International Journal of Technology in Education and Science (IJTES)

www.ijtes.net

Strategies and Tools Used for Learner-Centered Instruction

Yunjo An[1], Diana Mindrila[2]
[1]University of North Texas, United States
[2]University of West Georgia, United States

To cite this article:

An, Y. & Mindrila, D. (2020). Strategies and tools used for learner-centered instruction. *International Journal of Technology in Education and Science (IJTES), 4*(2), 133- 143.

IJTES International Journal of Technology in Education and Science
Volume 4, Issue 2, Spring 2020 ISSN: 2651-5369

Strategies and Tools Used for Learner-Centered Instruction

Yunjo An, Diana Mindrila

Article Info

Article History

Received:
24 November 2019

Accepted:
08 March 2020

Keywords

Learner-centered education
Learner-centered instruction
Teaching practices

Abstract

Learner-centered education has the potential to meet the needs of individual students and better prepare them for a rapidly changing global world. However, it can be a challenging task to implement learner-centered education in the current education system which was designed for sorting rather than learning. Although an increasing number of research studies report that teachers have positive attitudes toward learner-centered education, there is a paucity of research that has examined teachers' learner-centered practice. To address this gap, this study examined the strategies and tools used by 125 teachers to create learner-centered classrooms using an online survey. Further, the study explored the barriers they faced when using technology to facilitate learner-centered instruction. The strategies and tools used for learner-centered instruction are reported in six major categories: (1) getting to know individual students, (2) building a positive and supportive culture, (3) providing personalized learning experiences, (4) providing authentic learning experiences, (5) facilitating collaborative learning, and (6) facilitating self-regulated learning. The major barriers to using technology to support learner-centered pedagogy included lack of time, lack of technology, lack of knowledge of learner-centered instruction, and standardized tests.

Introduction

While traditional teacher-centered education requires all students to learn the same thing at the same time, learner-centered education considers individual students' differences and diverse needs and focuses equally on the learner and learning (APA Board of Educational Affairs, 1997; McCombs & Whisler, 1997). At the core of learner-centered education is the belief that learners "make sense or make meaning out of information and experience in their own way," and this belief stems from cognitivism, constructivism, and humanism (Reigeluth, Myers, & Lee, 2017, p. 12). The Learner-Centered Principles Work Group of the American Psychological Association (APA)'s Board of Educational Affairs (1997) identified 14 learner-centered psychological principles that are divided into four psychological factors, including cognitive and metacognitive, motivational and affective, developmental and social, and individual differences factors. The learner-centered psychological principles characterize learning as a whole-person phenomenon (McCombs, 2012).

Although learner-centered education has the potential to meet the needs of individual students and better prepare them for a rapidly changing global world, it is not easy to implement learner-centered education in the current education system which was designed for sorting rather than learning (Reigeluth, 1999). An increasing number of research studies report that teachers have positive attitudes toward learner-centered education (e.g., An & Reigeluth, 2011; An & Mindrila, 2017; Oliveira & Pombo, 2017; Tawalbeh & AlAsmari, 2015; Yilmaz, 2008). However, there is a paucity of research that has examined teachers' learner-centered practice. To address this gap, this study examined the strategies and tools used by K-12 teachers to create learner-centered classrooms. Further, the study explored the barriers they faced when using technology to support learner-centered instruction.

Literature Review

Learner-Centered Education

According to Reigeluth, Myers, and Lee (2017), early educational movements that led the way to learner-centered education include Dewey's progressive education (e.g., Dewey, 1938), Montessori Education (Montessori, 1917), and Carroll's and Bloom's mastery learning (Bloom, 1968, Carroll, 1963). Learner-centered approaches include but are not limited to problem-based learning, project-based learning, and inquiry-based

learning. Therefore, learner-centered instruction (LCI) can take many different forms. As McCombs (2008) noted, learner-centered practices do not look the same from school to school, classroom to classroom, or day to day.

