Student Perceptions of Critical Thinking Practice

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Abstract

The practices of articulating, defining, and studying critical thinking as an objective of any liberal arts discipline are difficult at best. Experienced teachers may have a good sense of how critical thinking can be encouraged or taught, but may have difficulties in finding valid and reliable ways of assessing critical thinking outcomes. Moreover, few measures exists that track how students perceive and understand critical thinking practice both in and outside the classroom. This study compared student perceptions of critical thinking practice in four types of courses offered at an English immersion liberal arts university in Japan. Students were provided with an on-line survey containing 80 items describing critical thinking practices in interpretation, analysis, evaluation, inference, explanation, and self-regulation. Upper-class students (N=62) identified third and fourth year content courses taught in English by a single instructor as the type of course in which critical thinking practice was significantly more prevalent compared to both English and Japanese language courses taught by a single instructor, as well as to $1^{st}/2^{nd}$ year team-taught content courses taught in English. First year students (N=48) identified single instructor English language courses as the type of course for which they perceived critical thinking practice to be most prevalent. These results are discussed in the context of future assessment of critical thinking practice by type of course as well as by individual instructor. *Key words*: critical thinking assessment, liberal arts, English immersion, student perceptions, on-line survey.

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The mission statements of colleges and universities often explicitly underscore the importance of critical thinking. Indeed, disciplines across the spectrum of higher education reinforce the necessity of critical thinking throughout the trajectories of their own array of courses (Goldsmid &Wilson, 1980; McPeck, 1990; Grauerholz & Bouma-Holtrop, 2003). Miyazaki International College (MIC), the English-based liberal arts college in southern Kyushu, Japan, at which we teach, has at the core of its academic program a "philosophy of critical thinking" (MIC, 2011a:4). "This philosophy asserts that academic capability is not acquired through passive reading of text or listening to lectures, but is achieved through explorative activities that require students to be actively engaged in reading, writing and discussion as part of the process of problem solving. Through this kind of "active learning" (initiative based learning) students engage in the dynamic development of higher order thinking skills that enable them to analyze, synthesize, evaluate and create" (Ibid.).

The practices of articulating, defining and studying (Baker, 1981; Geerston, 2003) critical thinking as an objective of any discipline are difficult at best (Grauerholz & Bouma-Holtrop, 2003). In a rather brief but telling explanation, Grauerholz and Bouma-Holtrop (2003) note the peculiarities critical thinking presents for researchers:

> Critical thinking seems to be much like good art: we know it when we see it, we have some sense of how we might encourage or even teach it, but we are not sure how to assess or measure it. (p.485)

Rather than pursuing what definitively constitutes critical thinking or trying to define[1] sharply the boundary between this concept and other similar interpretive ventures (i.e. logic, reason, hermeneutics, etc.) this article focuses on how student

[1]For a review of definitions of critical thinking as understood in the social sciences, across the liberal arts curriculum, and in the natural and medical sciences, see Grauerholz & Bouma-Holtrop (2003); Verbeek (2006).

perceptions of critical thinking practice may be tracked across a four-year liberal arts curriculum.

At MIC student development is assessed throughout the four years both in and outside the classroom. English skills are regularly tested via level exams and TOEIC. However, critical thinking is difficult to assess via objective measures. This situation has created problems in explaining what, beyond English skills and overseas experience, MIC graduates have to offer the job market; critical thinking skills *per se* are often couched as problem-solving or communicative skills. Nonetheless, the attributes MIC students display in internships and interviews have helped the college maintain a high percentage of job placement for its graduates relative to that of other tertiary institutions in Japan (MIC 2011b:38).

One venue for potential assessment of engagement in critical thinking has been the course evaluation survey conducted in each class near the end of each semester (Appendix I). In early 2010 an ad hoc MIC faculty committee was formed to review and possibly revise the course evaluation survey. One of the first actions of the committee was to conduct a detailed comparison of data by type of course generated by the course evaluation instrument over eight semesters (2005-2008) [‘MIC Student Feedback on Teaching. Some Questions and Preliminary Analyses.’ Committee report available upon request]. The committee quickly realized that the critical thinking section of the survey deserved improvement as the sole item referring to critical thinking, “[the instructor] encouraged critical thinking,” showed either poor or no correlation with the other items on the form and was rated inconsistently across the different types of courses [i.e. language; integrated (team-taught); specialized] that were evaluated.

