Students' perspectives, levels of epistemological understanding, and critical thinking dispositions related to the use of case studies in an educational psychology course

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Abstract

This is the second part of a research project investigating students' perspectives and critical thinking dispositions related to case study pedagogy in an educational psychology course. The first part of the research focused on students' perspectives on the meaningfulness of cases for transfer into future teaching situations and differences between students' perspectives and instructors teaching with cases (Razvi & Allen, 2005). This second part of the study looks at qualitative and quantitative data (video-tapes, California Critical Thinking Disposition Inventory) of students' behaviors exhibited during case discussions, their levels of epistemological understanding, and their critical thinking dispositions.

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Introduction

This study is the second part of a research project investigating teacher-education students' perspectives and critical thinking dispositions related to their exposure to case study pedagogy in an educational psychology course. The first part of the research (Razvi & Allen, 2005) focused on students' perspectives on the meaningfulness of case studies for transfer into future teaching situations and the differences between their perspectives and those of educational psychology instructors teaching with cases. This second part of the study looks at students' behaviors exhibited during case study discussions, their levels of epistemological understanding, and their critical thinking dispositions.

During the past decade, case studies have become readily available for use by instructors of education courses (Elksnin, 2001). Case studies are a common pedagogical method in educational psychology courses with most educational psychology textbooks either integrating vignettes (i.e., short cases) into the text or linking the text to supplemental case books (e.g., Eggen & Kauchak, 2004; Ormrod, 2006; Silverman, Welty, & Lyon, 1996; Snowman & Biehler, 2006; Woolfolk, 2005). Although there have been intermittent periods of research on case studies in teacher preparation courses, the research is far from extensive (Engle & Faux, 2004; Lundeberg, Levin, & Harrington, 1999; McNaughton, Hall, & Maccini, 2001; Sudzina, 1997). However, research on the effectiveness of cases as a pedagogical method in teacher education continues to be developed (Dai, Smith, Malkani, Gonyea & Zhang, 2005; Engle & Faux, 2004; Faux & Engle, 2005; Smith, 2005; Smith, Malkani & Dai, 2005; Yan & Liang, 2005). One area in which there is very little systematic research is on education students' perspectives based on their participation in case-based instruction (Ertmer,

Newby, & MacDougall, 1996). In particular there needs to be further investigation on students' perspectives and the developmental levels of students' critical thinking and epistemological understanding resulting from the use of cases in pre-service educational psychology courses.

This study focused on two major questions:

1. What levels of epistemological understanding do students engage when discussing cases in an educational psychology course?
2. Is there a relationship between students' levels of epistemological understanding and critical thinking dispositions?

Theoretical Perspective

As Anderson et al. (1995) describe in their article on the role of educational psychology in teacher education, "the goal of an educational psychology course … is to develop a teacher's psychological perspective, emphasizing analysis of and action in teaching situations" (p.145). They go on to describe how, based on the thinking of Doyle (1990), that it is important for teacher-educators to help pre-service teachers recognize "the complexity of teaching practice and the need to empower teachers to construct their knowledge in forms that help them interpret and solve teaching dilemmas" (p. 146). *Complexity* refers to the classroom's multidimensional nature and high level of unpredictability and uncertainty. In addition, the social and ethical values of pre-service teachers will influence the manner in which they construct their pedagogical knowledge and interact with students in this complex classroom environment. Harrington (1997) points out that this is why dilemma-based cases, often written in an ambiguous manner, such as those found in the Silverman et al. (1996) casebook, are ideal to help prepare teachers for the complex teaching situations that students will soon have a major contributing role.

Cases can be an effective way to prepare students for the reality of classrooms (Allen, 1995, 1994; Faux, 1999; Lundeberg et al., 1999; Malkani & Allen, 2005; Razvi & Allen, 2005; Stein, Hughes, Engle & Smith, 2003). The theoretical perspective often presented for the use of case studies as an effective pedagogy for pre-service teachers is grounded in cognitive and social constructivist learning principles (Sudzina, 1997). Through in-class group discussions and the individual writing of cases analyses, students are able to develop problem-solving abilities and construct their understanding of classroom situations by considering multiple perspectives which can lead to a reconstruction of their mental schemes about teaching (Silverman et al., 1996). Cases are seen as a way to develop reflective-practitioners and provide realistic meaningfulness of how educational theory can enhance classroom practice (Allen, 1995). As instructors, we seem to assume that all students can benefit from cases; however, not all students seem to gain these benefits. There are indications that older students (i.e., "returning" students) benefit more from case discussions than traditional-age students (Malkani & Allen, 2005) and students who score higher on critical thinking measures write stronger case analyses (Razvi & Allen, 2005). Although only anecdotal, based on teaching with cases for more than 10 years with both pre-service undergraduate students and in-service graduate students, one of the authors of this study has seen a distinct difference in the levels of critical thinking and epistemological understanding between the two groups. In-service graduate students, in general, seem to demonstrate much higher levels. This suggests that there may be developmental differences among students in their levels of epistemological understanding and critical thinking dispositions which allow some students to benefit to a greater extent than other students from case pedagogy.

Prospective teachers enter education courses with limited perspectives about teaching in general, as well as the variety of teaching methods used (Anderson et al., 1995). As education majors

in college transition from being students to teachers, their belief systems go through a gradual developmental change that expand this limited perspective (Kitchener, 1986; Kuhn, 1991). Since pre-service teachers are viewing the use of cases in their classes from the perspective as students, their perspective is likely to be very different than in-service teachers who are currently in the classroom. A relevant question to consider is: What is the relationship between students' developmental levels of epistemological understanding and critical thinking dispositions and their ability to benefit from a case pedagogy based on constructivist learning theory?

Kuhn and her colleagues have proposed a developmental model linking levels of epistemological understanding and critical thinking (Kuhn, 1999; Kuhn, Cheney & Weinstock, 2000; Kuhn & Dean, 2004). This developmental model suggests that there are four levels of epistemological understanding that individuals can progress through that require different critical thinking dispositions (see Table 1). Kuhn and Dean (2004) argue that the transition between the first three levels (Realist to Absolutist to Multiplist) occurs fairly naturally without the need of scaffolding by adults. However, the last transition to the Evaluativist level "requires the concerned attention of parents and educators, especially if it is this progression that provides the necessary foundation for intellectual values" (p. 273). Kuhn & Dean suggest that students need to be engaged in meaningful inquiry and argument activities that help them develop critical thinking skills that they will value in making decisions. Good decision-making by teachers in the complex environment of the classroom is at the heart of quality teaching. This is a major reason why many instructors of educational psychology courses chose to teach with cases. They hope that by having students investigate cases of realistic classroom situations, students will develop better decision making abilities that will transfer to when they are teaching in their classrooms. But how many pre-service teachers actually operate on

the Evaluativist level of epistemological understanding and engage in a high level of critical thinking?

Table 1: Levels of Epistemological Understanding (Kuhn & Dean, 2004)

Level	Assertions	Knowledge	Critical Thinking
Realist	Assertions are COPIES of an external reality.	Knowledge comes from an external source and is certain.	Critical thinking is unnecessary.
Absolutist	Assertions are FACTS that are correct or incorrect in their representation of reality.	Knowledge comes from an external source and is certain but not directly accessible, producing false beliefs.	Critical thinking is a vehicle for comparing assertions to reality and determining their truth or falsehood.
Multiplist	Assertions are OPINIONS freely chosen by and accountable only to their owners.	Knowledge is generated by human minds and therefore uncertain.	Critical thinking is irrelevant.
Evaluativist	Assertions are JUDGMENTS that can be evaluated and compared according to criteria of argument and evidence.	Knowledge is generated by human minds and is uncertain but susceptible to evaluation.	Critical thinking is valued as a vehicle that promotes sound assertions and enhances understanding.

Methods of Inquiry

Subjects

The subjects of this study were nineteen (N = 19) undergraduate pre-service education students enrolled in two educational psychology classes (n = 16; n = 12). There were 14 female and 5 male students, all Caucasian. Twelve students were classified as traditional age (18-24) and seven students were classified as "returning" students (25+ years of age). Fourteen students were "juniors" with five identifying themselves as "seniors." Five education "majors" were represented (elementary, secondary, special, art, music). Fifteen students indicated that they had previously experienced cases in an education course, while four indicated no experience with case discussions. These nineteen students volunteered for the study during the first class session. One of the courses (EPY370) was a morning section meeting twice a week and the other (EPY350) met once a week in the evening.

