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Battambang Teacher Education College

VOLUME 3

ACTION RESEARCH

Active-Collaborative-Authentic LEARNiNG

Battambang Teacher Education College

-2023-

ACTION RESEARCH SERIES

Volume 3

-2023-
BATTAMBANG TEACHER EDUCATION COLLEGE (BTEC)
Romcheck 4 Village, Rattanak Commune,
Battambang City, Batttambang

Battambang

Teacher

Education

College

Action Research

Series

Volume 3, 2023

Published and typeset in Cambodia by Battambang Teacher Education College

Battambang Teacher Education College

Action Research Series

Message from Director

I am delighted to announce the third volume of the action research series of Battambang Teacher Education College. It is a step forward for BTEC teacher educators to publish this volume with very hard work and huge contribution. The action research series provides a compilation of various topics to share knowledge and new findings to student teachers and teacher educators in BTEC and other educational institutions in Cambodia.

One of the three missions of BTEC is to promote a research culture among student teachers and make them accustomed to doing research. The guidelines and examples of building research are very significant for student teachers, and this volume provides a good example for student teachers to be a model of doing research. The purpose of implementing the Action Research is to improve the quality of teachers and promote professional development in line with the education reform of the Ministry of Education, Youth and Sport. Research has played crucial roles in promoting teaching and learning competency as well as enhancing the quality of education in Cambodia.

I would like to express my faithful thanks to BTEC teacher educators, BTEC management team, and all departments, and other donor partners who have supported BTEC so far to improve the research culture and continue working with us. Thank you.

Bin Chhom

Director

Battambang Teacher Education College

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A comparison of collaborative and individual assessment: Does working in collaboration support student teachers' remembering?

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Abstract- Collaborative assessment has usability matters—learners have the naiveté to believe that an assessment is used to label their learning outcomes as pass or fail and that it relies on individual effort. While collaborative assessment is beneficial for many educational activities—including reducing memory load, compiling cognition, inspiring students to take on challenging assignments, group cohesion, and lowering anxiety—it is not always an effective technique to support group members during social contagion of memory. To gain a better understanding of this theory-practice gap, in this study, we aim to compare the performances of collaborative and individual groups on memory assessments. To achieve this objective, an experiment was conducted, 112 participants were purposively selected into two groups of four—56 participants were assigned to the 4-person collaborative groups, for a total of 14 collaborative groups, and the numerical of the participants were assigned to the 4-person nominal groups. The findings concluded that collaborative assessment is superior to individual assessment of educational psychology tasks if performance is measured using explanation tasks in the cognitive load. In addition, collaborative assessment is slightly better compared to individual assessment if performance is measured using word recall tasks.

Introduction

Collaborative assessment is a widely used pedagogical approach and is considered a core skill of the 21st century because "the most modern work environments involve some type of collaboration or connected problem solving to enhance their corporation or product" (Marcinek, 2011, p.1). Social psychologists found that working in collaborative groups significantly reduces idea brainstorming productivity when compared to a similar proportion of persons who worked individually (nominal group) (Diehl & Stroebe, 1987). Analogously, cognitive psychologists adopted the methodologies of Diehl and Stroebe (1987) to tested the hypothesis of "recall strategies would be disrupted in group remembering" and found that outcomes for the collaborative retrieval group were higher than those of their counterparts that

were encoded alone but lower than those of the nominal retrieval group (Basden et al., 1997), in complex cognitive tasks, the assessment group that collaborates does better (F. Kirschner et al., 2009b, 2009a). In educational practice, teachers and the general public held belief that collaborative assessment was better than individual assessment (Henkel & Rajaram, 2011; Magnussen et al., 2006), and they were more motivated by and preferred to use collaborative retrieval (by testing information) during cooperative learning over practice testing information independently (Wissman & Rawson, 2016). Indeed, collaborative learning benefits a variety of educational and instructional activities such as improving critical thinking skills (Laal & Ghodsi, 2012), problem-solving (Barron, 2000), motivating (Nichols, 1996), and complex tasks of cognitive overload (Kirschner, Paas, & Kirschner, 2009; Zambrano et al., 2019)—cognitive overload refers to "the situation in which the demands placed on a person by mental work (the cognitive load) are greater than the person's mental abilities can cope with" (APA Dictionary of Psychology, 2018) but it does not always facilitate group members effectively when a group member has provided wrong information—a group member's errors can influence the whole group discussion (this process is called "social contagion of memory" Roediger, Meade, et al., 2001).

In Cambodia, since the implementation of educational reform in 1996, collaborative learning and assessment have become a staple of child-centered pedagogy in classroom settings (Song, 2015). The both low and high stake functions of assessment can be an important variable in reflecting curriculum, learning and instruction, and learning goals (Care, 2020). However, teachers are concerned about rote learning, individual assessment culture, and a lack of ability to teach 21st century education (Care et al., 2020). Culturally speaking, students see assessment as a way to monitor and appraise their development rather than as a way to make sure they continue to study (Ariel & Karpicke, 2018). Collaborative assessment has usability matters—the majority of learners erroneously believe that an assessment is used to label their learning outcomes as pass or fail and it relies on individual effort (Care et al., 2020). Collaborative assessments are often considered formative assessment methods to increase student teachers' engagement and enhance their ability. Assessments not only evaluate students and teachers performance but also support their learning and instruction (Shuttleworth & Shutteworth, 2017). More significantly, studies have demonstrated that students who participated in practice formative assessments saw a reduction in test anxiety, an increase in comfort level with the subject matter, and a decrease in exam anxiety (Agarwal et al., 2020). In reviewing the literature, it was determined that students would rather practice assessments

individually than collaboratively, and there is no clear picture of how and when the effectiveness of these two learning strategies differs (see Basden et al., 1997, 2000; Diehl & Stroebe, 1987; Kirschner et al., 2011; Rajaram & Pereira-pasarin, 2010; Zambrano et al., 2019, for a review). To gain insight into this theory-practice gap, the aim of the present study was to investigate performance outcomes between collaborative assessment and individual assessment groups in terms of word remembering and explain a list of words related to educational psychology, including the term cognitive overload.