As committee members noted that meanings associated with “critical thinking” had their obvious limitations and may have, in effect, contributed to the variance in the results, critical thinking became one point of departure for further investigation. Most of the students at MIC have spent K-12 in the Japanese school system. The three years of Japanese middle school and high school tend to be conducted in a teacher / text-centered transmission style with little requirement for active learner participation. For example, commenting on a lack of active learned participation within Japanese education, Kawashima and Petrini (2004 cited in Verbeek, 2006) state:

> Learning skills that require students to formulate their own questions in academia or social events are not encouraged, and neither are autonomy and independent learning, all of which have been associated with the cultivation of critical thinking skills and dispositions.

Similarly, Nishibata (2010) noted that “until this situation is remedied education will continue to be limited and stagnant” (p. 229).

In addition to an educational background that may not be conducive to the development of critical thinking skills, the committee also focused on the Japanese translation of the term “critical thinking” as there was some concern that term itself may be problematic. On the current evaluation form, the term “critical thinking” is translated as 「問題意識」 which, broken into its component parts means 「問題」 *mondai* “problem / question” and 「 意識」*ishiki* “consciousness.” The lack of a clear and corresponding translation suggests that students may either misinterpret or experience confusion when answering a single question about critical thinking.

Outcomes assessments of instruction are commonly measured through student evaluation of teaching (SET) instruments. In a general survey of overall methods, a great deal of variation can result from such issues as administering SETs consisting of different class sizes (Bedard & Kuhn, 2008; Balam & Shannon, 2010); among in-class and online instruments (Sorenson & Reiner, 2003; Dommeyer, Baum, Hanna & Chapman, 2004); between qualitative and quantitative data gathering (Nasser-Abu Alhija, & Fresko, 2009); and, of course, throughout different geographical regions that place different values upon the meaning of outcomes (Burden 2008; Davies, Hirschberg, Lye, & Johnston, 2010). When designed properly, the results of these SET instruments may serve to verify instructor performance (Mason, Steagall, & Fabritius, 1995) and increase students' sense of participation in the educational experience.

Conversely, a number of these instruments have, at times, proven problematic to the careers of instructors (Newton, 1988; Sproule 2002; Stark-Wroblewski, Ahlering, & Brill 2007), as well as depicting students' educational experience inaccurately.[2]If, for example, a survey instrument combines several items that bear no logical relation to each other and then somehow summarizes these items by generating an overall average, it would follow that such an average or summarized score would be arbitrary at best. Furthermore, if such aggregated items have this tenuous relationship, there would be no real basis for interpreting what is actually being measured. With this line of reasoning, some scholars have emphasized a multidimensional approach geared toward capturing a larger breadth of items, and thus illustrating a more thorough and detailed evaluation of all educational

[2]Indeed, it has been noted by several scholars that due to the limitations of some instruments, sole dependence upon these evaluations for the retention, promotion and tenure of faculty may be equivalent to fostering a form of pseudoscience, rather than anything resembling the scientific rigor fostered by higher education. See Hills, Naegle & Bartkus (2009) and Sproule (2002).

performances (Marsh, 1982; March and Hocevar, 1991).

The intersection of these SET instruments and our own focus on the measurement of critical thinking is lacking in thorough research across the social sciences, and has thus created several limitations for researchers. Among these limitations are the arguments that the ambiguity of the term critical thinking, as well as the lack of definitive research about it engenders substantial speculation as to whether or not critical thinking can even be taught (McPeck, 1985; 1990). It may follow then, that measuring critical thinking is equally challenging. To complicate these and other matters associated with research on critical thinking, located at the intersection of these limitations are difficulties in interpreting evaluative data as a measure of student outcomes.

In spite of conceptual and practical difficulties such as discussed above, incorporating student data generated through self-reporting methods (Shepelak et al, 1992; Tam, Pak, Hui, Kwan, & Goh, 2010) as well as quantitative and qualitative surveys (Stoecker, Schmidbauer, Mullin, & Young, 1993), has certainly given way to promising departures in research on critical thinking in higher education (cf. Verbeek, 2006). Here we report on our committee's development, administration, and analysis of a multi-scale on-line survey designed to track student perceptions of the teaching of critical thinking skills across the four-year curriculum at MIC.

Method

The ad hoc course evaluation committee comprised of the authors and Gregory Dunne, acted as both a collegial advisory group as well as a research team interested in exploring the possibilities of creating a useful course evaluation instrument. Meeting

bi-weekly for roughly a nine-month period, we were able to review literature on course assessments; discuss the advantages and disadvantages that evaluations present for faculty, students and staff; assess the strengths and weakness of our own current evaluation instrument; devise a novel critical thinking practice evaluation instrument, the Critical Thinking Survey (CTS); run this instrument as a pilot; and finally, analyze the data that this new instrument generated. The CTS research was reviewed and approved by the Testing, Research and Assessment Committee (TRAC) at MIC.

