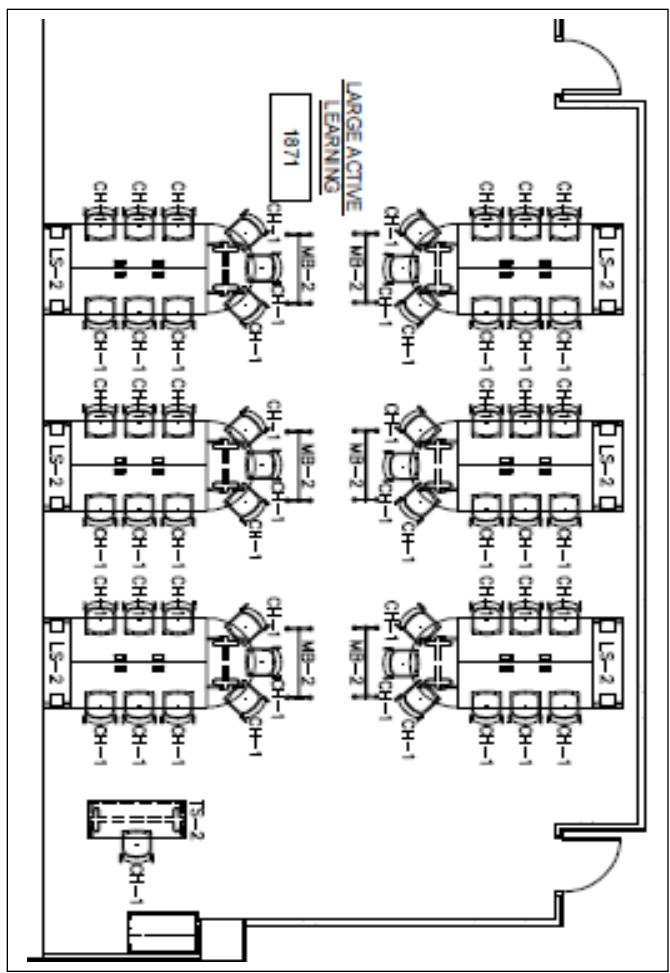




UWM Active Learning Classrooms Instructor Guide

UWM Research Findings and Instructional Recommendations



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Dear UWM Active Learning Classroom Faculty and Instructors,

The UWM Active Learning Classroom Guide is designed to support new or returning active learning classroom (ALC) instructors in the successful design and implementation of ALC courses in order to advance student learning. Your investment in teaching in these learning spaces is considerable and valued.

The ALCs with grouped tables and chairs, whiteboards, and technology that may include wall monitors, document cameras, and laptops, are well regarded by our students and instructors. However, teaching well and achieving the intended learning entails the constellation of many course, technology, and space design decisions in order to enhance student learning. We know that a well-designed space and great technology alone cannot address the concerns we share regarding student learning nor singularly sustain engagement. In order to maximize the space and available technology, faculty, staff and teaching assistants who teach in the ALCs often redesign prior courses in order to leverage these features. Some academic programs have invested considerable time in changing entire curricula in order to infuse active learning throughout a program or sequence of courses and innovatively utilize these spaces. When observing the ALCs in action, I have been impressed every time! We'd like to help share what works!

Over the first two ALC semesters (2015), the UWM ALC Assessment Team collected data from UWM ALC students and instructors. The recommendations provided in this Guide are based on the data collected through the very helpful participation of instructors and students in surveys, interviews, and class observations. We will continue to collect data for comparison and invite your participation near the semester end. We hope you will support ongoing ALC inquiry.

CETL hopes to ensure that you are supported in your efforts to make student learning successful! I hope that after browsing through this Guide, you will seek out further assistance from CETL workshops, consultations, or resources.

Sincerely,

Connie

Connie M. Schroeder, Ph.D.

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ALC Guide and Common Questions

The ALC Guide provides you with tools and excerpts of data collected from the UWM ALC instructor and student data collected in order to address the most common questions that frequently arise. Many of the questions listed below address concerns shared by nearly all ALC faculty and instructors. Crucial questions listed below impact student success, retention, and achievement. We have divided this Guide into five sections based on these commonly voiced questions. Each section concludes with practical recommendations for using this data.

- ❖ **1. ALC Student Identity and Behavior Factors and Impact**
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- ❖ **1. ALC Student Identity and Behavior Factors and Impact**

- *How do I get students to attend class?*
- *How do I get students to pay attention when I need to lecture?*
- *How do I get students excited about the course and learning actively?*

- ❖ **2. ALC Social Connection Factors and Impact**

- *How do I get students to learn from each other collaboratively?*
- *How do I interact with students in this type of learning environment?*

- ❖ **3. ALC Course Design Features and Impact**

- *What expectations should I communicate to students?*
- *What kind of learning outcomes do instructors include in their ALC courses?*
- *How do I get students to perform higher level thinking skills?*
- *How do I make the course relevant to them?*
- *How do I design activities in class that are worth it?*
- *What kinds of activities are worth doing? How much time should we spend?*
- *How do I get students to do the work outside of class in preparation for class?*
- *How do I get students to contribute to or stay engaged in class discussions?*
- *How do I maintain interest during a longer, two or three hour class?*
- *How do I get students to stay engaged in their groups?*
- *How do I assess students for group work the in class activities?*
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- ❖ **4. ALC Technology Factors and Impact**

- *What technology is most effective or valued by students in the ALCs?*

- ❖ **5. ALC Space Features and Impact**

- *How do the design features of the ALCs impact student learning?*

UWM Active Learning Classrooms Overview

Whether you are new or teaching again in the UWM Active Learning Classrooms (ALCs), the ALC Guide provides information that will help you and your students have a successful semester. This Guide focuses only on those ALCs that are “general assignment classrooms” – those classrooms that are available to everyone for scheduling UWM courses. Other buildings and programs with modified classrooms were not included in the data collected.

- If every ALC in the Northwest Quadrant was filled to its capacity with seventy-five minute class sessions, approximately 5,880 students would be impacted.
- The ALCs courses are filled to varying levels due to department caps and enrollment. Occasionally, a class period is not requested. The Registrar fills ALCs with courses that have not requested an ALC due to space limitations at UWM.
- Although the NWQ ALCs opened in spring of 2015, the Kenwood Interdisciplinary Research Center (KIRC) opened an ALC (KEN 1150) in fall of 2015 and seats 72 students. The College of Nursing opened CUN 108 with 107 seats. These ALC locations are outlined below:

General Assignment Classroom ALCS

<http://uwm.edu/registrar/faculty-staff/schedule-of-classes-resources/general-assignment-classrooms/>

Northwest Quadrant			Kirkwood Interdisciplinary Research Center		
<u>Seating</u>			<u>Seating</u>		
2	24 seats	NWQ 1975; 1961	1	72 seats	KEN 1150
2	36 seats	NWQ 1921; 1935			
1	54 seats	NWQ 1871			
<u>Technology</u>			<u>Technology</u>		
Laptops					
Monitors					
Microphones					
Whiteboards					
Central Screen					
Instructor Console					
Document Camera					
Cunningham Hall			Enderis Hall		
<u>Seating</u>			<u>Seating</u>		
1	107 seats	CUN 108	1	25 seats	END 127
<u>Technology (Contact Kim Litwack)</u>			<u>Technology (Contact Les Johnson)</u>		

UWM ALC Assessment

The student and instructor data reported in this Guide was gathered during the first two ALC semesters by the UWM ALC Assessment Team with Connie Schroeder as the study PI. The primary data was collected from instructor and student pre- and post-semester surveys that often asked multiple questions regarding a particular issue. In addition, students and instructors volunteered to serve as in depth case study participants and data was collected through recorded interviews, class observations, and content analysis of course syllabi, assignments, and rubrics. Only portions of that data were selected for this Guide.

