

How Should I Offer This Course? The Course Delivery Decision Model (CDDM)

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Abstract

The emergence of new methods of course delivery has increased the complexity of determining a course's optimal delivery mode. In this paper, teachers and designers are encouraged to take a systematic approach to making decisions about how a course should be delivered. To support this approach, the Course Delivery Decision Model (CDDM) is intended to help teachers and designers make pedagogically sound decisions regarding what delivery modes best target their learning outcomes. The CDDM guides users through a series of micro- and macro-level delivery mode decisions. Implications are discussed for when and how this model can best be used to determine a course's mode of delivery.

Keywords: course delivery mode, learning outcomes, course design, decision model

Introduction, Background, and Research Design

Recent developments in instructional technology provide teachers with a wide variety of new modes of course delivery, such as web assisted, blended, hybrid, asynchronous and synchronous online, and accelerated. However, while delivery mode options have evolved, guidance regarding how best to use these modes lags behind. This paper encourages teachers and designers to take a systematic approach to making decisions about how a course should be delivered. The primary objective is to introduce a decision-making guide intended to help teachers and designers make pedagogically sound decisions regarding what mode of delivery best targets their learning outcomes.

For many teachers in higher education, the current context of course delivery mode decisions appears to be that "no input is requested or taken," and no research could be found that has addressed the question of optimizing delivery mode decisions. It appears that decisions about whether to teach a course as face-to-face (F2F), hybrid, or online are often externally imposed onto teachers or are driven by non-pedagogical considerations. As [Jenkins \(2013\)](#) notes, the primary parties that drive the online education "locomotive" are not faculty or students, but rather administrators and politicians. Whether the latter parties are more concerned with financial considerations than educational quality is a topic for a different paper (see also [Edmundson, 2012](#)). If and when teachers find that their input is requested or taken with respect to how a course should be delivered, they will need a model for how to make and pedagogically support those delivery mode decisions.

In the past, course delivery mode decisions were simple. Other than F2F delivery, few other options existed. Today there are multiple delivery mode alternatives but few recommendations for choosing among them. As the course development process evolves, delivery mode decisions must be considered and should assume a prominent part of that process.

Adopting a new delivery mode without due consideration regarding the relevant learning outcomes is not good teaching practice. However, some faculty function under the misconception that one delivery mode is just as good as another. As a result, the technologies and tools can overshadow the pedagogy, and faculty may end up with mismatches between mode of delivery and learning outcomes. For example, deciding to offer a course online because the F2F sections are under-enrolled is not a decision based on pedagogical considerations. In addition, if a desired outcome involves learning how to work effectively in a team, a teacher should not use a grouping tool in a learning management system (LMS) that severely restricts the sharing of information or active teamwork. Conversely, teachers may fail to consider alternative delivery mode options that would further enhance student learning and teaching effectiveness. For example, teachers might use the gradebook feature of an LMS but not incorporate tools (such as rubrics or self-assessments) that would benefit specific learning outcomes. Teachers and course designers should, therefore, strive for identifying the optimal alignment of the elements in the curriculum with the available delivery mode options.

Prior to describing the Course Delivery Decision Model (CDDM) in detail: (1) the distinction between course design and course delivery mode is briefly discussed; (2) the primary audiences of the model are described; (3) the existing literature on course- and learning-design practices is briefly reviewed; (4) the nature and importance of learning outcomes for effective course design and delivery is highlighted; and (5) the major delivery methods available to teachers are briefly defined.

Course Design and Course Delivery Mode

Making sound pedagogical decisions requires recognition and acknowledgment of the interdependence between course design and course delivery. Course design is generally considered to refer to the structure of the course (i.e., what content is covered, what activities are included, what assessments are used) in order to achieve a set of learning outcomes (e.g., Fink, 2003; Gagné, Wager, Golas, & Keller, 2005; [Goodyear, 2001](#); [Gustafson & Branch, 2002](#)). Course delivery refers to decisions about how to present the content, activities, and assessments that are designed into the course (e.g., Owen, Aworuba, Fragoso-Diaz, & Ntoko, 2004; [Porto & Aje, 2004](#)). The design process may include a consideration of delivery options, but most approaches are not systematic and strategic in this consideration. The CDDM makes explicit the consideration of delivery mode.