However, LCI or learner-centered classrooms share one or more characteristics. An (2012) identified five characteristics of LCI that can be commonly shown in learner-centered classrooms: personalized learning activities and support, social and emotional support, self-regulation, collaborative and authentic learning experiences, and assessment for learning. McCombs (2015) defined five domains of learner-centered practice validated for college-level learners. The five domains include creating positive relationships and learning climate, adapting to class learning needs, facilitating the learning process, encouraging personal challenge and responsibility, and providing for individual and social learning needs. Recently, Reigeluth, Myers, and Lee (2017) proposed five foundational educational principles for learner-centered education: attainment-based instruction, task-based instruction, personalized instruction, changed roles, and changed curriculum. Learner-centered education meets the needs of our rapidly changing society as well as the needs of individual learners by focusing on developing real-world skills, including higher-order thinking, problem solving, decision-making, and collaboration skills (Bas & Beyhan, 2019; Bransford, Brown, & Cocking, 2000; McCombs & Whisler, 1997; Reigeluth, 1994).

Learner-Centered Beliefs and Practices

Researchers have explored K-12 teachers' beliefs, attitudes, and perceptions of learner-centered instruction. (LCI). For example, Yilmaz (2008) explored three social studies teachers' views of LCI and learning theories using a qualitative study approach. The teachers (2 male, 1 female) had considerable teaching experience (5-13 years) and advanced degrees (M.Ed. or Ph.D.) in social studies education. The results of the study showed that all three participants had positive attitudes toward LCI and were in favor of constructivist learning theory. Particularly, they believed that LCI has the potential to make learning engaging, enjoyable, challenging, and relevant.

Using an online survey, An and Reigeluth (2011) explored K–12 teachers' beliefs, perceptions, barriers, and support needs in the context of creating technology-enhanced, learner-centered classrooms. The survey results revealed that the majority of the participants had positive perceptions of LCI and believed that they were learner-centered teachers. They also agreed that LCI is challenging but rewarding. More recently, An and Mindrila (2017) conducted a research study to distinguish clusters of teachers based on their perceptions of LCI. Cluster analysis revealed that about 70% of the participants were assigned to the Average and High LCT (learner-centered teachers) groups, which had positive perceptions of LCI.

A small number of studies have explored university instructors' perceptions of LCI and reported inconclusive results. Using an adapted version of the questionnaire developed by An and Reigeluth (2011), Tawalbeh and AlAsmari (2015) examined university instructors' perceptions of LCI in the English as a Foreign Language classroom and found that participants had a positive attitude toward LCI and believed that they were learner-centered teachers. On the other hand, Ha (2014) reported criticisms of learner-centered education from three university instructors in English language and humanities classrooms. The participants reported that learner-centered education has been abused by many "lazy professors who just don't prepare for their class and let students discuss things in whichever ways they want to" (p. 400).

Researchers have noted that learner-centered teaching beliefs do not automatically lead to learner-centered teaching practice. Becker (2000) noted that teachers are much more constructivist in philosophy than in actual practice. An and Reigeluth (2011) reported that lack of knowledge about LCI and other barriers often prevent teachers from creating learner-centered classroom even though they have learner-centered beliefs. Kaymakamoğlu (2018) explored the EFL teachers' beliefs, perceived practice and actual classroom practice in relation to traditional (teacher-centered) and constructivist (learner-centered) teaching in Turkey. The results revealed that although the teachers expressed constructivist or both constructivist and traditional beliefs, their perceived practice was mostly traditional or teacher-centered.

Barriers to Implementing Learner-Centered Instruction (LCI)

Yilmaz (2008) explored three social studies teachers' views of LCI and found that most of the challenges mentioned by the participants were related to the organizational structure of their classrooms and schools (e.g.,

large class size, lack of resources, time constraints, etc.). An and Reigeluth (2011) examined teachers' perceived barriers to creating technology-enhanced, learner-centered classrooms using 11 items rated using a 3-point scale ranging from 1 (not a barrier) to 3 (a major barrier). Lack of technology, lack of time, and assessments (standardized tests) were identified as the major barriers, but their mean scores were relatively low. About 57% perceived lack of technology and time as a barrier or a major barrier. A little more than half of the participants perceived assessment as a barrier or a major barrier. Most participants believed that their attitude toward learner-centered instruction were not a barrier.

Schweisfurth (2011) conducted a meta-analysis of 72 articles in the *International Journal of Educational Development* in order to examine the reasons behind the largely unsuccessful implementation of learner-centered education in developing countries. The results showed several major obstacles to the implementation of learner-centered education, including lack of teacher training, concepts too difficult for teachers to understand, practical and material constraints, inconsistencies with national curricular and/or examinations, and cultural issues. Researchers also noted that teachers may not feel comfortable with their new role as a facilitator feeling students' independence as a threat to their identity (Robinson, Molenda, & Rezabek, 2007; Sockman, 2015).