Collaborative Assessment

Collaborative assessment refers to "an interactive process that enables students to work together and get engaged in shared decision-making toward mutually defined goals" (Suaco et al., 2023, p.1). Marcinek (2011) suggested five steps of collaborative assessment: (1) set clear objectives and tasks, (2) allow for open collaboration, (3) allow access to learning tools, (4) limit explicit direction, and (5) define clear expectations. Many educational and psychological studies have compared the combined ideas of individuals who worked collaboratively (collaborative groups) with a similar proportion of individuals who worked independently (nominal groups). To illustrate, (Weldon and Bellinger (1997) conducted an experimental study with Californian university students in which they compared learning outcomes between collaborative learning and individual learning in memory retrieval tests. The results showed that overall, outcomes for the collaborative retrieval group were higher than those of their counterparts that were encoded alone but lower than those of the nominal retrieval group. Similarly, Basden et al. (1997) compared the outcomes of a free-recall test between a collaborative group and a nominal group with university psychology students and found that the performance of the nominal group was superior to the collaborative group in several learning conditions. Basden et al. (2000) conducted an experimental study about the benefits and inhibition of collaborative learning with psychology students that showed that the nominal group was better at test recall than the collaborative group in both the initial recall test and final recall test.

According to the theory of cognitive load, collaborative group assessment is helpful for students with diverse information but unnecessary for those with approximate knowledge (Retnowati et al., 2018). When assessing complex cognitive tasks, group assessment outperforms individual assessment; nevertheless, when retention problems are used as a measure of performance, individual learning outperforms group assessment (F. Kirschner et al., 2009b). Researchers repeatedly demonstrated the mechanisms of collaborative success and

lack of success (see Browning et al, 2019; Nokes-Malach et al., 2015). As an example of memory recall, Andersson and Rönnberg (1995) compared learning outcomes of memory recall between collaborative encoding and nominal encoding in a sample of Linköping University students and found that the test results were worse for the collaborative group than for those working alone in different tasks and conditions (e.g., words recall, story recall, and videotape recall). Zambrano et al. (2019b) focused on complex cognitive tasks and, in line with cognitive load theory, revealed that when learners engaged in collaborative group assessments as opposed to individual group assessments on specific prior knowledge in complex tastes, both more knowledgeable and less knowledgeable learners performed better on retention tests. Group assessment can be beneficial for group formation, argumentation, communication, explanation, structuring, and coping and regulation (P. A. Kirschner & Erkens, 2013). Nokes-Malach et al. (2015) provided evidence that observational learning, explanation, pooled knowledge, and a less cognitive load were all key components of successful collaborative assessment.

Educational Psychology Curriculum

Cambodia implemented the first bachelor of arts in education in the 2018–2019 academic year. Student teachers who were enrolled in the 12+4 program have faced certain improvements and changes from the 12+2 program. The reformed educational psychology course syllabuses in the 12+4 program have been modified and changed some content knowledge. Educational Psychology I in the 12+4 teacher education program has added more concrete content such as cognitive development, motivation, mental health, and group dynamics. Standard psychology books (e.g., Atkinson and Hilgard's Introduction to the Psychology 16th edition, Nolen-Hoeksema & Hilgard, 2014), and robust methodologies for learning and instruction such as collaborative learning, experimental learning, and case study analysis are used, but it has fewer class hours than the 12+2 program. In fact, the course syllabus for Educational Psychology I consists of 2 credits (30 class hours). The first semester has 1 credit, which provides the fundamental knowledge of skills to apply the theoretical knowledge to explain issues in the classroom such as introduction to psychology, psychological development, perception, learning and memory, motivation, and social cognition. The second semester also consists of 1 credit—and provides the student teachers with basic knowledge and skills regarding personality, classroom management, and mental health.

Table 1

Educational Psychology Syllabuses and Content Knowledge (Foundation Year)

Four-year curriculum (12+4 curriculum)
Semester 1: 15 class hours
Introduction to Psychology: Definition and roles of educational psychology
Development of sociality I: Children's attachment and the effects of parents on children's attachments
Development of sociality II (e.g., the theory of mind)
Development of emotion and morality (e.g., moral dilemma)
Development of perception: Children's developments of perception
Development of cognition (e.g., the theory of Piaget)
Learning process and memory (e.g., theories and models of learning, types of memories)
Motivation (extrinsic and intrinsic motivation)
Methods of teaching (ex. project-based learning, small group learning)
Pygmalion Effect
Case study analyses I: Application to issues of teaching subjects
Semester 2: 15 class hours
Introduction
Personality (e.g., theories and measurement)
Aptitude treatment interaction
Relationship between children and teachers (e.g., leadership, social power)
Group dynamics in the classroom I (e.g., group thinking, decision making)
Group dynamics in the classroom II (e.g., conformity, bullying)
Measuring classroom (e.g., socio-metric test, guess-who test)
Mental health I: Stress and coping Mental health II: Defense mechanism School Counseling Case study analyses II: Application to issues of the classroom (e.g., bullying prevention, social skill training)

Objectives and Hypothesis of Present Study

In this study, the first objective is to examine whether student teachers in collaborative groups would perform better on recall tests than student teachers tested in nominal groups during working memory process. To meet this first objective, we compared the proportion of

correct recall of a list of words related to educational psychology in collaborative and nominal groups. We expect that the effects of reexposure, prior knowledge, and hearing one another's recall (Zambrano et al., 2019b, 2019a) will be beneficial to groups. However, retrieval disruption (Basden et al., 1997), social loafing (Karau & Williams, 1993), and group members vocalize their contributions rather than writing them down (Mullen et al., 1991). These aspects might cancel each other out, leaving collaborative groups with the same proportion of corrected recall as individual groups (H1).

The second was to determine whether working in collaboration supports student teachers in explaining a list of words related to educational psychology when the difficulty of tasks increases (cognitive overload). For this objective, we compared the proportion of collaborative and nominal groups in explaining the definitions of a list of words related to educational psychology and observed the mechanisms that drive group success. We hypothesize that working collaboratively will support student teachers with performance monitoring, group interdependence (Kirschner et al., 2009a, 2009b), and retrieval distribution (Zambrano et al., 2019a, 2019b) when difficult tasks increase and thus will produce higher performance than learners working individually (H2).