Because it is typically difficult or impossible to change how a course is delivered once it is being taught, the CDDM is best used in the development stage. In order to make the best use of a delivery mode decision model, a course design needs to be at least partially blueprinted or completed. In particular, a teacher or course designer should have clearly articulated learning outcomes as well as a collection of possible content, activities, and assessments that are designed to meet those outcomes. In this paper, the operating assumption is that systematic and strategic attention to the delivery mode decision will complement course design efforts.

The CDDM Targeted Audiences

The primary intended audience for the CDDM includes three groups: (1) experienced educators who could benefit from a fresh perspective in rethinking course delivery to address the learning styles and expectations of 21st-century students; (2) educators new to the profession faced with multiple options for course delivery and wanting to avoid the tendency to "teach as they were taught"; and (3) support

personnel (e.g., course design specialists, learning technologists, faculty mentors) in a position to advise and guide faculty through the decision-making process.

Course and Learning Design Practices

There is an abundance of resources that address curricular and instructional issues pertinent to course and learning design. Best teaching practices emphasize the importance of planning in all areas of course design and delivery (e.g., Fink, 2003; Gagné, 1985; [Koper, 2006](#); [Lockyer, Bennett, Agostinho, & Harper, 2009](#); [MacLean & Scott, 2007](#)), and implementing the use of a model provides a user with a framework or a systematic foundation from which to build a purposeful and useful product.

The major course- and learning-design models emphasize how specific content, activities, and assessments might be developed and potentially delivered. However, these models typically do not bring delivery mode decisions to the forefront, addressing this issue after the course has been designed and entered into the blueprinting stage. It is frequently assumed that a well-designed course can be delivered in many ways and that the overall design is independent of how it can or should be delivered. The delivery mode decision-making model was developed so that it can be utilized with any course- or learning-design model as a systematic consideration of how delivery mode decisions can improve one's course.

The Primacy of Learning Outcomes

Learning objectives are defined as targeted, competency-based statements conveying expected learning outcomes ([Mandernach, 2003](#); [MIT Teaching and Learning Laboratory, n.d.](#)). For simplicity and consistency, outcomes will be used when describing the CDDM. Learning outcomes are not always front and center in the delivery mode decision-making process, what others call an "optimization problem" ([DeSantis, 2012](#)). Fink (2003) clearly links learning outcomes to course activities and assessment as part of a well-integrated course, but he devotes less attention to the critical role of outcomes in deciding how courses should be delivered.

There are very good resources intended to help teachers and course designers with the process of articulating learning outcomes. These guides help faculty to determine what constitutes a well-written learning outcome, to know that their outcomes are clearly or accurately written, and to use general models, templates, and tips on how to write them effectively (e.g., [Clark, 2010](#); [Education Oasis, 2004](#); [Fink, 2005](#); [Mandernach, 2003](#); [MIT Teaching and Learning Laboratory, n.d.](#)). For example, a poorly-written learning outcome for an introductory health education course would be: "By the end of this course, students should increase their knowledge of the course content." The same learning outcome written more clearly would be: "By the end of this course, students will be able to identify and define foundational medical terminology." Well-written learning outcomes include active and measurable verbs and are realistic, specific, clearly stated, and student-centered. Although there are many useful learning outcome resources, an additional question needs to be addressed: How should faculty decide what delivery mode is best aligned with their well-written outcomes in order to maximize student learning?

There are several reasons why learning outcomes should be given primary consideration when making course delivery mode decisions. First, as already established, the content, activities, and assessments of a well-designed course should be driven by the learning outcomes (Bain 2004; Fink, 2003, [2005](#); Wiggins & McTighe, 2005). Second, when one's delivery mode decisions are made independently of the course learning outcomes, the teacher runs the risk of sub-optimal implementation of those outcomes in the final course. Finally, while accreditation agencies note that course learning outcomes are critical in achieving optimal student learning ([Beno, 2004](#); [Council for Higher Education Accreditation, 2010](#); [Ewell, 2001](#)), there is little attention devoted to the fact that learning outcomes are critical to making pedagogically sound course delivery mode decisions.

