A convergent parallel mixed-method research into the use of the cheat sheet in teacher education: State test anxiety, exam scores and opinions of prospective teachers

Dr. Selda ÖZER
School of Foreign Languages, Nevşehir Hacı Bektaş Veli University, Nevşehir, Turkey
sozer@nevsehir.edu.tr
ORCID ID: 0000-0003-2648-9150

Abstract
The aim of the study is to investigate the use of cheat sheets in teacher education. The research analyzed state test anxiety levels of prospective teachers, the correlation between their cheat sheet evaluation scores and exam scores, and opinions of prospective teachers about the cheat sheet. Thus, the study was conducted as a convergent parallel mixed-method research in which both quantitative and qualitative methods were used simultaneously. The study group consisted of 24 prospective teachers. Data regarding state test anxiety levels of the prospective teachers were gathered just before the exam via State Test Anxiety Scale. The cheat sheet evaluation rubric designed by the researcher was used to evaluate the cheat sheets prepared by the prospective teachers. The prospective teachers' exam scores were obtained from their responses. The data about opinions of the prospective teachers were collected via Standardized Interview Form developed by the researcher. The findings of the study revealed that prospective teachers' overall state text anxiety was at "very little" level. There was a statistically significant and positive correlation between the prospective teachers' cheat sheet evaluation scores and their exam scores. Qualitative findings revealed that the prospective teachers started taking notes at the beginning of the semester to write on their cheat sheets; however, they started to write their cheat sheets the day before the exam. They wrote their cheat sheets in 3-5 hours, and spent 3-5 hours studying for the exam. The prospective teachers rarely used their cheat sheets during the exam; however, the cheat sheet helped them learn the material, and they wanted to use cheat sheets in other courses. The prospective teachers used different strategies while writing their cheat sheets. Based on the conclusions of the study, teacher educators are also recommended to let prospective teachers use cheat sheets during exams to reduce their anxiety, to increase their exam scores, and most importantly, to help them learn the material thoroughly.
Keywords: Evaluation methods, the cheat sheet, state test anxiety, exam scores, opinions, prospective teachers.

INTRODUCTION

Assessment in teaching can be done in different ways. Formative assessment helps lecturers to evaluate students' academic development. It contributes them to adjust instructional methods to achieve the course objectives. Homework assignments, class discussions and quizzes are usually used for process assessment as formative assessment. However, summative assessment is more suitable for evaluating retention of materials and usually used at the end of a cycle with a mid-term exam or a final exam (Appiah-Kubi, 2016). Many exams are usually test-based, which encourages students to memorize the information to be tested. Moreover, test-based assessment hinders high-order learning, thinking critically and solving problems, which results in rote memorization (Wilson & Narasuman, 2020). Thus, students prefer surface learning in order to just pass the test rather than deep-level mastery of concepts or learning a subject thoroughly (Jensen, McDaniel, Woodard & Kummer, 2014). On the other hand, preparation of a cheat sheet may help students organize information for testing and promote to develop better study skills as well as deep learning. Test anxiety is another problem in assessment because the idea of taking tests may affect students' self-efficacy, motivation and effort (Harlen & Crick, 2003). Students may not reflect what they know exactly in a test due to test anxiety. In addition to improving performance, the cheat sheet may help reduce test anxiety (Erbe, 2007; Gharib & Phillips, 2012; Gharib, Phillips & Mathew, 2012).

A cheat sheet is defined as "a sheet containing information (such as test answers) used secretly for cheating" and "a written or graphic aid (such as a sheet of notes) that can be referred to for help in understanding or remembering something complex" in the dictionary of Merriam-Webster. A cheat sheet is also depicted as "a piece of paper, computer file, etc. that gives you useful information about a subject, or helps you remember or do something, sometimes used for cheating in a test or examination" in Cambridge Advanced Learner's Dictionary. Cheating is not allowed in assessment and evaluation process in education; however, registered cheat sheets may provide educational benefits. In the literature, there are some studies using the concepts of help sheet (Ludorf & Clark, 2014), support sheet (Danielian & Buswell, 2019), crib sheet (Cannonier & Smith, 2019; Rice, Vogelweid & Kitchel, 2017; Edwards & Loch, 2015), student-prepared testing aids (Larwin, 2012; Larwin, Gorman & Larwin, 2013) as well as cheat sheet (Appiah-Kubi, 2016; Song, Guo & Thuente, 2016; Song & Thuente, 2015; Pollari,

2015; de Raadt, 2012; Gharib & Phillips, 2012; Gharib, Phillips & Mathew, 2012; Grosz, 2008; Erbe, 2007; Cone, 2003; Wachsman, 2002). The concept of cheat sheet was preferred in the current study, and it can simply be defined as "a sheet of notes produced while preparing for an examination" (de Raadt, 2012). The size of the cheat sheet is double-sided A4, and students are allowed to write in hand whatever information they believe is relevant.

In preparing cheat sheets, students should be careful because if the material is large, they cannot possibly write all the information. Therefore, they should organize their notes more efficiently. They should first distinguish between the information they know and the information they do not know exactly. Next, they should decide what to write on their sheet so that it will be an excellent incentive and method for students (Grosz, 2008; Erbe, 2007; Cone, 2003). Moreover, they should write as small as possible to include more information, and they should write large enough to be able to read during the exam. Preparing the cheat sheet as early as possible in the course gives students some outlook on how to study and/or how to divide material down into its simplest form (Grosz, 2008). Consequently, they actually study, learn, absorb and internalize the material while they go through all the preparation process.

Using cheat sheets in testing resembles real-life situations in that people solve problems with reference materials. It reduces students' anxiety in exams (Erbe, 2007; Cone, 2003), and students concentrate more on learning instead of details. Organizing and writing the information allow students to fill in the blanks in their knowledge (Erbe, 2007). Finally, it provides lecturers to construct better exams with questions serving to reach higher levels of learning outcomes (Cone, 2003). During his 47 years of teaching at both graduate and undergraduate levels, Grosz (2008) recommended the use of cheat sheets under right circumstances. First, students should be informed that the cheat sheet can/will be used during the exam as early as possible. Secondly, the exam should cover more material than other exams will cover, especially with lots of details to be tested on. He also conveyed that letting students use their cheat sheet in an examination will be a notable educational tool.

When the literature was reviewed, it was observed that there were significant studies about the use of cheat sheets. Nsor-Ambala (2020) investigated the use of closed-book, open-book and cheat-sheet exams in cost and management accounting course and concluded that exam type affected exam scores, and the highest scores were of those who used cheat sheets. Students were less anxious when they had cheat-sheet or open-book exams than closed-book exams. Finally, retention was the highest in cheat-sheet exams than open-book and closed-book exams. Paquin, Miller and Baron (2020) also explored the effects of different exam types and reached the conclusion that the use of cheat sheets reduced exam failure rate from 11.8% to 0%. Likewise, Gharib, Phillips and Mathew (2012) compared different exam types, examined students' preferences and anxiety levels in introductory psychology course. They found out that students got higher scores on open-book exam than on closed-book exams, they preferred open-book and cheat-sheet exams over closed-book exams, and they were less anxious when they took open-book exams compared to cheat-sheet exams.