Method

Participants

Participants were 112 student teachers whom the researcher has taught. The majority of first-year student teachers (85%) were cisgender women and 15% were cisgender men. The mean age of the participants was 20 years (with a standard deviation of 2.04, and an age range between 18 and 31 years). Participants were divided into two groups according to the student's name list. Collaborative Group—56 participants were assigned to the 4-person collaborative groups, for a total of 14 collaborative groups. Nominal group—56 were assigned to the 4-person nominal groups.

Materials

We selected 15 key terms of educational psychology words from the content-knowledge of educational psychology I (in semester 2). The word list consisted of words and their explanation. **Table 2** shows an example of the keywords and their description of Education Psychology.

Table 2

Example of the keywords and their description of Education Psychology

Keywords	Description
Personality	Characteristic patterns of thoughts, feelings, and behaviors that make a person unique. Big five of personality such as extroversion, conscientiousness, agreeableness, openness, and neuroticism.
Aptitude-treatment interaction (ATI)	The concept is that some instructional strategies (treatments) are more or less effective for particular individuals depending on their specific abilities. ATI suggests that optimal learning results when the instruction is exactly matched to the aptitudes of the learner.
Stress	State of worry or mental tension caused by a difficult situation.
Defense machanism	strategies that are unconsciously used to protect a person from anxiety arising from unacceptable thoughts or feelings.
Mean	Numerical average of a set of scores, computed as the sum of all scores divided by the number of scores. The mean is the most widely used statistic for describing central tendency.

Procedure

The experiment was conducted during an educational psychology class—review lesson at the end of the educational psychology course at Battambang Teacher Education Colleges. The procedure of the research was divided into three phases: the Learning Phase, Test Phase, and Scoring Phase.

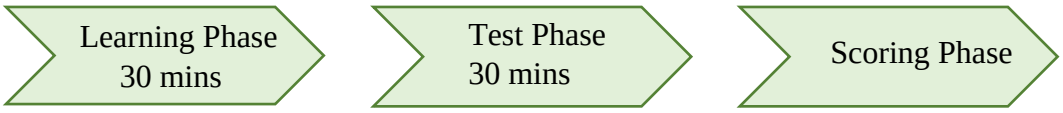

Figure1: Experimental Procedure

In the learning phase, the researchers displayed the word list on a projector screen for student teachers to practice encoding and memorizing the 15 words and their explanations individually for 30 minutes through multiple learning strategies such as note-taking, massed practice, and trial and error learning. After 30 minutes, the student teachers in nominal and experiment groups were asked to do a recall test. Student teachers in the nominal group recalled the words individually, whereas the student teachers in the experiment group recalled by discussing with their group members. The researchers collected the answer sheets once the test

ended for scoring. The total score for recalling all the words and explanations is 60 points; 15 points for recalling 15 words and 45 points for recalling the explanations. Each word equals 1 point and each word explanation equals 3 points.

Results

This study compared two different groups: collaborative and nominal groups. The researchers analyzed the scores on word recall and word explanation separately as shown in Table 3 and Table 4. For inferential statistical analysis, a probability level $\alpha = .05$ was employed for this and subsequent questions.

Table 3

A Comparison of Word Recall Between Collaborative and Nominal Group

Dependent variable	Group Condition	*Mean*	*SD*	*t*(112)	*p*
Word Recall	Collaborative Group	11.80	3.22	1.73	.08
	Nominal Group	10.80	2.89		

Based on the result above, the mean score for the collaborative group in word recall was 11.80 (SD 3.22), while the mean score for the nominal group was 10.80 (SD 2.89). The t-test value was 1.73, with a p-value of 0.08. As the *p*-value is greater than 0.05, it indicates no significant difference between the mean scores of the collaborative group and the nominal group. The results of the first recall test supported our hypothesis that recall in collaborative groups and nominal groups did not differ in recalling 15 educational psychology words (i.e., H1).

TABLE 4

A comparison of Word Explanation between Collaborative and Nominal Group

Dependent variable	Group Condition	*Mean*	*SD*	*t*(112)	*p*
Word Explanation	Collaborative Group	23.90	23.90	.02*	0.41
	Nominal Group	20.40	20.40		

Note: $*p < .05$, Cohen's $d = 0.20$ denotes a small effect, $d = 0.50$ denotes a medium effect, and $d = 0.80$ or higher denotes a large effect (Cohen, 1988, p. 40).

Based on Table 4, the mean score for the collaborative group was 23.90, with a standard deviation of 23.90. The mean score for the nominal group was 20.40 (SD 20.40). The t-test value for the difference between the mean score of the two groups was 0.02, with a p-value of

0.41. This result suggested that there was a significant difference between the two groups as the with a p-value of 0.02 and Cohen's d = 0.41. Thus, collaboration supports student teachers to remember more by allowing them to exchange and distribute ideas when difficult tasks increase (H2).

Discussion

The aim of the experiment was to examine whether student teachers in collaborative groups would perform better on recall tests than student teachers tested in nominal groups. The results show that recall in collaborative groups and nominal groups did not differ in recalling educational psychology words. The results of the recall duplicate and extend the findings of a collaborative remembering study the conducted through lens of cognitive load theory (Basden et al., 2000; Kirschner et al., 2011; Retnowati et al., 2018; Zambrano et al., 2019). Regarding the question of whether working in collaboration supports student teachers in remembering a list of educational psychology words when difficult tasks increase. Working in collaboration supports student teachers in remembering and explaining educational psychology tasks if they have prior knowledge, reexposure support, and borrowing words from one another (Paas & Sweller, 2012; Retnowati et al., 2018).

The findings concluded that collaborative assessment is superior to individual assessment of educational psychology tasks if performance is measured using explanation tasks when cognitive tasks increase and working memory limitations occur. In addition, collaborative assessment is slightly better compared to individual assessment if performance is measured on word recall tasks. This study also observed that collaboration benefits student teachers' emotions when difficult tasks increase. The findings suggest that the role of social factors (i.e., performance monitoring, group cohesion, pooled knowledge, disparate knowledge, and borrowed knowledge) is important for collaborative group success in remembering.

