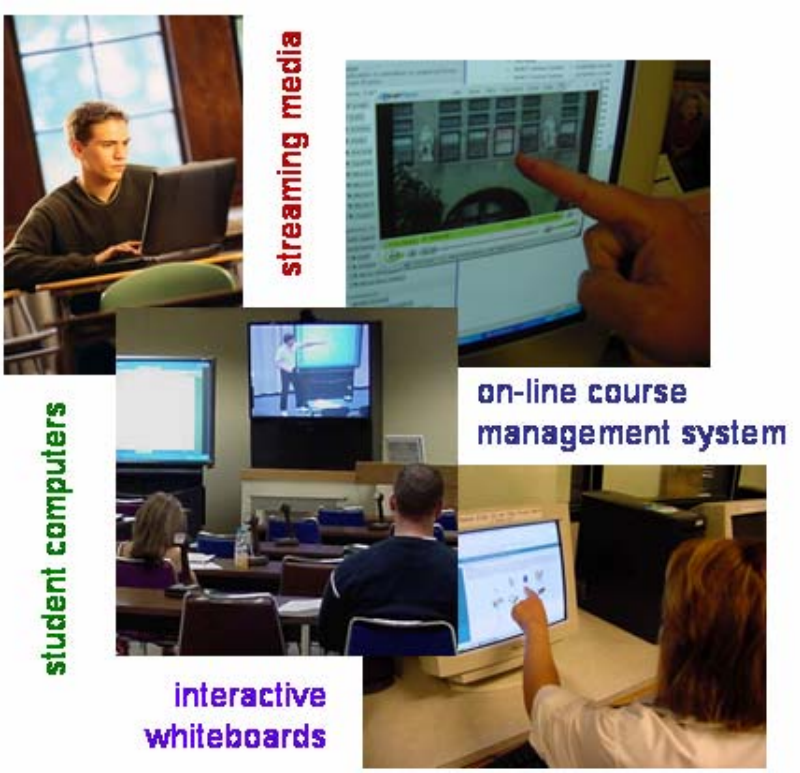
ITRC Guide

Developing Overlapping Technologies (DOT) Guide



The key to a successful distance education course is to evaluate and select the types of overlapping technologies (e.g., interactive whiteboard, on-line learning management system, streaming media, and student computers) that fit the instructor's pedagogy, the needs of the learner, and the objectives of the course. The DOT guide provides the instructor/designer with a series of reflective questions that aid in the strategic process of planning and implementing overlapping technologies in a interactive distance learning classroom.

The reflective questions in the DOT guide help the instructors to assess their own pedagogies, students' needs, and course content objectives when teaching in the video classrooms at ISU. After instructors read the recommendations and complete their responses to the reflective questions, the design guide allows them to begin organizing courses by selecting instructional technology activities that fit the course objectives and student learning outcomes. As learning outcomes are identified for each objective, a chart guides the selection of activities that correspond to the appropriate distance learning technology.

The DOT guide determines the overlapping technology resources available at the University with listed recommendations and best practices. This guide provides analysis, design, development, facilitation, and evaluation criteria, which faculty members will follow to plan out their distance education course when utilizing overlapping technologies.

Course Objectives and Learning Outcomes

The statements listed below will help you define your course objectives. Well-defined course objectives will be required to formulate instructional strategies for overlapping technologies. Course objectives help answer the question, "What will the students know or be able to do after completing this course?" Use the following criteria to help define your course objectives:

- The audience or learner
- The expectation of the learner
- The application of the skill/knowledge
- The tools that will be available to the learner
- The context in which the skills are applied and evaluated (overlapping technology)

In addition to the course objectives, the instructor will be responsible for identifying the learning outcomes that must be achieved by each objective. Educational objectives can be identified in the Bloom's (1964) taxonomy, which are categorized as knowledge, comprehension, application, analysis, synthesis, and evaluation. These educational objectives will guide your development of learning outcomes. One objective may contain more than one learning outcome. For example, an objective may contain a knowledge outcome that is accomplished by having the students define terms. By choosing the terms, a comprehension outcome will be facilitated by having students identify and explain their understanding of each term. An application outcome is accomplished through having students apply the terminology with their own experiences. All three outcomes fit under a single objective. Your mission is to identify outcomes for each objective and apply the outcomes to existing distance learning strategies and overlapping technology strategies offered in this guide.