Critical Thinking Survey (CTS)

In order to provide students with an understandable and accessible format for comprehending the concept of critical thinking, the committee identified specific examples of critical thinking in subject areas within the two main learning divisions of the humanities and the social sciences at MIC. After consulting with various faculty members from both of these divisions about how critical thinking is assessed and recognized in their respective disciplines, the committee then generated a list of items that captured the larger breadth of their suggestions.

Survey scales and subscales. The decision was made to incorporate the skills and sub skills of Facione [1990 adapted by Verbeek (2006)] into the item descriptors of critical thinking. An initial list of 110 items was created but was reduced to 80 items (Appendix II) in the interests of keeping the survey to a manageable length. The expertise and cooperation of bilingual faculty and staff was sought to translate these items into Japanese to ensure that students had the option to read items in both languages.

Table 1. Scales and sub-scales of the Critical Thinking Survey (CTS).

Main scale	Sub-scales	Number of items
Interpretation	Decoding significance	5
	Categorization	5
	Clarifying meaning	5
Analysis	Examining ideas	5
	Identifying arguments	5
	Analyzing arguments	5
Evaluation	Assessing claims	5
	Assessing arguments	5
Inference	Querying evidence	5
	Conjecturing alternatives	5
	Drawing conclusions	5
Explanation	Stating results	5
	Presenting arguments	5
Self-regulation	Self-examination	10
	Self-correction	5
Total		80

Table 1 presents the grouping of the final 80 survey items by 6 main scales and their corresponding sub-scales (N=15) that reflect the Facione (1990) critical thinking skills and sub-skills. The 80 items were listed on the survey in random order. Student participants were asked to check a box next to each of the following course type labels: Japanese language courses, English language course, Other language courses[3], Team-taught courses, and 3rd/4th year courses, for the aspect of critical thinking represented by the respective item that in their opinion was practiced in that particular type of course. For each item students were asked to check all boxes that applied. Through this method the students were asked for their memory-based perceptions of critical thinking practice by type of course. The data generated in this fashion thus provide insight into how students perceived similarities and differences in the

[3]Not included in the present analysis.

classroom practice of critical thinking across the MIC curriculum. These data do not, however, provide insight into how students evaluated individual courses or instructors on critical thinking practice.

On-line administration. In order to improve the survey-taking process, the committee decided to trial putting the new survey on line. The regular paper version of the MIC course evaluation is given in-class at the end of each semester and this practice takes up valuable classroom time and needs to be supervised by faculty not being evaluated. An on-line survey would allow for a more sensible use of student and faculty time. The other important benefit of an on-line mode would be ease of data collection, manipulation, transmission to stakeholders and the creation of a databank of responses. With technical expertise and cooperation from the system administrator, an on-line version of the CTS was developed and administered to a sample of 48 first year students and 62 third and fourth year students during the beginning of the 2011 fall semester.

Student sampling. All students present on campus during the planned time of administration (i.e. excluding 2nd year students on student abroad) were formally asked to voluntarily participate in the CTS. However, initially only a small percentage of them actually did so. Faced with this situation, the authors encouraged the students in their own courses to take the survey and in some cases escorted them to a computer lab to take the survey. Teachers of other courses, in particular those teaching Japanese language courses, did the same. These joint faculty efforts resulted in a total convenience sample of 110 students on which the analyses that follow are based.

Students took approximately 10 to 15 minutes to complete the CTS and their responses were stored by student ID. Prior to the analyses the student IDs were

replaced by randomly assigned serial numbers thus ensuring the confidential nature of their participation.

Results

1. Statistical Analysis

Student responses were downloaded from the server and entered in a single data file. For each checked box in a student record a value of 1 was recorded and for each blank box a value of 0 (zero) and these selection data were used for all analyses reported below. Analysis of Variance (ANOVA) and t-tests were used to test for differences among type of course and critical thinking scales and sub-scales. We used two-tailed tests throughout. Controls for unequal sample size and variances were used when necessary. We first analyzed the responses of the first year students followed by those of the third and fourth year students. Finally, we compared the responses of the first year students to those of the third and fourth year students for the type of courses that both cohorts experienced so far, i.e. Japanese language courses, English courses and Team-taught courses.