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Teacher Educators' Conception and Difficulties in Doing Action Research: Case Study at Battambang Teacher Education College (BTEC)

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Abstract

Research skills of teacher educators has been identified as a core area to strengthen and improve at Battambang Teacher Education College (BTEC). Since 2017, BTEC and partners have provided extra training to teacher educators, focusing on action research. Despite having received several trainings in this practical research competence, teacher educators' knowledge, and research skills remain limited, and they faced hurdles when conducting research. Therefore, this study conducted to explore the conceptions, difficulties, and other hindrances in doing action research on teacher educators at BTEC. Survey questionnaires distributed to 48 teacher educators as students' supervisors who were chosen at random from the entire BTEC teacher educators. Data was collected in both quantitative and qualitative formats. The results revealed that teacher educators believed that doing action research helped them improve their teaching methodology, develop their knowledge in research skills, and positively impact their student teachers' learning. However, they still face a lack of research culture, research skills, heavy workload, and financial support. These findings suggested that a lack of research abilities leads poor quality of student teachers' action research supervision. As a result, administrators at Battambang Teacher Education College should reduce their workload to facilitate teacher educator research, and additional research training of teacher educators is needed to continue to strengthen and upgrade their research abilities.

Keywords: action research, addressing research incapability, school-based research, research challenges, conception and difficulties in doing action research,

1. INTRODUCTION

Since 1993, education has been highlighted as a key factor in providing the human resources necessary for a nation's socio-economic development amidst globalization and regionalization (Om, et al., 2019). As globalization continues to evolve, education has become increasingly crucial in producing skilled individuals for a knowledge-based society. The Ministry of Education, Youth and Sport (MoEYS) has made "Improving the Quality of Education, Science and Technology" a top priority in its Strategic Plan for 2019-2030, with an expectation that teacher educators at Battambang Teacher Education College (BTEC) possess the necessary level of competency in progressive education. In response, Battambang Teacher Education College was integrated with the Provincial Teacher Training Center (PTTC) and Regional Teacher Training Center (RTTC) in 2017 to enhance the quality of education by producing competent teachers.

Since the inception of the new school, notable modifications have been made to the curricula. The credit-based system is now uniformly applied throughout the institution, supplanting the prior system. With the aim of achieving the MoEYS reform objective, the BTEC governing bodies have devised a comprehensive plan to elevate BTEC into a cutting-edge educational establishment for the 21st century. In this case, BTEC and partners have set some activities to activate teacher educators in a variety of skills, including classroom management, lesson study, and action research (BTEC, 2019-2023).

Indeed, promoting action research to improve the quality of teaching and learning is the second mission of the strategic plan to produce teachers' competency. Thus, research plays a vital role in developing a nation by advancing our knowledge and understanding of social issues and solutions, especially in education (Din, 2022). In so far as one of the most popular assertions is that conducting action research would help instructors become better at what they do and will improve the quality of learning for their students. Teacher research is also expected to promote beneficial changes in school culture and productivity, as well as elevate the status of teaching as a profession in society (Zeichner, 2006) and according to Marit (2014) revealed that action research under certain conditions offers a potential for professional development for teachers. Despite the expanding body of evidence in the literature about the beneficial results associated with teachers conducting research, the efficacy of teacher research as a professional development activity solely based on these

claims remains unclear. Heng (2022) found that promoting research in Cambodian teacher education institutions faces challenges such as insufficient government funding, limited research capacity and involvement, inadequate incentives for researchers, and lack of national publications and research platforms.

Hult & Lennung (1980) has been implemented as a form of professional development for classroom teachers. Basically, to enhance teachers' teaching profession so that to pursue a positive impact on students' learning outcomes. However, conducting action research in classrooms can be challenged by novice teacher-researchers (Jaipal & Figg, 2011). Agreeing to the workshop supported by JICA (2022) reported that teacher educators at BTEC are still unclear enough about the process of doing action research including: how to create research tools, how to analyze the research data, and how to interpret the research result, although they have already been gotten so many times of training.

Despite the challenges to implementing a robust research program, BTEC remains committed to expanding the action research skills of teacher educators. The findings of the study have shown to be highly beneficial for BTEC's administrators and partners who are committed to improving the proficiency of teacher educators in action research. As a result, educators are better equipped to integrate other impactful teaching approaches that are grounded in research-based knowledge and skills. The study centered on three main research objectives and questions to effectively showcase its results:

- Objectives of the study
    1. To describe the conceptions of teacher educators in doing the action research
    2. To describe the difficulties of teacher educators in doing the action research
    3. To investigate the other hindrances of teacher educators in doing the action research
- Research Questions
    1. What are the conceptions of teacher educators in doing the action research?
    2. What are the difficulties of teacher educators in doing the action research?
    3. What are the hindrances of teacher educators in doing the action research?

2. LITERATURE REVIEW

According to Un and Sok (2018), Cambodia's higher education system is comparatively new and unequal in comparison to other Southeast Asian nations. Sam (2012) notes that higher education in Cambodia has a long history dating back to the 12th century Angkor Empire, with seven stages of development throughout history. This includes periods under

French colonization, Prince Sihanouk, the Khmer Republic, the Khmer Rouge, Vietnamese occupation, the UNTAC and Coalition Government, and the Hun Sen regime. Chet (2009) confirms that higher education was free for three years under the Khmer Rouge and resumed after their overthrow in 1979. At present, there are over 62 higher education institutes in Cambodia offering both degree and sub-degree programs. Despite political unrest and violence, the higher education system has been reconstructed since the end of the civil war in the 1990s, with new institutions established and existing ones renovated. In recent years, research has also become a significant focus. Heng and Sol (2021) emphasize the significance of research in promoting knowledge, innovation, and socioeconomic growth. Research plays an essential role in creating, sharing, and utilizing knowledge in a knowledge-based economy, advancing innovation, technology, and knowledge creation. Lastly, as defined by Master (1995), Action Research refers to self-reflection and critical inquiry undertaken by participants.