As the CDDM is described, it will become apparent that the model will not be helpful if one's learning outcomes are poorly written. Outcomes should be assessed independently of each other as decisions are made about how best to deliver them. Learning outcomes that cannot be assessed in this way are probably poorly designed and are likely to be associated with design and delivery mode decisions that not well matched to those outcomes (Bain, 2004; [MIT Teaching and Learning Laboratory, n.d.](#)). Thus, prior to using the CDDM, it is recommended that a designer ensure that the learning outcomes are carefully articulated and well-worded. Using the CDDM allows experienced and inexperienced teachers, faculty developers, and instructional designers to bring learning outcomes from the background to the forefront of course delivery mode decisions.

Major Course Delivery Modes

A logical step in the course delivery mode decision-making process is to have a clear idea of the available options. This increases the chances that the most pedagogically appropriate strategies are implemented in attaining the desired learning outcome. Although there are other variations, the model incorporates the three most popular and common modes of course delivery:

- *The physical classroom:* F2F; a traditional approach; web-based storage of course materials may be included but little or no web-based learning is integrated; usually involves no reduction in the traditional "seat-time" ascribed to courses;
- *A blended or hybrid approach:* A combination of on-ground, traditional teaching/learning modes with varying amounts of online or networked learning activities; typically involves a decrease in the traditional classroom-based "seat-time" for the course; a variant includes "hyflex" or hybrid courses with flexible participation (e.g., [Beatty, 2010](#));
- *Web-based courses:* Online courses with no physical classroom; may be available anytime/anyplace (synchronous or asynchronous).

Experienced designers understand that a wide variety of tools can be used with each of these delivery modes. For example, networked learning ([Goodyear, 2005](#)) can include any of these delivery modes in promoting connectedness among learners. Frequently, the same tools can be used regardless of the course delivery mode. The decisions made about course delivery will be affected by the availability of instructional technology, faculty skills and interests, and degree of support for teachers when using various resources.

The Course Delivery Decision Model

The CDDM guides users through a series of micro- and macro-level decisions as the course's learning outcomes are assessed individually. As will be explained in more detail later, the first step in the model is to make delivery option decisions separately for each domain – content, learning activities, and assessments – of each learning outcome (Level I delivery mode decisions). Once the Level I delivery options for a given learning outcome are determined, users then decide which delivery mode works best overall for each learning outcome (Level II delivery mode decision). Once all outcomes have been assessed, users make the final delivery mode decision for the course (Level III delivery mode decision).

At each level of delivery mode decision-making, designers should keep in mind an over-arching variety of *holistic considerations*. These include the campus's delivery infrastructure (e.g., its learning management system and physical classroom space) and the technological support services that are available for both faculty and students (e.g., training workshops, 24/7 help desk). Another consideration is the receptiveness of one's institutional culture and climate regarding the use of alternative delivery modes and technologies. For example, are faculty members being pushed or pulled into specific course delivery formats? Delivery mode decisions should take into account the characteristics of the student body (e.g., demographics, percentage of nontraditional or commuter students) and whether those characteristics favor a particular delivery mode. It is likely that these kinds of considerations are most influential in determining a final delivery mode decision, and this is why they have been placed at the top of the model. Failure to consider these holistic factors is likely to lead to non-optimal delivery mode decisions.

There are several assumptions that underlie the development and implementation of this model. First, it is assumed that the learning outcomes should be considered individually rather than simultaneously. It is possible that previous Level I decisions about individual learning outcomes could influence subsequent Level I learning outcome decisions (e.g., if two or more learning outcomes are very similar); however, having two or more learning outcomes that are very similar is not an optimal use of learning outcomes. Best practice recommendations for learning outcomes support the notion that each learning outcome should address a separate and unique aspect of the course goals (e.g., Kennedy, Hyland, & Ryan, 2007).

Second, the components of a course (i.e., content, activities, and assessment and feedback) are recommended to be considered separately rather than together. This assumption is consistent with the recommendations of most popular course and learning design models (e.g., Fink, 2003; [Goodyear, 2005](#); Laurillard, 2012) that designers initially devote attention to each component separately and independently, even if they integrate those components at a later time.