Another study applied in principles of macroeconomics course explored the effects of cheat sheets on test performance, it analyzed students' performance with and without cheat sheets in an identical set of multiple-choice tests. When students had cheat sheets, they spent less time studying and performed better because the cheat sheet helped them be more optimistic and realistic about their test performance, in addition to leading them to study more efficiently. Moreover, the cheat sheet was effective for exam questions at apply level rather than remember level of Bloom's revised taxonomy. (Settlage & Wollscheid, 2019). Hamouda and Shaffer (2016) investigated whether there was any feature of cheat sheets that correlated with better exam scores in data structures and algorithms course. They concluded that students performed significantly better on questions at comprehension level of Bloom's original taxonomy (Bloom, 1956) if their cheat sheet contained the information on the topic. However, performance on questions at higher levels of the taxonomy did not show correlation with the content of the cheat sheet. In addition, the findings showed that medium- and high- achieving students did better on certain questions than others at application level if they had good coverage of the question's topic on their cheat sheets.

Danielian and Buswell (2019) analyzed the relationship between what is written on the cheat sheet and the students' performance on the mechanics of materials course and concluded that the most reflective feature of the cheat sheet leading to higher performance was the use of annotations on the cheat sheet; in other words, the absence of annotations led to lower performance. Another study in online mathematics course analyzing the quality of the cheat sheet revealed that the cheat sheets were neither well- made nor well used; and thus, they didn't affect student scores (Capaldi, 2019). Shaw and Almeida (2018) examined the relationship between quality of cheat sheets and exam scores in anatomy and physiology course and found correlations between the cheat sheet use and exam scores, and between the numbers of colors used on the cheat sheet and exam scores. However, they found no correlation between the number of sections used on the cheat sheet and exam scores. Song, Guo and Thuente (2016) compared the quality and the effect of graduate students' cheat sheets with undergraduate students' in

computer networking course. They found out that not only graduate but also undergraduate students who prepared better cheat sheets had higher scores in exams, the correlation between cheat sheet quality and exams scores were higher for undergraduate students than graduate students, undergraduate students were likely to write down more sample answers on their cheat sheets, too many sample answers didn't help them get higher grades in both groups, graduate students drew more graphs on their cheat sheets. In addition, graduate students expressed that the cheat sheets were helpful both as learning tools and aids during exams, that their attitude improved through the semester, and that spending excessive time preparing cheat sheets didn't help them do better on exams.

Cannonier and Smith (2019) investigated the use of cheat sheets in economics in a different way because they compared individually prepared cheat sheets with cooperatively prepared cheat sheets. They concluded that the use of cheat sheet can increase test performance. However, cooperative cheat sheets were not more effective than individual cheat sheets, and they were even worse than no cheat sheets. In their study with nursing students, Malecha and Budhrani-Shani (2018) found out that the frequency of looking at the cheat sheet during the exams was positively correlated with confidence, cheat sheets decreased anxiety, the time spent for writing the cheat sheet was also positively correlated with confidence, the use of cheat sheets was not correlated with overall exam scores, creating the cheat sheet helped students learn/memorize, and the cheat sheet was a security blanket during exams. Similarly, Burns (2014) investigated the use of cheat sheets in four separate exams in statistics course and revealed that there was a negative correlation between the number of times students used their cheat sheets and their exam performance. High-achieving students did not utilize their cheat sheets very much, and moderate- and low-achieving students increased their cheat sheet use throughout the semester.

In their two-year longitudinal study, Rice, Vogelweid and Kitchel (2017) analyzed the effects of the cheat sheet use on achievement and retention in virology course. They also examined opinions of the students. The students had six exams, the sixth one was retention, and the students were not allowed to use cheat sheets in all exams. Their scores with and without cheat sheets were compared. The results demonstrated that the cheat sheet use improved achievement but not retention. In addition, the cheat sheet use had positive effects such as decreasing anxiety, improving engagement and learning, and providing emotional comfort and support. On the other hand, the cheat sheet use caused dependency, and students neglected studying; thus, it decreased learning. The cheat sheet preparation process was stressful and took time away from productive studying, tests were harder when cheat sheets were allowed, and it gave a false sense of security. Appiah-Kubi (2016) analyzed the effect of cheat sheet on two separate exam scores in industrial and environmental safety course and found out that an effective cheat sheets helped students score above-average in both exams, and the number of effective cheat sheets prepared for the second exam was higher, which demonstrated that students experienced in preparing better cheat sheets in time. Song and Thuente (2015) explored the effect of cheat sheet quality on three separate grades of students who were taking computer science networking course. The study concluded that the cheat sheet quality varied significantly between high-achieving and low-achieving students, students' grades were related to their cheat sheet quality, and if students managed to improve the quality of their cheat sheets from the first exam to the next, their grades would improve for the subsequent exam. Similarly, in another study, more capable students in creating the cheat sheet got higher scores in physics (Hamed, 2008).

Vogelweid and Kitchel (2017) examined the performance of veterinary students on exams using cheat sheets in a two-year longitudinal study. The results displayed that utilizing cheat sheet enhanced exam performance, but it did not have an effect on retention. The students indicated that having the cheat sheet in the exam decreased their anxiety and provided assistance during both studying and testing. Erbe (2007) analyzed the use of cheat sheets in different courses such as statistics, research methods, methods of teaching mathematics, and computer use in education and revealed that it reduced anxiety in all exams. Edwards and Loch (2015), Ludorf and Clark (2014) and de Raadt (2012) examined the content and layout of cheat sheets in calculus, psychology and programming exams, respectively. Ludorf and Clark (2014) found out that the quality of cheat sheets predicted scores in the exam. Similarly, de Raadt (2012) found a positive relationship between the quality of cheat sheets and test performance. Pollari (2015) analyzed the use of cheat sheet in an EFL class and concluded that the presence and quality of cheat sheets correlated with test results. Therefore, students with a better cheat sheet scored slightly higher than others. Most of the students indicated that preparing cheat sheets reduced their test anxiety, improved their study habits, and they learned better.

