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A Literature Review of the Student-Centered Teaching Approach: National Implications

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ABSTRACT

In order to develop a clear understanding of the student-centered teaching approach, a literature review was conducted. The study asked two questions: How the student-centered teaching approach was defined by individual researchers; and what the main findings were in those studies. Twenty eight studies were selected for the literature review. Main findings of the review indicated that the student-centered teaching approach took a variety of forms, or it was individually defined, and wide differences were also found in the main findings of the studies.

A Literature Review of the Student-Centered Teaching Approach

For decades, the student-centered teaching approach, with its conceptual framework based on the constructivism theory (Confer, 2000; Cuban, 2006), has been popular among many educators. Teachers at various grade levels have been applying the student-centered teaching approach for a variety of reasons: to increase student participation (Kelly, 1985), to develop confidence in students (Dandoulakis, 1986), to foster the intellectual development of students (Burke, 1983), to enable students to build multiple historical perspectives (Ogawa, 2001), to improve students' understandings of historical ideas and concepts (Stout, 2004), to shift the learning responsibility to students (Passman, 2000) and so forth. However, little is known on how the student-centered teaching approach has been defined by various educators and researchers, on the impact of this teaching approach upon students' learning and other aspects of their behavior. A study of the research literature seems to be a reasonable way to develop a clear understanding of the student-centered teaching approach.

Purpose of the Investigation

This investigation asked two questions. 1) How did the researchers define the student-centered teaching approach in their respective studies? 2) What were the main findings of those studies?

A literary search and selection of the related studies focusing on the student-centered teaching approach generated mainly two types of studies: the qualitative and the quantitative type of studies, with the majority being qualitative studies (16 were qualitative and 12 were quantitative in design). The following is a brief description of the studies in the research literature.

The Body of Literature

Qualitative Studies

In this group of studies, the student-centered teaching approach was applied to teaching various school subjects at multiple school levels. The psychological impact of the use of the teaching approach on students was also studied.

Passman (2000) applied the student-centered teaching approach to teaching social studies to 5th-graders in one classroom. With this teaching approach, students worked in small groups; the teacher covered the curriculum first; the students then chose a question, did research and discovered the answer, prepared a report and gave presentations in class; they searched school library, internet and classroom resources for information. It was found that 2 student groups gave very impressive and sophisticated presentations on the topics they chose. However, the student-centered teaching project was stopped by the school principal because the regular school curriculum was not covered at the same time.

Using technology as a form of constructivist, student-centered teaching method was the focus of a large-scale study by Means and Olson (1995). In their study, technology (mainly computers) was used to enhance a restructuring of the classroom around elementary school students' needs and project-based activities. The effects of technology use included enhanced student work, increase in student motivation and self-esteem, and changes in student and teacher roles.

In a study involving middle school students, the student-centered teaching approach was applied to teaching a history class in order to investigate how the teaching approach influenced the perspective-taking skills of the participating students during a 3-week unit of instruction onWorld War II (Ogawa, 2001). The student-centered activities included: The students learned about the war with the teacher, analyzed the US textual passages of the atomic bombing of Hiroshima and Nagasaki and the Japanese textbooks, interviewed veterans, conducted classroom observations and writing tasks, had discussion sessions; they also analyzed, synthesized and evaluated the information. It was found that the historical-perspective taking skill could be developed through various activities; most students cited their teacher as a main information source, and they learned

better and more in-depth when they had to "do history" themselves. With the teacher acting as a facilitator, students could better develop and reveal their perspectives.

Focusing on a similar subject, Stout (2004) used the student-centered teaching method to teach 8th-grade US history, which included students analyzing and interpreting the historical documents, working in collaborative teams, presenting their interpretations, and making comparisons. Key findings showed that with an increased sense of confidence in the students and the class being shaped into a community of learners, the students were able to work collaboratively to develop deep understandings of historical content and to negotiate difficult primary source text.

The student-centered teaching approach was implemented by Akers (1999) to teach 2 high school biology classes. The student-centered activities involved in this study included "hands-on" team projects, the teacher assuming a facilitator role, and the participating students taking ownership and responsibility for their own learning. Research methods used in the study included interviews, classroom observations and teacher's written reports. The researcher reported that various factors (e.g.: disciplinary problems, state standards of learning, multiple repeaters, scheduling and administrative pressure) stopped the student-centered teaching project.