Third, delivery mode decisions made for individual learning outcomes are not assumed to influence the decisions for other outcomes. If learning outcomes are given primacy, then deciding that a given learning outcome should be delivered online should not, in itself, influence the decisions about other learning outcomes. The model is constructed in a way that the Level III decision is where the Level II decisions are brought together. In essence, the Level III decision is where different delivery conclusions about individual learning outcomes are addressed. This approach provides the "purest" delivery assessment of each learning outcome, such that each is considered as free-standing.

A fourth assumption is that the model is based on only three major delivery mode options. As noted earlier, there are multiple variations within and across these options. However, a fundamental delivery mode distinction is whether the course component exists or occurs in person or online. The model addresses the possibilities for delivery mode variations by giving the user the option of selecting "any preference" when one of the model's options is not appropriate or required.

At this point, the model can be described in detail. Figure 1 presents an overview of the CDDM. As the figure indicates, there are three levels of delivery mode decision-making in the model. As was briefly mentioned earlier, model users assess each learning outcome through a series of micro- and macro-level delivery mode decisions. The micro-level decisions pertain to the course's learning outcomes and the associated course elements that are used to meet those outcomes. The macro-level decision refers to one's final delivery determination for the entire course.

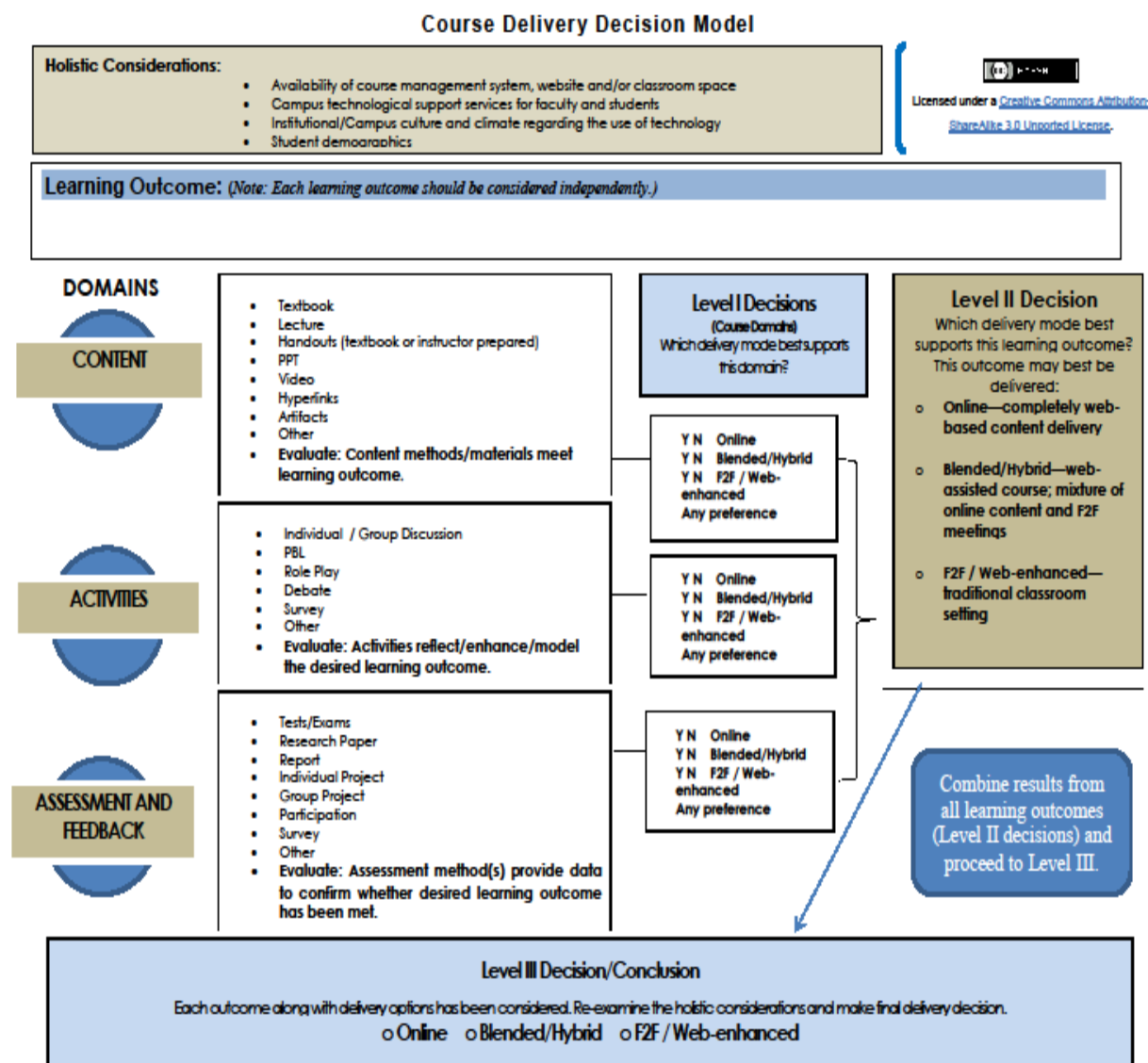


Figure 1. Course Delivery Decision Model

- *Level I delivery mode decision-making.* The first types of delivery mode decisions that need to be made are those connected to the implementation and evaluation of the domains for each individual learning outcome. Within each of these domains, there are multiple modes and techniques to meet the learning outcome (see Figure 1). Being mindful of holistic considerations and reflecting best practices for course and learning design, which mode of delivery works best for the content, the activities, and the assessment procedures? Additionally, there are short-term (within specific content sections) and long-term (by the end of the course) perspectives on meeting a learning outcome. When making Level I decisions, both perspectives should be taken into account.
- *Level II delivery mode decision-making.* Once the three Level I delivery mode decisions are made, designers can proceed to the Level II decision. At this level, the question to be answered is which delivery format is most appropriate, given the holistic considerations and given the content, activities, and assessment and feedback approaches chosen to address that learning outcome. According to the model, this decision should be a single one that assesses the relative advantages and disadvantages of the delivery mode decisions made in Level I. For example, if all three Level I decisions point to the same delivery format (e.g., F2F), then the Level II decision for this learning outcome is simple and straightforward. However, if the Level I decisions result in different delivery formats or any preference, then designers must decide which format and course element should be given the highest priority for this learning outcome.