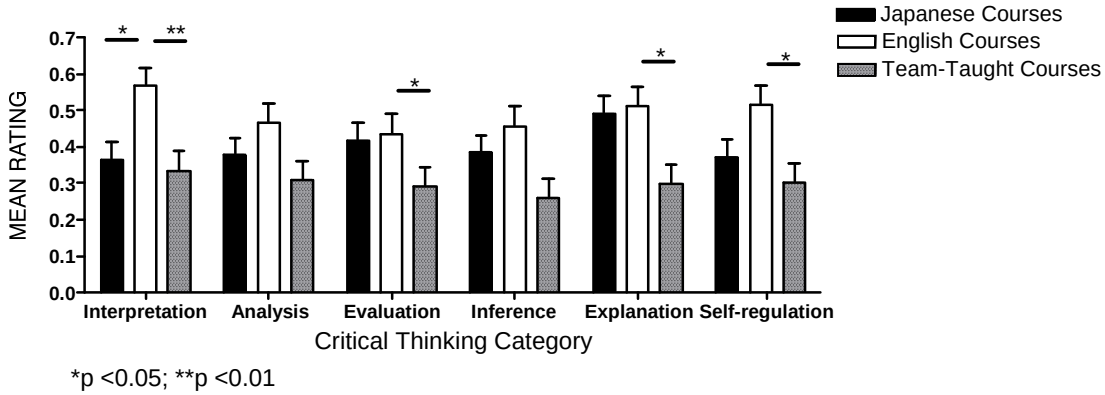

Figure 1. Main categories of critical thinking skills items selected by first year students for Japanese-, English-, and Team-taught courses. Mean (range: 0-1) $\pm$ SEM are shown.

First Year Students (N=48)

Analysis by main critical thinking skills category. Two-way ANOVA with critical thinking skill (*interpretation*, *analysis*, *evaluation*, *inference*, *explanation*, *self-regulation*) and type of course (Japanese courses, English courses, Team-taught courses) as main factors was used for the initial analysis. There was a significant main effect for type of course, $F_{2,846} = 21.14$. $p < 0.0001$, but not for critical thinking skill, $F_{5,846} = 0.75$, $p = 0.59$, nor for the interaction, $F_{10,846} = 0.60$, $p = 0.82$.

Post-hoc Bonferroni tests showed that *interpretation* items were selected more often for the English courses compared to both the Japanese courses ($p < 0.05$) and Team-Taught Courses ($p < 0.01$) [Fig. 1; Table 3]. In addition, *evaluation* items were selected more often for the English courses compared to the Team-taught courses ($p < 0.05$), and the same pattern was found for *explanation* ($p < 0.05$) and *self-regulation* ($p < 0.05$) [Fig. 1; Table 3]. No significant differences were found between Japanese Courses and Team Taught Courses. Taken together these initial results suggest that the first year students differentiated between the three types of courses and preferentially linked the teaching of *interpretation*, *evaluation*, *explanation*, and *self-regulation* skills to the English courses.

Analysis by critical thinking sub skills. Separate two-way ANOVAS were conducted to explore which critical thinking sub skills contributed significantly to the course differences in *interpretation*, *evaluation*, *explanation*, and *self-regulation*. Each follow-up two-way ANOVA showed a significant main effect for type of course ($p < 0.001$; $p < 0.05$; $p < 0.001$, $p < 0.001$, respectively), but not for critical thinking sub skill nor for the interaction.

Table 2. Post hoc comparison of critical thinking sub skill items selections by 1st year students by type of course. Mean (range 0-1) ± SEM are shown.

	Type of Course		
Main skill/sub skill	Japanese	English	Team-taught
Interpretation			
Decoding significance	0.31 (0.05)	0.55 (0.06)	0.31(0.05)
	$p < 0.01$		$p < 0.01$
Categorization	0.44 (0.06)	0.50 (0.06)	0.35(0.06)
Clarifying meaning	0.35 (0.05)	0.65 (0.04)	0.38(0.06)
	$p < 0.001$		$p < 0.01$
Evaluation			
Assessing claims	0.36 (0.05)	0.42 (0.06)	0.23(0.05)
			$p < 0.05$
Assessing arguments	0.47 (0.05)	0.45 (0.06)	0.35 (0.06)
Explanation			
Stating results[1]	0.50 (0.05)	0.50 (0.06)	0.28 (0.05)
			$p < 0.01$
Presenting arguments	0.48 (0.05)	0.52 (0.05)	0.32 (0.05)
			$p < 0.05$
Self-regulation			
Self-examination	0.36 (0.05)	0.55 (0.05)	0.30 (0.05)
			$p < 0.01$
Self-correction	0.36 (0.05)	0.48 (0.06)	0.30 (0.05)
			$p < 0.05$

[1]Japanese courses > Team-taught courses, $p < 0.01$.