Despite numerous research on the cheat sheet, only Skidmore and Aagaard (2004) examined the cheat sheet use in teacher education. Their study investigated the effect of cheat sheet on exam scores, but not the effects of cheat sheet on test anxiety and the opinions of prospective teachers. When the teacher education literature and the recent studies on the cheat sheet mentioned above were taken into consideration, it was noticed that the research on the cheat sheet was really limited in teacher education. The current study, presenting novice findings, will lead to eliminate the limitation of research on the cheat sheet use in teacher education literature. Consequently, the aim of

the study is to investigate the use of cheat sheets in teacher education. To reach this aim, the following research questions were posed:

1. What are state test anxiety levels of prospective teachers who used cheat sheets in the exam?
2. Is there a correlation between the cheat sheet evaluation scores of prospective teachers and their exam scores?
3. What are the opinions of prospective teachers about the cheat sheet?

METHOD

Research Design

The study was conducted as a convergent parallel mixed-method research. In the study, first of all, both quantitative (survey, cheat sheet evaluation scores and exam scores) and qualitative data (interviews) were gathered. Then they were analyzed separately. Next, the results from the analyses of both datasets were compared. Finally, the results were interpreted whether the results support or contradict each other (Creswell et al., 2003; Creswell & Plano Clark, 2007; Creswell, 2011). The convergent parallel mixed-methods design used in the study was given in Figure 1.

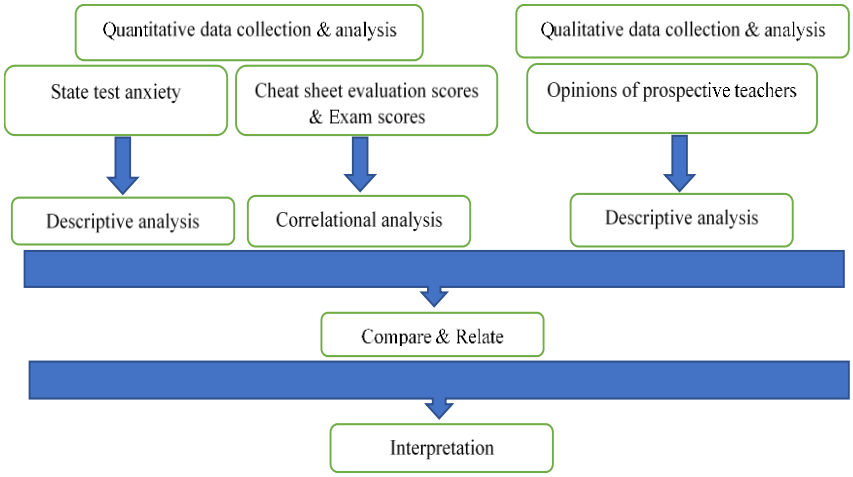

Figure 1. The convergent parallel mixed-method design used in the study

Study Group

In the study, criterion sampling method, one of the purposive sampling methods, was used. Prospective teachers' use of cheat sheets was considered as the sampling criterion in curriculum development in education course. Curriculum development in education course covers mostly content knowledge, so the exam covers more information than other exams with lots of details to be tested, which is considered as one of the certain circumstances by Grosz (2008). The prospective teachers taking the course are expected to "think like a curriculum developer" rather than memorize the content of the course, which has also led to determine the sampling criterion. Therefore, 24 prospective teachers who were taking curriculum development in education course at a faculty of education at a state university in Turkey, and who prepared and used cheat sheets in the midterm exam of the mentioned course constituted the study group. Prospective teachers participated in the study voluntarily. Demographic features of the study group were given in Table 1.

Instruments

State Test Anxiety Scale

State test anxiety levels of prospective teachers were examined using the data collected just before the exam via "State Test Anxiety Scale" developed by Şahin (2019). It was a four-point Likert scale graded as "not at all", "very little", "somewhat" and "to a great extent". The scale consisted of 22 items and 3 factors as cognitive, psychosocial and physiological. Confirmatory factor analysis displayed that fit indices ($\chi 2/sd=1.72$, CFI=.96, NNFI=.96, IFI=.96, RMSEA=.05, SRMR=.05) were at perfect levels (Şahin, 2019). The Cronbach's alpha was .93, .84 and .85 for cognitive anxiety, psychosocial anxiety, physiological anxiety, respectively. Cronbach's alpha was .94 for the overall state text anxiety scale (Şahin, 2019). In the current study, Cronbach's alpha was .89, .83 and .88 for cognitive anxiety, psychosocial anxiety, physiological anxiety, respectively, and .94 for the overall state text anxiety scale.

Table 1. Demographic features of the study group

Features		f
Gender	Female	19
	Male	5
Age	19	7
	20	10
	21	4
	22	3
Department	Preschool Teaching	9
	Primary School Mathematics Teaching	6
	Physical Education and Sports Teaching	3
	Social Sciences Teaching	2
	Guidance and Psychological Counseling	2
	English Language Teaching	1
	German Language Teaching	1
Midterm exam score	50-66	9
	67-83	11
	84-100	4
Cheat sheet evaluation score	6-13	1
	14-21	13
	22-29	10
Total		24

The Cheat Sheet Evaluation Rubric

A draft cheat sheet evaluation rubric was designed by the researcher to evaluate the cheat sheets prepared by prospective teachers after the literature review (Gharib, Phillips & Mathew, 2012; in Raadt, 2012; Ludorf & Clark, 2014; Song & Thuente; 2015; Song, Guo & Thuente, 2016; Appiah-Kubi, 2016; Hamouda & Shaffer, 2016; Capaldi, 2019; Danielian & Buswell, 2019). In order to ensure the content validity of the draft rubric, two experts were consulted. The draft was modified in line with the suggestions. The final evaluation rubric consisted of 10 criteria. While the highest score that could be obtained from the evaluation rubric was 29, the lowest score was 6.

Exam Scores

Prospective teachers' exam scores were obtained from their responses. Before the exam, a draft exam sheet was prepared by the researcher including questions of higher-order cognitive levels of Bloom's revised taxonomy (Anderson & Krathwohl, 2001). Two experts in the field were consulted to categorize the questions into Bloom's revised taxonomy, and to suggest on the questions. Their categorization was the same as the researcher's, but the structures of some questions in the draft exam sheet were modified in line with the suggestions. Finally, the exam sheet involved questions of understand (57%), analyze (14.5%) and evaluate (28.5%) levels of Bloom's revised taxonomy. Students had to explain ideas and concepts (understand), distinguish between different parts (analyze), and justify a stand or decision (evaluate) to answer the questions. Students could not get higher scores simply by copying the information in their sheets as Erbe (2007) suggested.

Standardized Interview Form

The data about the opinions of prospective teachers were collected via "Standardized Interview Form" developed by the researcher after the literature review (Song, Guo & Thuente, 2016; Gharib, Phillips & Mathew, 2012; Cone, 2003; Wachsman, 2002). The interview form included both closed- and open-ended questions. In order to ensure the content validity of the draft interview form, two experts were consulted, and the draft was modified in line with the suggestions. Since prospective teachers were in their hometowns due to Covid-19 pandemic, the data were collected online. The link of the interview form developed for the study was sent to the prospective teachers, and they were asked to express their opinions. The data were collected in the second half of the 2019-2020 spring semester.