- *Level III delivery mode decision-making.* Once all learning outcomes have been assessed through the Level I and II decisions, the final delivery mode decision for the whole course can be made. In the simplest case, the Level II decisions are identical regarding the ideal delivery format. Strictly speaking, every Level II learning outcome delivery mode decision does not have to be identical. If the majority of outcomes (e.g., 5 out of 6 or 8 out of 10) can be delivered in the same way, then the only issue is to decide whether any outcomes that were chosen to be delivered in an alternate format can be changed with minimal impact on student outcomes. In other cases, where multiple Level II delivery options are selected, designers will need to determine if some learning outcomes are more crucial or important than others.

Having proceeded through the model in the recommended sequence, there are several results for designers. First, they will have approached the delivery mode decision in a systematic and strategic manner. Second, they will have come to a delivery mode decision that presumably maximizes the effectiveness of the course learning outcomes by using those to dictate the delivery format. Third, at each level of decision-making, they will have considered the relative advantages of multiple delivery options. Fourth, if a course delivery mode decision has been externally-imposed, designers can now present their results from using the model to confirm or challenge the wisdom of that decision. Lastly, they will have a record of their delivery mode decision-making process that can be used when the course is offered by a different teacher, a course's learning outcomes change, or the course is in need of a redesign.

An Example Using the CDDM

This section provides an illustrative example of the implementation of the CDDM, using a hypothetical introductory health education course (see Table 1). The example uses five learning outcomes likely to be written for such a course. For the Level 1 decisions, the teacher or designer must select the best delivery option for each design component (content, activities, and assessment/feedback) associated with that learning outcome. Table 1 presents example methodologies chosen and associated delivery mode decisions made for each learning outcome.

Once the Level I decisions have been made for a single learning outcome, the teacher or designer moves to Level II decision-making. For this step, the Level I decisions are analyzed and the best delivery mode for that outcome is determined. In this example, the teacher or designer chose online delivery as the best choice to meet the first learning outcome, because there are many kinds of online content, activities, and assessments to identify and define foundational medical terminology that are preferable to using F2F class time for this purpose. For the second outcome, the teacher's or designer's decision included both online and F2F modes. In particular, the content associated with learning to apply theoretical frameworks to personal health habits could best be delivered online; however, application activities and assessments were deemed to be more effectively delivered in person. For this learning outcome, a blended delivery mode might be most preferred or effective. For the remaining three learning

outcomes, none of the Level I decisions fell exclusively in the F2F mode. Thus, the Level II decisions for these outcomes suggest either a blended/hybrid and an online delivery mode.