Purpose of the Study

The literature reveals that learner-centered teaching philosophy does not necessarily lead to learner-centered practice. To better understand K-12 teachers' learner-centered practices, this study explored what strategies and tools teachers were using to create learner-centered classrooms. The study also examined the barriers to using technology to support learner-centered instruction. The following research questions guided the study:

1. What kinds of instructional strategies and tools do K-12 teachers use to create learner-centered classrooms?
2. What kinds of barriers do K-12 teachers face when using technology to support learner-centered instruction?

Method

Instrument

An online survey was used to collect data, and it consisted of three parts: a) demographic information, b) perceptions of LCI (Likert-scale items), and c) learner-centered teaching practice (open-ended items). The quantitative findings from Likert-scale items have already been published (An & Mindrila, 2017); results from this section of the survey showed that the majority of the teachers had overall positive perceptions of LCI. The current paper focuses on the learner-centered teaching practice part of the survey. Sample questions asked in the learner-centered teaching practice part include the following:

- What strategies and tools do you use to provide social and emotional support to your students?
- What strategies and tools do you use to monitor individual students' progress and provide students with feedback on their growth and progress?
- What strategies and tools do you use to help students develop real-world skills?
- What strategies and tools do you use to conduct assessments that promote learning?
- What are the major barriers to using technology to support learner-centered pedagogy?

Participants

Email invitations were sent to K-12 teachers in all school districts in a southeastern U.S. state. Teachers' email addresses were collected from publicly available links on school websites, and school principals and assistant principals were encouraged to forward the email invitation to their teachers. Although 134 teachers chose to participate in the study and completed the Likert-scale items, only 125 teachers completed the open-ended questions on learner-centered teaching practice. Approximately 80% of the participants were female and Caucasian. Table 1 summarizes the participants' demographic information.

Qualitative Data Analysis

The five-step procedures proposed by Thomas (2006) were used to analyze qualitative data from participants' responses to open-ended questions:

(1) preparation of raw data files (data cleaning and printing)
(2) close reading of text
(3) creation of categories or themes
(4) overlapping coding and uncoded text
(5) continuing revision and refinement of category system

The procedure is consistent with the general patterns of other common qualitative data analysis approaches including the constant comparative method (Glaser & Strauss 1967; Strauss a& Corbin 1990). To improve the trustworthiness of the study, two coders discussed the discrepancies in the coding categories until a consensus was reached.

Table 1. Demographic Information of Participants

Variables		N	%
Gender	Female	103	82.4
	Male	22	17.6
Age	20-29	9	7.2
	30-39	32	25.6
	40-49	37	29.6
	50-59	42	33.6
	60 or older	5	4.0
Ethnicity	African American	12	9.6
	Asian	2	1.6
	Caucasian	102	81.6
	Hispanic American	5	4.0
	Multiple Ethnicity	3	2.4
	Native American	1	0.8
Grade Level	K-5	35	28.0
	6-8	37	29.6
	9-12	53	42.4
Teaching Experience	This is my first year	3	2.4
	1-2 years	3	2.4
	3-5 years	16	12.8
	6-10 years	17	13.6
	11-15 years	26	20.8
	16-20 years	24	19.2
	More than 20 years	36	28.8
Use of Technology in the Classroom	Yes	122	97.6
	No	3	2.4

Results

Getting to Know Individual Students

Participants reported using such tools as "All About Me" worksheets, a learning styles inventory, an interest inventory, and a personality inventory to get to know their students. In addition, observation, standardized test scores, get-to-know-you games or activities, and individual conversations with students were common strategies used by teachers to learn about individual students. As the following quotes indicate, a number of participants appeared to use more than one strategy to learn about their students:

> *I give out a survey at the beginning of the year and I try to make a point of getting to know my students just by talking to them.*
> *I use student interest inventories, I analyze prior standardized test scores/MAP data, I talk to my students and gain one-on-one knowledge of their school-related interests and preference.*

