



Preservice Teachers' Content Knowledge Acquisition Using Two Different Instructional Foci

Fatih Dervent, Erhan Devrilmez & Müfide Yoruç Çotuk



Purpose

To investigate differences between two types of volleyball instructional foci in terms of CCK and SCK acquisition by pre-service physical education teachers

Our primary research question was “How did pre-service teachers’ volleyball performance, CCK, and SCK differ as a function of the instructional foci?”



Method

A quasi-experimental design with a repeated measure

Pre-test

- Volleyball CCK test
- Content map
- Volleyball skill test

Intervention

8-day volleyball instruction

Post-test

- Volleyball CCK test
- Content map
- Volleyball skill test

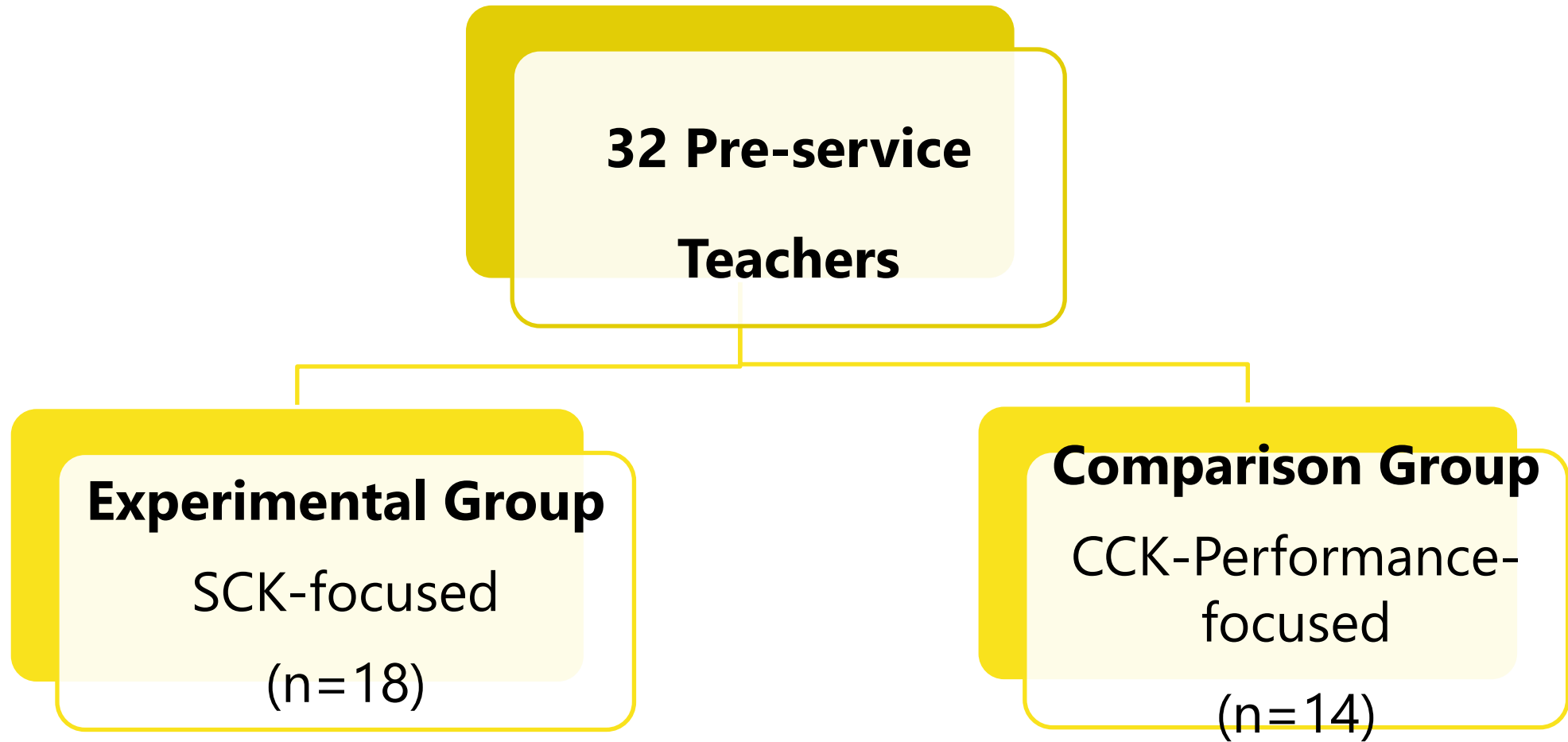
CCK-Performance-focused group

- Performing the critical elements of each technique
- Meeting once a week and the course total duration was
150 minutes
 - 15 min. warm-up,
 - 75 min. skill practice,
 - 60 min. game play