Table 1. *Example Level I decisions for five learning outcomes in an introductory health education course*

	Methodologies Chosen	Delivery Mode Decision Made
<i>Outcome 1: Students in this course will identify and define foundational medical terminology</i>		
Content	Textbook readings, glossaries	Online
Activities	Flashcards, definition games	Online
Assessment/feedback	Self-assessments, quizzes, definition sheets	Online
<i>Outcome 2: Apply theoretical frameworks to the development of personal health habits</i>		
Content	Textbook readings, lecture to compare and contrast theories	Blended/hybrid
Activities	Discussions	F2F
Assessment/feedback	Essay questions	F2F; in-class tests
<i>Outcome 3: Conduct a personal health habit assessment on themselves or another person</i>		
Content	Textbook readings, discussions to identify what constitutes a personal health habit, how it is acquired and perpetuated	Blended/hybrid
Activities	Frequency/duration log or check list keeping, discussions, journaling	Online
Assessment/feedback	Essays	Online document submissions
<i>Outcome 4: Identify and compare the effects of external factors on personal health habits</i>		
Content	Textbook readings, discussions to identify what external factors are and what effects they may have	Blended/hybrid
Activities	Personal health habit self-inventories, discussions, journaling	Online
Assessment/feedback	Essays	Online document submissions
<i>Outcome 5: Demonstrate one significant behavioral change pertaining to a personal health habit</i>		
Content	Textbook readings, supplemental readings (journals/articles), discussion, video presentations depicting individuals who have made positive health-related behavioral changes, guest speakers	Blended/hybrid
Activities	Discussion, journaling, video or picture diary (log)	Online
Assessment/feedback	Presentation with reflection paper highlighting concepts and theories culminating in the behavioral change/impact on health	Blended/hybrid

Finally, the teacher or designer is ready to make the Level III decision. For this decision, the Level II decisions for each learning outcome are analyzed and the best overall delivery mode for the course is determined. This decision must be made in light of the holistic considerations and any differences in the weight (or value) of each outcome. At this point, the teacher or designer – having considered the institutional culture and the resources available – would make the final course delivery mode decision. In this example, one might decide that a blended delivery mode would be most beneficial, once again depending on holistic considerations such as what is more likely to be desired or approved by the institution. Whether a blended delivery mode is favored over an online delivery mode will also hinge upon the teacher's or designer's judgments about how essential it is that certain course components be delivered F2F.

Conclusion and Recommendations

This paper began with the observation that while the current context of course delivery mode decision-making may typically exclude faculty, this will not always be the case. Use of the CDDM can be a valuable tool for faculty to consider pedagogically sound delivery mode decisions during the course or

learning design process. The model forces course delivery mode decisions to be driven by course learning outcomes. In addition, it encourages teachers and developers to be open to new modes, maximize learning outcomes, and increase their awareness of different delivery options. This model helps educators to be more cognizant of what and how they are teaching and has the potential to refresh their attitudes about content.

There are multiple questions associated with the use of this model. For example, compared to traditional decision-making about course delivery, will making systematic and strategic course delivery mode decisions have a positive impact on student learning, student evaluations, and faculty satisfaction? Is a particular mode of delivery most frequently the outcome of using the model? Does the model prove useful as an evaluative tool to determine the wisdom or validity of delivery mode decisions that have been externally imposed or already implemented? Can it be helpful to designers who are planning a redesign of an existing course? If the model proves to be popular, all of these questions can be addressed once sufficient numbers of faculty and designers have applied the model and provided evaluative data about it.

When a course is being developed, the decision of the optimal delivery mode for a given learning outcome is best made by the teacher. Thus, when designers are in the role of primary developers, they need to collaborate with the teachers to ensure that specific delivery mode decisions are best for each learning outcome. After a course has been offered, teachers can use the model to assess the effectiveness of the chosen delivery modes in helping to meet each learning outcome. It would also be good practice to obtain delivery-decision feedback from students who are veterans of the course. This feedback would be useful for the designer or teacher if they utilize the model prior to teaching the course again.