The purpose of the following questions is to reflect on the objectives of the course and determine the learning outcomes that are best suited for overlapping technology activities.

Note: The ISU Office of Institutional Research and the Center for Teaching and Learning provide faculty support in developing course objectives and outcomes. Ask about the "Course-Based Review and Assessment" guide.

1. What are the objectives of the course? Define outcomes (e.g., knowledge, comprehension, application, analysis, synthesis, and evaluation) for each objective.

   Objective:

   Learning Outcome(s):

   ----------***See example on page 10, Sample DOT Activity***----------

Instructor's Pedagogy

Time is the most critical element in the process of creating activities with overlapping technologies. The time it takes to acquire the technical skills, develop the group activity, and administrate an activity during the course offering is important. The support offered by the University must be factored as part of your planning process. The administration of the activity relies on the amount of time needed to support your activity.

The technical competency of the instructor(s) plays an important part in determining the selection of technologies. If the instructor is not comfortable with the technology, the instructor should identify the resources needed to become comfortable with the technology or decide on another activity utilizing a different instructional technology strategy.

1. How much time will the instructor have to design instructional technology activities, develop technical skills, and facilitate activities?

2. What type of class interaction fits the instructor's pedagogy?

3. How many instructors or teaching assistants will be involved in the activity(s)?

4. What technical tools will the instructor be responsible for managing or what additional support will be needed to facilitate the technology?

5. Do you have the ability to make activities ADA compliant?

Learner's Needs

It is important to determine the learner's role to successfully participate in overlapping technology activities. The learner should be informed about the expectations of the activity, but the instructor should allow a student proper time to get comfortable with the technologies. Each learner should be expected to demonstrate an understanding of the technologies before implementation.

Learner motivation is a critical issue to success in every course. Motivational issues need to be considered with regard to the activity and the individuals. For example, teaching with overlapping technologies motivates some students by simply allowing them to perform task with the technology.

Social/cultural needs are important for all students. Course introductions and Get-To-Know-You activities provide a resource for learners to get comfortable with each other before engaging in overlapping technology activities. These types of activities can be used as a means of opening up discussion about issues that have meaning to all students and provide and opportunity to expose students to the technology.

1. In what ways, if any, do learners already possess the necessary technical knowledge and skills to participating with the overlapping technologies?

2. What content knowledge and skills have the students mastered prior to this course?

3. What motivational factors will be used to support learning activities?

4. What social/cultural needs do the students have as related to the topic?

5. What assessment criteria (peer, self, instructor) will be utilized to assess students?

6. How will the students apply content and technology knowledge/skills to other courses, to their careers, or to their role in society?

7. How comfortable and/or interested are the students with technology?

8. What are the prerequisite skills or knowledge students will need to succeed in the course when utilizing overlapping technologies?

9. What software/hardware will the learners need in order to succeed?

Content Objectives

The answers to the following questions will provide you with strategic information for developing overlapping technology activities. The purpose of these questions is to connect practical content issues with the instructor's experience teaching. The answers to the questions that follow will help confirm the selection of overlapping technologies.

1. What type of overlapping technologies will be most effective in achieving the course objectives (e.g., interactive whiteboard, on-line course management system, streaming media, and student computers)?

2. What is the classroom setting (e.g., virtual, traditional or combination) in which technology activities will occur?

3. What is the role of the materials/supplies/books/multimedia that learners will need in order to succeed in overlapping technology activities?