SCK focused group

- Meeting once a week used the same space, and the same equipment with the performance-focused group
- Meeting once a week and the course total duration was 150 minutes
 - 15 min. warm-up,
 - 60 min. observing and practicing demonstration of teaching progressions,
 - 60 min. teaching each other
 - Debriefing end of each lesson

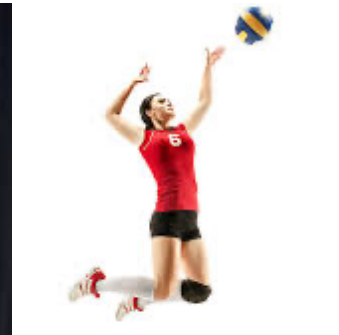
Participants



Data Collection for Performance

Volleyball Skill Test:

Critical elements in the performance of the over-head set, forearm pass, serve, spike, and block




Data Collection for CCK

Volleyball CCK test (Devrilmez et al., 2018)

- 20 items measuring participants' volleyball
 - techniques and tactics knowledge level.
- 18 of 20 items demonstrated high internal consistency and reliability

60%
Benchmark

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Validation of Volleyball Common Content Knowledge Test
Erhan Devrilmez¹, Fatih Dervent², Müfide Yoruç Çotuk³

Abstract	Keywords
<p>Aim: Aim of this study was to check and evaluate the validity and reliability of volleyball common content knowledge (CCK) test for physical education teachers.</p> <p>Methods: Rasch modelling was used for validating the test and data were collected from 214 physical education teacher education (PETE) students. The expert group followed a four-step test developing process and developed 20 test items.</p> <p>Results: Results showed that 18 of 20 test items demonstrated high internal consistency and reliability for both test items and person attended this study. The wrightmap showed that items demonstrated the cumulative norm.</p> <p>Conclusion: The developed test is valid and reliable for measuring volleyball CCK level of PETE students and physical education teachers. The knowledge base acquired from such CCK test may assist policymakers and university faculty to design the PETE programs as well as professional development programs.</p>	<p>Physical Education Teacher Education, Professional Development, Content Knowledge Test,</p>