Several of the assumptions made in designing this CDDM might be challenged. These assumptions include that the learning outcomes should be considered individually rather than simultaneously, that the domains of a course (i.e., content, activities, and assessment and feedback) should be considered separately rather than together, that delivery mode decisions made for individual learning outcomes should not influence the decisions for other outcomes, and that there are only three major delivery options. A closer examination of the validity or necessity of these assumptions could help to improve the model. For example, deciding about delivery mode decisions for individual learning outcomes might miss the ways that these outcomes fit together into the most effective learning environments. This is a question that can be addressed through empirical research comparing courses that have been designed with and without using the CDDM.

It is not an assumption of the CDDM that some learning outcomes cannot or should not be delivered via certain modes. There may be some courses or learning outcomes where this is true. However, according to the model, the course designer/developer needs to determine which delivery mode will work best for each learning outcome. And the best way to make this determination is to make a decision for each component of a learning outcome and then make a decision for the learning outcome as a whole. In actuality, it is likely that any learning outcome can be taught in any delivery mode. The challenge is to be creative in figuring out how to do it well with one particular mode.

In order to test the usefulness and effectiveness of the CDDM, the authors intend to first examine the model with faculty who come to teaching and learning centers for instructional design and course redesign consultation. Participants in teaching certificate programs and faculty learning communities will also be targeted during this pilot phase. The authors have created an evaluation survey for developers and faculty members who have used the model (http://www.surveymonkey.com/s/CDDM_Survey). Data from this survey will help to assess the validity of the assumptions and evaluate the usefulness of the model. Once the pilot testing of the model is complete and initial evaluation data have been collected, the model will be recommended as a tool for instructional design specialists as well as for departmental, college and university curriculum committees.

One potential criticism of the model is that it does not address what kinds of learning outcomes are best served by specific delivery modes. This is the emphasis of the work of Laurillard (2012), who advocates the identification and sharing of pedagogical design patterns or templates that can be shared across courses and disciplines. While it may be possible to make delivery recommendations about how certain outcomes can best be met (e.g., Angelo & Cross, 1993; [Clark, 2010](#); [Education Oasis, 2004](#); [Fink, 2005](#); [Mandernach, 2003](#)), that is not the intent of the CDDM model. Individual course designers will always need to match the delivery mode with the learning outcomes of each course. This matching process

must, by necessity, be based on the designer's or teacher's experiences, knowledge, preferences, comfort levels, and specific discipline associated with that course as well as the holistic considerations that overlay these other factors.

If the model proves to be unnecessarily complicated, removing some of these assumptions might not harm the overall benefits of using it. If other modes of delivery emerge, they can easily be incorporated into the model. There might also be some more systematic ways to incorporate the holistic considerations into the operation of the model. Having a delivery mode decision externally imposed may not be an optimal approach, if the delivery mode limits or alters the effective implementation of the course learning outcomes. Well-designed courses are possible when the delivery mode decisions have been made at the start. However, there is greater value in allowing the learning outcomes to dictate the delivery mode than in forcing them into a predetermined delivery mode.

As noted throughout, the CDDM differs from the approaches of course design models. In particular, it emphasizes deciding how the overall course should be best delivered, rather than how specific lessons, activities, or assessments can best be developed or delivered. It also brings delivery mode decision-making to the forefront of the design process. Despite these differences, taking account of how learning outcomes can best be delivered is a crucial component of effective course design. Design models should not neglect the question of overall course delivery. Instead they need to include this issue and integrate it into the course design process.

In summary, the CDDM should prove useful to new and experienced educators as well as to the support personnel who guide faculty through the course delivery mode decision-making process. The CDDM offers a framework for how this decision can be made systematically and strategically. Two major points about the model need to be made in conclusion. First, it appears that many course delivery mode decisions have been externally-imposed or made with very minimal consideration of the available options or the implications of those decisions. Second, the lack of a systematic and strategic approach to deciding how to deliver a course is likely to be limiting the overall effectiveness of course and learning design and, ultimately, of student learning. The CDDM provides a useful starting point to counter each of these limitations.

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