

MVRC Study: Community College Students

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Rationale for Study

Approximately two-thirds of community college students nationwide are considered academically underprepared and required to enroll in at least one developmental education course (Anderson & Horn, 2012; Bailey, Jeong, & Cho, 2010; Levin & Colcagno, 2008). Unfortunately, researchers have found that enrollment in developmental classes often has adverse effects on community college students (Bailey et al., 2010; Grubb, 2001). Bailey et al. (2010) and Grubb (2001) explained that enrolling in developmental courses is time consuming and often results in delay or prevents the completion of a degree. With a significant number of underprepared community college students, it is important to develop effective methodologies to help students gain the skills required to be successful in college and future employment. It is equally important to determine how the student experience impacts academic progress and motivation to succeed in developmental programs and continue in college credit courses. Developmental reading courses provide the gateway to college-level courses, therefore it is important to investigate effective, time efficient reading interventions that provide students with the basic reading skills in a private and self-directed environment. Peterson, Burke, and Segura (1999) suggested that struggling readers have a desire for privacy, and ability for self-pacing. They want to be motivated, and receive immediate feedback. All of these are components of computer-based instruction.

Unfortunately, a limited amount of research exists on the use of Computer Assisted Instruction (CAI) to teach developmental reading at the community college level (Bueno-

Alastuey & Perez, 2014; Nguyen, Fichten, King, Barile, Mimouni, Havel, & Asuncion, 2013; Vassiliou, 2011). The purpose of this study was to examine the effects of a computer-based reading intervention, MindPlay Virtual Reading Coach (MVRC), on the reading and spelling achievement of community college students.

Measures

The following reading and spelling tests were administered: Woodcock- Johnson IV (WJ IV) Sentence Reading Fluency, WJ IV Word Reading Fluency, WJ IV Letter-Word Identification, WJ IV Spelling, WJ IV Word Attack, and the Test of Silent Word Reading Fluency-2 (TOSWRF-2)

Descriptive Statistics for Reading and Spelling Measures

The descriptive statistics including mean, standard deviation, and standard error of mean can be seen in Table 1.

Table 1

Descriptive Results for Reading and Spelling Measures

Assessment	M		SD		SE	
	Pre	Post	Pre	Post	Pre	Post
WJ IV SRF	49	51.83	12.35	8.91	5.04	3.64
WJ IV WRF	36.83	43.5	9.37	5.21	3.82	2.13
WJ IV LWID	57.83	60.17	6.43	5.64	2.63	2.30
WJ IV Spelling	39	48.5	7.82	10.01	3.19	4.12
WJ IV Word Attack	18.33	22	4.76	5.66	1.94	2.31
TOSWRF-2	96.17	105	15.61	21.06	6.37	8.60

Note. n = 6; M = mean; SD = standard deviation; SE = standard error of mean; WJ IV SRF = WJ IV Sentence Reading Fluency; WJ IV WRF = WJ IV Word Reading Fluency; WJ IV LWID = Letter-Word Identification; TOSWRF-2 = Test of Silent Word Reading Fluency.

Statistical Significance on the Measures

Overall, findings demonstrated statistically significant results in both reading and spelling. A brief summary of the results is presented below.

Sentence Reading Fluency. A paired-samples t-test was conducted to compare Sentence Reading Fluency before and after MVRC. There was not a significant difference in the pretest scores for Sentence Reading Fluency ($M = 49$, $SD = 12.35$) and posttest scores ($M = 51.83$, $SD = 8.91$).

Word Reading Fluency. A paired-samples t-test was conducted to compare Word Reading Fluency before and after MVRC. There was a significant difference in the pretest scores for Word Reading Fluency ($M = 36.83$, $SD = 3.82$) and the posttest scores ($M = 43.5$, $SD = 2.13$); $t(5) = 3.37$, $p = .02$. Results were significant at the .05 level and suggest that word reading speed improved after MVRC.

Letter-Word Identification. A paired-samples t-test was conducted to compare Letter-Word Identification before and after MVRC. There was not a significant difference in Letter-Word Identification pretest scores ($M = 57.83$, $SD = 6.43$) and posttest scores ($M = 60.17$, $SD = 5.64$).

Spelling. A paired-samples t-test was conducted to compare Spelling before and after MVRC. There was not a significant difference at the .05 level, but there was a significant difference at the .10 level in the Spelling pretest scores ($M = 39$, $SD = 3.19$) and posttest scores ($M = 48.5$, $SD = 4.12$); $t(3) = 2.25$, $p = .07$.

Word Attack. A paired-samples t-test was conducted to compare decoding skills before and after MVRC. There was a significant difference in the pretest scores for Word Attack ($M = 18.33$, $SD = 4.76$) and posttest scores ($M = 22$, $SD = 5.66$); $t(5) = 2.92$, $p = .03$. These results were significant at the .05 level and suggest that phonics skills improved after participation in MVRC.

TOSWRF-2. In the initial analysis, the results of the TOSWRF-2 were not significant.

When looking at the individual pretest and posttest scores, one of the participant's raw scores dropped 26 points from the pretest to the posttest. This finding was inconsistent with other assessment results of this participant, which all displayed a positive trend. It is likely there was another reason for this negative result, such as inattention, poor motivation, etc. For an additional analysis, this participant was removed from the analysis because the result was considered to be an outlier. A paired-samples t-test was conducted to compare word reading fluency before and after MVRC. There was a significant difference in pretest scores ($M = 96.4, SD = 17.44$) and posttest scores ($M = 112.2, SD = 12.87$); $t(3) = 3.85, p = .02$.

An additional analysis was conducted using confidence levels for raw score discrepancies across the two administrations of the TOSWRF-2. The clinically meaningful difference between the two scores was calculated using the average raw score standard deviation across all ages and forms ($SD = 29$) in Reynold's (2003) formula for determining clinical usefulness. Two of the six participants indicated a significant difference at the .05 significance level. These results suggest that the MVRC program does have an effect on the reading achievement for some community college students when used over a 5-week time period.

Table 2

Results for Reading and Spelling Measures

Assessment	M		SD		df	t	p
	Pre	Post	Pre	Post			
WJ IV SRF	49	51.83	12.35	8.91	5	1.23	.27
WJ IV WRF	36.83	43.5	9.37	5.21	5	3.37	.02*
WJ IV LWID	57.83	60.17	6.43	5.64	5	1.16	.30
WJ IV Spelling	39	48.5	7.82	10.01	5	2.25	.07**
WJ IV Word Attack	18.33	22	4.76	5.66	5	2.92	.03*
TOSWRF-2	96.17	105	15.61	21.06	4	3.85	.02*

Note. n = 6; M = mean; SD = standard deviation; df = degrees of freedom; t = test statistic; p = p value; WJ IV SRF = WJ IV Sentence Reading Fluency; WJ IV WRF = WJ IV Word Reading Fluency; WJ IV LWID = Letter-Word Identification; WJ IV WA = WJ IV Word Attack; TOSWRF-2 = Test of Silent Word Reading Fluency; * = significant difference at the .05 level; ** = significant difference at the .10 level.

Attitude Survey

An attitude survey was given before and after use of MVRC and a significant change was found in the enjoyment of reading. There was a significant difference at the .05 level in the pretest scores for the composite score of reading enjoyment (M = 2.57, SD = .87) and posttest scores (M = 2.98, SD = 1.04); $t(5) = 4.58$, $p = .006$. These results suggest that the participants found reading to be more pleasurable after participation in the MVRC intervention.

References

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