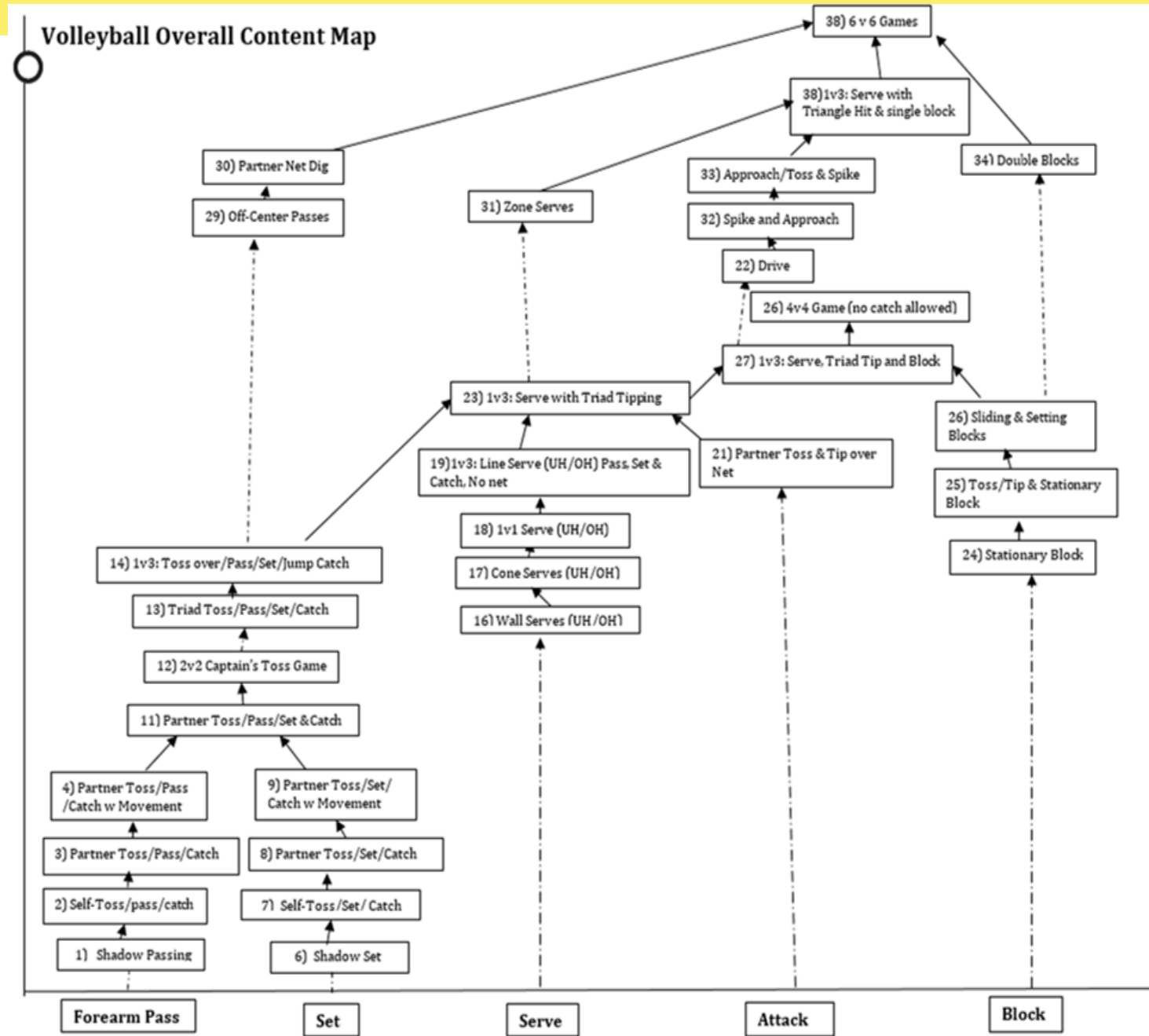
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INTRODUCTION

Effective teaching is quite important for contemporary school physical education and sport. Recent studies indicated that teachers need to have deep content knowledge (CK) for effective teaching in physical activity and sport related courses (Ward, 2009). For example, a physical education (PE) teacher needs to have basketball CK in order to teach it properly. CK is highly related to pedagogical content knowledge (PCK), which is defined by Shulman (1987) as a teacher's planning, enacting and describing of instructional tasks and its representations. Studies in PE concluded that if CK level of teachers increased, their PCK level also improved (Iserbyt, Ward & Li, 2017; Ward, Kim, Ko & Li, 2015). PE teachers with a lack of CK and PCK, cannot plan, sequence, and teach developmentally appropriate instructional tasks to their students thus expected learning outcomes cannot be reached (Siedentop, 2002).

Data Collection for SCK

Content Map (Ward et al., 2017)



Content Development Categories (Content Map Analysis)

Extending-
applying
EA



Refining-
applying
RA

Refining
R



Extending
E



Applying
non-game
AN

Informing
I



Formula and Benchmark for SCK measures

$$\frac{E+EA+R+RA+AG+AN}{I}$$

3.0 Benchmark

Coder Training and Inter Observer Agreement

- Three steps for coder training
 - 1) Definition and discussion of content development categories
 - 2) Matching the definitions and categories
 - 3) Coding 42 samples
- Interobserver agreement of 91.02 % (range 89.17–92.32%)

Data Analysis

- Non- Parametric Wilcoxon Signed-rank test (Tabachnick and Fidell, 2007)
- Effect size was calculated and formulation of $r = z / (\sqrt{N})$ was used

1991)

(Rosenthal,

Results- Performance Skills Test



Figure 1. Pretest, posttest, and gain scores from skill tests.

