply "readily perceived", but there are two sides to the equation: sending and receiving. For example, a clearly-spoken lecture may not reach a hearing-impaired student who relies on lip reading if the room is poorly lit.

To further explore this principle, ask yourself:

☐ Are there barriers to students receiving or understanding the information and resources they need in this course?

☐ Is some information in the course presented exclusively in a format that might be inaccessible to some students?

☐ Do I continually have to repeat information because students have not received it? Am I asked for materials in different formats?

☐ Would some materials be more effectively presented in a different format than they are now?

Examples from U of G

- instructors who have switched to typed overheads or projected presentations instead of handwritten notes
- instructors who ensure minimum standards for anything to be projected in front of the class (e.g., minimum font size of 20 pts.)
- instructors who ensure they face the class when speaking and use a microphone when necessary
- instructors who share a summary of key points to be covered a few days before each lecture
- course websites that offer a choice of file formats and include labels which suggest when each format might be advantageous
- instructors, new to teaching in large auditoriums, who seek advice or attend workshops about teaching large classes

Evaluation

After implementing this UID principle, ask your students: Are there any remaining barriers to your receiving or understanding the information and resources needed in this course?

5

Provide a supportive learning environment

What does this mean?

Universal Instructional Design is an inclusive approach, welcoming and encouraging students with diverse backgrounds, experiences, and abilities. This principle calls for us to recognize students as adult learners, respecting individual differences and fostering an open environment. It's likely that most people believe this is a worthwhile goal, but taking specific steps within a course can, however, mean subtle adjustments. It also means encouraging academic growth by helping to create an environment that encourages positive risk-taking and emphasizes learning from one's mistakes, rather than being penalized for them. It anticipates some of the errors that students may make and helps overcome or create learning experiences from them.

To further explore this principle, ask yourself:

- ☐ Would students be comfortable expressing their thoughts and exploring new ideas in this course? Are diverse opinions welcomed?
- ☐ Is the (real or virtual) classroom safe, free from undue criticism, personal attacks, or other negative influences that would stifle creativity or open academic discussion?
- ☐ Are there common mistakes, misperceptions, or pitfalls students encounter year after year with negative results?
- ☐ Are there administrative, logistical, or technical challenges that cause undue difficulties and distract from learning?
- ☐ Are students rewarded for taking appropriate risks?

Examples from U of G

- courses that have writing assignments allowing draft(s) to be submitted and peer reviewed
- instructors who design assignments that allow for experimentation
- instructors who use techniques to increase interactivity in lectures such as think-pair-share
- courses that offer a help room in addition to regular office hours
- instructors who integrate their own research when it relates to the course of study, and shares both successes and challenges with students.

Evaluation

After you have implemented this UID principle, ask your students: Do you feel respected as persons, welcome to express your thoughts and able to explore new ideas in this course?

Minimize unnecessary physical effort or requirements

What does this mean?

UID recognizes that students will be of a wide range of ages, backgrounds, physical characteristics, and personal circumstances. This principle calls for considering the physical effort required to complete the course and eliminating any that is unnecessary or not relevant to the learning process. The learning should be about the material not about obtaining the material.

Remedies will vary from forming teams for collecting data to simplifying navigation on the course website.

To further explore this principle, ask yourself:

☐ If there are physical challenges or obstacles to participating in this course, can they be reduced or avoided?

Examples from U of G

- course websites that are designed to be accessible and minimize the amount of clicking, scrolling, or hunting for information
- labs that allow students to work in pairs if the work requires students to physically exert themselves
- courses that use the Library online reserve or Desire2Learn for reading materials so that students could access them from home because of the electronic format, thereby eliminating the need for travel to the library, photocopying, etc..

Evaluation

After you have implemented this UID principle, ask your students: While you participated in this course, were there physical challenges or obstacles that could be avoided?

7

instructional materials & activities should

Ensure learning spaces that accommodate both students and instructional methods

What does this mean?