The results of Bonferroni posttests are summarized in Table 2. As shown, there were no significant differences among the courses neither for the *interpretation* sub skill *categorization* nor for the *evaluation* sub skill *assessing arguments*.

The course differences on sub skills revealed by the posttests mirrored those found for the main skills; noticeably, compared to Team-taught courses, students preferentially associated the teaching of all but two of the selected critical thinking sub skills with the English courses. Items belonging to the *interpretation* sub skill categories *decoding significance* and *clarifying meaning* were also selected significantly more often for the English courses compared to for the Japanese courses. There were no significant differences between Japanese courses and Team-taught courses with the sole exception of the *explanation* sub skill category *stating results* for which students favored the Japanese courses.

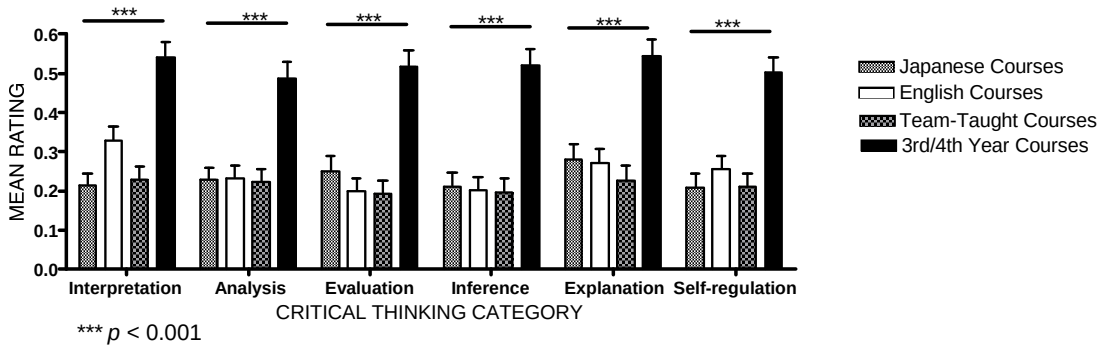

Figure 2. Main categories of critical thinking skills items selected by third and fourth year students for Japanese-, English-, Team-taught-, and $3^{rd}/4^{th}$ year courses. Mean (range:0-1) $\pm$ SEM are shown.

Third and Fourth Year Students (N=62)

Two-way ANOVA revealed a significant main effect for type of course (Japanese-, English-, Team-taught-, and 3rd/4th year courses), $F_{3,1464} = 95.99$, $p < 0.0001$, but neither for main critical thinking category, $F_{5,1464} = 1.32$, $p = 0.25$, nor for the interaction, $F_{15,1464} = 0.55$, $p = 0.92$.

Bonferroni posttests indicated that for each of the six main critical thinking skill categories the third and fourth year students selected 3rd/4th courses significantly more often compared to English courses ($p < 0.001$), Japanese Courses ($p < 0.001$), as well as the Team-taught courses ($p < 0.001$) [Fig. 2]. No significant differences were found among the Japanese courses, English courses and Team-taught courses for any of the main critical thinking categories.

Comparison of the Critical Thinking Selections of First Year Students (N=48) and Third and Fourth Year students (N=62).

The critical thinking selections of the second semester first year students and the third and fourth year students were compared for the type of courses that both cohorts experienced: Japanese language courses, English courses and Team-taught courses. Unpaired t-tests with Welch's correction to control for unequal sample size and unequal variance were used for this comparison. The results of this analysis are summarized in Table 3. The comparison showed that the selections of the first year students (shown in bold face) significantly exceeded those of the third and fourth year students for both the Japanese language courses and the English courses, but not for the Team-taught courses.

Table 3. Comparison of critical thinking skill item selections by 1st year students (N=48) and 3rd/4th year students (N=62) for Japanese-, English-, and team-taught courses. Mean (range: 0-1) ± SEM are shown.