SCK-focused group had significantly higher post-test scores than those in the performance-focused group in the skill test ($Z = -2.63$, $p = .00$, $r = 0.46$)

Results -CCK

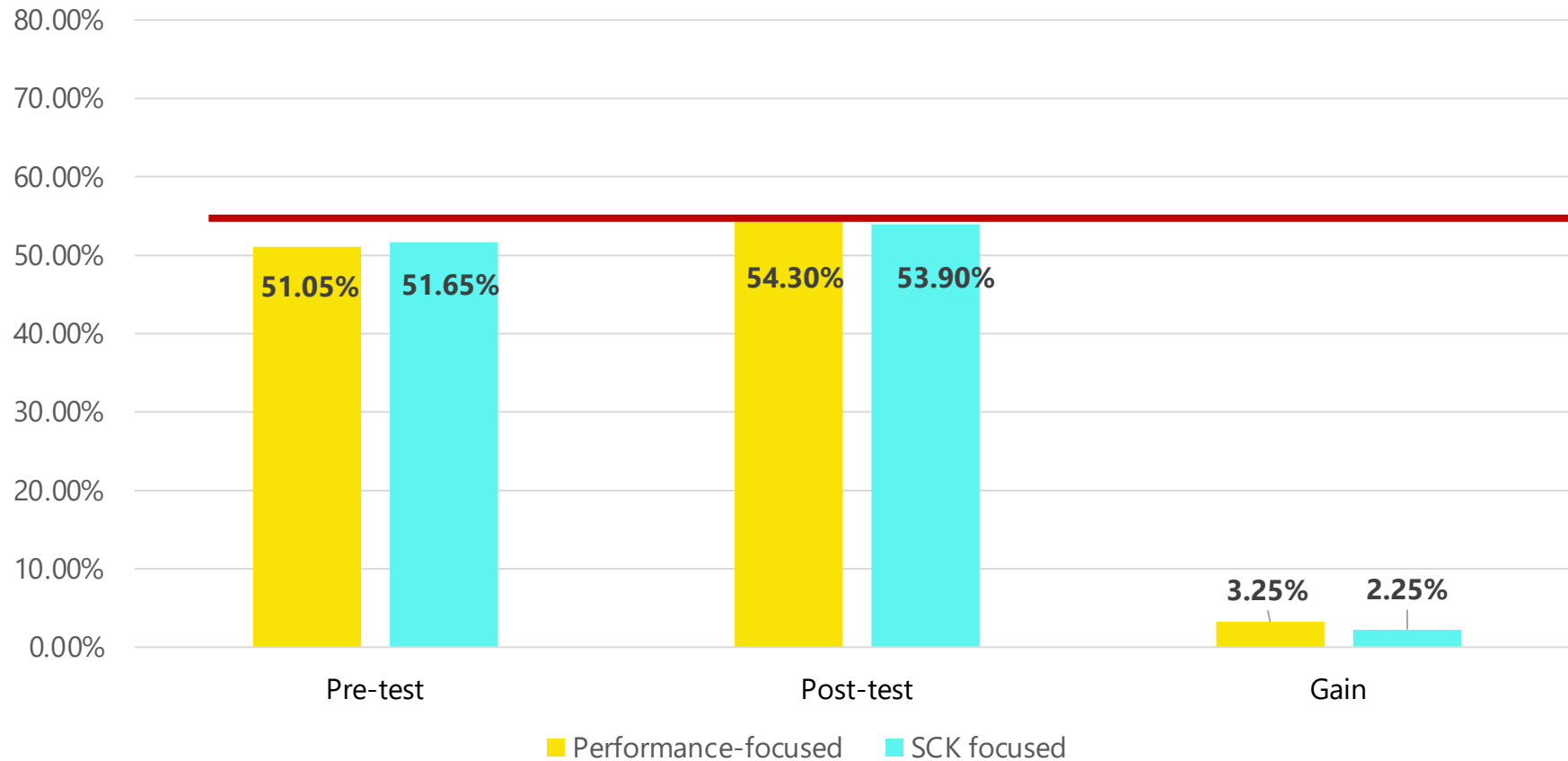


Figure 2. Pretest, posttest, and gain scores from CCK

No significant difference was found in CCK scores between SCK-focused and performance-focused groups ($Z = -.27, p = .79$)