Universal Instructional Design recognizes that learning happens in virtual as well as physical space. These spaces must be accessible and accommodate all learners. The design of these spaces should also support the type of learning you are trying to facilitate.

To further explore this principle, ask yourself:

- Is there anything in the design of the learning space that prevents the full participation of all of my students?
- Are there any barriers to entry, movement, or activity?
- Does my learning space support the type of learning activities that I'm asking students to engage in?
- If not, can anything be done to change either the environment or the activity?

Examples from U of G

- instructors who request facilities that have the technology they require whenever possible
- instructors who request space that fits with their teaching technique (e.g., case rooms when class discussion is essential)
- instructors who review their course in detail and make any necessary changes after it is switched into a large lecture hall rather than the customary seminar room.
- courses that schedule small group activities outside of lecture hours if the classroom does not accommodate physical movement and group work

Evaluation

After you have implemented this UID principle, ask your students: Has anything prevented you from accessing the learning spaces required for this course? Did the learning spaces support your learning?

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UID at the University of Guelph http://www.tss.uoguelph.ca/uid/

APPENDIX A: UID Implementation Worksheet

Problem areas in my course	What I can do about it	Resources I need	Target Date
Will students have difficulties accessing course materials or participating in any essential activities related to this class?			
Does the course offer students enough choices in how it is presented so that they can, to a reasonable extent, approach the course in a way that suits their needs and abilities?			
Will students find major areas of confusion or inconsistency among course objectives, your expectations, and/or how the course is presented?			
Are there obstacles to students' receiving or understanding the information and resources they need in this course?			
Will students feel respected as individuals, welcome to express their thoughts and able to explore new ideas in this course?			
If there are physical challenges or obstacles to participating in this course, can they be reduced or avoided?			
Is it likely that students will find any of the materials or activities in this course to be inappropriate or unsuitable?			
Has anything prevented students from accessing the learning spaces required for this course? Did the learning spaces support your teaching?			

For additional information about implementation, please see the UID website at http://www.tss.uoguelph.ca/uid

APPENDIX B: UID Quick-Start Implementation Checklist

- ☐ provide ample time for assignments; determine how much time would be required by a typical student and add a "buffer" to address various contingencies
- ☐ differentiate between need to know (required material) and nice to know (optional) information
- ☐ allow students to work in pairs in labs where physical effort may disadvantage someone with a disability
- ☐ use mid-semester feedback to discover any problems or areas of confusion
- ☐ provide ample time for online work in case of system malfunction

- ☐ always face the class and make eye contact when speaking
- ☐ use a microphone when necessary
- ☐ structure class time in a consistent manner
- ☐ post course materials such as syllabi or handouts in Desire2Learn or readings in the Library Online Reserve
- ☐ allow students to submit assignments electronically
- ☐ if you use electronic presentation tools (e.g., PowerPoint) make sure that presentation is legible (minimum 20 pt. font, with a high contrast colour scheme)
- ☐ provide feedback on work before the next assignment or assessment

- ☐ consider providing lecture outlines (not complete notes) and advanced organizers for lectures that students can annotate during class
- ☐ structure and format material for easy readability
- ☐ provide students with materials in multiple formats. At the very least, provide digital equivalents of hardcopy handouts
- ☐ ensure that all digital materials you provide to students are in an accessible format
- ☐ ensure all materials, case studies, etc., are free of negative stereotypes

- ☐ ensure your course website is accessible and usable: use an accessibility checker to identify any potential problems or have someone review it for you
- ☐ use "ALT" (alternate text) tags for any images on web pages so that they may be identified by screen readers used by students with disabilities or text-only browsers
- ☐ do a "room check" to make sure there are no problems with hearing, sightlines, or the arrangement of the furniture (e.g., enough left-handed seats). Ask students experiencing problems hearing, seeing, writing, etc., to come forward.
- ☐ when possible, request the proper room and/or arrange the room to facilitate the type of teaching you are doing
- ☐ at the beginning of a course and/or in your syllabus, encourage anyone with a disability to come forward and speak with you about it
- ☐ help ensure people feel free to engage in discussion in your course without fear of ridicule or harassment; encourage the open exchange of ideas