Procedure

At the beginning of the semester, the prospective teachers were told that they would be allowed to prepare a cheat sheet for themselves in order to use during the exam, and they were given the following rules for its preparation and use (Cone, 2003):

1. They may write their cheat sheets on both sides of a regular sheet of paper (A4).
2. Everything on the sheet must be in their own handwriting. Because there is a relationship between hand-writing and higher exam results.

3. They may prepare cheat sheets in groups, but everything on one's cheat sheet must be only his/her own handwriting.
4. They may put down anything they think will be useful: definitions, abbreviations, concept mapping, drawings, etc.
5. They will be asked to turn in their cheat sheets after the exam.

Data Analysis

In order to analyze state test anxiety levels of prospective teachers, maximum, minimum, mean and standard deviation scores of three sub-scales and overall state Test Anxiety Scale were determined. Class width formula (class range/number of classes) recommended by Tekin (2002) and used in educational studies (Özer, 2019) was used in the evaluation of mean scores. Class width was calculated by the dividing the difference between the highest (4) and lowest score (1) by the number of classes (4). Class width levels used in the evaluation of the research findings were as follows:

1-1.75: "Not at all",
1.76-2.50: "Very little",
2.51-3.25: "Somewhat" and
3.26-4.00: "To a great extent".

Cheat sheets of all prospective teachers were evaluated by the researcher in terms of the criteria in the cheat sheet evaluation rubric and scored between 6 and 29. Then cheat sheets were scored by another expert in the field. The numbers of "agreements" and "disagreements" were determined, and interrater reliability was calculated via the reliability formula (reliability= the number of agreements/ the number of agreements+ the number of disagreements) proposed by Miles and Huberman (1994). Within the scope of the reliability study, the expert scored the cheat sheet of three prospective teachers differently from the researcher. Reliability in the evaluation rubric was calculated as (reliability= 21/21+3) 87.5%, which is sufficient as it was expected to be at least 80% (Miles & Huberman, 1994; Patton, 2002). Finally, the cheat sheet evaluation scores of these three prospective teachers were used by calculating mean scores of both evaluation scores. Ultimately, Pearson correlation analysis was applied in order to analyze the relationship between prospective teachers' cheat sheet evaluation scores and their exam scores.

The data about the opinions of prospective teachers were analyzed descriptively using traditional qualitative data analysis. The answers given by prospective teachers were downloaded onto the computer by giving numbers to the interview forms according to the order of the online forms. In closed-ended question, the frequencies were given so as to reflect the situation. However, in open-ended questions, the frequencies were not given since the opinions of prospective teachers included more than just one category. After the answers were examined in general, similar opinions were the grouped into categories. Direct quotations were included in order to reflect the opinions of prospective teachers more accurately. While giving direct quotations, the letter "PT" for prospective teacher, numerical codes such as 1, 2, 3, 4 ... for the order of submitting the interview form, and the letters "F" and "M" to indicate their gender were used. For example, the code "PT1F" was used for a female prospective teacher who submitted the first form.

FINDINGS

State test anxiety levels of prospective teachers who used cheat sheets in the exam were analyzed and the findings (Table 2) displayed that prospective teachers' mean score for cognitive anxiety (X=2.79) was at "*somewhat*" level. Their mean score for psychosocial anxiety (X=1.65) and physiological anxiety (X=1.75) were at "*not at all*" level. Finally, prospective teachers' mean score for overall state text anxiety (X=2.15) was at "*very little*" level. The findings suggests that the process of preparing cheat sheets and the idea of having cheat sheets with them during the exam have presumably affected prospective teachers' state test anxiety levels and led to lower anxiety levels.

Table 2. The state test anxiety levels of prospective teachers

	N	Minimum	Maximum	X	Sd	Level
Cognitive anxiety	24	1.56	4.00	2.79	.73	Somewhat
Psychosocial anxiety	24	1.00	4.00	1.65	.73	Not at all
Physiological anxiety	24	1.00	3.88	1.75	.73	Not at all
Overall state text anxiety	24	1.27	3.95	2.15	.65	Very little

The correlation between the cheat sheet evaluation scores of prospective teachers and their exam scores was analyzed and the findings (Table 3) indicated that there was a statistically significant and positive ($r=.56$, $p<.01$) correlation between prospective teachers' cheat sheet evaluation scores and their exam scores. In other words, the higher the cheat sheet evaluation score, the higher the exam score.

Table 3. The correlation between the cheat sheet evaluation scores of prospective teachers and their exam scores

Variables	X	SS	1	2
1. Cheat sheet evaluation score	20.16	4.50	-	
2. Exam score	69.50	14.90	.56**	-

**p<.01

Opinions of prospective teachers were analyzed and the findings were given in the order in the interview form. Analyses revealed that most of the prospective teachers (f=9) started taking notes at the beginning of the semester to write on their cheat sheets. These prospective teachers may be considered to be the most self-disciplined and self-directed ones. While 9 prospective teachers started taking notes 5, 3 or 2 weeks before the exam, 6 prospective teachers started to take notes the week before the exam. However, when starting time for writing cheat sheets was analyzed, it was observed that the majority of prospective teachers (f=7) started to write their cheat sheets 1 day before the exam. These prospective teachers may have thought that they could easily remember what and where on the cheat sheet they had written; and thus, they could find the answers of the questions during the exam immediately. In addition, 6 prospective teachers started to write their cheat sheets 3 days before the exam, 5 prospective teachers started to write their cheat sheets 1 week before the exam, and 3 prospective teachers started to write their cheat sheets a few hours before the exam. Finally, 1 prospective teacher started to write his/her cheat sheet 2 weeks before the exam, 4 days before the exam and 2 days before the exam, respectively.

The vast majority of prospective teachers (f=12) wrote their cheat sheets in 3-5 hours. While 6 prospective teachers spent 6-8 hours, and 5 prospective teachers spent less than 3 hours writing their cheat sheets, only 1 prospective teacher spent 9-11 hours. Whereas the majority of the prospective teachers (f=10) spent 3-5 hours studying for the exam, 8 prospective teachers spent less than 3 hours. In addition, 2 prospective teachers studied 6-8 hours, and 4 prospective teachers studied 9-11 hours for the exam. The prospective teachers who spent less time on writing their cheat sheets may have preferred to study more; on the other hand, those who spent more time on writing their cheat sheets may have preferred to write and study at the same time.