In another study, the student-centered teaching approach was utilized to teaching physics to11th-grade students (Wilkinson, Treagust, Leggett & Glasson, 1988). In the study, students took responsibilities for their own learning; activity sheets were used for students to relate new experiences to prior knowledge; activity sheets and note guides were used to engage students in activities constructing their own learning; syllabus and assessment structure were used to control the time that students spent on each topic. The researchers found that the learning environment promoted students' self-esteem.

A study by Rowe (1996) involved students with learning disabilities. In this study, the student-centered teaching approach took the form of transactional teaching. The participants were 7th-grade language arts students with learning disabilities and 8th-grade social studies students with learning disabilities. The transactional approach was based on the teacher and active students. The researcher found that the intervention was associated with greater improvements in student attitudes and learning behaviors in the 8th-graders than in the 7th-graders. There was no change in the learning behavior of the 7th-graders.

In addition to the studies involving school students, the literature also provides a number of studies on applying the student-centered teaching approach to teaching college students in various subject areas. In a study by Wallhead (2004), the student-centered teaching approach mainly involved using the peer-assisted method to learn the tasks of a curriculum unit of sport education. The researcher studied the evolution of the content knowledge of 6 students. The participants were found to have demonstrated a high level of engagement and compliance with the intended content of the peer-assisted learning tasks. The peer teaching approach was effective in developing the participants' knowledge of lower complexity content, but was not effective in developing their higher order content knowledge due to deficiencies in their ability to elaborate content through appropriate demonstration, error diagnosis, and task modification.

In a study conducted by Deretchin (1997), the student-centered teaching and learning approach was applied to teaching a medical curriculum. In this study, the actual teaching practice took a small-group, self-directed learning format with a problem-based

learning curriculum (also called hybrid curriculum). Deretchin found that the hybrid curriculum class rated the conceptualization and reflection higher than did the traditional classes, but lower than did the traditional problem-based learning class. It rated memorization higher than did the traditional and the problem-based class. The hybrid curriculum class favored lectures over small-group sessions. Self-directed learning was rated most highly among the learning approaches by all classes studied.

Pursuing an inquiry-based form of learning, Luke (2004) used the student-centered teaching approach in college level, 4th semester Spanish instruction. In Luke's study, the teaching and learning activities included: Students explored authentic inquiries, self-selected inquiry topics, generated their own research questions, researched their own topics through various online and office sources, created multimedia presentations to share with peers; they also used computers as supplementary individual, small-group and whole class activities, which fostered their reading, writing, speaking and listening skills. In an earlier study by Rada (1975), the use of an add-on group dynamics to teaching as compared to teaching without the group dynamics activity was considered a student-centered teaching method in a college health class. Data evaluations by the researcher indicated a 100% consensus among the participants that the student-centered class was more interesting than other classes they had taken. Ninety percent of them favored the group dynamic methodology; 93% said that they learned more in the course than they would have in a traditional course. Final grades reflected this higher achievement.

The student-centered pedagogy was adopted by Njoroge (1998) to teach college level basic writing in order to understand how to relate basic writing to students who were under-prepared for college writing. Specifically in the study, problem-posing by the instructor was used, in which the instructor led a critical dialogue in class and the students selected their own writing topics. The researcher also attempted to create a supportive classroom climate. The students were found to participate more and take writing more seriously. Through this writing process, the students learned much about themselves and others. The author also reported that this method of teaching writing was more challenging and enlightening.

Student-centered teaching methods were even integrated into an institution-wide first year college curriculum (Haruta & Stevenson, 1999). The main focus of the project was to improve teaching and learning in the science, math, engineering and technology discipline for freshmen. In this project, problem-solving, collaboration, multiple intelligence, real world applications and technology use were applied as the student-centered teaching methods. Findings of the project indicated that faculty had reported significant changes in student enrollment patterns and increases in student retention rates as well as a general favorable impression among students on innovative materials and methods. According to the authors, the particular student-centered teaching methods applied in the institution led to increased freshmen enrollment and retention rates in science, math, engineering and technology disciplines.