Table 2. Strategies for Getting to Know Students and Building a Positive Culture

Getting to Know Individual Students	Building a Positive and Supportive Culture
• "All About Me" worksheet	• Praise
• Learning styles inventory	• Encouragement
• Interest inventory	• Positive feedback
• Personality inventory	• Anonymous online help
• Standardized test scores	• Classroom communication platforms (e.g., ClassDojo)
• Observation	• Being kind and approachable
• Get-to-know-you games or activities	• Listening to students
• Individual conversations with students	• Building individual relationships with students
	• Treating students with respect

Building a Positive and Supportive Culture

Praise, encouragement, and positive feedback were common strategies used to create a positive learning environment. One teacher reported that she created an online "I Need Help" form using *Google Form* so that students could contact her anonymously. Several participants stated that they were using *ClassDojo*, a classroom communication platform, to encourage students and get parents engaged. Other strategies related to building a positive and supportive culture included being kind and approachable, listening to students, building individual relationships or rapport with students, and treating students with respect. Table 2 summarizes the strategies and tools used to get to know individual students and build a positive and supportive culture.

Personalized Learning Experience

In order to meet individual students' varying needs and provide personalized learning experience and support, participants appeared to use a variety of strategies. The analysis revealed eight major themes or strategies under the personalized learning category: varied instructional methods, small groups, adaptive software, choices, leveled activities or assignments, formative assessments, progress monitoring, and individualized feedback. Table 3 provides sample quotes for each of the strategies.

Participants were using a variety of online programs and adaptive software, such as *ReadTheory*, *Readworks*, *MobyMax,* and *Nearpod*, to provide more personalized learning experience and to allow students "work at their own pace." Several participants reported that they were using *Kahoot* or *Google Forms* for formative assessments because they enable them "to quickly collect data and assess which questions were commonly missed and why" and to "provide instant feedback."

Authentic Learning Experience

Project-based learning was one of the common strategies used to provide authentic learning experience. A number of participants described various projects that "require students to synthesize what they have learned" and use real-world skills. For example, one participant stated, "We just created a dream bedroom where students had to find the area of two walls in a room, doors and windows. Then students had to determine the amount of space that would be painted." Another participant mentioned that he had his students "create, develop, and market their own product." Similarly, inquiry-based learning and learning by making (e.g., computer game building) approaches were mentioned by several participants.

Participants also reported using real-world scenarios or examples, case studies, current events, filed trips, and community leaders for real-world connections and applications. For example, a math teacher mentioned that she uses real-world problems to help her students see how math concepts are used in the real-world. In a similar vein, a science teacher stated, "Since I teach science, I try to relate labs to actual experiences outside the classroom. I try to get my students up and moving and I give them examples of how they can use these concepts in the real world."

Participants appeared to use various tools and resources to facilitate projects and provide real-world examples, including *YouTube* videos, *Google Images*, *Google Docs*, *Twitter*, *CIA World Factbook*, movies, *Scholastic* magazines, *Newsela*, and virtual labs. For example, a participant stated, "We use Google images and other internet tools to see real-world subjects, and try to go on field trips when possible."

Table 3. Strategies for Providing Personalized Learning Experiences and Support

Strategy	Sample Quotes
Varied instructional methods	• "Variety is the recipe to success in teaching as students must learn using many types of learning styles. In my classes, students have the chance to draw, analyze, summarize, jigsaw, create, act, write, direct, or any other means of helping them to learn what a text means." • "Making sure there are different ways to get the information, such as audio, video, etc. so if they struggle with reading, they can still get the information." • "I always teach using a variety of methods to address and meet the needs of learners with varying needs."
Small groups	• "I put students in groups and assign activities according to the different needs." • "Different groups work on different assignments that support the learners' needs within the groups." • "Small group instruction"
Adaptive software	• "The programs such as *ReadTheory* and *FrontRow* are individualized." • "Online programs automatically scale and differentiate based on student performance."
Choices	• "Give choices and opportunities that parallel their learning styles." • "My projects always involve student choice (topic, method, product, sometimes environment)." • "Provide choice boards/menus when appropriate to the content area."
Leveled activities or assignments	• "Leveled assignments when appropriate" • "We use leveled texts in order to keep students reading at an appropriately challenging level."
Formative assessments	• "I use *Google Forms* to quickly collect data and assess which questions were commonly missed and why." • "I have been trying to incorporate more formative assessments into my planning. For example, I spent three days on one math lesson because the students were struggling. To make sure they really understood before I move on, I gave them a formative assessment."
Progress monitoring	• "Individual conferences with students and parents on progress" • "Progress monitoring of IEP goals and other academic standards" • "I constantly check their work, I ask what's going on with their lives, classes, school friends, etc. I pay close attention in noticing any change, something unusual that may tell me more about problems or situations that may interrupt their learning experience."
Individualized feedback	• "I provide a lot of feedback to my students by having individual conferences with them to discuss their grades and their assessments." • "I review formative and summative assessments and provide individualized feedback."