Data Sources

Cases from the Silverman et al. (1996) casebook were used extensively to help students connect educational psychology principles and theories to real classroom situations. Depending on which section of the course they were enrolled, students were required to read and prepare a discussion outline for either five or six cases during the semester (approximately one every two weeks). In-class discussions of the cases usually lasted between 60 and 75 minutes. Following the in-class discussions, students in both sections were also required to write extended case analyses (approximately 8-10 pages) for several of the cases; three in the morning section and four in the evening section. Qualitative and quantitative data was collected through a demographic survey, participating observation, student interviews, analysis of video-tapes of case discussions using a self-designed rubric, and administration of the California Critical Thinking Disposition Inventory (CCTDI).

Demographic Survey

Demographic data was collected at the beginning of the term on students regarding gender, age, major, and experiences with case studies. This information has been summarized above.

Participating Observation and Student Interviews

One of the authors was a participating observer who recorded field notes to document students' behaviors and actions related to the use of case studies and discussion of them by students in the evening educational psychology class. In addition, the participating observer gathered observational data by conversing with peers, as well as listening to public comments exchanged between students before and after class sessions, and recorded them in a journal. Interviews were conducted during the semester to gain students' perspectives on cases and changes in their thinking about cases before they were discussed, after the third case, and at the end of the semester after all the cases had been studied. The interviews were conducted with a set of structured questions with follow up probes (see Appendix A).

California Critical Thinking Disposition Inventory (CCTDI)

The CCTDI was administered at the beginning of the semester to the research subjects to classify students by their critical thinking dispositions (Facione & Facione, 1992). The CCTDI measures seven dispositions related to critical thinking. These dispositions include:

1. *Truth-seeking* which is being "courageous when asking questions, eager to seek best knowledge in a given context, and honest in the pursuit of inquiry."
2. *Open-mindedness* which is "being open to and tolerant of the expression of divergent points of view with the sensitivity to the possibility on one's own bias."

3. *Analyticity* which is "being alert to potentially problematic situations, anticipating possible results or consequences, and prizing the application of reason and the use of evidence even if the problem at hand turns out to be challenging or difficult."
4. *Systematicity* which is approaching "specific issues, questions or problems in an orderly, focused, and diligent way."
5. *Self-Confidence* "refers to the level of trust one places in one's own reasoning processes."
6. *Inquisitiveness* which "measures one's intellectual curiosity … and values being well-informed, wants to know how things work, and values learning even if the immediate payoff is not directly evident."
7. *Maturity* which measure how one "makes reflective judgments, particularly under conditions of uncertainty" and "approach problems, inquiry, and decision making with a sense that some problems are ill-structured … and many times judgments must be made based on standards, context and evidence which precludes certainty."

   (Facione, Facione, & Giancarlo, 2001, pp. 2-3)

The CCTDI was chosen since the seven dispositions it measures correspond to the types of skills that reflect instructor rationales for teaching with cases (see Razvi & Allen, 2005). In addition, the qualities of critical thinking measured by the *analyticity* and *maturity* scales correspond to the manner in which Kuhn and Dean (2004) define epistemological understanding at the Evaluativist level in their taxonomy focusing on the "use of evidence" to make "judgments". Furthermore, the *truth-seeking*, *self-confidence*, and *inquisitiveness* critical thinking measures of the CCTDI can be viewed as indicators of the level of active engagement and participation one might expect from students who demonstrate critical thinking during a case discussion.

Video tapes of case discussions

Case discussions in each of the Educational Psychology course sections were videotaped and analyzed using a rubric based on the model of Kuhn and Dean (2004). Each videotape recorded approximately 60 minutes of the case discussion. The rubric was designed to rate and record levels of epistemological understanding exhibited by students during the discussion (see Appendix B). The ratings were established through consensus by the two authors along with an independent review by a third recorder not associated with the research study. These ratings were used to determine the frequency of students' case discussion responses at each of the four levels of epistemological understanding and compared to the CCTDI data to look for any relationship to the critical thinking disposition categories measured by the CCTDI.

Data Analysis & Results

Data from observational notes and interviews with students and case instructors were analyzed using a constant comparative method (Glasser & Strauss, 1999). This analysis identified common and variant themes about students' and instructors' perspectives and thinking related to the case studies. An analysis of students' achievement on written case analyses and their CCTDI scores was also conducted indicating that there was a positive relationship between higher case analysis scores and higher CCTDI scores (see Figure 1). These analyses are discussed in more detail in a previous report by the authors (Razvi & Allen, 2005).

In this paper data from the CCTDI is compared with the data from the rubric analysis of eight of the videotapes of the case discussions held in the two educational psychology classes. The cases discussed, videotaped, and analyzed include *Maggie Lindberg*, *Ken Kelly*, *Mark Siegel*, and *Sarah Hanover* (Silverman et al., 1996) covering respectively the topics of behavioral and social learning theory; cognitive, constructivist, and humanistic perspectives on learning; motivation and cultural

diversity; and assessment and grading. The analysis of the data attempts to understand more clearly the relationship between students' levels of epistemological understanding, their critical thinking dispositions, and the use of cases as a pedagogy to promote epistemological understanding and critical thinking.

Findings

Question 1: What levels of epistemological understanding do students engage when discussing cases in an educational psychology course?

Table 2 summarizes the videotape data indicating the frequency of students' responses based on the four levels of epistemological understanding demonstrated for each of the four cases. Table 2 also indicates the CCTDI scores of the students. Overall, 676 individual student responses were recorded from the approximately 8 hours of videotaped case discussions analyzed. Figure 2 provides a graphical representation of the number of student responses for each of the four cases according to the levels of epistemological understanding recorded. As can be noted, there was a general upward trend in all levels of understanding from the first case discussion to later case discussions, with the largest changes in the Multiplist and Evaluativist levels. During the analysis of the videotapes it became clear that often the level of students' responses were directly related to the type (or level) of question that the instructor asked, and that as the semester progressed, students seemed to become more comfortable with stating assertions that more often went beyond the Relativist and Absolutist levels of understanding. The students not only offered their opinion more frequently (Multiplist level), but more often supported their ideas with evidence and logical argument (Evaluativist level).

Question 2: Is there a relationship between students' levels of epistemological understanding and critical thinking dispositions?

As mentioned above, when looking at the CCTDI the two subscales *analyticity* (An) and *maturity* (Ma) correspond to the Evaluativist level of epistemological understanding. Figure 3 indicates that there is a slight positive relationship between the maturity scores (Ma) on the CCTDI and the total number of Evaluativist responses (Te) by students during case discussions. However, as Figure 4 indicates, there is a slight negative relationship between the analyticity scores (An) and the number of Evaluativist responses by students. If these two subscores are combined (AnMa), as illustrated in Figure 5, we can see that these two subscores essentially cancel out and there seems to be little relationship to the number of Evaluativist responses and these CCTDI scores of the students.

The *truth-seeking* (TS), *self-confidence* (SC), and *inquisitiveness* (In) subscales, as mentioned above, could be viewed as indicating level of active engagement and participation in a critical thinking manner during a case discussion. As seen in Figure 6, Figure 7, Figure 8, and Figure 9, all of these scores, as well as the sum of these three scores (TSSCIn) have a very slight negative relationship to the total number of responses (Total) by individual students. This indicates that students' critical thinking as determined by these subscores on the CCTDI seem to have little relationship to their level of participation in case study discussions.

If we consider the total CCTDI scores of the individual students in relationship to the number of Evaluativist responses given by the students, we see another very slight negative relationship between students' level of critical thinking and their level of epistemological understanding at the Evaluativist level (see Figure 10).

In sum, the data indicates that there is little relationship between students' score on a critical thinking instrument (CCTDI) and the frequency and level of epistemological understanding exhibited

during case study discussions. However, the authors believe that there are several limitations that may provide explanation as to why weak relationships were shown between critical thinking and epistemological understanding among students. The limitations will be discussed in the following section.