Hult & Lennung (1980) defined Action research as a collaborative process that aims to increase understanding of a given social situation by using data feedback in a cyclical process, and practical problem-solving and expands scientific knowledge while also enhancing the competencies of the respective actors with a mutually acceptable ethical framework. In addition, action research is a term that encompasses a wide range of evaluative, investigative, and analytical research methods aimed at identifying problems or weaknesses in organizations, schools, and classrooms, as well as assisting educators in developing practical solutions to address them quickly and effectively (Forum, 2015). Additionally, during the past few years, action research in education has attracted more and more attention. It is regarded as a commonsense, but methodical, investigative style that gives teachers the freedom to examine their teaching abilities and students' learning (Nolen & Putten, 2007). By the way, Ferrance (2000) argued that action research is a procedure in which participants use research methods to conduct a systematic, in-depth analysis of their pedagogical practices. In the same way, Pelton (2010) explained that action research, in the school setting, is a systematic approach to improve teaching practice if you learn how to use it, it will meet many of your teaching goals. On the other hand, Borja (2018) stated that action research projects positively impacted both students' learning and teaching. This proves that action research as viewed and assessed by teachers has a major role in improving the teaching-learning process. Agreeing to the Alberta Teacher Association (2000) mentioned that the action research method consists of four steps: planning, activity, observation, and reflection on the action's outcomes. The action

research process can be broken down into a spiral of cycles, with the researcher commenting on each stage of the process. Each phase of reflection brings in more information. Alternatively, Sharma (2022) explained that action research there were six steps mentioned as the following figure 1:

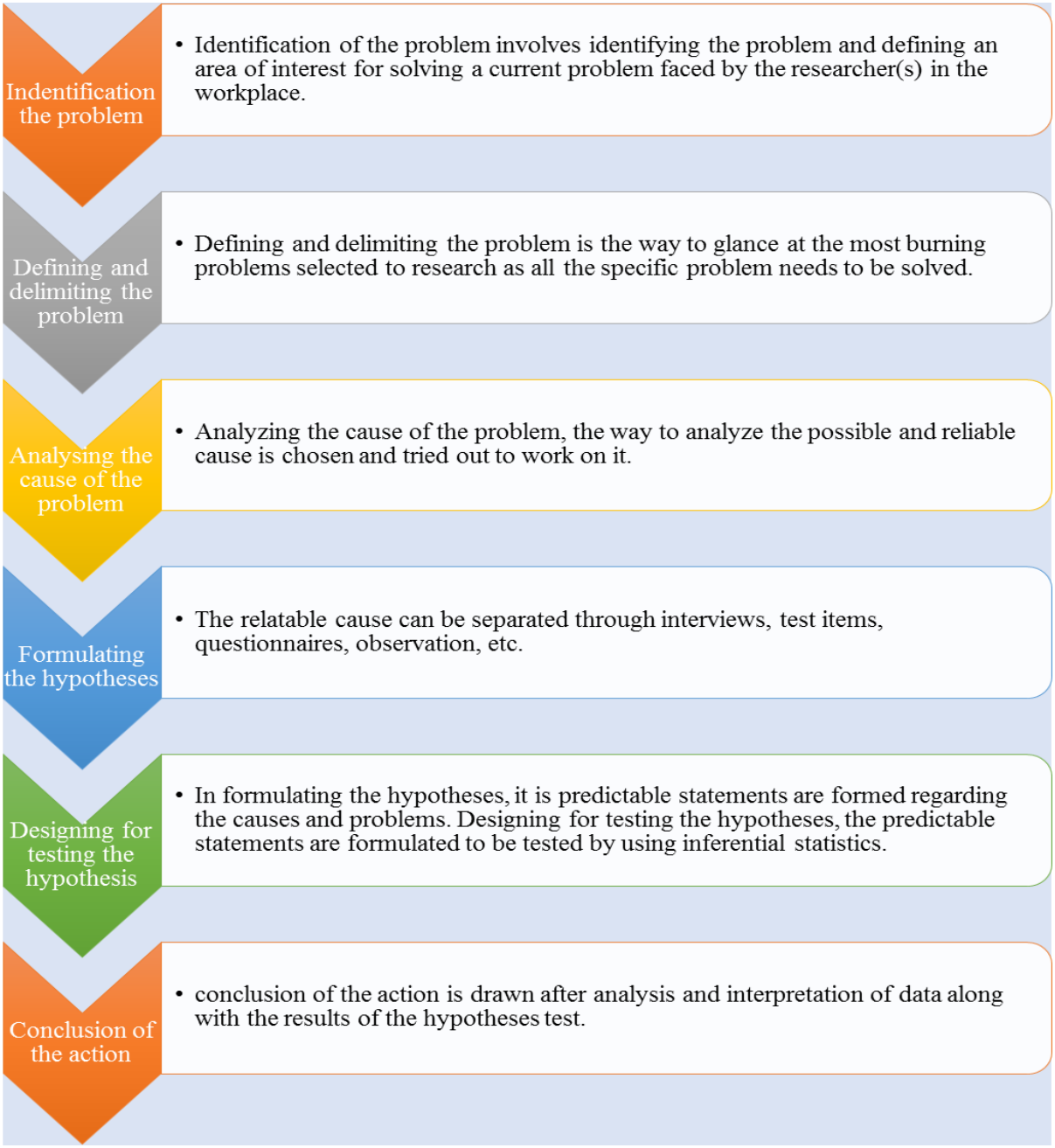

***Figure 1*. Steps of action research**

Source: Lok Raj Sharma. (2022)

According to Creswell (2012), there are eight steps involved in conducting action research: deciding if it is the best design to use, identifying a problem to study, finding resources to help address the problem, identifying information that is needed, implementing

the data collection, analyzing the data, developing an action plan, carrying out the plan, and reflecting on it.

Other literature has noted the positive effects of action research on teacher's teaching and learning processes as well as their pedagogical and instructional knowledge (Darin et al. 2019; Tindowen, et al., 2019). Moreover, they can gain knowledge and have a good impact on student's learning, but teachers faced challenges in conducting action research (Darin, et al., 2019). According to Tindowen, et al., (2019) found that literature search, presentation and publication of results, data collection, additional workload, writing anxiety, lack of time, and inadequate knowledge are the key challenges in conducting action research.