Table 4. Strategies and Tools Used for Authentic and Collaborative Learning

Providing authentic learning experiences	Facilitating collaborative learning
• Project-based learning • Inquiry-based learning • Learning by making • Real-world scenarios or examples • Case studies • Current events • Field trips • Interaction with community leaders	• Group projects • Cooperative learning groups • Partner work • Group discussions • Peer review and editing • Paired assignments

Collaborative Learning

Most participants reported that they used some type of group work that provides collaborative learning experience and peer support. Examples of group work reported by participants include group projects, cooperative learning groups, partner work, group discussions, peer review and editing, and paired assignments. One participant stated, "students are working collaboratively in every subject at least once a day. They hold each other accountable and are aware of their responsibilities." Another participant mentioned that "most class assignments are done in collaborative pairs" in her class. Table 4 summarizes the strategies used for authentic and collaborative learning.

Participants appeared to use a variety of tools to facilitate collaboration. Examples of collaboration tools reported by participants included *Seesaw*, *Padlet*, *Google Docs*, and *Google Slides*. A participant stated, "students use Google Slides and Docs to collaborate on projects and share lab data."

Self-Regulated Learning

Three major themes or strategies were identified under the self-regulated learning category: goal-setting and self-monitoring, reflection, and self-assessments. Participants reported that they had students set their own goals, monitor their progress towards those goals, reflect on their learning, and engage in self-assessments. Table 5 provides sample quotes for each strategy.

Table 5. Sample Quotes for Self-Regulated Learning Strategies

Strategy	Sample Quotes
Goal-setting and self-monitoring	• "Students write their own goals, monitor their progress towards those goals, keep track of grades towards those goals." • "Students monitor their progress through formative assessments measures."
Reflection	• "I have them self-reflect and rate their knowledge on various activities." • "Students have to reflect at the end of each week. I have them answer two questions: What did I learn this week and What do I still need help with."
Self-assessments	• "We conduct a quarterly self-assessment (using tools similar to those used in student-led conference models), where students both reflect on past-performance and set future goals." • "Self-assessment using rubrics"

Major Barriers to Using Technology to Support Learner-Centered Pedagogy

The major barriers to using technology to support learner-centered pedagogy included lack of time, lack of technology, lack of knowledge of learner-centered instruction, and assessments (school and national high-stakes testing). In order to overcome these barriers, the participants reported they would need more time to plan and teach, more training or examples, and more access to technology. A number of participants, mostly high school teachers, indicated that schools need to put less focus on test scores in order for them to create learner-centered environments. Table 6 provides sample quotes for each barrier.

Discussion

Researchers have noted the discrepancy between teachers' pedagogical beliefs and actual practices (Arslantas & Kurnaz, 2017; Becker, 2000; Mansour, 2013; Polly & Hannafin, 2011; Rashidi & Moghadam, 2015). Teachers who are learner-centered in philosophy could be teacher-centered in practice (An & Reigeluth, 2011). The findings of this study, however, indicate that the participants' beliefs and practice are quite consistent. The majority of the participants (about 70%) had positive perceptions of learner-centered instruction (An & Mindrila, 2017), and qualitative data analysis in this current study revealed that the participants were actually using a variety of learner-centered instructional strategies in their classrooms. Table 7 summarizes the strategies and tools used for learner-centered instruction in six major categories: (1) getting to know individual students, (2) building a positive and supportive culture, (3) providing personalized learning experiences, (4) providing authentic learning experiences, (5) facilitating collaborative learning, and (6) facilitating self-regulated learning.