Among the qualitative studies, three examined the psychological impact of the application of the student-centered teaching approach upon students. In a survey by Spurlock (2001), the impact of student-centered instructional approach on high school students' motivation to cheat, testing performance, perceived feelings of academic competence, autonomy, and relatedness in school was studied. The participating teachers used student-led discussions and students working in small groups in this teaching

approach. The findings indicated that students who felt a sense of autonomy were not likely to cheat on tests and had high test scores, which suggests that the student-centered teaching approach helped students to develop positive school experiences, such as: being motivated in school, feeling competent in their abilities, and feeling connected to teachers and peers. However, Spurlock also noted that the experience of autonomy and positive school experiences were ultimately connected to the students' socioeconomic background.

In order to determine how high school students managed their learning while working within the guidelines of a student-centered approach to teaching and learning, Harper (1997) conducted interviews, used questionnaires, participant observations with 7 teachers and 40 students. With Harper's student-centered teaching approach, students organized and transformed information, planned and set goals, sought peer help and teachers' help. It was found that less productive students were weak in two of the four learning strategies. Students weak in 'Fact Finding' and 'Follow-through' skills had the skills to learn. The same students talked about a fatigue factor involved in the student-centered approach. All students shared the importance of knowing themselves as learners and how that was a process learned over time. They also talked about the importance of the teacher-centered relationship and believed that the student-centered curriculum provided more opportunities to develop skills necessary for self-regulation.

In an earlier study, Wood (1990) used the student-centered instructional approach to teach writing skills but for a therapeutic purpose. Wood's emphasis was on students' gaining power over themselves and gaining control of their own lives. Self-expression and self-discovery were regarded as important as writing skills; the teacher functioned as a facilitator by asking questions and providing an environment for students to learn by doing. According to Wood, by suggesting an equal status between the teacher and students and equality among students themselves, and by focusing on students' development of self-confidence as writers, this instructional approach gave the appearance of increasing the student personal power without affecting social power.

Quantitative Studies

While the majority of the studies in this body of literature were qualitative in design, a number of researchers conducted their investigations using a quantitative design. Out of this group of studies, five were related to middle and high school students, seven were conducted in college classrooms.

In Seidenstricker's (1999) study, the student-centered teaching activities mainly included small group, peer-led discussions in which 7th-graders controlled topic selection, turn-taking and response evaluation on the strategic reading comprehension, and literary interpretation. The researcher also used teacher-led large group discussions with open-ended questions, conversation-like interactions, contiguous discourse, and high-level evaluations in the instructional process. The effects of discussion structure and reading ability on reading comprehension, literary interpretation and engagement were examined. Main findings indicated that teacher-led large group readers comprehended at significantly higher levels than did the peer-led small group readers; interpretative readers comprehended better than did plot readers; peer-led small group readers reported more engagement; interpretative readers outscored plot readers on post-treatment

measure. This study showed comprehension benefits for large group teacher-led discussions and engagement benefits for small group student-led learning activities.

Focusing on a different school subject, Erwin (2004) tested teaching 9th-grade physics with a student-centered teaching approach. Her study aimed at developing students' meaningful learning of motion and energy. The participating students constructed their knowledge based on what they already understood with LEGO Mindstorms and Texas Instruments TI-83 calculators/CBL sensors. The pre- and post-test results showed that students had large gains in their knowledge of motion and energy, and had higher achievement on performance-based as opposed to calculation-based activities. Students preferred the more student-centered activities.

The effects of a cooperative small-group instructional approach on four categories of students' oral behaviors were investigated by Kuehnle (1988). In the study, the participating students first received traditional, whole group teacher-directed instruction, which was then compared with the same students' using a cooperative small-group problem-solving strategy, in which the teacher served as a facilitator and resource person. This second approach constituted the student-centered teaching approach of the study. The findings were that the problem-solving approach was significantly associated with increased cooperative oral behaviors, and with decreased competitive oral behaviors. No significant change in competitive oral behaviors occurred.

To investigate the effects of prediction and explanation activities, and the effects of student-centered discussions in junior high school science learning, Chang (1993) utilized an applied constructivist approach: Students predicted and explained the outcomes of a given situation, conducted student-centered discussions, while students in conventional approach did not have such activities. Results of the post-test (which included multiple choice and open-ended explanation questions) showed that students in the prediction and explanation group provided higher explanation scores than did those in the conventional teaching approach, but did not perform significantly better on the multiple choice test. Students in the conventional treatment group performed significantly better in lower-level (recall) questions. Students in the student-centered approach did not produce higher scores in higher-level (non-recall) questions. A retention test revealed that regardless of the teaching approach used, no student performance differences persisted 2 weeks after instruction.