☐ consider the wide range of abilities, backgrounds, and experiences of your students when designing your activities and assignments

☐ use online quizzes and self-tests to provide feedback for students

☐ for writing assignments, allow for drafts and revisions; consider using peer review

☐ design assignments that don't unnecessarily penalize students for some experimentation and risk-taking

☐ review activities and assignments for the course and assess whether any would present an insurmountable barrier for persons with cognitive or physical disabilities; provide equivalent alternatives if possible

☐ design assignments to minimize non-essential tasks (e.g., learning irrelevant software just to access information) or non-essential physical travel.

☐ provide choice in assignments if possible (including topic, format, and due dates)

☐ consider using online conferencing for course support, discussion of content, and group work to foster peer-to-peer and collaborative learning

☐ provide equivalent resources or materials for those that cannot be made accessible

☐ provide grading schemes and sample assignments to students

☐ apply grading standards consistently among students and across assignments

☐ consider using a variety of strategies during lecture periods including problem-solving, discussion, hands-on exercises, presentations, etc.

☐ use techniques that increase interactivity in lectures such as think-pair-share

☐ ensure examples and content used in class are relevant to people from diverse backgrounds and experiences

☐ present information in multiple, complementary formats such as text, graphics, audio, and video

☐ review your class written materials including overhead and PowerPoint slides for clarity, consistent formatting, and cognitive cues; ensure they are free from unnecessary jargon

☐ if unaccustomed to teaching larger numbers of students in large auditoriums, seek advice or take a workshop on teaching larger classes

☐ integrate your own research when it relates to the course of study; share successes and challenges

☐ provide tutorials and resources that students that can reinforce learning outside of class

☐ develop a list of Frequently Asked Questions and distribute to students

☐ design documents that can be repurposed for multiple uses (e.g, in class, online)

☐ use a variety of media such as text, graphics, audio, and video

☐ where appropriate, offer a choice of file formats for content (e.g., Word, PDF, HTML) on your website and include labels which suggest when each might be useful

☐ provide captioning or transcripts with any video used for class

☐ develop a clear course outline that provides policies, procedures, and expectations

☐ check multimedia or web-based tutorials for proper navigation and user feedback; conduct usability testing with some students

☐ when possible, request the proper room and/or arrange the room to facilitate the type of teaching you are doing

☐ in small classes, use circular seating arrangements

3. Things that can be done when you develop or update your course

- ☐ ensure that learning objectives are SMART (specific, measurable, achievable, relevant, and timely)
- ☐ involve experts in course and curriculum design
- ☐ consider a variety of teaching and learning techniques that include active and passive learning
- ☐ ensure that course content, assessment, and learning objectives are consistent and all activities and assessment relates to a learning objective(s)
- ☐ consider using a variety of assessment approaches and techniques (e.g., portfolio-based assessment).
- ☐ design a web-based course site with online resources
- ☐ ensure that the number of student hours of work is consistent with guidelines
- ☐ review your course in detail when it has grown in numbers and/or moved from a small room to large lecture hall
- ☐ consider gender, culture, disabilities, learning preferences, language and experiences, prior learning
- ☐ consult someone with instructional design experience/expertise
- ☐ consider ways to increase active learning strategies and student responsibility for learning

- ☐ consider if a "help room" may benefit your students in addition to regular office hours
- ☐ break up each class into segments which use different teaching approaches

- ☐ develop a process by which you can generate material and easily convert it to multiple forms
- ☐ have any video you use in your course captioned

- ☐ think about the kind of learning environment that would be optimal for your course
- ☐ consider how blending online and face-to-face learning can allow you to enhance the range of learning materials and activities used in the course
- ☐ design a course website that is accessible and minimizes the amount of clicking, hunting, or scrolling for information

open learning and **ed**ucational support