4. What technical support documentation, resources, and guidelines will be needed prior to the delivery of the course?

Selection Criteria for Overlapping Technologies

The technology selection of the DOT guide defines the steps involved in preparing overlapping technologies (OT) for interactive distance learning classrooms (IDLC). When making decisions about technology, instructors should identify the technology tools for each intended learning outcome and consider how the combination of tools will be facilitated. Faculty members compare technology practices with intended learning situations. Based on media-selection factors developed by Gagné, Briggs, and Wager (1992), the following will aid the instructor when selecting overlapping technologies

- ☐ **Physical attributes** – technology that enhances learning through visual, verbal, or motion
- ☐ **Learner characteristics** – technology that supports student learning styles, reading comprehension, and social backgrounds
- ☐ **Task characteristics** – technology that fits the learning outcomes (e.g., knowledge, comprehension, application, analysis, synthesis, and evaluation)
- ☐ **Instructor characteristics** – technology that supports instructor's teaching styles, technology comfort, and organization methods

The DOT methods help instructors to determine the technology selection criteria to fit their pedagogies and the students' instructional needs. The selection factories must be suited to address both learner characteristics and instructor characteristics. Use the following tables to help support the design process of integrating OT into IDLC in distance learning activities.

Physical Characteristics	Technology Consideration
Technology that enhances learning through visual, verbal, or motion	• **Verbal attribute**– consider using with OT and IDLC when both print and audio messages are required to support course activities • **Visual attribute** – consider using with OT and IDLC when demonstrating colors, shapes, objects, mapping locations, etc. • **Motion attribute** – consider using motion with OT and IDLC when teaching motor skills or complex assignments.

Learner Characteristics	Technology Consideration
Technology that supports student learning styles, reading comprehension, and social backgrounds	• **Learning styles** – consider using appropriate OT in the IDLC when identifying auditory, kinesthetic, tactile, and visual styles. • **Reading comprehension** - consider evaluating appropriate OT in the IDLC that addresses reading comprehension by students' age and prerequisite knowledge. • **Social needs** – consider using appropriate OT in the IDLC when addressing students' cultural, social, technology, and attitudinal needs.

Task Characteristics	Technology Consideration
Technology that fits the learning outcomes (e.g., Knowledge, Understanding, Application, Analysis, Synthesis, and Evaluation)	• **Knowledge** - consider a knowledge outcome(s) with OT and IDLC when having students arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, and state. • **Comprehension** - consider a comprehension outcome(s) with OT and IDLC when having students classify, describe, discuss, explain, express identify, indicate, locate, recognize, report, restate, review, select, and translate. • **Application** - consider an application outcome(s) with OT and IDLC when having students apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, and write. • **Analysis** - consider an analysis outcome(s) with OT and IDLC when having students analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, and test. • **Synthesis** - consider a synthesis outcome(s) with OT and IDLC when having students Arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, and write. • **Evaluation** - consider an evaluation outcome(s) with OT and IDLC when having students appraise, argue, assess, attach, choose, compare, defend, estimate, evaluate, judge, predict, rate, core, select, support, and value.

Instructor Characteristics	Technology Consideration
Technology that supports instructor's teaching styles, technology comfort, and organization methods	• **Teaching styles** – consider using technologies that adapt to your method of teaching or approach (e.g., constructivist, behaviorist, etc.) • **Technology comfort** – consider using technologies that are comfortable or identify support or training to gain comfort with the technology. • **Organization method**s – consider appropriate OT in the IDLC that supports organization methods for content distribution, administration, communication, and planning.

Technology Activity Strategies

The following table represents the technologies supported in the interactive distance learning classroom (IDLC). Each classroom has been developed with similar technologies to prevent confusion and develop consistency in the teaching environment. Each overlapping technology (OT) will be listed with a set of activity strategies connecting the IDLC technologies. Follow the chart listed below to help strategize about types of technologies when combining activities.