Limitations

One limitation of this study that may have influenced the results is the video tapes that were analyzed only recorded 60 minutes of case discussions, some of which were in fact 75 minutes long. During these last 15 minutes the authors believe that many more Evaluativist responses were most likely given by students as the teacher used this time to focus on finding solutions to problems in the case based on evidence and connection to principles of educational psychology. Thus, if more Evaluativist responses were recorded from these last 15 minutes not captured in the videotapes, we might have found a stronger connection between those students who participated, their CCTDI scores, and number of Evaluativist responses.

Another limitation which became obvious in viewing the videos is that the epistemological level of the students' responses seemed to correspond highly to the level of the instructor's questions. For example, most of the Evaluativist responses by students seemed to be directly related to Evaluativist level questions asked by the instructor. However, Evaluativist questions occasionally elicited Multiplist responses and conversely, some Multiplist questions were responded to at an Evaluativist level. The number and level of student responses recorded is strongly influenced by the number and level of questions posed by the instructor. This may have prevented getting a true representation of students' level of epistemological understanding.

An additional limitation related to the number and level of student responses could be the nature and content of each of the cases themselves. Some of the cases allowed for less depth in the

level of discussion because multiple case issues were present within the case and more time was spent on Realist questions in order to understand the "problems" in the case. When questions were asked that specifically addressed concepts in educational psychology from the text, more Absolutist questions and responses would be expected and fewer Multiplist and Evaluativist responses. On reflection, the authors believe that a good case discussion would elicit from students a high level of Absolutist responses, due the direct application of educational psychology principles, as well as a higher number of Evaluativist responses in order to facilitate higher epistemological understandings.

One other limitation that would effect the number of responses has to do with the amount of time the teacher engaged in instruction and explanation. It was noted through watching the videos that there were times when the teacher talked much more, allowing fewer instances where students were called on to participate.

Finally, having only 19 participants in this study may have contributed to a very uneven number of responses among the students. This may have effected some of the analysis. A larger sample size may help to get a more even distribution of responses from students so that one or two "talkative outliers" would not dominate the findings as shown in Figures 3-10.

Educational Implications

A major reason why this study has educational importance is that it provides information about case pedagogy from a developmental perspective as well as a learning perspective. This should help teacher-educators who employ cases to modify and improve their use of cases in teacher education courses. It may also provide insight into why case pedagogy seems effective with some pre-service students but not others.

One educational importance of this study is that it provides information about students' way of thinking as it relates to a common method of instruction. Second, by gaining information on

students' thinking and level of understanding, teacher-educators can use cases more effectively by modifying how they use cases in teacher education courses. One of the main findings of analyzing the video tapes of the case discussions is that the questioning methods of the instructor are extremely influential in helping students to think at the Evaluativist level. This implies that if case discussions are going to be an effective pedagogy for increasing students' level of critical thinking and epistemological understanding, then it is important to consider how instructors are trained to lead case discussions. This research contributes to the on-going development towards the knowledge base regarding the use of cases as a pedagogy in the preparation of teachers, specifically their use in educational psychology courses.

This research provides implications that more research is needed on effective practices of teaching with case studies. The influence of the instructor as facilitator has to be taken into account if we expect case studies to promote effective change in students. More research and observations on practices used to facilitate and participate in case discussions, and the evaluation of case analyses written by students, needs to be conducted in order to develop a better understanding of students' critical thinking and epistemological development as related to the methods of instruction used by case facilitators. The authors found that analysis of videos of case discussions, although time intensive, to be a rich source of data related to this issue of case facilitation and student development. We recommend more case discussions be video taped for further analysis on this issue.

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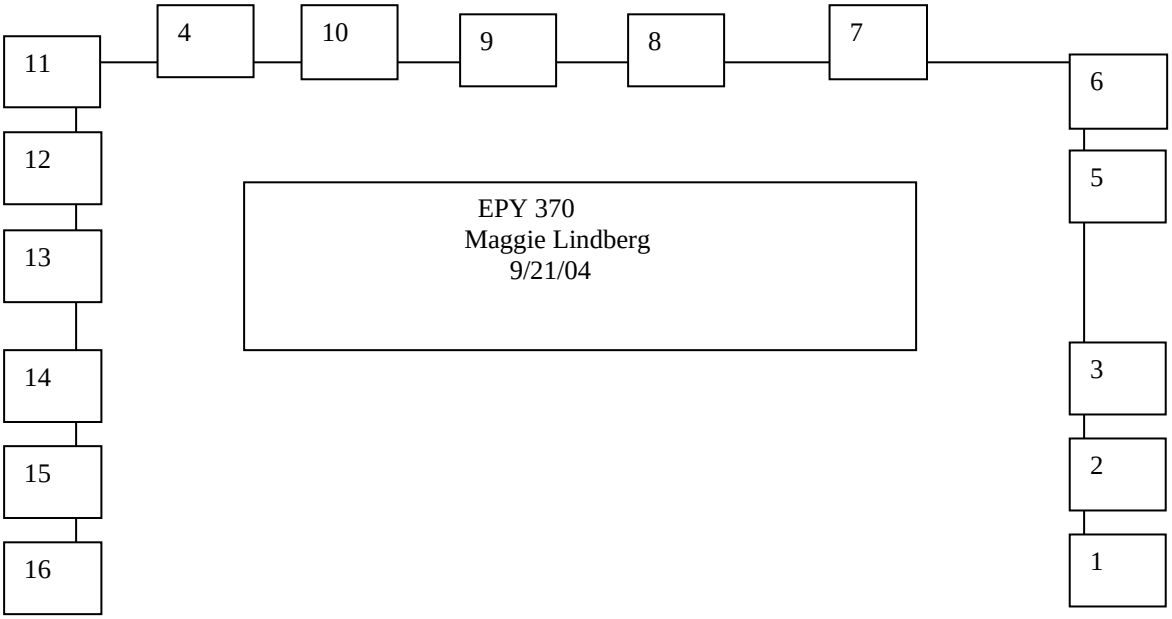
Appendix A: Interview questions for students

- What are your general thoughts about the cases that are used for your educational psychology course?
- What purpose do you think case studies serve? In general and to you specifically?
- What are your thoughts about reading the case studies for class?
- What are your thoughts about the case discussions in class?
- What are you thoughts about writing case analyses?
- What do you like in general and specifically about studying cases as part of the course?
- What do you dislike about the cases?
- What additional thoughts would you like to share about the use of case in the course?

Appendix B: Epistemological Understanding Rubric



Level of Epistemological Understanding	Responses by Students (Numbers1-16)
Realist Statements made are direct copies of what teacher says in case	
Absolutist Statements are stated as absolute fact from an external source (case book; B&B text; teacher, etc.)	
Multiplist Statements are personal opinions and not accountable to other views/perspectives.	
Evaluativist Statements are reasoned judgments evaluated & compared according to criteria of argument and evidence.	