The majority of the prospective teachers (f=10) rarely (for less than half of the questions) used their cheat sheets during the exam. While 7 prospective teachers sometimes (for half of the questions) used their cheat sheets, 4 prospective teachers often (for more than half of the questions) used their cheat sheets, and 3 prospective teachers always (for all the questions) used their cheat-sheets during the exam. In addition, 13 prospective teachers thought that cheat-sheet was helpful, and 6 preservice teachers thought that it was very helpful during the exam. Whereas 4 prospective teachers were not sure about the effect of using their cheat sheets, only 1 prospective teacher thought that it was not helpful. The findings evoke that the process of preparing cheat sheets and the idea of having cheat sheets with them during the exam, similar to lowering anxiety levels, have presumably led prospective teachers to learn the material thoroughly and get a solid grasp of the topics covered in the courses.

Another finding of the study was that most of the prospective teachers (f=18) thought that writing cheat sheets helped them learn. However, 4 prospective teachers thought that writing cheat sheets did not help them learn, and 2 prospective teachers were not sure about the effect of writing their cheat sheets on their learning. Similarly, most of the prospective teachers (f=15) thought that they could have got a score between 50 and 66 in the exam without using their cheat sheets, which means they would have performed worse than they did with their cheat sheets. The finding also supports the previous finding of the current study that most of the prospective teachers thought that writing cheat sheets helped them learn the material. 6 preservice teachers thought that they could have got a score of 49 and below. Finally, only 3 prospective teachers thought that they could have got a score between 67 and 83. When their preference in exam types were analyzed, the vast majority of prospective teachers (f=12) preferred taking the exams using all their notes, which may have resulted from their indecision about what was important and what to write on their cheat sheets. 8 prospective teachers preferred taking the exams using their cheat sheets, and 2 prospective preferred open-book exams. On the other hand, 2 prospective teachers preferred traditional exams. These 2 prospective teachers may be the ones who are less innovative than others.

In the same vein, when the opinions of the prospective teachers about using the cheat sheet in other courses were analyzed, the findings (Table 4) reflected that most of them wanted to use the cheat sheet in the exams of other courses because it enabled them to learn permanently, it helped them remember the material, it helped them repeat the material, it enabled them to learn by writing, it reduced their stress/anxiety, it increased their effort, and it enabled them to comment on the questions during the exam. To illustrate, PT10M declared, "*Yes, writing over and over again enabled learning."*, PT21M stated, "*Yes, because I am a prospective teacher, I forget some of the information since we comment more in the exam than just writing the knowledge."*, and PT23F explained, *"Yes, we have notes, so it makes us feel comfortable."* On the other hand, some of the prospective teachers did not want to use the cheat sheet because they studied less, they couldn't write everything on the cheat sheet, or it took them

a lot of time to prepare. PT17F emphasized, "*Although I think it has helped me in the exam, I don't want to use it in other courses because it takes time to fit notes on the cheat sheet, and all of the information cannot be included.",* and PT3F expressed, "*No, I don't want to use cheat sheets because I studied less because I trusted the cheat sheet, but I didn't use cheat sheet, either."* A few prospective teachers wanted to use cheat sheets in some courses expressing that it can be used in social sciences courses, it is not suitable for all courses, and it can be used for formulae in numerical courses. To exemplify, PT7F stated, "*It can help in verbal classes. I think it could be easier to memorize the topics when I try to write on the cheat sheet.",* and PT5F explained, "*I want to use the cheat sheet in the exams because most of my courses are numerical, and it can help about formulae."*

Table 4. Desire to use the cheat sheet in other courses

Desire to use cheat-sheet in exams of other courses	
Yes	• Because it enabled me to learn permanently. • Because it helped me remember. • Because it helped me repeat the material. • Because it enabled me to learn by writing. • Because it reduced my stress/anxiety. • Because it increased my effort. • Because it enabled me to comment on the questions in the exam.
No	• Because I studied less. • Because I couldn't write everything. • Because it took me a lot of time to prepare.
In some courses	• Because it can be used in social sciences courses. • Because it is not suitable for all courses. • Because it can be used for formulae in numerical courses.

When it comes to experiences of the prospective teachers on preparing the cheat sheet, the findings (Table 5) indicated that opinions of the prospective teachers were positive about the cheat sheet preparation process, and that they benefited from their cheat sheets. They expressed that they used the paper effectively applying different strategies. While some of them numbered the topics, some of them wrote the notes in headings and subheadings, some of them folded the paper in two and wrote back and forth, and some of them divided the paper into sections. PT10M explained his strategy, "*I struggled a lot to fit the material, and it was also effective for me to learn. I underlined and numbered the titles with colored pencils in order not to confuse what I wrote, and at the same time, I divided the paper into sections."* Moreover, PT6F expressed, *"After I wrote it, I underlined the important sentences or headings. I wrote in a way that I could understand."*

Some of the prospective teachers didn't have much problem during the cheat sheet preparation process. To illustrate, PT18F declared, "*I did not have any problem. I only wrote certain topics my teacher emphasized. I wrote the definitions. I think I used the page effectively. I did not write every detail. it was short and clear. I started 3 days before the exam. What I learned is that if we do not understand and grasp the subject, it does not change the truth even if we use the cheat sheet and get 100. We had to write the cheat sheet using our own sentences after reading and understanding the subjects."*, and PT23F explained, "*I had no problems, but I was afraid of not fitting. I did not write descriptions or details. I prepared it as a reminder using short sentences in the form of headings and subheadings. I wrote from the first topic to the last topic covered in the courses. Since my notes are ready, I did not start to write too early. I prepared it 3-4 days before the exam. Since I wrote it 3-4 days ago, what I wrote was all in my mind."*

Table 5. Experiences on preparing the cheat sheet

Experiences on preparing cheat-sheets
• I used the paper effectively.
• I wrote the topics that were emphasized in the course and that I considered important.
• I was worried about writing all my notes on a piece of paper.
• I did not write in details.
• I did not have any problems.
• I wrote my notes in the order covered in the courses.
• I could not decide what was important and what to write.
• It took time to write/fit my notes on a piece of paper.
• I wrote what I didn't know, not what I knew.
• I wrote down the notes that I took every week.

- It was very difficult.
- I wrote informative notes instead of comments.
- It was a different experience.
- I wish I could use all my notes.
- It remembered everything easily in the exam as I wrote the cheat-sheet a few days before the exam.
- I realized that using the cheat sheet alone wouldn't work.
- I wrote almost everything.
- I just wrote the headings.