Studying a younger age group, Watford (1981) compared the effects of a teacher-centered and student-centered thematic approach on the locus of control for achievement, the attitude toward language arts and the persistence of urban 8th-grade students. In her study, the teacher-centered instruction used teacher-directed, teacher talk, chalk and board activities, while the student-centered approach involved a learning activity packet and a contract approach to learning. The study lasted for 4 weeks. It was found that neither the teacher-centered nor student-centered thematic approach were statistically better over the other on either achievement or on attitude. However, the teacher-centered approach was superior on persistence. Internal locus of control in the teacher-centered approach was the most persistent of all students. Significantly fewer class absences, tardiness, discipline problems, pay-attention reminders and requests to be excused from class occurred in the student-centered approach.

In a study by Nicolo (1993), the effects of cooperative learning and the learning cycle on student sense of control were examined. According to Nicolo, three student-

centered teaching approaches (cooperative learning, learning cycle and the combined cooperative learning/learning cycle) were applied to the 10th-, 11th-, and 12th-grade students in 4 science classes. The researcher reported that, as compared to students receiving science course instruction through conventional expository methods, the cooperative learning and the combined method group gained significantly more in their sense of control than did the learning cycle group. Relatively brief classroom exposure to a group learning approach could induce a shift in student control beliefs toward an internal orientation by enhancing self-esteem and perceived peer support.

In addition to the above studies on secondary school students, this body of literature also provides a number of studies conducted in college classrooms. In an earlier study conducted by Ciaburri's (1975), the student-centered teaching method was applied to teaching drama as a literary form in the acquisition of cognitive information by college students. The researcher compared the traditional lecture-discussion form of teaching to one that combined lecture-discussion with individualized student projects, in which students set their own performance objectives. The instructor provided individualized instruction to help students in the experimental group with their own projects.
Participants were pre- and post-tested to measure the cognitive achievement of students in the area of drama. No significant differences between the control and the experimental group were found in their cognitive information learning.

In teaching a writing course, Semmar (2000) compared the effects of student-centered interactive feedback on students' achievement in writing English as a second language to the writings of those who received standard writing conference input. In the study, the student-teacher interactive conference approach was applied as the student-centered teaching method. Semmar found significant differences between the 2 groups of students' writing texts in favor of the student-teacher interactive feedback approach. In contrast, the group receiving the teacher-centered input actually did worse in their rewrites. It seems that Semmar treated the student-teacher interactive feedback approach as a student-centered teaching approach.

Bayard (1994) investigated a problem-based learning, case-driven type of student-centered teaching approach in an effort to foster critical thinking, self-directed learning skills, and to enhance knowledge acquisition and retention. The college dietectic students' responses to this teaching approach were examined. Thirty-two undergraduate dietectic students and 52 dietectic interns participated in the study. Data from the problem-based learning (PBL) group and the lecture-based group indicated that the PBL students were more apt to use articles, books and professionals to study than lecture notes. In terms of knowledge gain, the undergraduate PBL group scored higher than did the lectured-based undergraduate group. Tenets that PBL enhances retention, self-directed learning skills and motivation level were not supported for the undergraduate dietectic students. Self-directed learning skills and confidence in problem-solving skills increased for the interns. This problem-based teaching and learning approach was basically an independent study approach.

The student-centered teaching approach took the form of group discussion and active reflections in Katz's study (1981). In the study, the interactive effects of matching the occupational therapy students' learning style with teaching methods (lectures vs. group discussion) were examined. It was an attitude-treatment interaction study with a

randomized-block design. Multiple regression analysis with a step-up procedure showed significant interactions for achievement and attitude with perceived benefit from lectures, and for problem-solving and amount of time with individual learning style. Students in the matched conditions (e.g., reflective style in lecture) scored higher on problem-solving and reported having less study time. Graduate students, regardless of teaching method, scored higher and studied for less time, and among them the reflective style in lecture scored the highest.