Figure 1: Comparison of Student's CCTDI scores and Average Case Analysis Grade

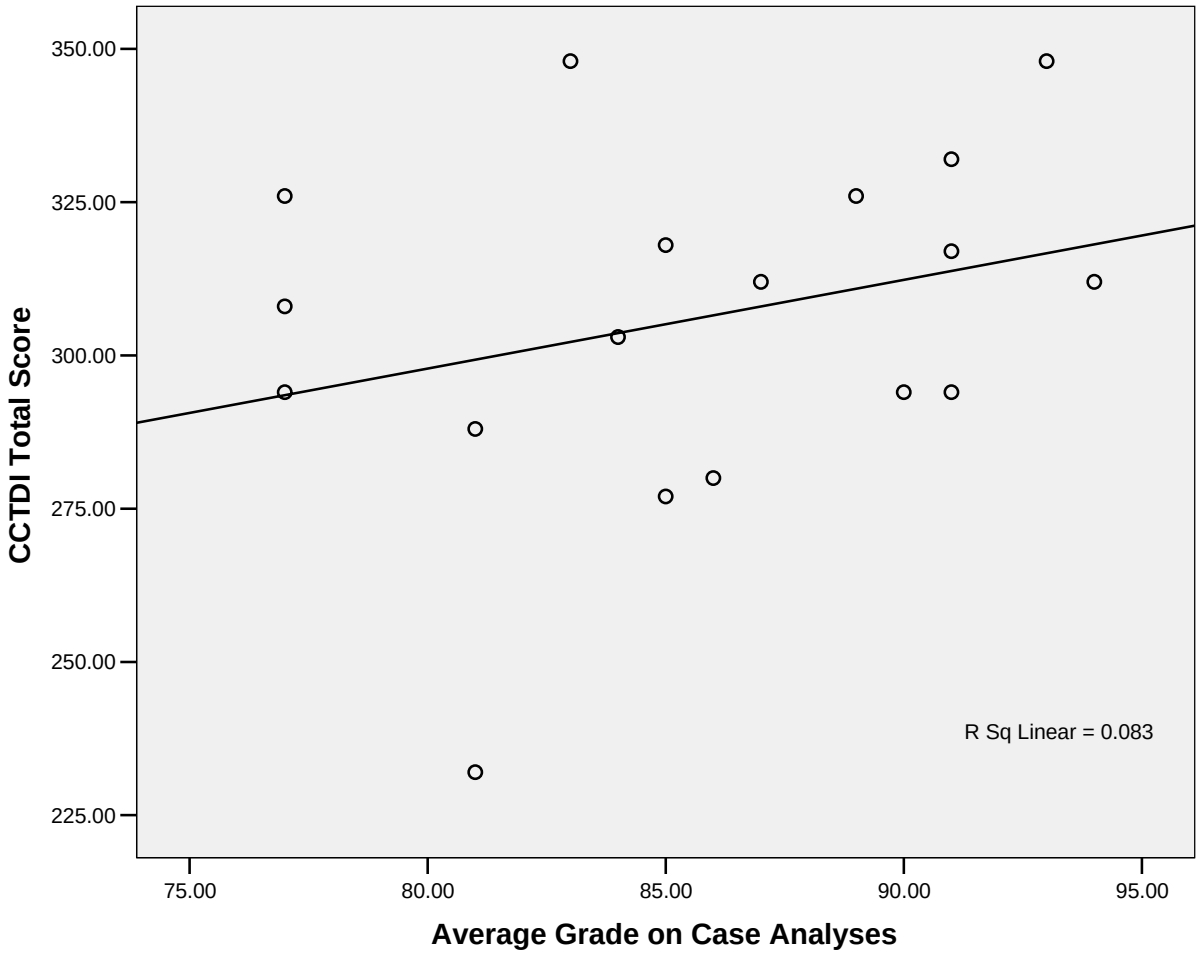


Figure 2: Frequency of Students' Case Responses by Levels of Epistemological Understanding

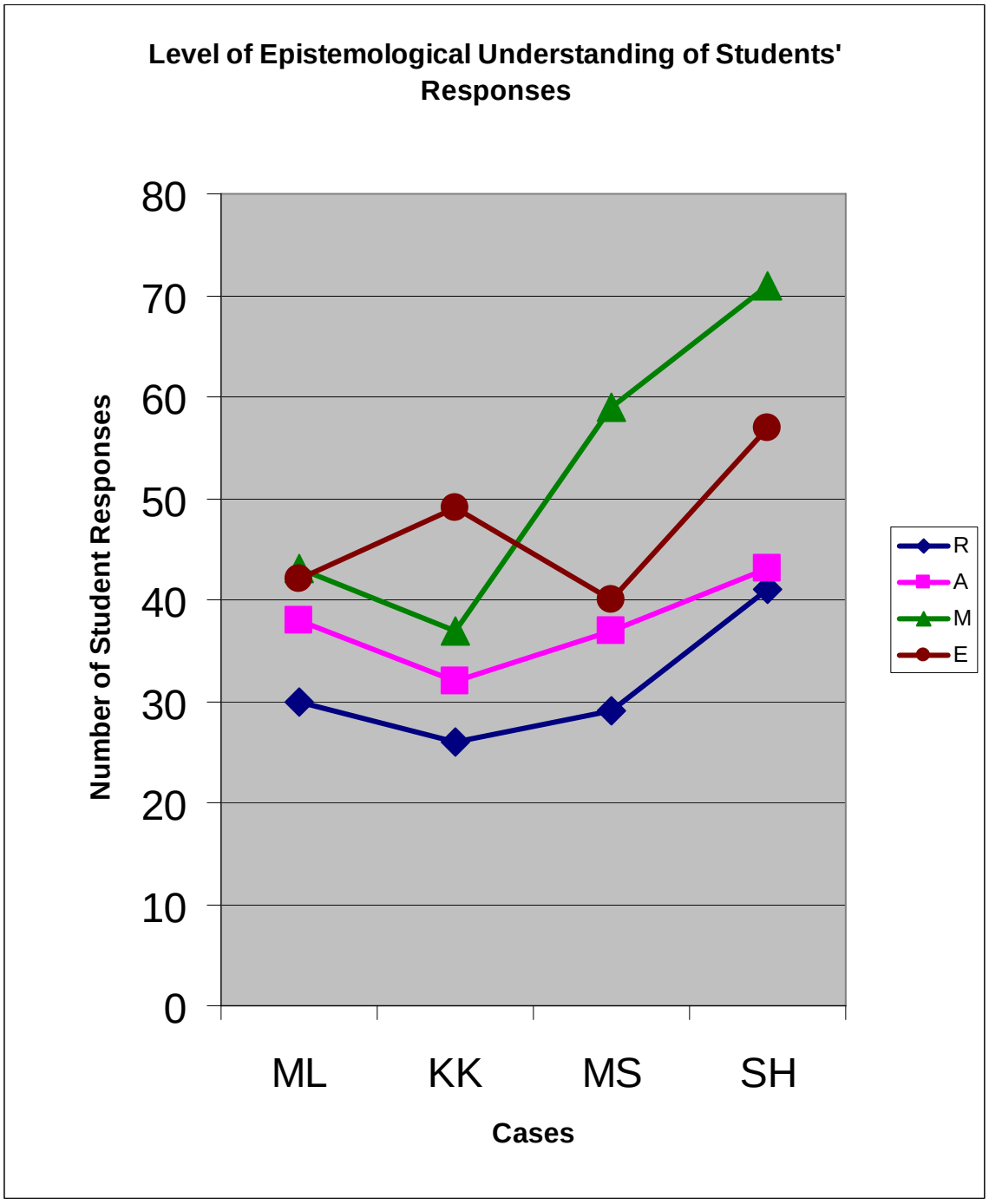


Figure 3: Comparison of CCTDI subscale Maturity (Ma) and Total Evaluativist (Te) Responses