Correlation analysis of the anonymous survey data examined the relationships between a wide range of space, technology, and course design factors and student thinking skills (see Appendix A, B & C). The case interviews were compared to one another to identify patterns in perceptions and use of technology, space, and course features and their impact on learning. The instructor case data was compared with the overall instructor aggregate survey data. Common patterns and differences were reported. Several ALC instructors and courses were observed in order to compare frequency and time spent in instructor and teaching and learning behaviors. This data was recorded on a grid and compared with the self-reported data from the surveys and interviews. The observations provided an additional source of data on the activities and pedagogy within the ALC courses.

A concurrent ALC study was performed through a grant obtained by Connie Schroeder from the Professional and Organizational Development Network (POD), an international organization that supports the development of Centers of Teaching and Learning and educational developers. This grant focused on the factors that enhanced critical thinking in ALCs. Portions of this data are reported in the Course Design section.

The data was presented at UWM and the UW System OPID Conference in spring, 2016 and at the POD in Louisville, Kentucky in fall 2016. For information on the overall ALC data collected or reported in this Guide, please contact Connie Schroeder at CETL, connies@uwm.edu or 229-5764. Additional nation-wide literature on active learning classrooms is available to the ALC Users D2L site. To join this ongoing D2L site, please contact CETL. If you would like to work on the ALC Assessment team, contact us:

Connie Schroeder, PI

UWM ALC Assessment Team Members:

John Berges, Biology
Anja Blecking, Chemistry
Johanna Dvorak, Emeritus Academic Affairs
Debra Siebert, English
Kelly Kohlmetz, Mathematics

1. ALC Student Identity, Behavior Factors, and Impact

- *How do I get students to attend class?*
- *How do I get students to pay attention when I do need to lecture?*
- *How do I get students excited about the course and learning?*

In surveys and interviews, students and instructors were asked how students typically act in the ALC classes, what kind of learner they are, and what type of learning activities they prefer. Affective factors were examined as well, including asking students to gauge their level of engagement and excitement. During the initial semesters in the UWM ALCs, students were not aware before attending that their course would be in an ALC.

Instructor Perspectives on Student Behaviors and Attributes

Instructors in ALCs compared their ALC students' behaviors to students in traditional courses. The following percentage of ALC instructors *agreed* or *strongly agreed* with the following statements:

In comparison with "traditional classrooms,"

- | | |
|---|-----|
| ▪ This course engaged students in the learning process. | 94% |
| ▪ ALC students were engaged in the learning process. | 86% |
| ▪ This course increased students' excitement to learn. | 75% |
| ▪ ALC students were more engaged and attended class more regularly. | 60% |
| ▪ There were fewer "passive learners." | 43% |

Student Perspectives on their Behaviors and Attributes

Some of the preferences and attributes reported by students were interesting. For example, the follow percentage of students *agreed* or *strongly agreed* with the following statements.

- | | |
|--|------|
| ▪ I like being an active learner. | 100% |
| ▪ I attended class regularly. | 100% |
| ▪ I regularly am engaged in my face-to-face classes. | 100% |
| ▪ I completed the assignments and readings before class. | 100% |
| ▪ I like thinking critically. | 93% |
| ▪ I know what it means to think critically. | 92% |
| ▪ I like working in groups. | 79% |
| ▪ I was engaged in the ACL more than in a traditional class. | 43% |

The factor with the strongest correlation to the higher learning skill perceptions was **student excitement to learn** (see Appendix D). Given that the study focused on the ALC space, technology and course design, it is critical that the role of **student excitement to learn** is recognized when teaching in the ALCs. Further correlation analysis provided factors most related to **student excitement to learn** (see Appendix D). Three of the factors most closely associated with student excitement to learn were technology related:

- Use of technology
- Student Focus enable through use of technology
- Effective use of technology by instructor

Student excitement to learn was also strongly correlated with:

- The use of critical thinking assignments
- Scaffolding assignments (breaking them into small steps; developing skills)
- Integration of readings with in class activities
- Development of transferrable skills

➤ *Student Identity and Behavior Recommendations*

Student excitement to learn -- the factor most highly correlated with the higher learning skills, can be leveraged by being intentional about the other course design features that impact our UWM students' excitement to learn. Multiple questions collected instructor and student perceptions of student engagement, student attendance, excitement, learning preferences, preparation for class.

Although comparisons to other or traditional, non-ALC courses fared positively, the distinction between traditional and ALC courses may increase over time as both instructors and students become familiar with ALC courses and pedagogical, assessment, and technology strategies.

Instructors expressed surprise that space and pedagogy alone did not eliminate personal versus academic use of students' mobile devices in class. In the interviews, instructors noted that students were able to shift their attention to their mobile devices during group exercises or class discussions. Engaging students is a course design challenge and involves a constellation of design features. ALC instructors are urged to include a policy in their syllabus that is reviewed the first day of class as well as allot significant portion of overall course points to in class and production of concrete evidence of student learning exercises. For more insight into course design features for engagement, you are encouraged to participate in CETL's *Active Learning: Experiential Learning* and the *Small Group Learning* workshop each semester or summer.

Instructors are encouraged to utilize the complete array of course design modifications that our ALCs instructors used frequently and increase **student excitement to learn**, including:

- ❑ Frequent use of in class activities.
- ❑ Integration of low stakes assessments (with point value).
- ❑ Student accountability weekly in preparation for class.
- ❑ Transparency and explanation of course learning outcomes.
- ❑ Modification of course grading schemes.
- ❑ Effective instructor use of technology and integration of student technology use.
- ❑ Make transparent how in class activities and assignments develop transferrable skills. Provide real world contexts, cases, opportunities for students to practice and get feedback.

- ☐ Anticipate student use of mobile devices and communicate a policy in the syllabus and first day of class.

2. ALC Social Connection Factors and Impact

- *How do I get students to learn from each other collaboratively?*
- *How do I interact with students in this type of learning environment?*
- *Is in class interaction that important – how will it not deteriorate into social exchange?*
- *How do I get students to learn from each other collaboratively?*
- *How do I interact with students in this type of learning environment?*

The in-class interaction is a key feature of student learning and success in the ALCs. The furniture, technology, and seating in ALCs all contribute to effective use of collaborative learning or group learning and interaction between students and the instructor (as well as TAs, Supplemental Instructors, or Mentors). Not surprisingly, the ALC students reported *very high* connections with both their peers and the instructors, and being comfortable working with different cultural backgrounds. The frequency of instructor interaction was reported as *at least once a week*, indicating a consistent feature of the ALC courses. The impact of social interaction on learning has been highly recognized as playing a key role in student persistence, satisfaction, sense of belonging, and student success (Astin, 1984). Very strongly relationships were evident between the students’ perceptions of their achievement of the higher thinking skills, excitement to learn, and connections between peers and the instructor.