Table 6. Sample Quotes for Barriers to Learner-Centered Technology Integration

Barriers	Needs	Sample quotes
Lack of time	More time	• "The biggest thing would be time to plan and execute activities in class." • "More time to create student-centered activities" • "Time to work with individual students" • "More planning time"
Lack of technology	Technology	• "Better wifi" • "Increase the availability of wiki in the school" • "Consistent access to functioning technology" • "More access to mobile technology (laptop carts, iPad carts) and computer labs" • "More money spent on technology – not all students have technology at home."
Lack of knowledge	More training and examples	• "Training on learner-centered learning" • "Examples of project-based lessons on grade level standards" • "More training/lessons using inquiry-based, project-based learning to show me how to integrate these ideas into my own classroom." •
Assessments	Less focus on testing	• "We use a lot of traditional assessments so students are prepared for Milestones in the spring." • "To be honest, I'm very frustrated by trying to teach my students the curriculum to pass these standardized tests." • "I give assessments that mirror what the standardized tests look like. The reality of the matter is that colleges will also give you multiple choice tests whether you like it or agree with it or not. I am preparing them for reality." • "Less focus on test scores"

However, it is worth noting that their practice was not purely learner-centered. Most participants, if not all, appeared to mix teacher-centered and learner-centered approaches. For example, participants tended to teach content first and then have students work on a project. This finding is in line with a recent study by Bremner (2019) which found that five Mexican EFL teachers were convinced by learner-centered approaches but adopted a "hybrid" combination of teacher- and learner-centered practices due to contextual constraints in their teaching contexts.

The participants were well aware of the importance of getting to know individual students and building a positive and supportive culture. Within our current education system, it might be very hard or even impossible to meet the needs of individual students. However, the participants tried to provide personalized learning experience as much as possible by using varied instructional methods, small groups, and other strategies. Along with varied instructional methods that address different learning styles, "small groups" was one of the most frequently mentioned strategies.

Grouping students based on learning levels and using peer support might be the most realistic way to meet the different needs of students in our current education system. Through a variety of group projects and other hands-on activities, the participants tried to provide authentic learning experience and facilitate collaborative learning. The results indicate that project-based collaborative learning is a common instructional approach across different learning levels and subject areas.

Table 7. Strategies and Tools Used for Learner-Centered Instruction (LCI)

Strategies and Tools Used for LCI	
Getting to know individual students • "All About Me" worksheet • Learning styles inventory • Interest inventory • Personality inventory • Standardized test scores • Observation • Get-to-know-you games or activities • Individual conversations with students	Building a positive and supportive culture • Praise • Encouragement • Positive feedback • Anonymous online help • Classroom communication platforms (e.g., ClassDojo) • Being kind and approachable • Listening to students • Building individual relationships with students • Treating students with respect
Providing personalized learning experiences • Varied instructional methods • Small groups • Adaptive software • Choices • Leveled activities or assignments • Formative assessments • Progress monitoring • Individualized feedback	Providing authentic learning experiences • Project-based learning • Inquiry-based learning • Learning by making • Real-world scenarios or examples • Case studies • Current events • Field trips • Interaction with community leaders
Facilitating collaborative learning • Group projects • Cooperative learning groups • Partner work • Group discussions • Peer review and editing • Paired assignments	Facilitating self-regulated learning • Goal-setting and monitoring • Reflection • Self-assessments

Further, most participants in this study appeared to give students some choices whenever possible (e.g., project topics) and encourage students to set their own goals, monitor their progress toward those goals, reflect on their learning, and engage in self-assessments. This finding is inconsistent with some of the existing literature (Robinson, Molenda, & Rezabek, 2007; Sockman, 2015; Zimmerman, 2002). For example, Zimmerman (2002) noted that students are seldom given choices and rarely encouraged to establish their own goals and self-evaluate their work. Previous research also showed that some teachers do not feel comfortable with the facilitator role in learner-centered environments and feel students' independence as a threat to their identity (Robinson, Molenda, & Rezabek, 2007; Sockman, 2015).

The results showed that most participants were using a variety of technology tools to facilitate learner-centered instruction. Only three teachers (2.4%) reported that they were not using technology in the classroom. They were all female teachers with more than 10 years of teaching experience. Some of the common tools used across different subject areas included *Google Docs*, *Google Slides*, *Google Forms*, *Google* images, *YouTube* videos, *Kahoot!*, and *Class Dojo*. Having students collaboratively work on a project using *Google Docs* and present their work using *Google Slides* was a common practice among the participants. Participants also mentioned many different subject-specific software. For example, English teachers reported using software such as *ReadTheory* and *Readworks* to provide more personalized reading comprehension activities. Participants valued the adaptive feature of learning software that provides individualized content or activities based on students' performance or levels. Well-designed adaptive learning software has the potential to provide differentiated instruction and feedback and facilitate personalized learning in mixed-ability classrooms.