Results - SCK

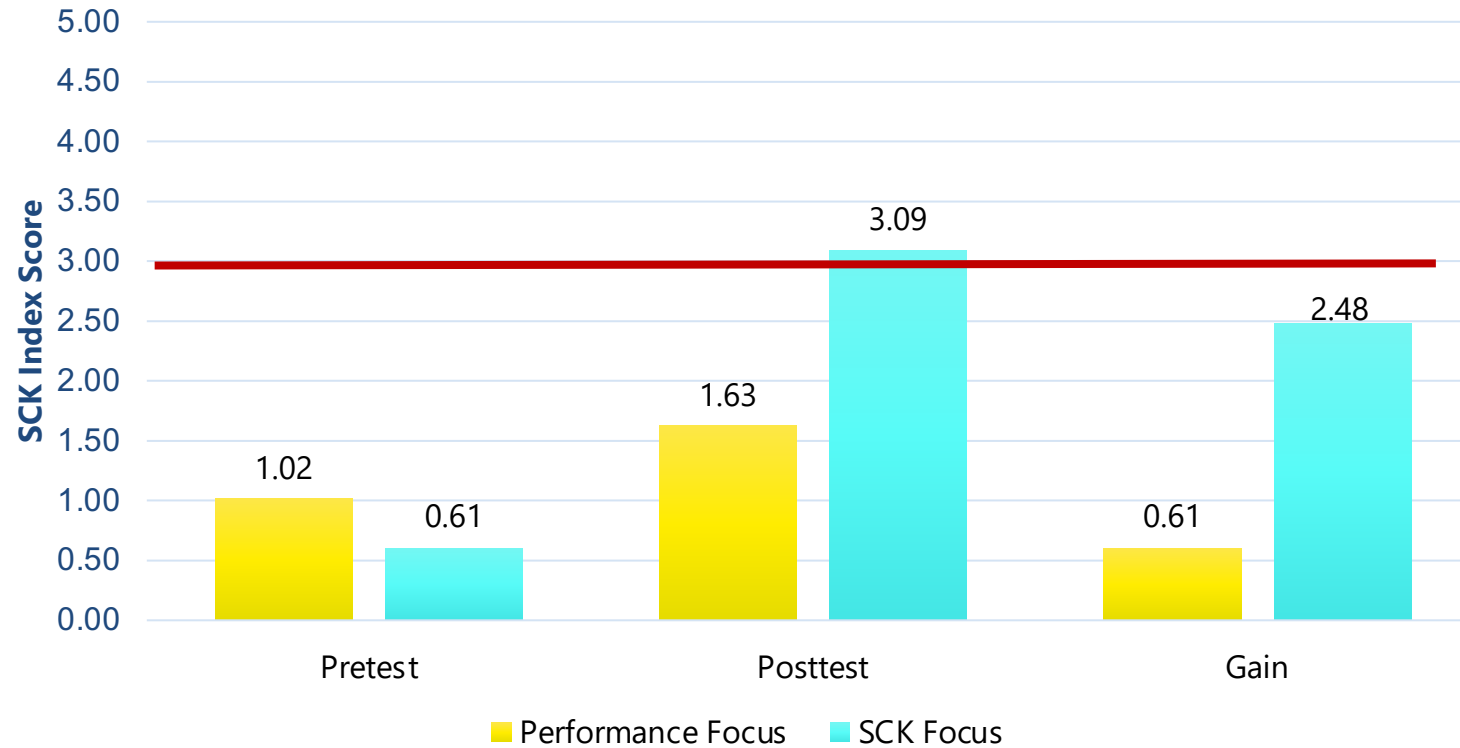


Figure 3. Pretest, posttest, and gain scores from SCK

SCK-focused group performed better than those in the performance focused group ($Z = -1.98$, $p = .05$, $r = 0.35$).

Discussion

- SCK-focused group had significantly higher post-test scores than those in the performance-focused group in the skill test.
- No significant difference was found in CCK scores between SCK-focused and performance-focused groups.
- SCK-focused group performed better than those in the performance focused group

One of few studies conducted by Tsuda et al. (2019) found similar results

Conclusions

- To date, very few studies examined CCK, SCK and performance of Pre-service teachers.
- Performance did not result in sufficient CCK and SCK acquisition in either condition.
- Each component of content knowledge must explicitly be taught to preservice teachers.

THANK YOU

Contact information:
erhandevrilmez@gmail.com