The student-centered instructional approach was applied by Delaney (1980) to teaching college composition, which was compared to a teacher-centered rhetorical approach. The experimental group used a peer-oriented, peer-evaluated method; the control group used the teacher-evaluated method. Students' performance in sentences, paragraphing and attitude toward free writing, rhetorical modes, peer evaluation and teacher evaluation were examined. No significant pre- to post-test differences between the control and experimental group in the organization, style of writing and syntactic maturity were found. Developing a central figure, using correct and varied syntax, peer evaluation and free writing were measured higher for the student-centered group, which also showed higher maturational changes in writing attitude.

To determine how student ratings on instructors and course were influenced by the two different instructional methods (the lecture-based teaching and student-centered instruction), students in 20 sections of a first semester calculus course were given a evaluation form to evaluate their instructors on 12 attributes of instruction and administration (Keller, Russell & Thompson, 1999). Ten sections formed the student-centered teaching group; 10 sections formed the lecture-based group. The student-centered activities included cooperative learning, technology, pair, group and class discussions and contextualized, project-based learning. On 8 of the 12 instruction-related attributes, students' ratings for the project group were significantly higher than those of the comparison group. On 4 of the 12 attributes related to administrative matters, no differences were found between the ratings of the 2 groups, which suggest that students in the first-semester engineering calculus course preferred learning in the student-centered environment.

Results

The student-centered teaching approach in the literature took the following forms and each form was defined as the student-centered teaching approach/method. Main findings of the studies are also provided in this section.

Forms of the Student-Centered Teaching Approach

1. Teacher covered the curriculum first; students worked in small groups, chose a question, did research and discovered the answer, prepared a report and gave presentations in class; they also searched school library, internet and classroom resources (Passman, 2000).

2. Students used computers and had project-based activities (Means & Olson, 1995).

3. Students learned the material with the teacher, analyzed the material provided by the teacher; conducted interviews, classroom observations and writing tasks; had discussions; analyzed, synthesized, and evaluated related information (Ogawa, 2001).

4. Students analyzed and interpreted historical documents, worked in teams, and presented their interpretations and made comparisons (Stout, 2004).

5. Students worked on hands-on team projects, were responsible for their own learning; teacher assumed a facilitator role (Akers, 1999).

6. Students were responsible for their learning; they used activity sheets, note guides, the syllabus and the assessment structure (Wilkinson, Treagust, Leggett & Glasson, 1988).

7. Teacher used transactional teaching (Rowe, 1996).

8. Teacher used the peer-assisted method (Wallhead, 2004).

9. Students engaged in small-group, self-directed learning format with a problem-based learning curriculum (Deretchin, 1997).

10. Students explored authentic issues, self-selected inquiry topics, generated and researched their own topics through various online and office sources, created multimedia presentations; they also used computers for individual, group and whole class activities (Luke, 2004).

11. Teacher used an add-on group dynamics activity (Rada, 1975).

12. Teacher posed problems to students, led a critical dialogue in class; students selected their own writing topics; teacher attempted to create a supportive classroom climate (Njoroge, 1998).

13. Students used self-expression and self-discovery in writing activities; teacher functioned as a facilitator by asking questions, provided an environment for students to learn by doing (Wood, 1990).

14. Instructors used problem-solving, collaboration, multiple intelligence, real world applications and technology to teach science, math, engineering and technology (Haruta & Stevenson, 1999).

15. Students led discussions and worked in small groups (Spurlock, 2001).

16. Students organized and transformed information, planned and set goals, and sought peer help (Harper, 1997).

17. Students controlled their own topic selection, turn taking, response evaluation on reading comprehension and literary interpretation; teacher used teacher-led large group discussions with open-ended questions, conversation-like interactions, contiguous discourse and high level evaluations (Seidenstricker, 1999).

18. Students constructed their own knowledge with LEGO Mindstorms and calculators (Erwin, 2004).

19. Teacher used teacher-directed instruction and small group problem-solving activities, served as a facilitator and resource person (Kuehnle, 1988).

20. Students used prediction and explanation to given situations, and conducted student-centered discussions (Chang, 1993).

21. Teacher used a learning activity packet and a contract approach to teach a language arts course (Watford, 1981).

22. Teacher used a combined lecture-discussion with individualized student projects, provided individualized instruction to help students with their projects; students set their own performance objectives (Ciaburri, 1975).