Instructor Perspectives on ALC Social Connection Factors and Impact

- Students developed connections with students. 94%
- Instructor interacted with groups. 93%
- Students developed student-student connections. 69%

Moreover, when instructors compared ALC with “traditional course” they have taught

- Instructor interacted with groups. 93%
- Instructor(s) felt connected with their students. 70%
- The class seemed like a learning community. 70%
- Instructor interacted with students. 60%

Student Perspectives on ALC Social Connection Factors and Impact

The following percentages of students *agreed* or *strongly agreed* that the ALC helped them to:

- Grow comfortable working with people from other cultures. 86%
- Develop connections with my instructors. 82%
- Develop connections with classmates. 75%

Additionally, students reported that the course instructor interacted with individual students at least once a week during in class activities. 89%

➤ *Social Connection Recommendations*

Student and instructor surveys reported that very high levels of connections developed between instructors and students, and between students in the ALCs. In addition, connections with the instructor and connections with other students were two of the highest factors correlated with **student excitement to learn** (see Appendix D). This impact is particularly important as interaction with peers and relationships with instructors have long been viewed as key factors in student persistence and academic success (Astin, 1984; Milem & Berger, 1997; Pascarella & Terenzino, 1991; Tinto, 1975). How to utilize the social interactions to advance student learning is addressed in the next sections on Course Design.

For further assistance in fostering effective social connections, ALC instructors are encouraged to participate in the CETL Active Learning, Small Group Learning workshops, individual consultations, and class observations.



3. ALC Course Design Features and Impact

- *What expectations should I communicate to students?*
- *What kinds of learning outcomes can students achieve in the ALCs?*

Several key design dimensions of ALC courses surfaced across the multiple sources of data collected. This section on Course Design is subdivided into the dimensions of course expectations, course learning outcomes, pedagogy, assignments, in class activities, and assessment and evaluation. Each dimension of course design highlights specific questions and is followed with practical recommendations.

Course Design: Clear Expectations

Providing clear expectations regarding learning is an important and often underestimated aspect of student success for any course. ALC courses often introduce many new expectations regarding the new learning space with unfamiliar student and instructor role changes, grading and class preparation, unfamiliar group and active learning strategies, in and out of class assignments and peer interaction, and overall greater accountability and responsibility for learning. The ALC instructors reported a pattern of being clear and transparent with students regarding course learning outcomes, expectations, and definitions by discussing these issues in class. The ALC courses can differ significantly from other modes of instruction, and some instructors reported that students resisted and questioned the expectation of greater responsibility for learning that was embedded in group, pair, or peer review learning activities.

Instructor Perceptions of Expectations

Instructors reported that they explained the following expectations and concepts:

- | | |
|---|-----|
| ▪ The course learning outcomes on the syllabus. | 93% |
| ▪ Expectations of an ALC course. | 93% |
| ▪ Expectations of students as learners in an ALC. | 86% |
| ▪ Defined what critical thinking is. | 79% |

Student Perceptions of Expectations

The survey data reported rather strong differences in perceptions between students and instructors regarding how well expectations were provided. A surprisingly lower percentage of students reported that their instructors made clear what the ALC expectations were or defined what critical thinking was. However, students indicated that the instructors did review the course learning outcomes on the syllabus. They *agreed* or *strongly agreed* that the instructor:

- | | |
|--|-----|
| ▪ Reviewed the course learning outcomes on the syllabus. | 83% |
| ▪ Explained the expectations of an active learning course. | 71% |
| ▪ Explained what critical thinking is. | 68% |
| ▪ Explained what is expected as a learner in an ALC. | 62% |

Course Design: Course Learning Outcomes

- *What kind of learning outcomes do instructors include in their ALC courses?*
- *How do I get students to perform higher level thinking skills?*

Investigation into the level of student learning in the UWM ALCs began by asking students and instructors what the course learning outcomes were and whether or not they believed they were achieved. The particular course learning outcome of critical thinking is discussed following a general overview of perspectives on course learning outcomes. This data is followed by a review of the pedagogy of in class active learning, assignments, and the evaluation and assessment practices in the ALCS.

Instructor Perspectives on Course Learning Outcomes

Instructors were asked whether or not students demonstrated the following abilities by the end the active learning course. The learning outcomes in **bold** indicate the definitional framework of critical thinking by Blue, Taylor, Yarrison-Rice, (2008) that framed the portion of the study on critical thinking and guided the design of the data collection instruments. The instructor perceptions of student achievement varied widely across the spectrum of learning outcomes and critical thinking skills investigated.

Instructors *Agreed or Strongly Agreed* that students demonstrated or achieved the ability to:

	<u>Agreed or Strongly Agreed</u>
▪ Confidence in analyzing.	94%
▪ Assess the soundness of their conclusions.	86%
▪ Identify and summarize a problem/question or issue.	86%
▪ Locate and critically evaluate information.	81%
▪ Examine how others gather and interpret data and assess the soundness of their conclusions.	81%
▪ Provide additional data or evidence related to the problem/issue/question.	71%
▪ Create or generate new ideas, ways of understanding.	64%
▪ Make connections between theories and practice.	64%
▪ Identify and consider other perspectives and positions that are important to the analysis of the problem/question/issue.	60%
▪ Identify and assess key assumptions for the problem/question/issue.	60%
▪ Identify and assess the quality of supporting data or evidence.	60%
▪ Identify and consider the influence of context related to the problem/question/issue.	50%
▪ Identify and summarize their own perspective and position of problem/question/issue.	50%
▪ Identify and assess conclusions, implications and consequences related to the problem/question/issue.	50%

Instructor Perspectives on Required Demonstration of Critical Thinking Learning Outcomes

Instructors were asked which learning outcomes students were required to demonstrate. Instructors did not widely require demonstration of the critical thinking skills identified by Blue, Taylor, Yarrison and Rice (2008) although only half of the ALC instructors reported that they taught students what critical thinking means (43% yes; 36% unsure). Additionally, there was evidence of limited or inconsistent alignment between CLOs and assignments that required demonstration of critical thinking. Only the *ability to provide evidence* and *identify and summarize a problem* were frequently selected as highly demonstrated critical thinking skills.

- Required students to demonstrate the ability to identify and summarize a problem/question/issue. **86%**
- Required students to demonstrate the ability to provide additional data or evidence related to the problem/question/issue. **71%**
- Required students to demonstrate the ability to identify and assess conclusions, implications, and consequences related to the problem/question/issue. 64%
- Required students to demonstrate the ability to make connections between theories and practice related to the problem/question/issue. 64%
- Required students to demonstrate the ability to identify and assess key assumptions for the problem/question/issue. 64%
- Required students to demonstrate the ability to generate new ideas, products, or ways of thinking related to the problem/question/issue. 57%
- Required students to demonstrate the ability to identify and consider the influence of context related to the problem/question/issue. 57%
- Required students to demonstrate the ability to identify and present their own perspective and position of a problem/question/issue. 43%
- Required students to demonstrate the ability to identify and assess the quality of supporting data or evidence. 43%

Student Perspectives on Critical Thinking Skills

More students reported achieving the following critical thinking abilities for all but one skill. Students reported that they *agreed or strongly agreed* that the ALC increased their ability to:

- | | <u>Student</u> | <u>Instructor</u> |
|--|----------------|-------------------|
|--|----------------|-------------------|

- question/issue. 68% (-11%)
- Identify and consider the influence of context related to the problem/question/issue. 67% (-17%)

➤ Course Design: Course Learning Outcome and Expectation Recommendations

Students unfamiliar with the rationale for active learning can misunderstand the purpose of courses that focus on their active engagement and higher level thinking in class. At times, student resist “learning from their peers” or complain that the instructor “didn’t teach” if group work replaces instructor lectures. The **CETL workshops** explore strategies to evoke discussion of expectations and the value of active learning with students in ALCs beginning on the first day of class. Instructors often provide a rationale in the syllabus and explanation of expectations.