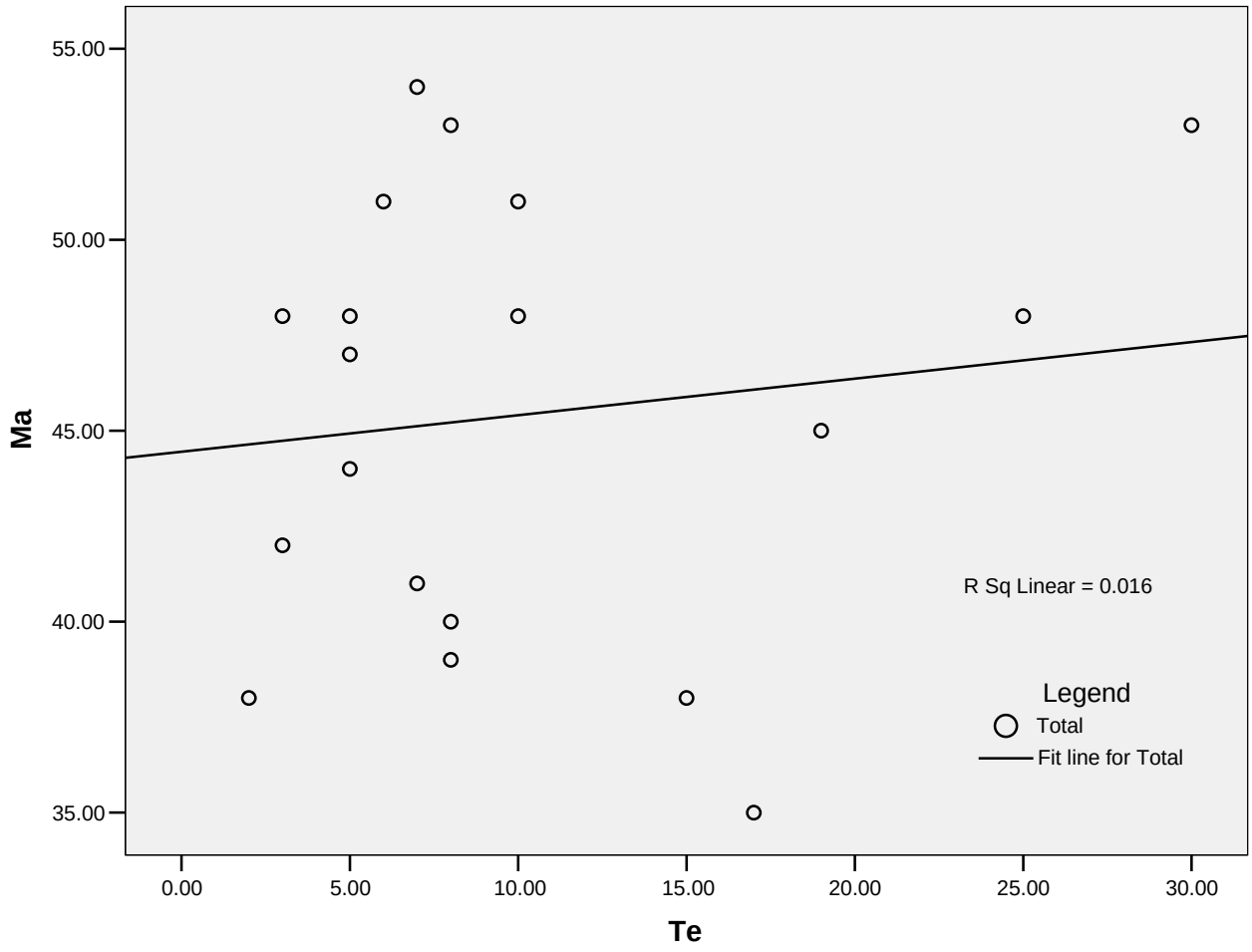


Figure 4: Comparison of CCTDI subscale Analyticity (An) and Total Evaluativist (Te) Responses

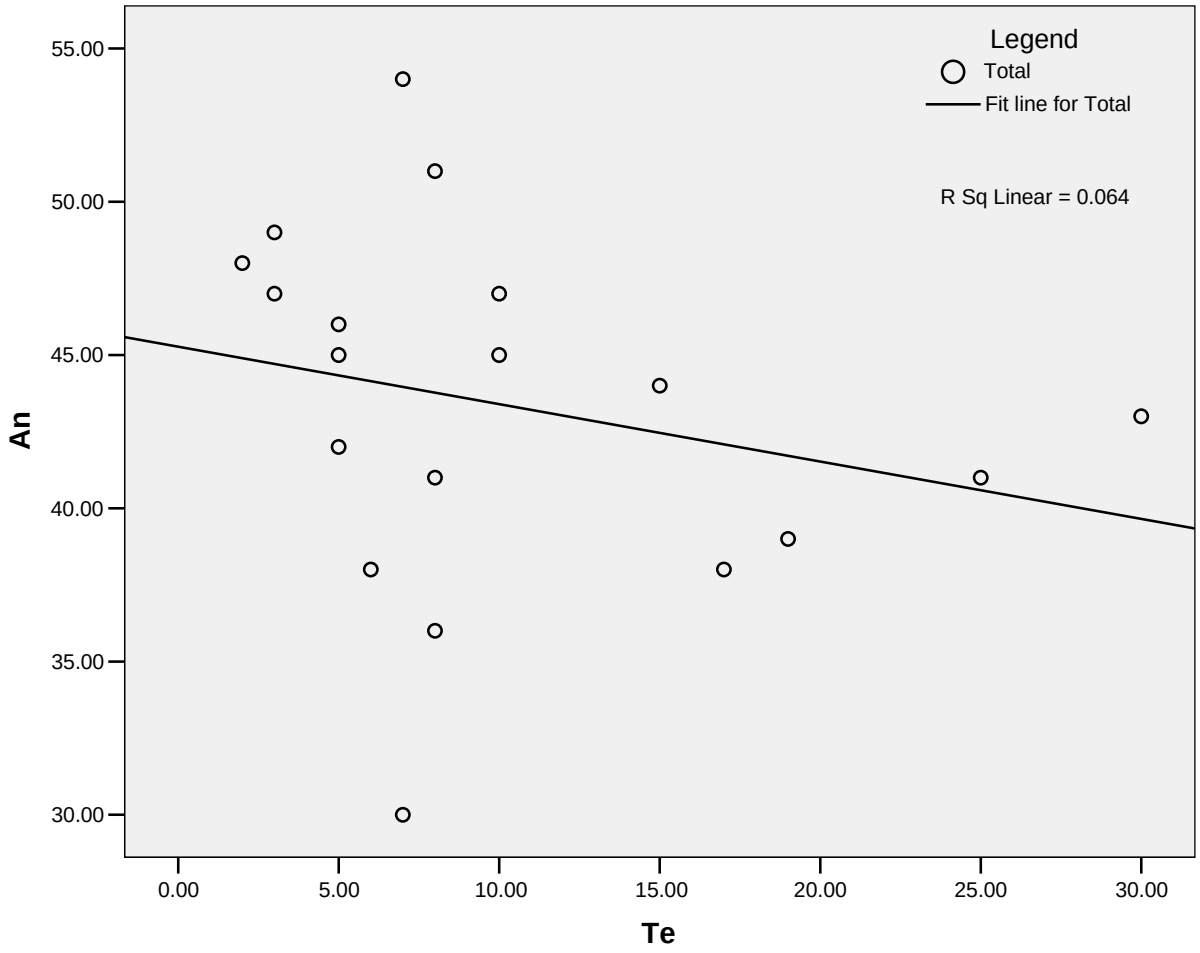


Figure 5: Comparison of Combined CCTDI subscales Analyticity and Maturity (AnMa) and Total Evaluativist (Te) Responses

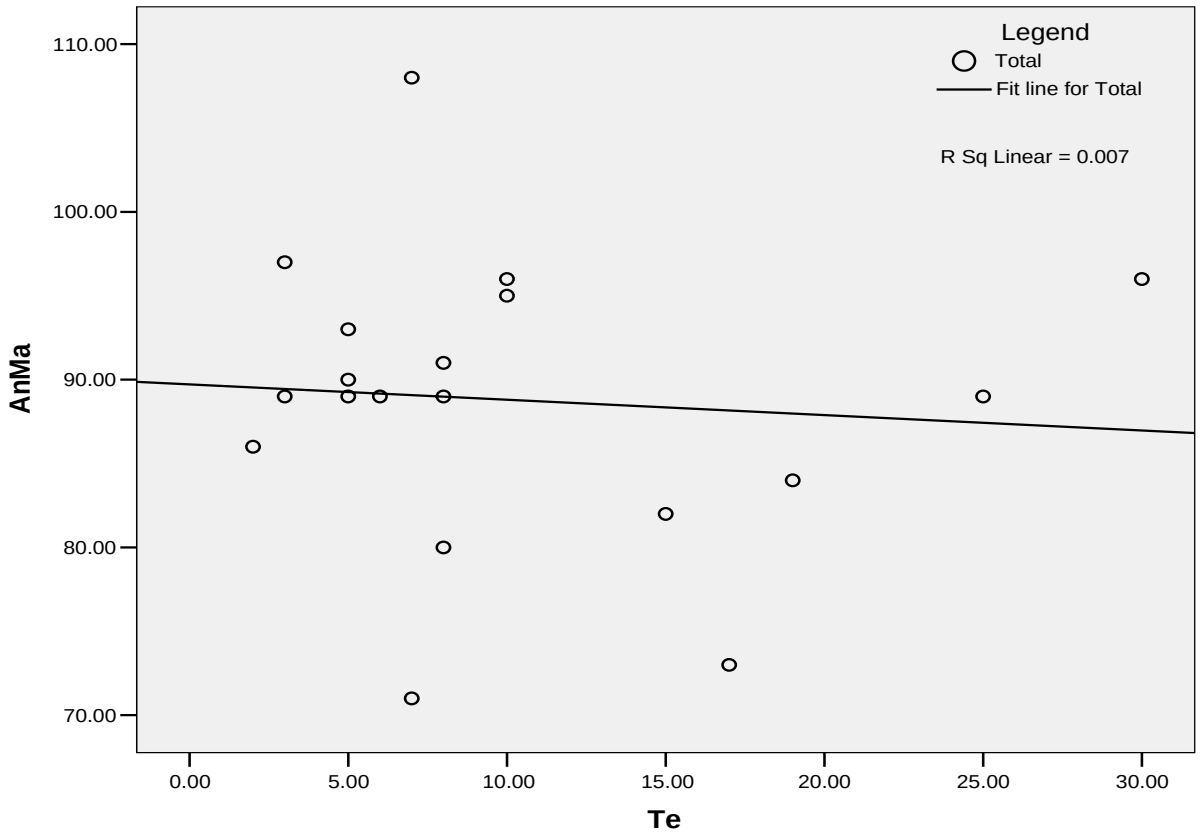


Figure 6: Comparison of CCTDI subscale Truth-Seeking (TS) and Total Number of Student Responses (Total)