The results of the study revealed that lack of time, lack of technology, lack of knowledge of learner-centered instruction, and assessments (school and national high-stakes testing) were major barriers to using technology to support learner-centered instruction. This finding was consistent with previous research (An & Reigeluth, 2011). In terms of assessments, the participants, especially high school teachers, appeared to be frustrated by having to prepare students for the standardized assessments. As suggested by the participants, schools need to focus less on testing and test scores to better meet the needs of individual students and the society. Even if teachers are

prepared to teach in learner-centered ways, they will not be able to provide effective learner-centered instruction if they still have to focus on preparing students for the standardized tests.

However, changing the sorting-focused education system to learning-focused system is not a simple problem. As Reigeluth and Duffy (2008) pointed out, paradigm change must occur at three different levels, including teaching and learning, the school system's social infrastructure, and the relationship between the school system and its environment, to achieve a paradigm that is learning-focused rather than sorting-focused. The literature indicates that the teaching and learning level is gradually changing at least in the United States. Research has shown that teachers in the United States have positive attitudes toward learner-centered instruction and are willing to learn more about it if they are not prepared (e.g., An & Reigeluth, 2011; An & Mindrila, 2017; Tawalbeh & AlAlsmari, 2015; Yilmaz, 2008). It is worth noting that teachers in different cultural contexts may have different perceptions of learner-centered instruction and face different barriers in the process of moving from teacher-centered to learner-centered practice (Schweisfurth, 2013).

Limitations and Future Research

This study examined K-12 teachers' learner-centered teaching practices by surveying teachers in a southeastern U.S. state. The results of the study could be different in different parts of the country or in different cultural contexts. As addressed in the Discussions section, the implementation learner-centered education and the barriers teachers face in the implementation process can be different in other cultural contexts. Although the sample size was not too small for a qualitative study, the findings of the study were based on self-report data from 125 teachers. Therefore, the results should be interpreted with caution.

Further studies might test the generalizability of the findings of this study by examining teachers' learner-centered teaching practice in different states and different countries. Future research could examine the strategies and tools used for learner-centered instruction in greater depth using interviews and observation. Also, it would be interesting to explore how teacher- and learner-centered practices are combined and if there is any difference in different grade levels.

References

An, Y. (2012). Learner-centered technology integration. In V. C. X. Wang (Ed.), *Encyclopedia of E-Leadership, Counseling and Training*. Hersey, PA: IGI Global.

An, Y., & Mindrila, D. (2017). Clusters of teachers based on their perceptions of learner-centered instruction. In D. Mindrila (Ed.), *Exploratory factor analysis: Applications in school improvement research* (pp. 63-85). New York, NY: Nova Science Publishers.

An, Y., & Reigeluth, C. M. (2011). Creating technology-enhanced, learner-centered classrooms: K-12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digita Learning in Teacher Education, 28*(2), 54-62.

APA Board of Educational Affairs (1997). *Learner-Centered Psychological Principles: A Framework for School Reform and Redesign*. Washington, DC: American Psychological Association.

Arslantas, S. & Kurnaz, A. (2017). The effect of using self-monitoring strategies in social studies course on self-monitoring, self-regulation and academic achievement. *International Journal of Research in Education and Science (IJRES), 3*(2), 452-463.

Bas, G. & Beyhan, O. (2019). Revisiting the effect of teaching of learning strategies on academic achievement: A meta-analysis of the findings. *International Journal of Research in Education and Science (IJRES), 5*(1), 70-87.

Becker, H. J. (2000). Findings from the teaching, learning, and computing survey: Is Larry Cuban right? *Education Policy Analysis Archives, 8*(51).

Bloom, B. S. (1968). Learning for mastery. *Evaluation Comment, 1*(1), 1-12.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.

Bremner, N. (2019). From learner-centered to learning-centered: Becoming a 'hybrid' practitioner. *International Journal of Educational Research, 97*, 53-64.

Carroll, J. B. (1963). A model of school learning. *Teachers College Record, 64*(8), 723-733.

Dewey, J. (1938). *Experience and education*. New York, NY: Kappa Delta Pi.