CETL workshops offer strategies for helping students understand their role and that of the instructor in an ALC, particularly for the first day and week of ALC classes. Consultations, workshops, and online resources are available to provide ALC instructors with exercises for demonstrating active learning the **first day of class** and go beyond reviewing the syllabus.

The CELT Course Design Institute as well as the **Small Group Learning Workshop** emphasize the critical importance of writing clear outcomes that emphasize the level of learning expected and aligning all in and out of class assignments and activities with the course learning outcomes. In addition, write clear and specific outcomes for *each class session* that incrementally help students achieve the larger outcomes and help you design in class exercises.

Course Design: Pedagogy

- ❓ *How do I make the course relevant to them?*
- ❓ *How do I design activities in class that are worth it?*
- ❓ *What kinds of activities are worth doing?*
- ❓ *How do I get students to contribute to or stay engaged in class discussions?*
- ❓ *How do I maintain interest during a longer, two or three hour class?*
- ❓ *How do I get students to stay engaged in their groups?*

Engagement, relevance, and value are highly desired in all classes and particularly in ALCs. At times, very good pedagogical ideas “flop” or are less effective and instructors can be anxious about giving up lecturing or “control” of the class if it is not effective. The following data points indicate how students and instructors perceived the pedagogical strategies in the ALCs.

Instructor Perspectives on Course Design and Pedagogy

Several common ALC pedagogical strategies were identified from the survey data and were given very high percentages of agreement among all of the ALC instructors particularly the high use of small groups and brief, break out groups. The use of these groups occurred more than in their traditional classes and usually took place more than once per class session. Additionally, in class discussion was a frequently used pedagogical strategy.

- In class discussion 93%
- Instructor interacted with groups 93%
- Group sizes: 2-3; 4-6; (met once to twice/class session) 1x/cl-2x/class 86%; 30%
- Breakout Groups: Occurred more than in traditional classes 64%

Student Perspectives on Course Design and Pedagogy

The students recognized several predominant pedagogical features of the ALC courses. The high frequency use of active learning required them to:

- ☐ Integrate previously assigned reading or preparation into in-class activities. 85%
- ☐ Explain course ideas or concepts to other students at least once a week. 72%

Students highly rated the impact of interaction with their peers on their learning:

- Learning in groups increased my learning. 78%
- Interacting with other students increased my learning. 74%
- Learning in groups increased my critical thinking skills. 65%
- Interacting with other students increased my critical thinking skills. 62%

When students compared their other classes to ALCs, *students* reported the following distinctions:

- Their ALC used longer-term team-based group activities more than other classes. 71%
- Their ALC used brief, temporary group activities in-class more than other classes. 64%
- Their ALC students helped each other learn more than other classes. 64%

The pedagogical strategies and practices used in the course entailed face-to-face, out of class, or online activities at the level of individual, pair, groups, or whole class learning experiences. Instructors in ALCs provided occasional lectures as well as had student facilitated class discussions, guest speakers, and digital media sourced content.

Observation of ALC In-class activities

- ☐ *What kinds of activities are worth doing?*
- ☐ *How much time should we spend?*

Several ALC instructors volunteered to be observed as case studies and participated in interviews, being observed in class, and submitted course syllabi, rubrics and assignments for analysis. A wide range of active learning strategies were observed and reported. The instructor (and sometimes a Teaching Assistant or Supplementary Instruction peer) was available to the groups and very frequently answered individual or group questions. During these guiding interactions, the instructor often used the marker board to illustrate a point. At times, groups

asked a nearby group for help. When working individually or in pairs at a group table, individual or pairs make inquiries to other students at their table. Students were interacting at their tables before and after class. The tone in the ALCs was relaxed, focused, and happy. A number of smiles and palpable energy was present. Even noted, students were highly attentive and productive in 8:00 a.m. ALC classes.

Instructor and student frequency of and time spent on specific in class learning behaviors were recorded on a grid designed for this study. The observed data collected a record of all of the ALC course design elements in action, including assessment, engagement, pedagogy, student responsibility for learning, peer and instructor interaction, and use of technology to advance learning. The observations aligned with data collected from both student and surveys and interviews. For example, the percentage of overall class time spent primarily on student actions ranged from 40-91% of the time. In the class where 91% of the time was spent in student versus instructor actions, the most amount of time involved the use of laptops, asking questions, and working in pairs. The most frequent student behaviors were answering and asking questions, group use of wall monitors, and students asking students questions.

Across the ALC courses that volunteered to serve as case studies, the most **frequent instructor** teaching behaviors observed in the ALCs were the following:

- Asked questions
- Gave instructions
- Spoke to one group at a time
- Lectured
- Clarified

The most **frequent student** learning behaviors observed in the ALCs were the following:

- Group work – laptop use/pairs
- Group dialogue
- Answered instructor questions
- Asked instructor questions
- Individual work
- Group use of monitors
- Asked questions of other students

➤ *Course Design: In-class Learning Activities Recommendations*

1. Require a **pre-course D2L survey** (several points) due the evening before the first class. Find out the key skill and knowledge level of students in each course. I include about 5-8 questions that include having students rate their level of knowledge and skills that align with the course outcomes. I include a brief story or vignette that asks them to solve or provide an assessment or recommendation. This allows me to identify some key strengths or misconceptions. I also ask about their interests and at times, course or professional experience related to the course concepts. This information guides group membership, creating relevance selection of examples used, and levels of knowledge to expect. This may

also guide you in giving students choices of readings or topics. Student choice can help boost interest and relevance.

2. Student prior knowledge is regarded as a primary aspect of learning deeply. Getting students to tell you and each other what they already think, assume, believe or wonder about your course subject and key concepts creates a beginning point from their existing knowledge (wrong, partially wrong, or right) to the new ideas they will store in their brains. The first day is ideal for getting students to tell you what they think is true, accurate, or likely. They can be asked to predict, hypothesize, interpret, solve, etc.
3. Students highly valued having their **pre-class assignments** integrated into the class time. If their work is never built upon or integrated with the class time, they will lose interest in the assigned work. If the instructor merely “goes over” the same material assigned for reading, the students will not be motivated to read. Higher learning levels can be achieved if students are well-prepared before class.
4. Rather than give students a topical “agenda” for the day, include the phrase, “*By the end of today, you should be able to...*” This clarifies what they should be able to do with the new knowledge and ideas rather than tells what you are covering. Alignment between the course learning outcomes, pedagogical strategies, and assessment and evaluation is critical throughout the course.
5. Engagement **in class learning** involves a cluster of efforts. Be sure to provide all in class activity instructions on the students’ wall monitors, worksheets, and in your verbal explanations. Most importantly, the in class activities will be worth it and not viewed as busy work if the pedagogical choices are driven by the specific learning outcomes designated for that day. Whether one or multiple types of in-class activities are used, it is critical to ensure that they align with the outcomes for that particular day. Active learning is not done to “break up” the class time or make it easy to “cover” multiple chapters, or keep them awake. They should lead students to demonstrate the level of learning you are after for that day. Lower level learning and use of factual questions and answers stall groups and are better done on their own outside of class. Save the heavy lifting, most complex and controversial or ambiguous ideas for class so that they can engage one another in the different points of view possible.
6. However, if students are not engaged or individual thinking is not made evident, the risk increases that the time spent in active learning was not effective. Students need to see some connection, value and **relevance** to their lives. Try to identify the really big questions lurking behind your course. Why should someone want the new knowledge they will acquire? What big questions might matter to them they can explore in your course. The beginning of engagement starts with evoking these questions from students on the first day. How can you design context into your concepts and examples?