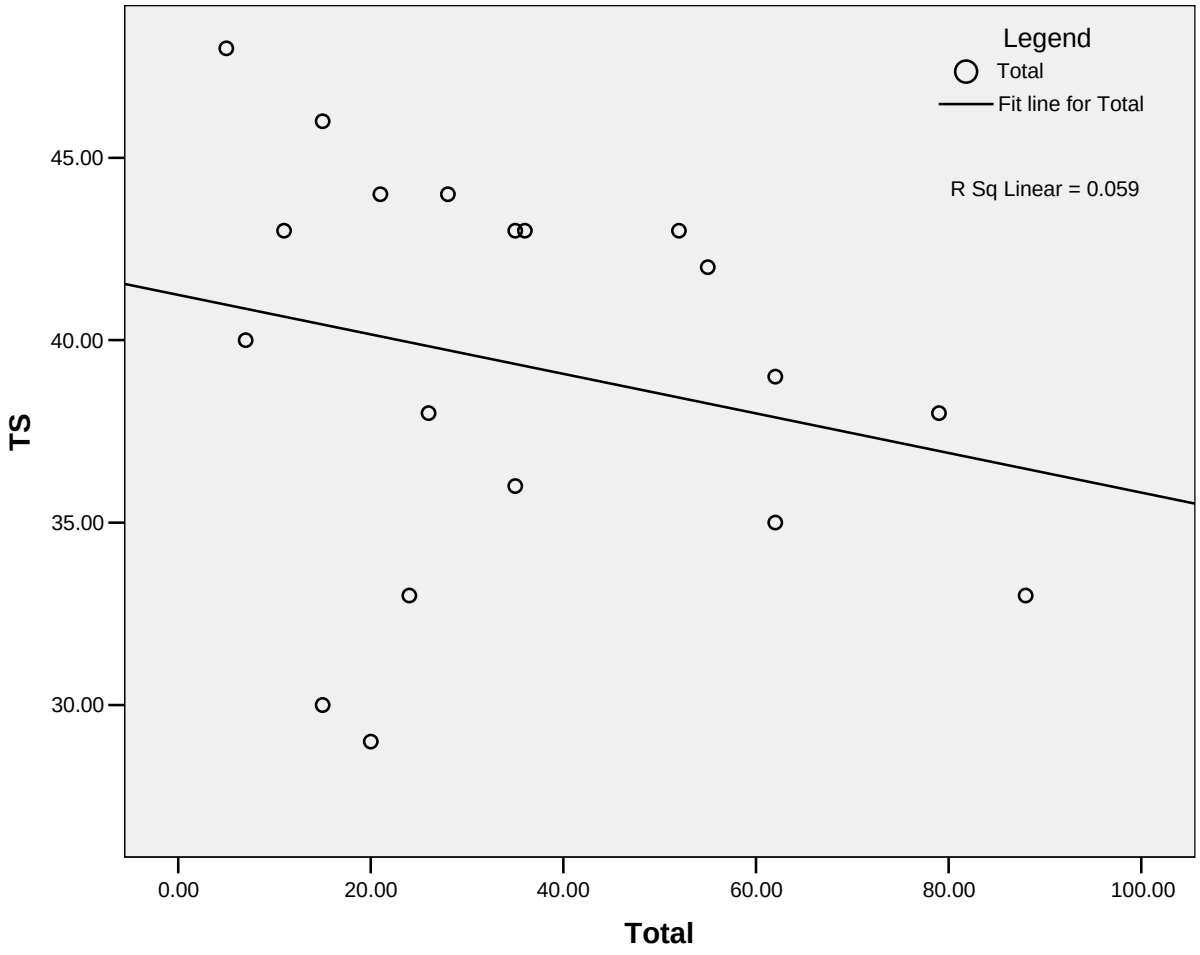


Figure 7: Comparison of CCTDI subscale Self-Confidence (SC) and Total Number of Student Responses (Total)

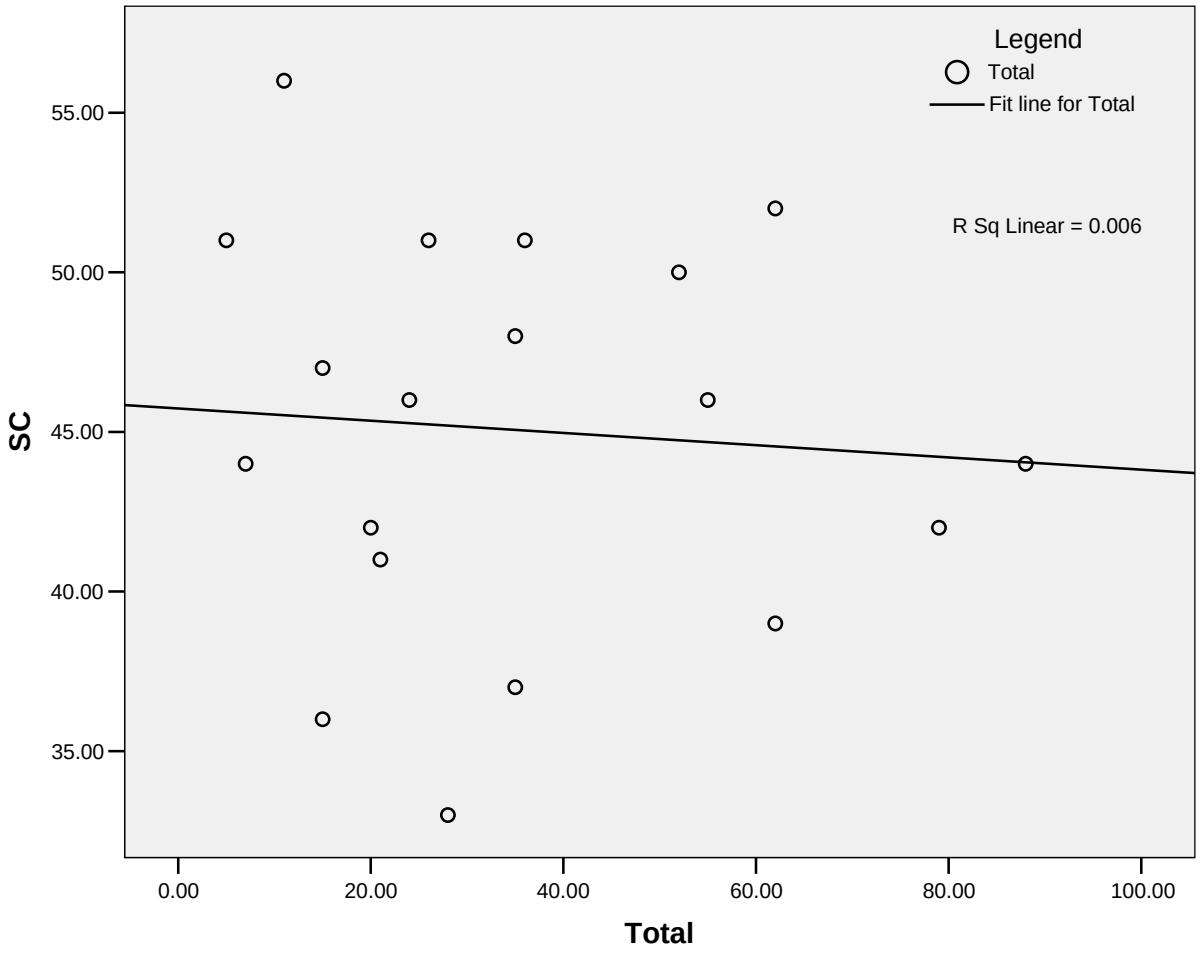


Figure 8: Comparison of CCTDI subscale Inquisitiveness (In) and Total Number of Student Responses (Total)