Supported Interactive Distance Learning Classroom Technologies	Combined Activity Methods (asynchronous and synchronous)	Supported Overlapping Technologies
IDLC ❖ communication ➢ Microphones ➢ Monitors ➢ Computer (Instructor only) ➢ Document camera ➢ Cameras (classroom video) ❖ content delivery ➢ Computer (Instructor only) ➢ Video/DVD players ➢ Document camera ❖ assessment and evaluation ➢ Monitors ❖ administrative ➢ Microphones ➢ Monitors ➢ Computer (Instructor only) ➢ Cameras (classroom video)	• presentation/lecture • group projects • writing assignments • quizzes/surveys • case studies • student presentations • observation/demonstration • class discussion	LMS-WebCT ❖ communication ➢ chat ➢ discussion boards ➢ whiteboards ➢ email ❖ content delivery ➢ content module ➢ organizer page ❖ assessment and evaluation ➢ quiz/survey ➢ assignment ❖ administrative ➢ student management ➢ content management Streaming Media ❖ content delivery ➢ video ➢ audio ➢ interactive media Interactive Whiteboard ❖ communication ➢ writing instruments ❖ content delivery ➢ recording instruments ➢ concept mapping ➢ playback - archiving Student Computers ❖ communication tools ❖ content delivery tools ❖ assessment and evaluation ❖ administrative tools

Overlapping Technology Activity Planning Table

Planning and developing course activities depends on end product from various technology delivery system(s) and whether the delivery mode is self-instruction or classroom-based instruction (Piskurich, 2000). The development process encourages instructors to think about how the end product (e.g., course objectives) will be delivered through the technology. For example, as an instructor develops lecture materials for a video classroom to help facilitate the verbal and cogitative outcomes for a specific objective, an online discussion will employ an intellectual outcome for the same objective and encourage collaboration among students. The use of overlapping technologies provides students with synchronous and asynchronous methods to communicate while allowing the instructor to avoid utilizing valuable lecture time to disseminate all three outcomes for a single course objective.

Delivering overlapping technologies encourages the use of a teaching matrix as it relates to the instructor's role as facilitator. As part of aiding students, the instructor should introduce various technology tools to students prior to any graded activities with an explanation of each tool and how it will be utilized in the course. Porter (2004) suggests using a check-off list when facilitating online technologies to determine the instructor's responsibilities. The guide offers of planning table that can be used to list the activity, objectives, outcomes, OT/IDLC technologies, technology factors, assessment, and evaluation criteria that will indicate important instructional responsibilities (e.g., locate electronic resources, prepare discussion board, and post lecture handouts).

The overlapping technology activity planning table provides the planning criteria needed to begin strategizing about your activity. The table includes the following fields:

- ☐ Activity Name
- ☐ Description of Activity and Technologies
- ☐ Objective
- ☐ Outcomes
- ☐ Physical Characteristics
- ☐ Task Characteristics
- ☐ Learner Characteristics
- ☐ Instructor Characteristics
- ☐ Assessment Criteria
- ☐ Evaluation Criteria

Delivering overlapping technologies encourages the use of a teaching matrix as it relates to the instructor's role as facilitator. The overlapping technology activity planning table provides faculty with a matrix to develop activities. Porter (2004) suggests using a check-off list when facilitating online technologies to determine the instructor's responsibilities. Use this check off list to identify all the matrix requirements before planning your activity in the activity table provide in the next couple of pages of this guide.