Critical thinking skill		1st year students	3rd/4th year students		*p*
Japanese courses					
Interpretation	**0.37**	0.05	0.21	0.03	0.009
Analysis	**0.38**	0.05	0.23	0.03	0.009
Evaluation	**0.42**	0.05	0.25	0.04	0.009
Inference	**0.38**	0.05	0.21	0.04	0.005
Explanation	**0.49**	0.05	0.28	0.04	0.001
Self-regulation	**0.37**	0.05	0.21	0.03	0.009
English courses					
Interpretation	**0.57**	0.03	0.33	0.03	0.0001
Analysis	**0.47**	0.05	0.23	0.03	0.0003
Evaluation	**0.43**	0.06	0.20	0.03	0.0006
Inference	**0.46**	0.05	0.20	0.03	0.0001
Explanation	**0.51**	0.05	0.27	0.04	0.0003
Self-regulation	**0.52**	0.05	0.26	0.03	0.0001
Team-taught courses					
Interpretation	0.33	0.05	0.23	0.03	n.s.
Analysis	0.31	0.05	0.22	0.03	n.s.
Evaluation	0.31	0.05	0.20	0.03	n.s.
Inference	0.26	0.05	0.20	0.03	n.s.
Explanation	0.30	0.05	0.23	0.04	n.s.
Self-regulation	0.30	0.05	0.21	0.03	n.s.

Discussion

Our study showed that when given the appropriate tools students clearly differentiate between courses in terms of their perception and recollection of the degree and kind of critical thinking practice that different types of courses tend to offer. Third and fourth year students identified single-taught third and fourth year courses as the type of courses in which critical thinking practice was offered to a significantly greater degree than in any of the other types of courses in the MIC liberal arts curriculum. In fact, this was true for each of the six main critical thinking skills (*interpretation*; *analysis*; *evaluation*; *inference*; *explanation*; *self-regulation*) measured by the 80 item Critical Thinking Survey (CTS) that we designed for this study.

First year students identified English courses as the type of course in which several aspects of critical thinking practice were significantly more often part of the classroom proceedings compared to team-taught courses and Japanese courses. For example, the responses of the first year students suggest that critical thinking practice in *interpretation,* and, specifically, in *decoding significance* and *clarifying meaning*, occurred significantly more often in the English courses compared to both Japanese language courses and team-taught courses. Practice in *evaluation* (*assessing claims*), and *explanation* (*stating results* and *presenting arguments*), was rated by the first year students as being significantly more prevalent in English courses than in team-taught courses. Moreover, the responses of the first year students suggest that compared to team-taught courses English courses were significantly more likely to inspire students to engage in critical *self-examination* and *self-correction* in the course of their studies.

Finally, when we compared the responses of the first year students with those of the third and fourth year students for the courses that both cohorts experienced, we

found that first year students consistently rated the incidence of critical thinking practice in both Japanese language and English courses significantly higher than the third and fourth year students did. There was no difference between the two cohorts in their perception and recollection of critical thinking practice in team-taught courses, which they both identified as being infrequent.

What do these results tell us? Can we assume that the student perceptions of differences in critical thinking practice among the types of courses more or less accurately reflect what goes on in terms of critical thinking practice in MIC classrooms? When we reflect on these questions we need to consider both the strengths and the weaknesses of our study. Starting with the latter, the convenience sample that we were able to work with (N=110), although sizeable in terms of the current total student enrollment (N=260), was limited in terms of its make-up, as it did not include second year students who were on study abroad at the time of the study. Moreover, the sample was a convenience sample, which does not rule out biased responding due to a particular motivation (or lack thereof) to participate in the CTS. Future studies should either use equal random samples taken from first- through fourth year student cohorts, or preferably, plan on surveying the entire student body.

Another limitation of our study is that the CTS administration procedure required student participants to recall their perceptions of critical thinking practice from memory. While recall from memory is a common procedure for most kinds of student evaluations of teaching, in this particular case the time frame differed between the two cohorts. We asked third and fourth year students to reflect on team-taught courses, which is a type of course they had taken two or three years ago. In contrast, first-year students were either enrolled in a team-taught course at the time they took

the CTS, or had been enrolled in this type of course during the previous semester. Interestingly, the perceptions of critical thinking practice in team-taught courses did not differ significantly between the two cohorts.

The main accomplishment of our study is that for the first time in the history of the institution it provides a detailed look at student perceptions of critical thinking practice in the different types of courses offered at MIC. As such it constitutes a major departure from the limited way critical thinking practice has traditionally been evaluated by MIC students, namely through a single item at the end-of-the-semester course evaluation form ["(The instructor) encouraged critical thinking"]. We hope, as we suggest in more detail below, that the CTS in its current -or in a modified form will became a standard assessment tool at MIC.

One of the strengths of our study is that we polled students on multiple aspects of critical thinking practice without ever mentioning the term critical thinking. Instead we asked students to select from a set of descriptions of critical thinking classroom practices that we developed based on previous research and the ideas and suggestions of faculty colleagues who teach the type of courses listed on the CTS. In this sense we believe that the CTS is a valid measurement tool of student perceptions of critical thinking classroom practice at MIC.