7. **Class discussions** can create an opportunity for students to disengage or tune out and rely on the few who contribute. In large ALCs, it is not essential to attempt a class discussion very frequently with over 70-120 students. Class discussion is an over-used and often less effective pedagogical strategy than other options. As class discussions typically do not hold students accountable for thinking and making sense of the ideas being discussed, they can be less effective. Limiting the use of lectures and all class discussions are *strongly advised* in order to engage students in other types of learning strategies that employ individual accountability and responsibility for learning. Since all class discussions are ripe opportunities for disengagement, other active learning strategies and integration of technology are more effective.

8. Whether using groups or discussions, ALC instructors are encouraged to try out having individual students first jot down their reactions or thoughts to a prompt, question, or activity (or homework assignment), and share them in pairs (**Think-Pair-Share**) before trying to engage the entire class in discussion. That way, the instructor can be assured that more of the students have thought about the ideas and concepts and actually achieve the learning expected and even reluctant students have something in front of them. These in class writing exercises can be used to launch interaction among a greater number of students and collected as indicators of student thinking vs. merely showing up. Students and instructors may better identify where students are confused and unable to make sense of the ideas. See links below for examples of **Think-Pair-Share**:
<http://www.theteachertoolkit.com/index.php/tool/think-pair-share>
https://kaneb.nd.edu/assets/137953/think_pair_share_tips.pdf
<http://serc.carleton.edu/sp/library/interactive/tpshare.html>
<http://serc.carleton.edu/sp/library/interactive/tpshareexm.html>
<http://serc.carleton.edu/details/files/19473.html>

9. Small group learning is a common strategy in ALCs. **Group learning** is a complex pedagogical strategy. A number of combinations of activities “will work” but are highly dependent on several small group learning principles. CETL offers an in depth **Small Group Learning** workshop each summer and semester, as well as individual consultation. These practical workshops enable instructors to avoid uneven distribution of work among groups and strategic tips on forming groups, and creating and assessing group assignments effectively.

Whether they are brief, break-out groups or longer term projects, instructors still encounter many of the pitfalls of group learning. **Individual accountability** is usually one of the most frequently missing dimensions that derails group work of any type. Breakout groups were used the most frequently and can end up being handled too casually. As with any active learning exercise, the instructor needs to pre-determine the learning purpose or learning outcome(s) of each in class activity. Making this clear beforehand to oneself and the students influences the instructions provided, time allowed, and processing of the activity.

These pitfalls can be traced back to practices that run contrary to the well-researched principles of collaborative learning. Instructor use of the five principles of collaborative learning (Johnson & Johnson, 1998; 2006) were investigated through interviews, syllabi, assignments, and class observations and found inconsistently applied. For example, the ALC group sizes were often “too large” to be effective. Ideal group size has been established as 5-7 (Johnson & Johnson, 1989; 1999). However, I often recommend pairs, groups of three and four, depending on the depth of learning and purpose intended. All group work entails significant advanced planning and structuring. Instructors seemed to want to reduce the number of groups by making fewer and larger groups. This tendency ended up creating more work and less learning by enabling more students to sit passively within their groups.

Similarly, instructors admitted relying on group meetings outside of class for critical portions of the group work. The instructor lost track of how the groups actually functioned, their progress, and which obstacles were interfering with their learning. Requiring students to accomplish some of their hardest group tasks and highest level of thinking (analysis, solving, creating, synthesizing, critiquing) in class can enable the instructor to monitor the progress of the groups and guide their thinking. If critical thinking is intended, or other high level thinking, it is essential that each student either thinks and writes individually in class or has a follow-up assignment after the in class group activity. This can further ensure that they are maintaining contribution to the group and supports individual accountability.

10. Instructors should give careful consideration to embedding numerous **low stakes assessments** and in-class points awarded exercises to break up lectures or discussions.

Course Design: Assignments, Assessment and Evaluation

- *How do I get students to do the work outside of class in preparation for class?*
- *How do I assess students for the in class activities?*
- *How do I assess students for group work during class?*
- *How do know if students are “getting it?”*
- *How much weight should I give to each in or out of class assignment?*

The data below indicated a very high percentage of instructors in the ALCs awarded points for in class activities and interaction. This pattern supports the shift away from solely relying on high stakes exams or projects in order shift some of the grades to support attendance, preparation for class, and engagement. Student learning or misunderstanding was revealed through an assortment of learning activities and assessment in class.

In order encourage preparation for class and in class learning, the ALC instructors highly reported having a grading scheme that allotted points to students for weekly preparation for class (required readings, quizzes, writing, etc.) and for completion of worksheets and exercises in class. The in class and out of class preparation was assessed with simple rubrics or simply as completed or not rather than “corrected” since the purpose was to ensure that students were

thinking and making sense of the new material. Misconceptions were clarified in class in groups or pairs.

Additionally, nearly 60% of the instructors scaffolded critical thinking assignments in which the larger assignments were broken down into smaller steps with sequenced due dates.

- Students were able to receive points/grades for in-class activities, group work, and interaction. 100%
- Points awarded for preparation for class (readings, quizzes, homework). 99%
- Outside of class individual work was assigned. 86%
- Assignments were designed to teach the ideas behind critical thinking. 86%
- Formal writing papers were assigned. 79%
- The course included assignments that built from lower level critical thinking skills up to more difficult skills – or scaffolded assignments. 57%
- Assignments which broke down the critical thinking skills into smaller increments. 57%

Instructor Perspectives on Assessment and Evaluation

Instructors reported that they *agreed* or *strongly agreed* that they **assessed** student demonstration of their ability to perform the following critical thinking abilities:

- Identify and summarize a problem/question/issue. 80%
- Identify and consider other perspectives and positions that are important to the analysis of the problem/question/issue. 80%
- Identify and assess key assumptions for the problem/question/issue. 70%
- Identify and assess the quality of supporting data or evidence. 70%
- Identify and their own perspective and position of a problem/question/issue. 50%
- Provide additional data or evidence related to the problem/question/issue. 50%
- Identify and consider the influence of context related to the problem/question/issue. 40%
- Identify and assess conclusions, implications, and consequences related to the problem/question/issue. 40%

Instructor Perspectives on Critical Thinking Assessment

When instructors were asked specifically about assessing critical thinking outcomes, they reported a very high use of rubrics, points for preparation for class weekly and for in class engagement in exercises, worksheets, groups, etc. These assessment strategies were selected specifically for their impact on critical thinking and indicate a long term, developmental and incremental approach to critical thinking across the course. The complex skills involved in higher level thinking were reflected in the scaffolding, intentionality, use of practice, and rubrics. Very few used exams or quizzes. It is important to note that at the time of the data collection, the largest ALC seated 54 students.

- Points for in class work performed. 100%
- Use of a rubric. 93%

- Low stakes assessment were used at least once per class 50%
- Peer review was utilized. 21%
- Exams and/or quizzes took place 1-2 times per semester 8%

Student Perspectives on Assessment and Evaluation

- Received significant points/grades for in-class activities, group work, and interaction. 87%
- Missing class impacted students' grades. 82%
- Assignment grading rubrics highlighted critical thinking skills. 79%
- Students received points for attending class. 79%
- Learning was assessed through highly weighted exams, quizzes and assignments. 75%
- Received substantial points/grades for completing required readings and assignments before class. 75%

Students appeared to match the assessment features of the course perceptions of the course. Students seem to have grasped what the expectations were and the shift to less high stakes assessment in their ALCS when they completed the surveys at the end of course.