On the other hand, Borja (2018) established similarly that knowledge statistics or data analysis and time-consuming are the hindrances to difficulties in conducting action research for teachers. Anyway, Abelardo, et al., (2019) revealed that the main challenges encountered in conducting action research by teachers were: insufficient training and seminars on research, heavy teaching loads, lack of clear role of teachers in the school to conduct research, and busy personal life. These challenges may be comparably faced by teacher educators at Battambang Teacher Education College.

3. METHODOLOGY

3.1. Research Design

Based on the previous study, both quantitative and qualitative approaches were used. The survey questionnaires were distributed to 48 teacher educators who were the supervisors at Battambang Teacher Education College. There were four parts of survey questionnaires; each part asked accordingly through the research purposes. Collected data were analyzed by Mean, SD, to express about teacher educators' conception and the level of difficulties in conducting action research.

3.2. Participants

All 48 teacher educators as supervisors at BTEC were randomly selected among the population. The selected respondents were given questionnaires with closed and open questions for collecting the data. Survey Questionnaires were administered to describe those teacher educators' conceptions, difficulties, and other hindrances in doing action research.

3.3. Research Instrument

In this study, the research instrument which was adapted from Tindowen et al., (2019) was used for collecting the data. A survey questionnaire was used to describe teacher educators' profiles and conceptions and to find out the difficulties and hindrances in doing action

research. Moreover, the survey questionnaire was divided into four parts. In the first part, there were 8 items, asked to describe the teacher educators' profile. In the second part, there were 5 items, asked to demonstrate teacher educators' conception about the outcome of doing action research. In the third part, there were 17 items, asked to find out the difficulties of teacher educators in doing action research, and in the fourth part of the questionnaire, there was one comment question, asked to gather the other hindrances of teacher educators in doing action research.

3.4. Data collection

In this study, data was collected in four parts of survey questionnaires. Part **A**, asked to describe the demographic information of teacher educators (gender, qualification, etc.), and part **B**, asked to demonstrate the concept of BTEC teacher educators on the outcome of action research by using a five-point Likert scale (i.e. strongly agree, agree, neutral, disagree and strongly disagree), part **C**, asked to discover the difficulties of BTEC teacher educators in doing action research by using five-point Likert scale (No difficulty, Low Level of Difficulty, Moderate Level of Difficulty, High Level of Difficulty and Extreme Level of Difficulty), and part **D** was the open-ended question which used to gather BTEC teacher educators ' opinion about the hindrances of conducting action research. All data collected by survey questionnaires were presented as quantitative and qualitative analyses.

3.5. Data analysis

This study analyzed both quantitative and qualitative data; therefore, quantitative data obtained from questionnaires in part **A** was analyzed as descriptive statistics (percentage)**,** and quantitative data obtained from questionnaires in parts **B**, and **C** were analyzed as descriptive statistics (mean, standard deviation, etc.), and qualitative data obtained from questionnaires in part **D** was analyzed by using qualitative method, i.e., thematic analysis.

Sources of Data	Types of Data	Statistics/method
Questionnaire (**A**, **B**, **C**)	Quantitative	Percentile, Mean, SD
Questionnaire (**D**)	Qualitative	Thematic analysis

3.6. Evaluation Criteria

There were two kinds of evaluation criteria for evaluating teacher educators' conception and difficulties in doing action research as following:

3.6.1. Teacher Educators' Conception Evaluation Criteria

Quantitative data obtained from the survey questionnaire in part **B** on teacher educators' conception was evaluated by the following criteria:

Score Interval (Mean)	Evaluation Criteria
1.00 - 1.79	Strongly disagree
1.80 - 2.59	Disagree
2.60 - 3.39	Neutral
3.40 - 4.19	Agree
4.20 - 5.00	Strongly agree

Source: Gözde Tantekin Çelik, Emel Laptalı Oral (2016)

3.6.2. Teacher Educators' Level of Difficulties Evaluation Criteria

Quantitative data obtained from the survey questionnaire in part **C** on teacher educators' level of difficulties was evaluated by the following criteria:

Score Interval (Mean)	Evaluation Criteria
1.00 - 1.49	No difficulty
1.50 - 2.49	Low Level of Difficulty
2.50 - 3.49	Moderate Level of Difficulty
3.50 - 4.49	High Level of Difficulty
4.50 - 5.00	Extreme Level of Difficulty

Source: Borja, J. M.-d. (2018)

4. FINDING

This section presents the analysis of percentile from the survey questionnaire in part (**A**) of which mentioned about teacher educators' demographic and their experiences in doing action research, one-to-one:

4.1. The respondents' Personal Profiles

Table1

The personal profile of teacher educators

Items	Statements	N	Percentage (%)
Gender	Female	17	35.42
	Male	31	64.58
Qualification	High School	0	.00
	Association Degree	0	.00
	Bachelor degree	7	14.58
	Master degree	41	85.42
	PhD degree	0	.00
Teaching Experience	Less than 1 year	0	.00
	1 to 2 year	0	.00
	2 to 3 years	1	2.08
	4 to 5 years	1	2.08
	More than 6 years	46	95.83
AR Training	Never	9	18.75
	1 time	7	14.58
	2 times	4	8.33

	3 times	8	16.67
	4 times	3	6.25
	5 times	2	4.17
	More than 5 times	15	31.25
AR Conducting	None of the AR conducted	32	66.67
	1 action research	11	22.92
	2 action researches	5	10.42
	3 action researches	0	.00
	4 action researches	0	.00
	5 action researches	0	.00
	More than 5 action research	0	.00
Publication	None process for publishing journal articles	37	77.08
	1 journal article	10	20.83
	2 journal articles	1	2.08
	3 journal articles	0	.00
	4 journal articles	0	.00
	5 journal articles	0	.00
	More than 5 journal articles	0	.00
Satisfaction	Strongly dissatisfy	2	4.17
	Dissatisfy	5	10.42
	Satisfy	32	66.67
	Strongly Satisfy	9	18.75