On the other hand, some of the prospective teachers declared that it was a troublesome and tiring process, and they couldn't see the forest for the trees. In addition, some of them depended more on their cheat sheets and didn't study enough. PT17F expressed her experience, "*I had some problems. It took a lot of time to fit the notes on the cheat sheet. It was a disadvantage in terms of time, and I could not include all information in terms of using the paper. For this reason, unfortunately, I could not include details on all issues. I wrote the topics in the order that we studied in the courses. I started to prepare it 2 weeks ago in order not to get stuck with other courses during the exam week. Moreover, I started to write early because I may have to erase it all and write over again if I couldn't write all the material on the paper. I decided on what to write by paying attention to the topics that the teacher explained and emphasized more in the courses."* As some of the prospective teachers stated, the most important point in preparing and writing the cheat sheet is knowing how to take effective notes. PT14M explained, "*Actually, it was very difficult because this was the first time I encountered such a notetaking. But I had got great tips from our teacher about how to use an A4 paper effectively while taking notes in biology course at high school. God bless him."* Similarly, PT22F expressed, "*I didn't elaborate, I thought I would comment during the exam. I was mentally tired while writing."* The quotations echo the significance of knowing how to take effective notes on the cheat sheet because preparing effective cheat sheets entails to read material, process information actively, select, organize, and prioritize the content, and the lack of these skills may probably make prospective teachers be fed up with the process of preparing the cheat sheet.

DISCUSSION AND CONCLUSION

The aim of the study was to investigate the use of cheat sheets in teacher education course. A convergent parallel mixed-method research was applied in the study using both quantitative and qualitative methods. The research analyzed state test anxiety levels of prospective teachers, the correlation between the cheat sheet evaluation scores of prospective teachers and their exam scores, and opinions of prospective teachers about the cheat sheet.

The findings achieved from quantitative data revealed that prospective teachers' overall state text anxiety was very low and analyses of qualitative data support this finding since prospective teachers also expressed that using cheat sheets reduced their stress/anxiety and increased their effort. Moreover, this finding echoes the findings in the literature (Cone, 2003; Erbe, 2007; Gharib & Phillips, 2012; Gharib, Phillips, & Mathew, 2012; Vogelweid, Kitchel & Rice, 2014; Hamouda & Shaffer, 2016; Rice, Vogelweid & Kitchel, 2017).

The study found out that there was a statistically significant and positive correlation between prospective teachers' cheat sheet evaluation scores and their exam scores. In other words, the higher the cheat sheet quality, the higher the exam score. Similarly, Shaw and Almeida (2018) found correlations between the cheat sheet use and exam scores, and between the numbers of colors used on the cheat sheet and exam scores. Appiah-Kubi (2016) showed that an effective cheat sheet was highly likely to help a student score above average, and Song and Thuente (2015) concluded that exam scores are highly related to the cheat sheet quality. Another research found that both higher quality and lower density of cheat sheets were related to higher test performance (Ludorf & Clark, 2014). However, Visco et al. (2007) and Hamouda and Shaffer (2016) found no direct relationship between the cheat sheet quality and exams scores in chemical engineering. Another study in the literature found out that cheat sheets were more useful for undergraduate students than graduate students (Song, Guo & Thuente, 2016).

The processes of designing, preparing and writing the cheat sheet improved prospective teachers' exam scores since prospective teachers wrote their own cheat sheets in handwriting. The preparation process may have helped prospective teachers make less effort to find information on their cheat sheets during the exam. In addition, most of the prospective teachers had written their cheat sheets just before the exam, which may have a positive effect on their exam scores. The finding is also in parallel with Erbe (2007)'s finding that students spent a lot of time creating their cheat sheets, they did not actually refer to them during the exam. Prospective teachers declared that they adapted the information in the way to meet their own needs, and wrote only the information that they couldn't learn thoroughly. The act of organizing and writing the information on the cheat sheet enabled most prospective teachers to fill in the gaps in their knowledge as suggested in previous studies in the literature (Erbe, 2007; de Raadt, 2012).

The study revealed that most of the prospective teachers started taking notes at the beginning of the semester to write on their cheat sheets. The prospective teachers were informed at the beginning of the semester that they would have their exam using cheat sheets as Grosz (2008) recommended. Thus, they wanted to be ready for taking notes in order to write on their cheat sheets, which suggests that they are self-disciplined and self-directed. However, the majority of prospective teachers started to write their cheat sheets the day before the exam. They may have thought that they would remember more easily if they wrote their cheat sheets just before the exam.

Most of the prospective teachers wrote their cheat sheets in 3-5 hours, and spent 3-5 hours studying for the exam. Similarly, in a study, students spent less time studying when they took the exam with cheat sheets than without it, and with cheat sheets their performance was better (Settlage & Wollscheid, 2019) Surprisingly, one prospective teacher spent 9-11 hours writing the cheat sheet. It may have resulted from that she couldn't decide what and how to write because most of the prospective teachers explained that the process of writing the cheat sheet was troublesome, and they were mentally tired during writing. The finding echoes another conclusion in the literature that spending excessive time creating cheat sheets alone do not help students do better on exams (Song, Guo & Thuente, 2016).

Although the majority of the prospective teachers rarely used their cheat sheets during the exam, they stated that the cheat sheet was helpful or very helpful. Likewise, students, in other studies, loved the idea of cheat sheets though they rarely needed them in the exam (Erbe, 2007; Smith, 2007; Song, Guo & Thuente, 2016). This finding supports the explanation that the act of organizing and writing the information on their cheat sheets enabled most prospective teachers to fill in the gaps in their knowledge (Erbe, 2007; de Raadt, 2012). In addition, most of the prospective teachers themselves proved this idea by reporting that writing cheat sheets helped them learn the material. On the other hand, in their two-year longitudinal study, Rice, Vogelweid and Kitchel (2017) reached different conclusions. In their former application, students indicated that the cheat sheet helped them retain the course information longer, but in the following study, students did not have the same idea. Supporting their finding, Burns (2014) and Funk and Dickson (2011) ascertained that there was a negative relationship between cheat sheet use and exam scores. In other words, the more students looked at their cheat sheets during exams, the lower their exam scores were, which may indicate that students used the cheat sheet as a crutch but not for truly learning the course material.

Another finding of the study displayed that most of the prospective teachers thought that they could have got a score between 50 and 66 in the exam without using their cheat sheets, which was lower than the results of the actual exam because most of them got a score between 67 and 83. The finding indicates that prospective teachers gave enough importance to exam preparation, as in Burns (2014)'s study, the cheat sheet worked as a security blanket for high-achieving students who consider exam preparation seriously, but as a crutch for low- and moderate-achieving students. Furthermore, the finding reflects that both preparing and having their cheat sheets with them during the exam helped them get higher scores in addition to reducing anxiety. Likewise, Erbe (2007) concluded that cheat sheet enhanced learning, improved test performance, and reduced test anxiety.