➤ *Course Design: Assignments, Assessment, and Evaluation Recommendations*

- When instructors and students engage in larger portions of time in active learning, it becomes essential that the students are prepared with some of the course content beforehand, that they come to class to build on that knowledge, and that they actually think and engage in learning activities in class. ALC instructors have better success when they require weekly reading class through weekly, brief writing, quizzes, or assignments that entail 20-50% of the course points.
- The in class learning also carries a substantial point weight as well, rather than merely rewarding attendance or 10% for participation. If another 20% of points are possible from weekly engaging in individual, pair or group work in class, students are held accountable for what they do *individually* in class. Shifting a significant amount of points to these parts of the learning activities sends the messages:
 - a) You need to be prepared for class.
 - b) Coming to class is essential.
 - c) Having your minds active in class is required.
 - d) Learning is ongoing vs. only "high stakes" activities and you can't cram higher learning.
- Using a grading scheme that supports these expectations and active learning entails providing students with clarity about how it works and indicating in the syllabus that in class learning activities can't be made up. However, if there are 12 days of in class activities, the grading scheme should indicate that only ten will count towards their grade. This allows room for when "life" happens and the instructor doesn't have to sort through myriad explanations for absence.

- The instructor’s workload is not heavily increased as the pre-class writing or in class exercises are evaluated with a simple rubric. Time isn’t spent on correction as the ideas are clarified in class. The earned points can be 2, 1, or 0, or 1 or 0. I have mine due the night before class and the drop box locks at 5 p.m. so I can review them before class and see where their thoughts are. Contact CETL for more information on these practices.
- The data indicated the assessment of critical thinking was less intentional among the respondents. However, 25% of instructors were not sure if they had a critical thinking learning outcome and 50% said they did not. In some cases, the rubrics instructors used did not align with their definitions and expectations of critical thinking. Given that the data reported highly different student and instructor definitions of critical thinking, greater transparency and intentionality are needed to advance critical thinking in ALCs and distinguish it from problem solving, creativity, and thinking.
- We encourage instructors to divide large assignments into smaller assignments with due dates, point values, and feedback pre-scheduled, in order to avoid last minute work and to best guide students towards the intended assignment outcomes. This intentionality and focus on the learning process by “**scaffolding assignments**” yields greater success in the final product. Formal writing papers were often featured as this type of assignment. This shift away from a high stakes course grading scheme is a key feature of successful ACL courses.

ALC Technology Features and Impact

- *What technology is most effective and valued by students?*

The data on the positive impact of the use of technology in the ALCs on student was evident. Overall, the technology is being used and thought of very highly by both students and instructors. Instructors and students perceptions on the impact of wall mounted wall monitors and whiteboards in the ALCs were rated the most useful.

Instructor Perspectives on ALC Technology Features and Impact

Instructors shared their perspectives of student use of technology and the impact of technology in the ALCS. The monitors and whiteboard “walls” were highest rated technology in the ALCs.

- | | |
|---|-----|
| ▪ The wall mounted monitors were useful. | 85% |
| ▪ The wall-mounted monitors were useful for student learning in this class. | 85% |
| ▪ The whiteboards were useful for learning in this class. | 77% |
| ▪ Technology was used effectively for instructional purposes. | 77% |
| ▪ Students felt comfortable using the laptops to display work on wall monitors. | 77% |
| ▪ The classroom technology helped student focus and keep on task during class. | 46% |

Student Perspectives on ALC Technology Features and Impact

More students than instructors *agreed* and *strongly agreed* with the impact of technology on their learning. Students did not high attribute the use of technology to their critical thinking

skills. They may not be able to parse out how technology or even group work (which may use technology) assists or enables the cognitive skill development inherent in their critical thinking assignments or activities without explicit explanations or examples. Given that student definitions of critical thinking varied considerably from the instructors and instructors themselves were unsure if they had CT outcomes, there is considerable room for ambiguity regarding this level of learning.

- Technology in the class increased my learning. 92%
- The wall-mounted monitors were useful for learning in this class. 85%
- The whiteboards were useful for my learning in this class. 84%
- Technology was used effectively for instructional purposes. 82%
- Rated their instructor use of technology. 80%
- Rated their own use of technology as preferred learning activities. 80%
- The classroom technology helped me focus and keep on task during class. 70%
- Felt comfortable using the laptops to display their work on the wall monitors. 70%
- Technology in the class increased my critical thinking skills. 33%

➤ Technology Use Recommendations

Overall, the use of technology by both students and instructors was perceived very positively. However, students ranked more aspects of the technology as being highly related to their learning and enabling their focus. These results were supported by the correlation analysis that reported technology use was strongly related to student excitement to learn. As reported earlier, **excitement to learn** was the factor correlated most highly with critical thinking.

The wall monitors and whiteboards were viewed very strongly for learning and engagement by both instructors and students. Student excitement was strongly correlated with instructor and their own use of technology in class. Student responses further indicated that they valued *effective* use of the ALC technology by instructors. However, students may not see the connection between critical thinking and technology or understand how technology impacted their thinking. Instructor concern with student use of the laptops in the NWQ ALCs for non-academic student use was evident in both interviews and the survey data.

1. In addition, CETL workshops need to address effective strategies for limiting student non-academic or course related use of laptops during class.
2. Articulate in the syllabus and first day of class the course policy regarding use of technology, mobile devices, etc. during class.
3. Learn a wide range of strategies for using the ALC technology effectively.

Support for ALC Technology

Who to contact for ALC Technology Concerns:

Classroom Services 414-229-2382 classroomhotline@uwm.edu
 For questions or problems that do not require immediate attention.

- Markers and erasers
- Whiteboard cleaning cloths and spray
- Service requests for tables, chairs, lighting, and windows

Professional Staff

- Melissa Beauchamp
- Tim Brice
- Kevin Jahnke
- Jay Peine
- Khadijah Perry

4. ***ALC Space Features and Impact***

- *How do the seating and design features of the ALCs impact student learning?*

Instructor Perspectives on ALC Space Features and Impact

Instructors *agreed* or *strongly agreed* that the ALC space:

- | | |
|--|------|
| ▪ Provided a comfortable learning environment. | 100% |
| ▪ Promoted discussion among students in class. | 93% |
| ▪ Encouraged student active participation in class. | 86% |
| ▪ Was more conducive to building connections to their students than traditional classroom. | 70% |

Instructors reported a high frequency of interaction with students and groups in class.

- | | |
|---|-----|
| ▪ I interacted with individual students and with small groups during an in-class activity more than once per class. | 79% |
|---|-----|

Student Perspectives on ALC Space Features and Impact

Students reported that they *agreed* or *strongly agreed* with liking the ALC space and that the ALC furniture and space:

- | | |
|---|-----|
| ▪ Helped my learning. | 92% |
| ▪ Increased my learning. | 92% |
| ▪ Encouraged class participation. | 85% |
| ▪ Helped them grow comfortable working with people from other cultures. | 80% |
| ▪ Helped them to develop confidence working in small groups. | 76% |
| ▪ | |
| ▪ Increased my critical thinking skills. | 29% |

In addition, students commented on the high level of ease with which they were able to do the following tasks:

	<u>Easy/Somewhat Easy</u>
▪ Speak during class.	95%
▪ Follow what is going on during class.	89%
▪ Identify the focus of the activity at a given point in the class.	82%

➤ ALC Space Recommendations

Student perspectives on the impact of the ALC space on their learning were very positive. Many of the ALC course, technology, and space features increase student interaction and are known to build a learning community environment. The strong connections with instructors and peers are very evident in the data and are well established indicators of persistence.