Table 1 indicated that the percentage of teacher educators who responded to the survey questionnaire in part (A) is shown by each item: In the first item, there were 17 respondents (35.42%) said that they were female, and 31 (64.58%) were male. In fact, according to the second item, 7 (14.58%) of teacher educators had a bachelor's degree, and 41 (85.42%) had a master's degree. Of course, third item, there were 46 (95.83%) of respondents who had been practicing for more than 6 years, while 1 (2.08%) had experience in 2 to 3 years and 1 (2.08%) in 4 to 5 years of qualification. In addition to the fourth item, 15 teacher educators engaged in the action research training more than five times, compared to 9 (18.75%) who never attended, 7 (14.58%) who attended once, 4 (8.33%) twice, 8 (16.67%) three times, 3 (6.25%) four times, and 2 (4.17%) five times. The fifth item revealed that 32 teacher educators (66.67%) had not undertaken any action research, compared to 11 (22.92%) who had one and 5 (10.42%) who had carried out two. Contrarily, the sixth item showed that 37 people (77.08%) had not published any journal papers, 10 people (20.83%) had published one article, and 1 person (2.08%) had published two publications. Finally, when it came to their

satisfaction with the action research they conducted, teacher educators said that 2 (4.17%) were "Strongly Dissatisfied," 5 (10.42%) were "Dissatisfied," 32 (66.67%) were "Satisfied," and 9 (18.75%) were "Strongly Satisfied."

The analysis of the score interval from the survey questionnaire portion (**B**) of teacher educators' conception answer to research question 1 are shown in this section, respectively:

4.2. What are the conceptions of teacher educators in doing the action research?

Table 2

The Conception of BTEC Teacher Educators on the Outcome of Action Research

Items	Statements	Mean	SD	Description
1.	Action research is a valuable way to improve teaching and learning	4.29	0.65	Strongly Agree
2.	Action research is a valuable way to develop knowledge as a teacher educator	4.27	0.71	Strongly Agree
3.	Action research is important to activate teaching methods.	4.31	0.66	Strongly Agree
4.	Action research will positively impact on my student teachers' learning	4.10	0.78	Agree
5.	I view myself as a teacher-researcher.	3.54	0.90	Agree
	Total mean	**4.10**	0.74	**Agree**

Table 2 illustrated the result from part B of teacher educators' conceptions of the outcome of action research from survey questionnaires which contain five 5-point Likert scale items. The total mean of all the items is 4.10 (SD=0.74), indicating that teacher educators' conception, in general, was "Agree" on the outcome of doing action research. Item 5 "I view myself as a teacher-researcher" has the lowest mean of 3.54 (SD=0.90) indicating that teacher educators' conception was "agree" as a teacher-researcher, while Item 3 "Action research is important to activate teaching methods" has the highest mean of 4.31 (SD=0.66) revealed that teacher educators' conception was definitely "strongly agree" in which mean doing action research was the way to strengthen their teaching methodology. The teacher educators' conception levels range being "Agree" (Item 5) to "Strongly Agree" (Item 3).

This section discusses the analysis of the score interval from the survey questionnaire portion (**C**) regarding the challenges faced by teacher educators when doing action research to accordingly react to research question 2:

4.3. What are the difficulties of teacher educators in doing the action research?

Table 3

The Difficulties of BTEC Teacher Educators in Doing Action Research

Items	Statements	Mean	SD	Description
1.	Identifying issues and problems to be investigated in the chosen study	3.06	1.06	Moderate Level of Difficulty
2.	Searching for relevant literature to the chosen study	3.35	1.18	Moderate Level of Difficulty
3.	Using technology to find the literature reviews of the chosen study	3.10	1.15	Moderate Level of Difficulty
4.	Developing the processes of doing research and collecting the relevant evidence for the chosen study	3.33	1.10	Moderate Level of Difficulty
5.	Writing the literature reviews of the chosen study	3.38	1.10	Moderate Level of Difficulty
6.	Selecting the sampling methods for the chosen study	3.00	1.19	Moderate Level of Difficulty
7.	Selecting the respondents to the chosen study	3.04	1.27	Moderate Level of Difficulty
8.	Designing the effective research tools for the chosen study	3.46	1.18	Moderate Level of Difficulty
9.	Using the data collection methods for the chosen study	3.46	1.11	Moderate Level of Difficulty
10.	Selecting the data analysis methods for the chosen study	3.67	1.12	High Level of Difficulty
11.	Analyzing quantitative data for the chosen study	3.56	1.24	High Level of Difficulty
12.	Analyzing qualitative data for the chosen study	3.60	1.16	High Level of Difficulty
13.	Using technology in statistical analysis of the chosen study	3.31	1.27	Moderate Level of Difficulty
14.	Using technology in data presentation to the chosen study	3.27	1.38	Moderate Level of Difficulty
15.	Organizing and writing the findings of the chosen study	3.19	1.23	Moderate Level of Difficulty
16.	Making a relevant presentation on the project and writing an article for publication	3.40	1.23	Moderate Level of Difficulty
17.	Using technology in Bibliographical/References entries to the chosen study	3.19	1.21	Moderate Level of Difficulty
	Total mean	**3.32**	**0.08**	**Moderate Level of Difficulty**

Table 3 demonstrates the result from part **C** of teacher educators' difficulties in doing action research questionnaires which contain seventeen 5-point Likert scale items. The total mean of all the items is 3.32 (SD=0.08), specifying that teacher educators' difficulties, in general, were "Moderate Level of Difficulty" in doing action research. Item 6 "Selecting the

sampling methods to the chosen study" has the lowest mean of 3.00 (SD=1.19), while, in order, Items 10, 11 & 12 ["Selecting the data analysis methods to the chosen study", "Analyzing quantitative data to the chosen study", "Analyzing qualitative data to the chosen study"] has the high mean of 3.67 (SD=1.12), 3.56 (SD=1.24), 3.60 (SD=1.16), but among of the three high means, only Item 10 is the highest mean of 3.67 (SD=1.12) shown that the way how to select the data analysis methods was the most difficulty of teacher educators in doing action research. The teacher educators' difficulties in doing action research levels range being "Moderately Levels of Difficulty" (Item 6) to "High Level of Difficulty" (Item 10).