Sample — DOT Activity Planning Table

<table>
<tr><td colspan="2">Name of Activity: Education 505 - Theoretical Process in Higher Education – Lecture Discussion Activity</td><td colspan="2">Description of Activity and Technologies: The students will be actively involved in IDLC classroom lecture with an OT discussion outside of class in the WebCT discussion.</td></tr>
<tr><td colspan="2">Objective: As a result of taking this course, the student will be able to evaluate and apply theory and philosophy to teaching methods in higher education.</td><td colspan="2">Outcomes:
☐ Students will discuss and debate philosophy of higher education using lecture notes to label and support their arguments
☐ Students will apply theory of higher education by defining methods and applying these to discussion topics
☐ Students will compare higher education learning theory to their own experiences as a student.</td></tr>
<tr><td>Physical Characteristics:
☐ Visual presentation in lecture materials
☐ A verbal character will be utilized in online discussion</td><td>Task Characteristics:
☐ Knowledge – use to define theory and label philosophy
☐ Comprehension - discuss
☐ Application – apply theory
☐ Analysis – debate philosophy and compare with personal experiences</td><td>Learner Characteristics:
☐ Learning styles – auditory style (lecture), tactile style (discussion tool), and visual style (PP presentation and visual discussions.
☐ reading comprehension - graduate level
☐ social needs – Introductions! Discuss technology in class, provide students with both classroom culture and online culture, and address attitude and motivation toward both teaching methods</td><td>Instructor Characteristics:
☐ teaching methods primarily lecture driven behaviorist
☐ limited technology comfort
☐ Organization methods would include tracking student participation in the discussion and posting grades for the lecture/discuss activity.</td></tr>
<tr><td colspan="2">Assessment Criteria: Students will be assessed…
- Correctly answering discussion topic (10% of grade)
o Participation in discussions
o Supporting their answers with educational theory discussed in class and presentations.</td><td colspan="2">Evaluation Criteria: This objective will be evaluated by the instructor and students.
- student feedback and evaluations
- instructor self-evaluation and content evaluation</td></tr>
</table>

Start Planning — DOT Activity Planning Table

<table>
<tr><td colspan="2">Name of Activity:</td><td colspan="2">Description of Activity and Technologies:</td></tr>
<tr><td colspan="2">Objective:</td><td colspan="2">Outcomes:</td></tr>
<tr><td>Physical Characteristics:</td><td>Task Characteristics:</td><td>Learner Characteristics:</td><td>Instructor Characteristics:</td></tr>
<tr><td colspan="2">Assessment Criteria:</td><td colspan="2">Evaluation Criteria:</td></tr>
</table>

Evaluation Activity – Instructor, Learner, & Content

The following instrument will help the instructor evaluate the selection of overlapping technologies. This summative evaluation instrument can be administrated after the students have completed the activities involving the selected overlapping technologies. This process is designed to determine the quality and effectiveness of the overlapping technologies and provide feedback for improving the next offering of the course.

Note: You should apply this process for each activity utilizing overlapping technologies.

Instructor Evaluation *(filled out by the instructor)*

1. Did you feel your _____ (identify the overlapping technology) activity supported your students' learning styles (identify learning styles)?

2. Describe your role as facilitator when using the _____ (identify the overlapping technology) activity. What would you improve or continue using?

3. Did you have enough support? Did you allow enough time to administrate the activity?

4. Did the technology diminish your teaching style (explain)?

5. Did you feel your guidelines provided enough direction for your students (explain)? How would you improve this process?

6. Did you address your students' cultural and social needs with the _____ (identify the overlapping technology) activity (explain)?

Learner evaluation *(filled out by the student)*

1. Did you feel the _____ (identify the overlapping technology) activity helped your understanding of the topic?

2. Did the technology improve or diminish your learning experience (please explain)?

3. Did you feel comfortable sharing your ideas, collaborating, or interacting in the _____ (identify the overlapping technology) activity?

Content Evaluation Instrument *(filled out by the instructor or designer)*

1. Did you feel the _____ (identify the overlapping technology) activity accomplished the objective better than traditional video classroom activities?

2. How would you improve your course content or the overlapping technology to improving content delivery?

3. Did the technology improve or diminish your content objectives (please explain)?

References:

Bloom, B. S. (1964).*Taxonomy of Educational Objectives: The classification of educational goals, by committee of college and university examiners*. New York: Longhams, Green.

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INSTRUCTIONAL TECHNOLOGY RESOURCE CENTER
Idaho State University
Campus Box 8064
Pocatello, ID 83209
208.282.5880

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