23. Teacher used student-teacher interactive conference approach to teach English as a second language (Semmar, 2000).

24. Teacher used a problem-based learning, case-driven type of student-centered teaching approach (Bayard, 1994).

25. Cooperative learning, learning cycle and the combined cooperative learning/learning cycle represented three student-centered teaching approaches (Nicolo, 1993).

26. The student-centered teaching approach took the form of group-discussion and active reflection (Katz, 1981).

27. Teacher used peer-oriented, peer-evaluated method as the student-centered teaching approach (Delaney, 1980).

28. Teacher used cooperative learning; technology; pair, group and class discussions; contextualized and project-based learning (Keller, Russell & Thompson, 1999).

Main Findings of the Reviewed Studies

A Brief Summary of the Main Findings Follows.

Findings of the Qualitative Studies.

1. Students gave very impressive and sophisticated presentations on topics they chose (Passman, 2000).

2. The teaching approach enhanced student work, increased student motivation and self-esteem (Means & Olson, 1995).

3. Students could learn to take historical perspectives through participating in various activities; most students considered their teacher as a main information source; students learned better and more in-depth when they "did history" themselves (Ogawa, 2001).

4. Students were able to work collaboratively to develop deep understandings of historical content, to negotiate difficult primary source text and direct connection to the learning objectives (Stout, 2004).

5. The learning environment promoted the students' self-esteem (Wilkinson, Teagust, Leggett & Glasson, 1988).

6. Greater improvements were found in attitudes and learning behaviors of 8th-graders and no change was found in learning behaviors of 7th-graders (Rowe, 1996).

7. Students demonstrated high levels of engagement and compliance with the intended content; the peer teaching approach was effective in developing participants' knowledge of lower complexity content, not effective in developing their higher order content knowledge (Wallhead, 2004).

8. The hybrid curriculum class rated the conceptualization and reflection higher than did the traditional classes, but lower than did the traditional problem-based learning class; it rated memorization higher than did the traditional and the problem-based class, favored lectures over small-group sessions; self-directed learning was rated most highly among the learning approaches by all classes studied (Deretchin, 1997).

9. The student-centered teaching approach fostered reading, writing, speaking and listening skills (Luke, 2004).

10. Students thought that the student-centered class was more interesting than other classes that they had taken; they favored the group dynamics method; they believed that they had learned more than they would have in a traditional course. Their final grades reflected a higher achievement (Rada, 1975).

11. Students participated more and took writing more seriously, learned much about themselves and others (Njoroge, 1998).

12. The student-centered writing instruction approach gave the appearance of increasing the students' personal power without affecting social power (Wood, 1990).

13. The student-centered teaching approach led to increased freshmen enrollment and retention rate in science, math, engineering and technology disciplines (Haruta & Stevenson, 1999).

14. Students who felt a sense of autonomy were not likely to cheat on tests and had high test scores (Spurlock, 2001).

15. Less productive students were weak in two learning strategies; they talked about a fatigue factor involved in the student-centered approach; all students agreed on the importance of knowing themselves as learners, and they believed that the teaching approach provided more opportunities to develop skills necessary for self-regulation (Harper, 1997).

Findings of the Quantitative Studies

16. Teacher-led large group readers comprehended at significantly higher levels than did the peer-led small group readers; peer-led small group readers reported more engagement (Seidenstricker, 1999).

17. Students had larger gains in knowledge of motion and energy, had higher achievement on performance-based as opposed to calculation-based activities, preferred the more student-centered activities (Erwin, 2004).

18. The problem-solving approach was significantly associated with increase cooperative oral behaviors, with decreased competitive oral behaviors during the treatment (Keuhnle, 1988).

19. Students in the prediction and explanation group provided higher explanation scores than did those in the conventional teaching approach, but did not perform significantly better on the multiple choice test. Students in the conventional teaching group performed better in recall questions; those in the student-centered approach did not produce higher scores in higher level (non-recall) questions (Chang, 1993).

20. Neither the teacher-centered nor the student-centered thematic approach was statistically better on achievement or on attitude. The teacher-centered approach was superior on persistence. Internal locus of control in the teacher-centered approach was the most persistent of all students. Significantly fewer class absences, tardiness, discipline problems, pay-attention reminders and requests to be excused from class occurred in the student-centered approach (Watford, 1981).