This section discusses the analysis of the teacher educators' responses to the open-ended question portion (**D**) about the other hindrances that teacher educators faced when doing action research to address research question 3:

4.4. What are the other hindrances of teacher educators in doing the action research?

Table 4

The other hindrances of teacher educators in doing action research

Themes	Descriptions	Supporting Quote	Frequency
Work Load	Teacher Educators commented that there is much work to do such as being a mentor during students' practicum, teaching, and as supervisors.	"…*I have to prepare lesson plans for teaching, guide student teachers to do action research, and mentor student teachers during practicum*…"	25
Lack of Time	Based on respondents claimed that another hindrance was lack of time. This means that teacher educators do not have available time to conduct action research because each of them has many responsibilities in their teaching, supervising, mentoring, and caring for their family.	"… *I have to teach many classes with two or three different subjects and different levels*." "…*I have to take care of my children and family*…"; "…*I need time to relax after working time*…"	25
Financial Support	Respondents demanded that doing action research not only needs time but also money to support their research process.	"… *doing action research need to spend money; no financial support; no processing*…"	1

Table 4 revealed that the other hindrances of teacher educators in doing action research were mentioned by three mains thematically. There were teacher educators' workload, lack of

time, and financial support. Teacher educators claimed that work responsibility at BTEC was their obligation. They not only took responsibility for teaching, and mentoring but also supervising. Teaching was one of their scheduling every Monday to Friday. They were very busy with their lesson planning, classroom assessing/evaluating, mentoring students' practicum, and guiding their students to do action research as well, "…*I have to prepare a lesson plan for teaching, guiding student teacher to do action research, and mentoring student teachers during practicum*…" [25]. These challenges caused teacher educators to have no sufficient time for ding action research, "… *I have to teach many classes with two or three different subjects and different levels*…", "…*I have to take care of my children and family*…"; "…*I need time to relax after working time*…" [25]. In addition, teacher educators demanded that doing action research not only needs time but also money to support their research processing. Their research should be granted some package of financial support to speed up the research result, "… *doing action research need to spend money; no financial support; no processing*…" [1]. As a consequence, all these three main hindrances were the most challenging to dissatisfy, demotivate, and stop them from doing action research.

5. DISCUSSION

The study found that teacher educators believed that doing action research was valuable, helped to improve their teaching methodology, developed their knowledge in research skills, and positively impacted their student teachers' learning. Similarly, Tindowen et al., (2019) explained the role of action research in the enhancement of pedagogical and instructional knowledge of teachers as a way of professional growth. As well as, Morales, et al., (2016) stated that Filipino teachers had positive views about action research because it helps to develop their student learning in science and mathematics and promotes lifelong learning. While teacher educators had a positive conception of doing action research which significantly improved their teaching methodology and research skills, teacher educators also demonstrated the difficulties of doing action research as well. In general, finding 2 illustrated that teacher educators at BTEC are still confronted with doing action research in moderately level, but the biggest hitches were "Selecting the data analysis methods to the chosen study", "Analyzing quantitative data to the chosen study", and "Analyzing qualitative data to the chosen study". The teacher educators struggled to determine the appropriate research approaches and data analysis methods to be used in their research design. What kind of research approaches and data analysis methods should be used in their research design. This reason required teacher educators at BTEC need to strengthen more about their research skills.

However, the total mean of all items was shown in moderate level of difficulty. Zhou (2012) and Biruk (2013) specified that doing action research requires sufficient research knowledge or skills. Lack of theoretical guidance or knowledge of research methodology was the most problematic to ending up research successfully. Similarly, Borja (2018) also supported that a lack of knowledge of statistics or data analyses was one of the difficulties encountered by teachers in doing action research. Anyway, Morales, et al., (2016) reported that statistics, data organization, literature searching, and writing reports were difficult for Filipino teachers. In addition, Doqaruni, et al., (2022) mentioned that the major challenges of Iranian teachers doing action research were logistic, requiring teachers to have sufficient knowledge, support and attitudinal resources. Furthermore, action research was not only required teacher educators' knowledge of research skills, but also need less of workload, sufficiency of time, and financial support, or research culture. In the survey (A) responded that teacher educators have not done action research (66.67%) because they had many works to do such as being a mentor during students' practicum, teaching, and being as a supervisor. To be clear, Antonio Jr (2020) also claimed that teachers do not engage in action research unless they had sufficient time, or less responsibility at work. According to Tindowen, et al., (2019); Yang (2009) & Doqaruni, et al., (2022) found that additional workload, writing anxiety, lack of time, and inadequate knowledge is the other giant challenges in conducting action research. Moreover, Abelardo, et al., (2019) revealed that the main challenges encountered by the teachers were: insufficient training and seminars on research; heavy teaching loads; lack of clear role of teachers in the school to conduct research; and busy personal lives. Borja (2018) also suggested that for teachers to conduct research, there should be a lesser teaching load to provide extra time for institutional research and support more teacher researchers. Necessarily, teacher educators explained that the outcome of doing action research can be achievable and ensure the sustainability of teacher educators' doing action research, financial support needs to be granted**.** Ulla (2018) & Thalho (2021) assumed that conducting action research requires spending some money or incentive should be given for their research processes like equipment and materials, facilities, data collection and analysis, experiments, as well as publication support. Based on Shanmugam & Shok Mee (2017) the lack of research culture in teacher training institutions, and teachers' lack of confidence due to limited scaffolding received in acquiring research-based knowledge and skills were also the key challenges in doing action research as well. Consequently, teacher educators who had inadequate knowledge of research skill; it leads to poor student teachers' action research supervision.

6. CONCLUSION AND RECOMMENDATION

The study concluded, after analysis and discussion, that conception and difficulties in doing action research of teacher educators were necessarily considered. Teacher educators believed that action research was valuable, helpful, practical, and knowledgeable. However, promoting research culture at BTEC needs improvement. Teacher educators indicated low confidence, which was related to a lack of knowledge of research skills; however, those teacher educators had already trained were identified as key challenges; In addition, teacher educators' heavy workload, included time constraints and lack of financial support. There were some implications as follows: Based on the findings of this study, teacher educators continue to face significant challenges of conducting action research from their perspective as novice teacher researchers.

As a result, BTEC's administrators should reduce their workload to free up time for research, and the partners should continue to support research training courses to strengthen and upgrade their research abilities. Otherwise, the research culture and the quality of student teachers' action research supervision at BTEC will likely remain in need of improvement.

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