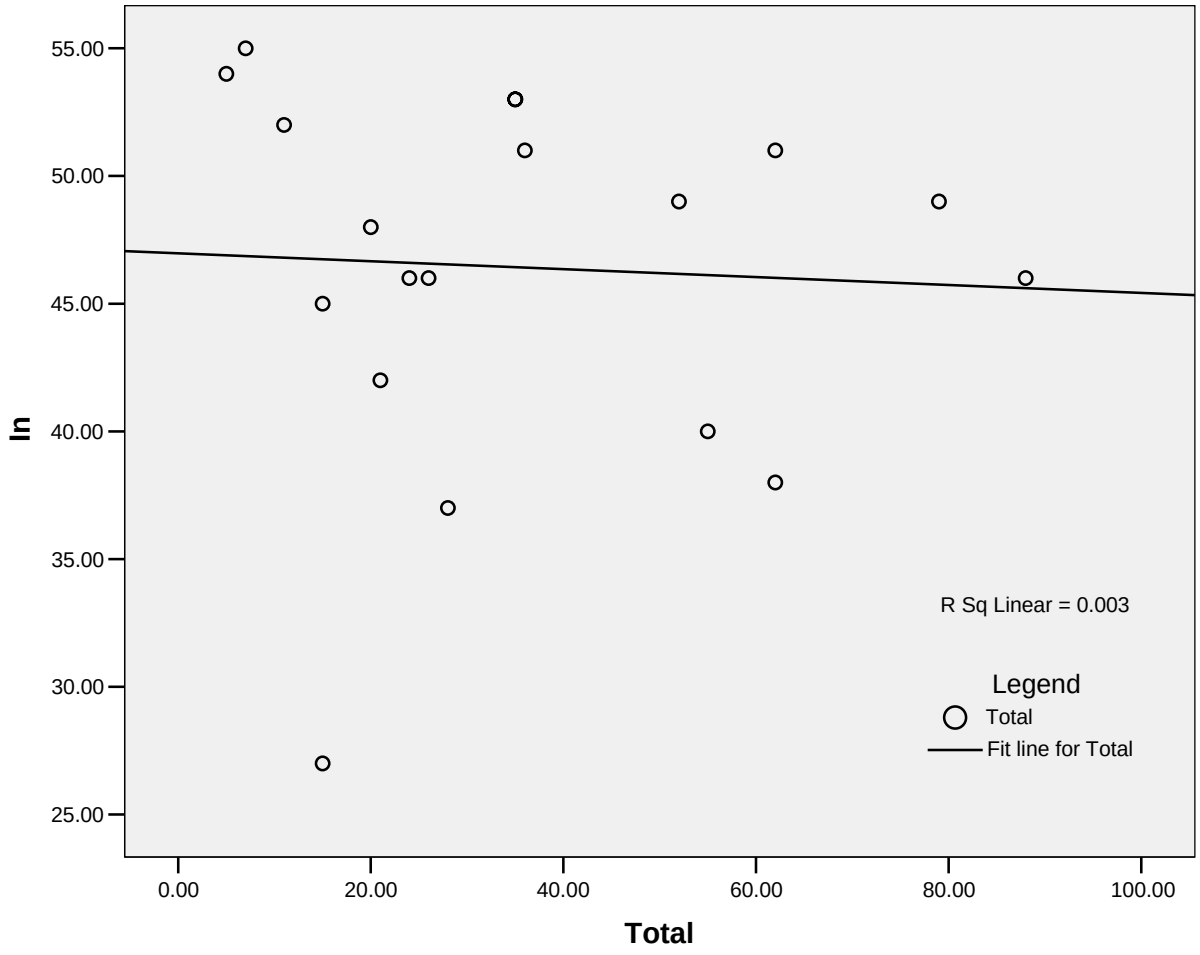


Figure 9: Comparison of Combined CCTDI subscales Truth-Seeking, Self-Confidence, and Inquisitiveness (TSSCIn) and Total Number of Student Responses (Total)

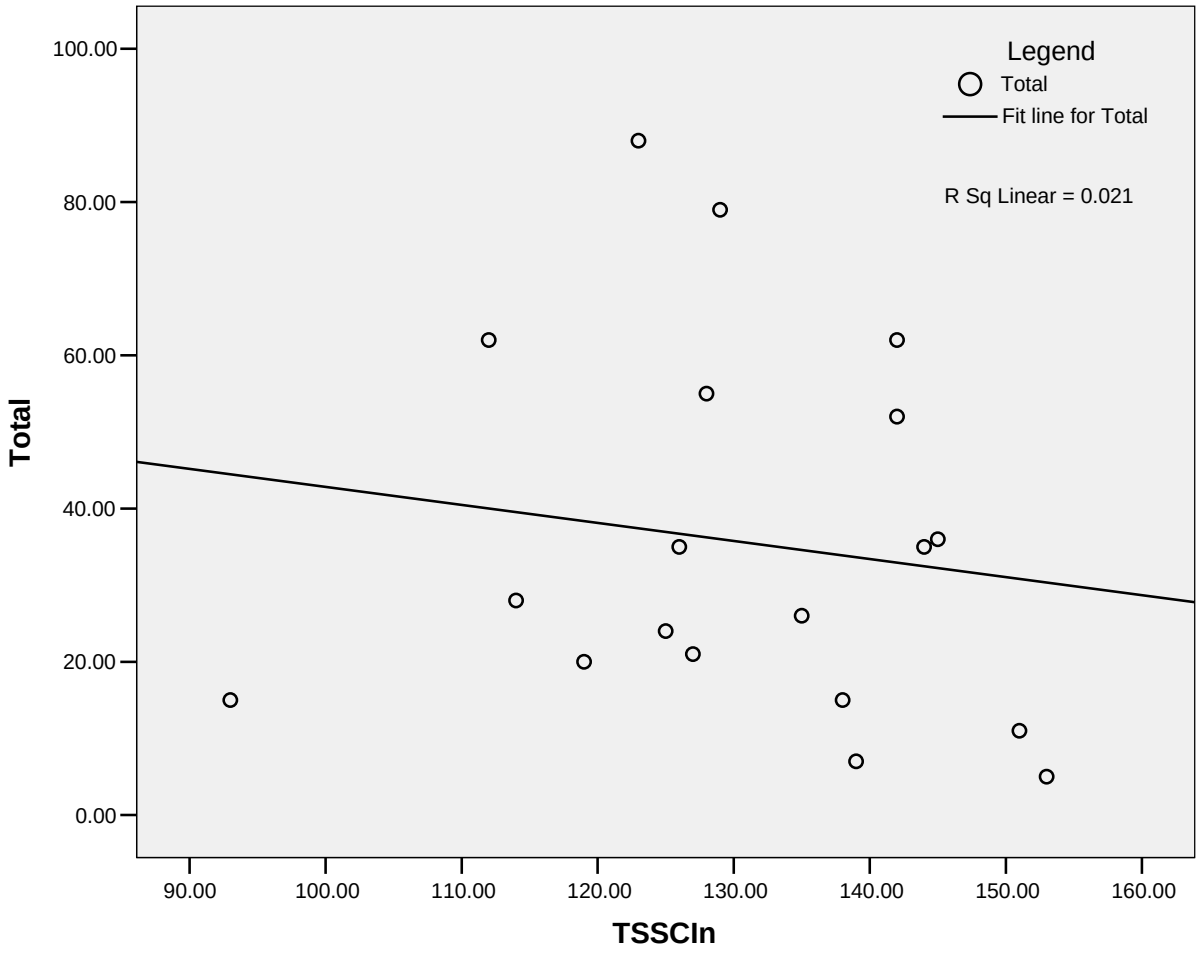


Figure 10: Comparison of Total CCTDI scores (CCTDITotal) and Total Evaluativist Responses (Te)