21. No significant differences between the control and the experimental group were found in their cognitive information learning; the researcher noted greater depth of knowledge and greater effort self-imposed by the experimental group through self-designed projects (Ciaburri, 1975).

22. Significant differences were found between the 2 groups' writing texts in favor of the student-centered interactive feedback approach (Semmer, 2000).

22. The problem-based learning (PBL) students were more apt to use articles, books and professionals to study than lecture notes; only the undergraduate PBL group scored higher than did the lecture-based undergraduate group; Tenets that PBL enhances retention, self-directed learning skills and motivation level were not supported for the undergraduate students; self-directed learning skills and confidence in problem-solving skills increased for the interns (Bayard, 1994).

23. The cooperative learning and cooperative learning/learning cycle group gained significantly more in sense of control; the learning cycle group did not (Nicolo, 1993).

24. Students involved in reflective style in lecture scored higher on problem-solving and reported having less study time. Graduate students regardless of teaching method scored higher and studied for less time; and among them, the reflective style in lecture scored the highest (Katz, 1981).

25. No significant pre- and post-test differences between the control and experimental group in the organization and style of writing and syntactic maturity were found. Developing a central figure, using correct and varied syntax, peer evaluation and free writing were measured higher for the student-centered group, which also showed higher maturational changes in writing attitude (Delaney, 1980).

26. Students in the student-centered group gave significantly higher ratings to their instructors than did those in the comparison group (Keller, Russell & Thompson, 1999).

Discussion

As this body of literature shows, the so-called student-centered teaching approach/method has been applied to teaching school and college students for over 6 decades (Massey, 1978). A close look of the research literature indicates that a wide variety of definitions have been given to the student-centered teaching approach. Individual researchers created his/her own version of the teaching method, or every researcher had his/her own definition. It seems safe to say that when it comes to the definition for the student-centered teaching approach, there is no consensus. It means to be conceptually different to different people (Hodson, 2002). It seems advisable that educators keep this phenomenon in mind.

In addition to showing the differences in definitions, the literature also indicates that the extent to which students handled their own learning activities without teacher's direct involvement in the student-centered learning process also varied widely. There seems to be a continuum as to the extent that students took responsibilities in their learning. On the low end of the continuum, students generally took limited responsibility or had few activities (Chang, 1993; Ciaburri, 1975; Katz, 1981; Kuehnle, 1988; Rada, 1975; Semmar, 2000); on the high end of the continuum, students had engaged in multiple self-managed activities, and were largely on their own in their learning process (Deretchin, 1997; Luke, 2004; Ogawa, 2001; Passman, 2000; Seidenstricker, 1999; Stout, 2004; Watford, 1981; Wilkinson, Treagust, Leggett & Glasson, 1988).

With respect to its impact on students' psychosocial behaviors and academic learning results, the majority of the studies showed positive effects on students' behavior, attitude, interest and self-confidence (Deretchin, 1997; Harper, 1997; Haruta & Stevenson, 1999; Means & Olson, 1995; Nicolo, 1993; Njoroge, 1998; Rada, 1975; Rowe, 1996; Spurlock, 2001; Stout, 2004; Wallhead, 2004; Wilkinson, Treagust, Leggett & Glasson, 1988; Wood, 1990;). A small number of the studies reported positive improvement in student learning outcomes (Chang, 1993; Katz, 1981; Rada, 1975; Semmar, 2000). It seems that the majority of the studies focused their investigation of the student-centered teaching approach's impact on various psychosocial aspects rather than on academic learning of the students.

Concluding Remarks

A close look at the main findings of the studies seems to reveal that with those studies involving the use of multiple student-centered activities, students mainly showed changes in the non-academic areas, such as: behavior, attitudes, interests and self-confidence; in studies that used few student-centered activities, and teacher played a relatively more active role in giving directions and teaching, students' improvements were mainly in the academic areas. Based on this finding, it seems fair to say that before we rely on using a highly student-centered teaching approach to generate high levels of

learning in various academic subject areas (if that is our primary purpose of academic instruction), further study of the issue seems to be reasonably necessary.

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