Overall, prospective teachers preferred taking the exams using all their notes or their cheat sheets. The finding is in parallel with the literature because students got slightly better scores if they had the additional resources, and because they preferred open book and cheat sheets to closed book exams (Gharib, Phillips, & Mathew, 2012; Hamouda & Shaffer, 2016). The finding is also consistent with other findings of the study. To illustrate, prospective teachers were worried about writing all their notes on a piece of paper, so it was very difficult, and they had problems, which reflected that they would be more comfortable with all their notes. Moreover, they were mentally tired while writing, and they explicitly emphasized that they wished they could have used all their notes because they couldn't write all the information. The finding also embraces Rice, Vogelweid and Kitchel (2017)'s claim that the matter of course is not the cheat sheet itself, but how it is prepared, organized and used by the students. On the other hand, as Appiah-Kubi (2016) indicated, students can easily get experienced in preparing better cheat sheets in time if they are let to use cheat sheets more in their exams.

Most of the prospective teachers voiced that they wanted to use the cheat sheet in other courses, because it enabled them to learn permanently, it helped them remember, it helped them repeat the material, it enabled them to learn by writing, it reduced their stress/anxiety, it increased their effort, and it enabled them to comment on the questions in the exam. In the same vein, another study reported that students preferred using the cheat sheet during all exams of other courses (Rice, Vogelweid & Kitchel, 2017). On the other hand, some of the prospective teachers stated that they didn't want to use the cheat sheet in other courses because they couldn't write everything, and it took them a lot of time to prepare. Some of them also expressed that they studied less because they were too dependent on the cheat sheet; therefore, they didn't want to use the cheat sheets in other exams. Likewise, some studies in the literature exposed that some students used cheat sheets as a crutch, and developed a dependency on it (Gharib, Phillips & Mathew, 2012; Larwin, Larwin, & Gorman, 2012; Burns, 2014; Rice, Vogelweid & Kitchel, 2017). The dependency may be reduced with proper training on the preparation and use of the cheat sheet as a tool because

students' willingness to prepare and use the cheat sheet and how to prepare it has a significant role (de Raadt, 2012; Rice, Vogelweid & Kitchel, 2017). Some of the prospective teachers asserted that the cheat sheet was not suitable for all courses, and they suggested it could be used in social sciences courses or for formulae in numerical courses. This finding reflects thinking, studying and learning differences among prospective teachers.

Most of the prospective teachers expressed that they used the paper effectively. Each prospective teacher used a different strategy while writing their cheat sheets. Some of them numbered the topics, some of them wrote in headings and subheadings, some of them divided the paper into sections, some of them folded the paper in two and wrote back and forth. In addition, some of them wrote it first, and then they underlined the important sentences or headings, some of them wrote in a way that they could understand, and some of them wrote exactly what they wanted. These explanations also repeated the fact that all students are unique, and they think and learn differently as well as they have distinctive study habits.

The current study has some limitations. First of all, the research was planned to be conducted not only in the mid-term exam but also in the final exam of the course. However, due to Covid-19 pandemic, schools and universities were shut down, and prospective teachers were in their hometowns, so the second part of the research could not be applied. The repetition in the use of cheat sheets may enable prospective teachers to improve the quality of their cheat sheets from the mid-term exam to the final exam, so their scores may increase more in the subsequent exam. Thus, further research may include both mid-term exams and final exams, and a thorough conclusion may be drawn. Because of Covid-19 pandemic, the opinions of prospective teachers were obtained via online interview form, which may be regarded as another limitation. Further research may obtain more comprehensive data for qualitative research using face-to-face interviews or focus group interviews. Finally, the research was carried out in curriculum development in education course. Therefore, in the future, the research may be replicated in other courses in teacher education, and the results may be compared and contrasted. Beyond the current study, further research may investigate the use of ready-to-use high-quality cheat sheet versus student-produced cheat sheet and the effect of each practice on achievement and retention, explore the best practices of composing the cheat sheet, analyze the best time to produce the cheat sheet, or compare and contrast learning outcomes from students who created cheat sheets four days versus one day before the exam.

Based on the results of the research, teacher educators are recommended to let prospective teachers use the cheat sheet in exams in order to reduce their anxiety, increase their exam scores and most importantly, help them learn the material thoroughly. The cheat sheet can easily be used as an effective teaching tool in teacher education because teachers are expected to think critically and solve problems in schools and society. In the modern era, information is freely available, and it is the prospective teachers who should be encouraged first to search and consult the relevant documents to find the solution as appropriate as possible in a problematic situation. Therefore, they will be an ideal model for future generations.

REFERENCES

Anderson, L. W. & Krathwohl, D.R. (Eds.). (2001). *Taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy of educational objectives*. Needham Heights, MA: Allyn & Bacon.

Appiah-Kubi, P. (2016). *Evaluation of Engineering Teaching Effectiveness through Cheat-Sheet Data-Mining.* American Society for Engineering Education, proceedings, 1-6.

Bloom, B. S. (1956). *Taxonomy of educational objectives, the classification of educational goals, handbook I: Cognitive domain.* New York: David McKay Company.

Burns, K. C. (2014). Security blanket or crutch? Crib card usage depends on students' abilities. *Teaching of Psychology*, *41*(1), 66-68.

Cambridge Advanced Learner's Dictionary. (2021). *Cheat sheet.* Retrieved from https://dictionary.cambridge.org/tr/s%C3%B6zl%C3%BCk/ingilizce/cheat-sheet. Accessed January 19, 2021.

Cannonier, C., & Smith, K. (2019). Do crib sheets improve student performance on tests? Evidence from principles of economics. International Review of Economics Education, 30, 100147. https://doi.org/10.1016/j.iree.2018.08.003

Capaldi, M. (2019). The use of exam notes in an online mathematics course. *Journal of Educators Online, 16*(2), 26-33.

Cone, D. I. (2003). Benefits of a "cheat sheet". *The Physics Teacher, 41,* 509-510. https://doi.org/10.1119/1.1631614

Creswell, J. W. (2011). *Educational research.* New Delhi: PHI Learning Private Limited.

Creswell, J. W., & Plano Clark, V. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: SAGE.

Creswell, J. W., Plano Clark, V., Gutmann, M., & Hanson, W. (2003). Advanced mixed methods research designs. In A. Tashakkori & C. Teddle (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 209-240*).* Thousand Oaks, CA: SAGE.

Danielian, S. A., & Buswell, N. T. (2019). *Do support sheets actually support students? A content analysis of student support sheets for exams*. American Society for Engineering Education, proceedings, 1-11.

de Raadt, M. (2012). *Student created cheat-sheets in examinations: Impact on student outcomes.* Proceedings of the Fourteenth Australasian Computing Education Conference, p. 71-76, January 31- February 03, 2012, Melbourne, Australia.

Edwards, A., & Loch, B. (2015). A preliminary categorization of what mathematics undergraduate students include on exam "crib sheets". 18th Annual Conference on Research in Undergraduate Mathematics Education. Pittsburgh, Pennsylvania, February 19-21, 2015.

Erbe, B. (2007). Reducing test anxiety while increasing learning: The cheat sheet. *College Teaching, 55*(3), 96-97.