Very often, instructors often are discouraged with the limited number of students willing to speak in class. However, in the ALCs, 95% of the students reported that speaking in class as *easy* or *somewhat easy*. Further study is warranted to understand the relationship between student preparation for class, relationships with peers and instructors, and in class activities and speaking in class.

Students also reported becoming much more comfortable with other cultures. An often overlooked dimension of acting on diversity values is enabling students to meet others with different ethnic, religious, class, sexual identity, and gender orientation than their own (Allport, 1950; Wright & Taylor, 2009). Given the confusion with critical thinking definitions and indication that critical thinking was either not an intentional part of many of the ALC courses, instructors often did not include a critical thinking learning outcome, definition, or assessment, the near 30% score of positive impact of ALCs among the students is not surprising.

Instructors can consider how to act on the data reported in several practical ways:

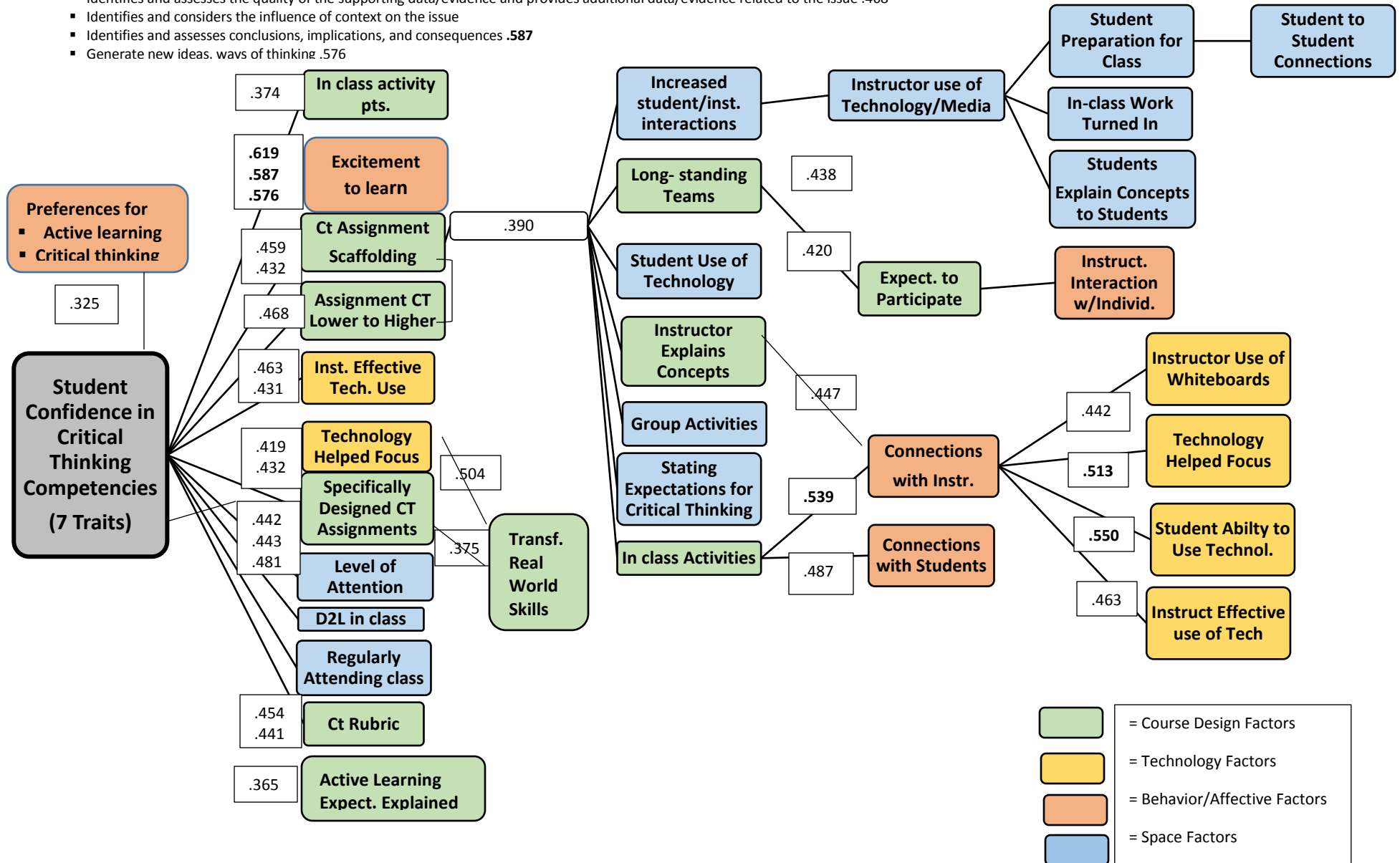
- Despite the size of the tables, limit the interaction to the frequent use of pairs or groups of three. When groups are smaller, each person is able to speak more often and is more likely to make sense of the ideas involved.
- Use the mobile, large whiteboards creatively. Create opportunities for students to write reactions to other groups' ideas on their group wall monitors; divide the class in half use the whiteboards as sound partitions;
- Use the room space creatively. Use the center of the room space to create to lines of chairs facing one another and create a "speed cycle" of responses to homework or reactions to a clip.
- Ask other ALC instructors if you can observe their class.

Appendix A

Correlation Diagram: ALC Student, Instructor, and Course Attributes in Relation to Student Confidence in Critical Thinking Competencies¹

Seven Traits of Critical Thinking

- Identifies and summarizes the problem/question at issue .413
- Identifies and presents the student's own perspective and position as it is important to the analysis of the issue .443, .463
- Identifies and considers other salient perspectives and positions that are important to the analysis of the issue .499; .437, .441
- Identifies and assesses the key assumptions .443, .454, .459
- Identifies and assesses the quality of the supporting data/evidence and provides additional data/evidence related to the issue .468
- Identifies and considers the influence of context on the issue
- Identifies and assesses conclusions, implications, and consequences .587
- Generate new ideas, ways of thinking .576