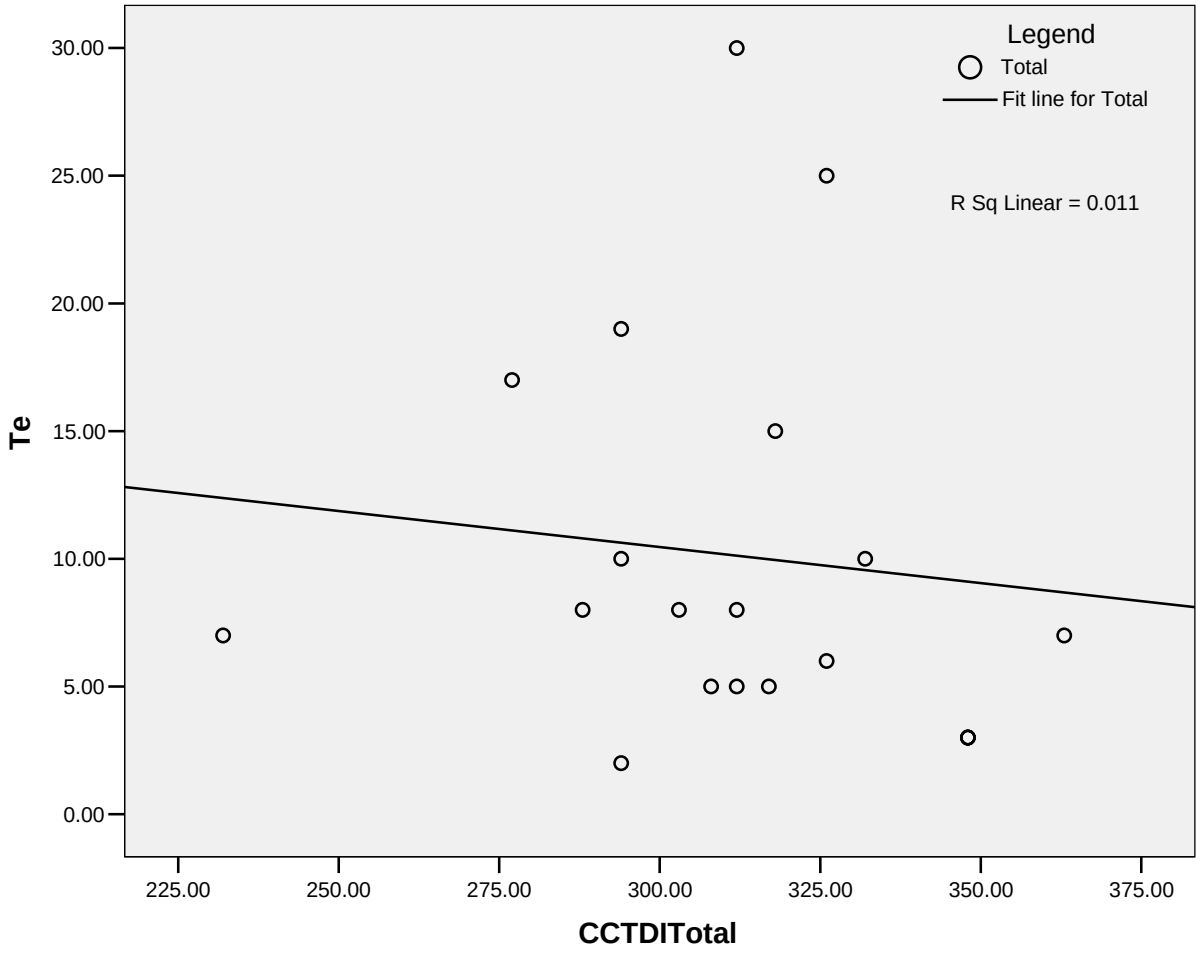


Table 2: Frequency of Students' Responses, Levels of Epistemological Understanding, and CCTDI Scores

	Realist				*Tr*	Absolutist				*Ta*	Multiplist				*Tm*	Evaluativist				*Te*	*Total*		TS	OM	An	Sy	S-C	In	Ma	An Ma	TS SC IN	*CCTDI Total*
	ML	KK	MS	SH		ML	KK	MS	SH		ML	KK	MS	SH		ML	KK	MS	SH												
EPY350																															
S109 (1)	0	0	1	3	*4*	0	0	1	2	*3*	0	0	0	1	*1*	1	0	1	1	*3*	*11*		43	57	49	43	56	52	48	97	151	*348*
S110 (2)	1	5	2	A	*8*	3	2	1	A	*6*	2	3	2	A	*7*	2	2	1	A	*5*	*26*		38	38	45	55	51	46	44	89	135	*317*
S101 (3)	2	2	2	0	*6*	0	0	2	0	*2*	4	2	7	6	*19*	4	0	2	2	*8*	*35*		36	45	41	37	37	53	39	80	126	*288*
S105 (4)	3	4	2	9	*18*	8	4	5	8	*25*	2	2	5	8	*17*	5	4	7	3	*19*	*79*		38	45	39	36	42	49	45	84	129	*294*
S107 (6)	5	0	2	1	*8*	7	4	6	9	*26*	0	0	10	8	*18*	1	0	3	6	*10*	*62*		35	41	45	45	39	38	51	96	112	*294*
S102 (8)	4	2	5	0	*11*	0	2	2	2	*6*	5	5	3	7	*20*	2	4	2	7	*15*	*52*		43	50	44	44	50	49	38	82	142	*318*
S111 (11)	2	2	0	3	*7*	0	0	2	0	*2*	1	2	2	4	*9*	1	0	1	0	*2*	*20*		29	43	48	46	42	48	38	86	119	*294*
S108 (12)	5	6	2	14	*27*	3	3	3	5	*14*	4	10	5	11	*30*	3	5	6	3	*17*	*88*		33	39	38	42	44	46	35	73	123	*277*
S112 (13)	0	1	0	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*	0	2	1	0	*3*	*5*		48	53	47	53	51	54	42	89	153	*348*
EPY370																															
S119 (1)	0	0	0	2	*2*	1	4	1	1	*7*	2	2	3	0	*7*	1	3	1	3	*8*	*24*		33	42	51	45	46	46	40	91	125	*303*
S116 (5)	0	0	4	0	*4*	3	3	2	5	*13*	8	1	6	5	*20*	9	6	5	5	*25*	*62*		39	50	41	45	52	51	48	89	142	*326*
S117 (6)	0	0	0	3	*3*	0	0	0	0	*0*	1	2	3	0	*6*	2	1	1	2	*6*	*15*		46	52	38	47	47	45	51	89	138	*326*
S120 (7)	1	A	1	0	*2*	2	A	0	0	*2*	3	A	6	7	*16*	2	A	1	5	*8*	*28*		44	36	36	41	33	37	53	89	114	*312*
S118 (9)	0	1	3	0	*4*	1	0	1	0	*2*	0	0	0	2	*2*	0	2	3	2	*7*	*15*		30	39	30	29	36	27	41	71	93	*232*
S123(11)	0	0	2	1	*3*	0	4	2	0	*6*	3	0	3	1	*7*	0	2	1	2	*5*	*21*		44	48	42	43	41	42	48	90	127	*308*
S124 (12)	2	0	1	2	*5*	2	2	4	5	*13*	2	2	2	2	*8*	4	1	0	5	*10*	*36*		43	53	47	39	51	51	48	95	145	*332*
S125 (13)	3	2	A	1	*6*	5	3	A	3	*11*	2	3	A	6	*11*	1	4	A	2	*7*	*35*		43	52	54	59	48	53	54	108	144	*363*
S122 (14)	0	0	0	0	*0*	0	0	0	0	*0*	0	1	1	0	*2*	2	2	0	1	*5*	*7*		40	44	46	36	44	55	47	93	139	*312*
S127 (16)	2	1	2	2	*7*	3	1	5	3	*9*	4	1	1	3	*9*	7	11	4	8	*30*	*55*		42	43	43	45	46	40	53	96	128	*312*
Totals	30	26	29	41	*126*	38	32	37	43	*147*	43	37	59	71	*210*	42	49	40	57	*193*	*676*											