Glaser, B.G., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine.

Ha, P. L. (2014). The politics of naming: Critiquing "learner-centered" and "teacher as facilitator" in English language and humanities classrooms. *Asia-Pacific Journal of Teacher Education, 42*(4), 392–405.

Kaymakamoğlu, S. E. (2018). Teachers' beliefs, perceived practice and actual classroom practice in relation to traditional (teacher-centered) and constructivist (learner-centered) teaching. *Journal of Education and Learning, 7*(1), 29-37.

Mansour, N. (2013). Consistencies and inconsistencies between science teachers' beliefs and practices. *International Journal of Science Education, 35*(7), 1230–1275,

McCombs, B. L. (2008) From one-size-fits-all to personalized learner-centered learning: The evidence. *The F. M. Duffy Reports, 13*(2), 1–12.

McCombs, B. L. (2012). The learner-centered model: Implications for research approaches. In J. H. D. Cornelius-White, R. Motschnig-Pitrik, & M. Lux (Eds.), *Interdisciplinary handbook of the person centered approach: connections beyond psychology*. New York: Springer.

McCombs, B. L. (2015). Learner-centered online instruction. *New Directions for Teaching and Learning, 144*, 57-71.

McCombs, B. L., & Whisler, J. S. (1997). *The learner-centered classroom and school: Strategies for increasing student motivation and achievement.* San Francisco: Jossey-Bass.

Montessori, M. (1917). *The advanced Montessori method* (Vol. 1). New York, NY: Frederick A. Stokes Company.

Oliveira, A. & Pombo, L. (2017). Teaching strategies mediated by technologies in the Edulab model: The case of mathematics and natural sciences. *International Journal of Research in Education and Science (IJRES), 3*(1), 88-106.

Polly, D., & Hannafin, M. J. (2011). Examining how learner-centered professional development influences teachers' espoused and enacted practices. *Journal of Educational Research,104*(2), 120-130.

Rashidi, N., & Moghadam, M. (2015). The discrepancy between teachers' belief and practice, from the sociocultural perspective. *Studies in English Language Teaching, 3*(3), 252-274.

Reigeluth, C. M. (1994). Envisioning a new system of education. In C. M. Reigeluth & R. J. Garfinkle (Eds.), *Systemic change in education* (pp. 59–70). Englewood Cliffs, NJ: Educational Technology Publications.

Reigeluth, C. M. (1999). What is instructional design theory and how is it changing? In C.M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Volume II, pp. 5–29). Mahwah, NJ: Lawrence Erlbaum Associates.

Reigeluth, C. M., & Duffy, F. M. (2008). The AECT FutureMinds initiative: Transforming *America's school systems. Educational Technology, 48*(3), 45-49.

Reigeluth, C.M., Myers, R.D., & Lee, D. (2017). The learner-centered paradigm of education. In C. M. Reigeluth, B. J. Beatty, & R. D. Myers (Eds.), *Instructional-design theories and models: The learner-centered paradigm of education* (Volume IV, pp. 5-32). New York, NY: Routledge.

Robinson, R., Molenda, M., & Rezabek, L. (2007). Facilitating learning. In A. Januszewski, & M. Molenda (Eds.), *Educational technology: A definition with commentary* (2 nd ed., p. 15-48). New York, NY: Lawrence Erlbaum.

Schweisfurth, M. (2011). Learner-centred education in developing country contexts: from solution to problem? *International Journal of Educational Development, 31*, 425–432.

Sockman, B. R. (2015). Innovative teacher's perceptions of their development when creating learner-centered classrooms with ubiquitous computing. *International Education Research, 3*(3), 26-48.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tawalbeh, T. I., & AlAsmari, A. A. (2015). Instructors' perceptions and barriers of learner-centered instruction in English at the university level. *Higher Education Studies,* 5(2), 38-51.

Yilmaz, K. (2008). Social studies teachers' views of learner-centered instruction. *European Journal of Teacher Education, 31*(1), 35-53.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. American Journal of Evaluation, 27(2), 237-246.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview, *Theory Into Practice, 41*(2), 64-70.

Author Information

Yunjo An
University of North Texas
3940 N Elm St, Denton, TX 76207
USA
Contact e-mail: *Yunjo.An@unt.edu*

Diana Mindrila
University of West Georgia
1601 Maple St., Carrollton, GA 30118
USA