Funk, S. C., & Dickson, K. L. (2011). Crib card use during tests: Helpful or a crutch? Teaching of Psychology, 38(2), 114-117.

Gharib, A., & Phillips, W. (2012). Test anxiety and performance on open book and cheat sheet exams in introductory psychology. *IPEDR, 53*(1), 1-4.

Gharib, A., Phillips, W., & Mathew, N. (2012). Cheat sheet or open-book? A comparison of the effects of exam types on performance, retention, and anxiety. *Psychology Research, 2*(8), 469-478.

Grosz, R. (2008). A legitimate cheat sheet? *The Internet Journal of Allied Health Sciences and Practice. 6*(3), 1.

Hamed, K. M. (2008). Do you prefer to have the text or a sheet with your physics exams? *The Physics Teacher, 46*, 290-293. https://doi.org/10.1119/1.2909747

Hamouda, S., & Shaffer, C. A. (2016). Crib sheets and exam performance in a data structures course. *Computer Science Education, 26*(1), 1-26. https://doi.org/10.1080/08993408.2016.1140427

Harlen, W., & Crick, R. D. (2003). Testing and motivation for learning. *Assessment in Education: Principles, Policy & Practice, 10*(2), 169-207. https://doi.org/10.1080/0969594032000121270

Jensen, J. L., McDaniel, M. A., Woodard, S. M., & Kummer, T. A. (2014). Teaching to the test…or testing to teach: Exams requiring higher order thinking skills encourage greater conceptual understanding. *Educ Psychol Rev, 26*, 307-329. https://doi.org/10.1007/s10648-013-9248-9

Larwin, K. (2012). Student Prepared Testing Aids: A Low-Tech Method of Encouraging Student Engagement. *Journal of Instructional Psychology, 39*(2), 105-111.

Larwin, K. H., Gorman, J., & Larwin, D. A. (2013). Assessing the impact of testing aids on post-secondary student performance: A meta-analytic investigation. *Educational Psychology Review, 25*, 429-443. https://doi.org/10.1007/s10648-013-9227-1

Larwin, K. H., Larwin, D. A., & Gorman, J. (2012). Mnemonic aids during testing: Worthless frivolity or effective tool in statistics education? *Journal of Instructional Pedagogies, 8*, 1-16.

Ludorf, M. R., & Clark, S. O. (2014). Help sheet content predicts test performance. In W. Altman, L. Stein, & J. R. Stowell (Eds.), *Essays from E-xcellence in Teaching*, 13, 3-5.

Malecha, A., & Budhrani-Shani, P. (2018). Use of crib sheets and exam performance in an undergraduate nursing course. Nursing Education Research Conference: Generating and Translating Evidence for Teaching Practice, Washington DC.

Merriam-Webster Dictionary (2021). *Cheat sheet.* Retrieved from https://www.merriam-webster.com/dictionary/cheat%20sheet. Accessed January 19, 2021.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis.* Thousand Oaks, CA: Sage.

Nsor-Ambala, R. (2020). Impact of exam type on exam scores, anxiety, and knowledge retention in a cost and management accounting course. Accounting Education, 29(1), 32-56. https://doi.org/10.1080/09639284.2019.1683871

Özer, S. (2019). Self-efficacy perceptions of vocational students about cognitive objectives of English language course. *Maarif Mektepleri International Journal of Educational Sciences, 3*(2), 1-16.

Paquin, J., Miller, M., & Barron, J. (2020). Efficacy of learning with course-provided equation reference sheets in engineering education. Paper presented at 2020 Fall ASEE Mid-Atlantic Section Meeting, Virtual (hosted by Stevens Institute of Technology). https://peer.asee.org/36046

Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd Ed.). London: Sage Publications, Inc.

Pollari, P. (2015). Can a cheat sheet in an EFL test engage and empower students? *AFinLAn vuosikirja–AFinLA* Yearbook, 73, 208-225.

Rice, A. H., Vogelweid, C. M., & Kitchel, T. (2017). The influence of crib sheets on veterinary students exam performance, perceived stress, and retention of subject matter knowledge. *NACTA Journal, 61*(1), 66-72.

Şahin, A. (2019). State test anxiety scale (STAS): Validity and reliability study. *Trakya Journal of Education, 9*(1), 78-90.

Settlage, D. M., & Wollscheid, J. R. (2019). An analysis of the effect of student prepared notecards on exam performance. *College Teaching*, *67*(1), 15-22. https://doi.org/10.1080/87567555.2018.1514485

Shaw, J. A., & Almeida, M. G. (2018). Does the quality of student crib cards influence anatomy and physiology exam performance? *HAPS Educator*, *22*(1), 50-54. https://doi.org/10.21692/haps.2018.005

Skidmore, R. L., & Aagaard, L. (2004). The relationship between testing condition and student test scores. *Journal of Instructional Psychology*, *31*, 304-313.

Smith, T. (2007). Exams as learning experiences: One nutty idea after another. In R. J. Mezeske & B. A. Mezeske (Eds.), *Beyond tests and quizzes: Creative assessments in the college classroom* (pp.71-83). San Francisco, CA: Jossey-Bass.

Song, Y., & Thuente, D. (2015). *A quantitative case study in engineering of the efficacy of quality cheat-sheets*. IEEE Frontiers in Education Conference (FIE), 1-7.

Song, Y., Guo, Y., & Thuente, D. (2016). *A quantitative case study on students' strategy for using authorized cheat-sheets.* In 2016 IEEE Frontiers in Education Conference (FIE) (pp. 1-9). https://doi.org/10.1109/FIE.2016.7757656

Tekin, H. (2002). *Eğitimde ölçme ve değerlendirme*. Ankara: Yargı Yayıncılık.

Visco, D., Swaminathan, S., Zagumny, L., & Anthony, H. (2007). Interpreting student-constructed study guides. *Proceedings of the 114th Annual ASEE Conference & Exposition*, Honolulu, Hawaii, USA, June 24-27, 1-9.

Vogelweid, C. M., Kitchel, T., & Rice, A. H. (2014). Veterinary Students' Use of Crib Sheets in Preparing for Learning and Reducing Stress. *NACTA Journal*, *58*(2), 135-139.

Wachsman, Y. (2002). Should cheat sheets be used as study aids in economics tests? *Economics Bulletin*, 1(1), 1-11.

Weimer, M. (2013). Crib sheet help students prioritize and organize course content. Faculty Focus: Focused on Today's Higher Education Professional. Magna Publications. https://weber.edu/WSUImages/tlf/TLF%20Crib%20Sheets.pdf

Wilson, D. M., & Narasuman, S. (2020). Investigating teachers' implementation and strategies on higher order thinking skills in school based assessment instruments. *Asian Journal of University Education (AJUE)*, *16*(1), 70-84.