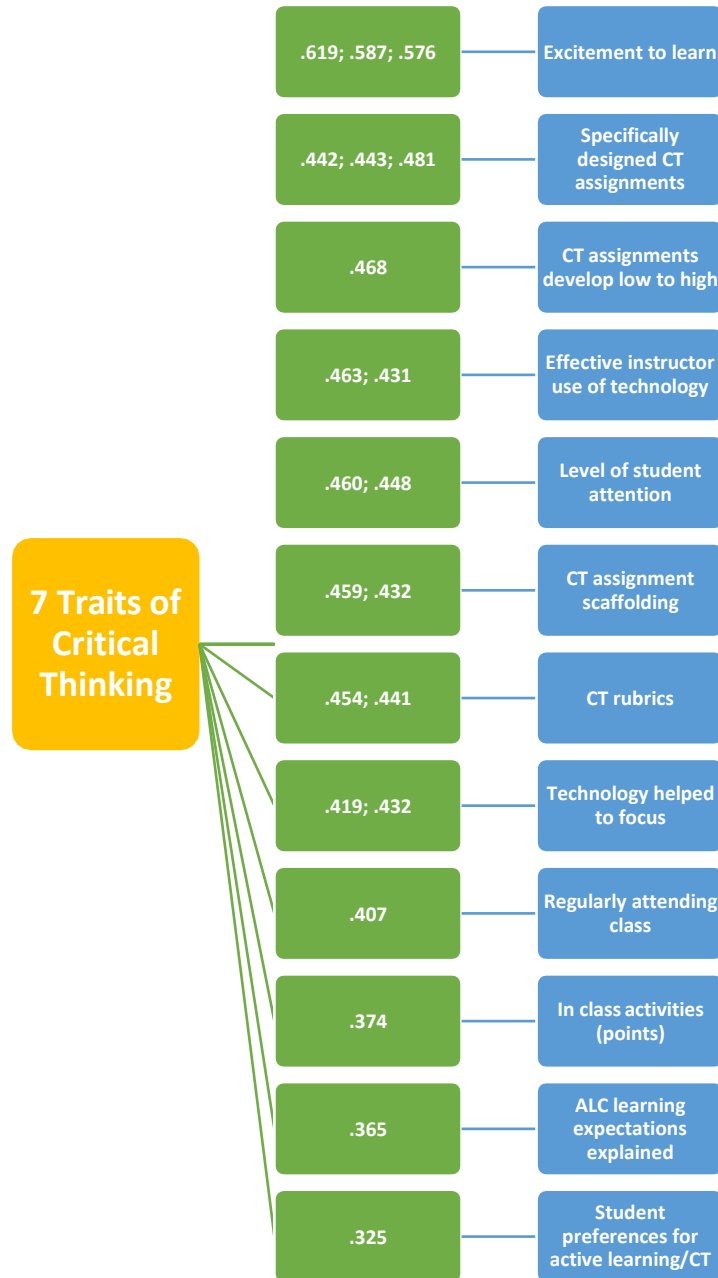


	= Course Design Factors
	= Technology Factors
	= Behavior/Affective Factors
	= Space Factors

¹ Blue, Taylor, and Yarrison-Rice, (2008)

Appendix B

Correlation Diagram: Factors Moderately to Strongly Related to Critical Thinking Traits



Seven Traits of Critical Thinking

- Identifies and summarizes the problem/question at issue
- Identifies and presents the student's own perspective and position as it is important to the analysis of the issue
- Identifies and considers other salient perspectives and positions that are important to the analysis of the issue
- Identifies and assesses the key assumptions
- Identifies and assesses the quality of the supporting data/evidence and provides additional data/evidence related to the issue
- Identifies and considers the influence of context on the issue
- Identifies and assesses conclusions, implications, and consequences

(Blue, Yarrison-Rice, & Taylor, 2008).

Figure: Summary of the positive moderately strong correlations between factors and critical thinking

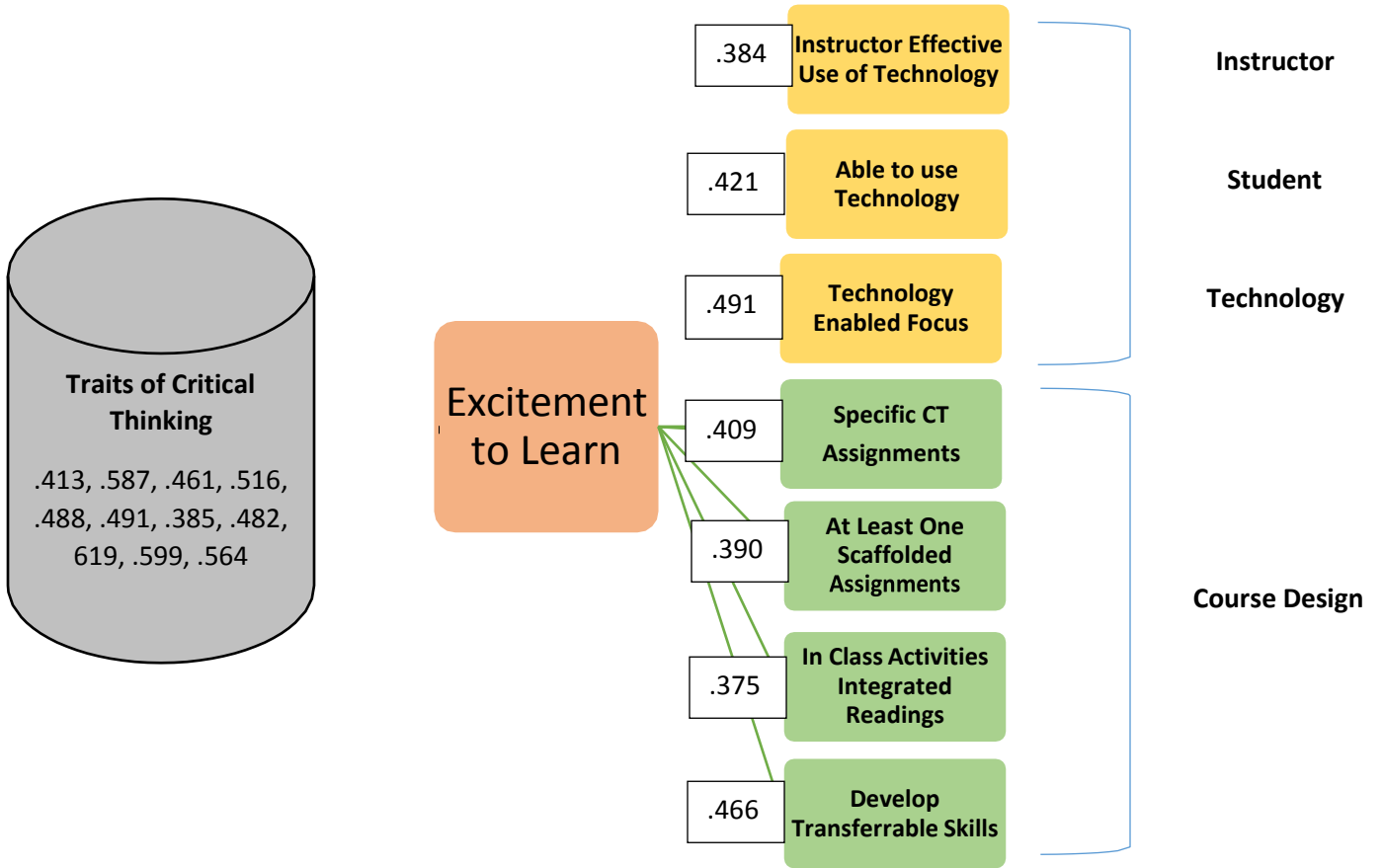
Appendix C

Summary of Correlations with Critical Thinking Traits

Variable	Correlation
Student Attributes, Behavior, and Affect	
Excitement to Learn	= .619; .587; .576
Level of attention	= .460; .448
Regularly attended class	= .407
Preferred active learning and critical thinking	= .325
Course Design Factors and Critical Thinking (CT) Traits	
Specifically design CT assignments	= .481; .443; .442
Assignments building from lower CT skills to higher	= .468
Instructor effective use of technology	= .463; .431
CT assignments scaffolded	= .459; .432
CT assignment rubrics	= .454; .441
Completion of class activities assigned point values	= .374
Expectations of active learning were explained	= .365
Technology Factors and Critical Thinking Traits	
Technology focused learning	= .432; .419

$p < .01$

Appendix D
 Factors Correlated with Excitement to Learn



Technology and course design factors with strongest correlations with excitement to learn. Excitement to learn scored the highest overall correlations with the seven traits of critical thinking.

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