Another strength of our study is that the CTS is designed to generate data that allow for detailed comparisons among the various types of courses taught at MIC. Traditional course evaluations have been designed to provide data on individual courses and instructors, and such individualized data do not lend themselves well to valid comparisons among course types.

In conclusion, we clearly see a future for the CTS as the instrument of choice

to track trends in critical thinking practice at MIC. Keeping a finger on the pulse of critical thinking practice is important for faculty and administration alike as fostering critical thinking is central to the mission of the institution. We would like to suggest administering the CTS each semester, perhaps at the time of course registration. CTS data could be stored by individual student, and multiple assessments during the 4-year curriculum would allow for longitudinal developmental trend tracking, both individualized by student, as well as aggregated by cohort or gender, or other salient student characteristics (e.g. TOEIC scores, etc.).

As for the future assessment of critical thinking practice by individual course and instructor we suggest to revise the current student evaluation form by incorporating a selection of the most salient items from the CTS. To that end our committee will conduct a detailed item analysis using the current dataset and make recommendations to the Faculty Council based on the outcome of this analysis.

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APPENDIX I

In this course we learned new concepts to help our thinking.
ものごとを考える上で役に立つ新しいものの見方を学んだ

In this course we learned to tell the difference between reasonable and unreasonable arguments.
筋の通った議論とそうでない議論とはどう違うのかを理解した

In this course we were challenged to solve problems.
課題解決に努力した

In this class we looked at arguments from various perspectives.
さまざまな観点からある議論を検討した

In this course we learned to focus on the key points when we present an argument.
議論のキーポイントに注目することを学んだ

In this course we learned to explain how we arrived at a specific conclusion.
ある結論に達した筋道を説明することを学んだ

In this course we learned to clearly organize our thoughts.
考えを明確に整理することを学んだ

In this course we checked whether evidence is plausible.
論拠の合理性を検討した

In this course we learned to decide whether or not an argument is valid.
議論の妥当性を検討した

In this course we learned to present the good and bad points of an idea.
ある考えの短所と長所を述べることを学んだ

In this course we looked for the logic in arguments.
考えを順序だてて進める方法を学んだ

In this course we learned why some ideas are important and others are not.
何が思想の価値を決定するのかを学んだ

In this course we made connections between our learning and the world.
学習したことと現実の世界とを関連を考察した

In this course we applied our knowledge to new situations.
新しい状況に当てはめて獲得した知識を活用した

In this course we were taught to ask questions that help us understand.
理解するためには質問が大切であると教えられた

In this course we were encouraged to question ideas.
つねに問い直すようにと教えられた

In this course we examined our own ideas and feelings.
自分の考えと感情を吟味した

Because of this course I am motivated to stay well informed.
このクラスのおかげで今以上に知識を身に付けてゆきたいと希望するようになった

In this course we learned to draw conclusions that are consistent with one another.
一貫性のある判断を下すことを学んだ

In this course we learned to look for connections between issues.
問題間にある関連性を探求した

In this course we learned to recognize good evidence.
論拠の正否を識別しようとした

In this course we read texts and interpreted meaning.
テキスト読解の方法を学んだ

In this course we learned to develop an informed opinion about things.
知識に基く意見を積み上げてゆく方法を学んだ

In this course we learned the difference between a wild guess and an educated guess.
裏付けのない推測と経験に基づく推測の違いを学んだ

In this course we looked for all possible explanations for an event.
方法を尽くして事象を説明しようとした

In this course we learned why some popular beliefs are false.
どうして通説が時に誤謬であるのかを学んだ

In this course we learned to ask the right questions to help us learn.
理解するために正しく質問する仕方を学んだ

In this course we learned to recognize and correct our own biases and prejudices.
自分の偏見や先入観を認め、訂正することを学んだ

In this course we learned to challenge our own ideas.
自分の考えをあえて疑ってみることを学んだ

In this course we learned to identify biased opinions.
偏りのある意見をそれと認識する方法を学んだ

In this course we learned about the relationships between issues.
問題間にある関連について考察した

Because of this course I am more willing to reconsider and change my views.
このクラスのおかげで、自分の考えを再考、または変更することに対する抵抗が減少した
In this course we were challenged to change our opinions based on new evidence.
新たな根拠が認められた時には自説を改めることを求められた
In this course we learned about different ways of testing a premise.
議論の根拠を多方面から検討した
In this course we learned the difference between a personal opinion and an informed opinion.
個人的な見解と知識に基いた見解との違いを理解した
In this course we learned to clearly express our thoughts.
考えを明確に述べることを学んだ
In this course we learned not to blindly accept some conclusions or statements.
既存の結論や主張を盲目的に受け入れることのないように教えられた
In this course we looked for explanations that are relevant and can be tested.
適切で検証に堪える説明を追求した
In this course we learned to support our opinions with reasons.
自らの意見に筋を通すことを学んだ
In this course we learned to summarize and paraphrase reading passages.
テキストを要約し、また言い換える方法を学んだ
In this course we studied the cause and effect of things.
事象の因果関係を考察した
In this course we learned why some things belong together and others do not.
事柄を関係付けるものは何かを考察した
In this course we investigated why people can have different ideas about an issue.
同じ問題であっても、人によって見方が異なるのはどうしてかを考察した
In this course we learned the importance of being fair in our criticism.
公平な批判の大切さを学んだ
In this course we looked for the reasons why people hold certain opinions.
人がある考え方をするのはどうしてかを考えた
In this course we learned how to prepare a convincing presentation step-by-step.
説得力のあるプレゼンテーションをする段取りを順を追って学んだ
In this course we learned to keep an open mind for new ideas.
新しい考えを受け入れる心構えをもつように教えられた
In this course we learned to organize information systematically.
情報を整理する方法を学んだ
In this course we learned not to draw hasty conclusions.

性急に結論を出すことのないよう教えられた

In this course we compared and contrasted ideas.

思想を比較・対照して検討した

In this course we learned to present results based on evidence.

証拠に基づいて考えた結論を説明した

In this course we tested the advantages and disadvantages of competing ideas.

相反する考えそれぞれの長所短所を吟味した

In this course we learned to make a strong case based on clear premises and conclusions.

明確な根拠と、結果に基づいて強力な主張をする方法を学んだ

In this course we tested hypotheses.

仮説を検討した

In this course we learned to draw conclusions about characters in stories from their actions and dialogue.

その行動や話から物語の登場人物を判断する方法を学んだ

In this course we learned to question premises as reasons for accepting a conclusion.

結論を受け容れるために出される前提を問い直すことを学んだ

In this course we learned to look for premises likely to lead to the conclusion.

結論につながる前提を考えた

In this course we learned to focus on the most important parts of a problem.

課題の最重要点に注目することを学んだ

In this course we looked for similarities and differences between issues.

問題相互の類似と相違を考察した

In this course we learned the difference between inductive and deductive reasoning.

演繹と帰納との違いについて学んだ

In this course we monitored our own progress and sought help when we fell behind.

自分の学習の進み具合をチェックし、遅れていれば助力を求めた

In this course we learned to develop new ways of solving an old problem.

古くからある問題に対処する新しい解決策を考案した

In this course we learned how to draw logical conclusions from evidence.

論拠から論理的に結論を導く方法を学んだ

In this course we learned to identify the main issues of a problem.

問題の中心課題が何であるかを理解する方法を学んだ

In this course we learned to recognize weaknesses in our arguments.

自分の議論の弱点を認識する方法を学んだ

In this course we tested the evidence for popular beliefs.

通説の根拠を吟味した

In this course we analyzed language in order to learn.
言語を分析して学習する方法を学んだ
In this course we had the opportunity to write a defensible thesis and develop an argument.
十分議論できるテーマを提出し、議論を発展させる時間があった
In this course we learned to understand the reasons behind opinions.
どうして人がそのような考え方をするのか、それを知る方法を学んだ
In this course we learned to form explanations.
説明の仕方を学んだ
In this course we learned to explain the reasons for my opinions.
意見の裏付けを説明しようとした
In this course we learned to check whether evidence is credible.
論拠の信憑性を確認した
In this course we studied the pros and cons of an argument.
賛成・反対の両方の意見を検討した
In this course we learned to evaluate the merits of the literature we read.
どうすれば文献の真の価値が見極められるかを学んだ
In this course we learned to look for the evidence behind an argument.
議論の背後にあるべき論拠を追求した
In this course we learned to tell the difference between fact and opinion.
事実と意見との相違を分別した
In this course we checked evidence for a reliable source.
論拠の出典の信憑性を確認した
Because of this course I am more likely to persist until I find the correct answer to a problem.
このクラスのおかげで、以前より問題解決のための粘り強い努力が出来るようになった
In this course we learned to be logical when we present our arguments.
議論を論理的に展開することを学んだ
In this course we learned to look for other valid ways of obtaining evidence.
論拠に到達する適切な方法を模索し、それを獲得した