RESEARCH

Perceptions of creative self-efficacy of students with Learning Disabilities

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Abstract

Creative self-efficacy, a subcomponent of creativity, is the belief in one's ability to be creative. It is a necessary construct for a well-developed sense of creativity. With creativity being a vital skill cited by employers for employees to be prepared for 21st century careers, it is necessary to research creative self-efficacy early on and with all students. Limited research regarding students with learning disabilities and creativity, creative thinking, and creative self-efficacy exists. Because higher creativity is necessary for greater positive post-secondary outcomes, research in creative self-efficacy is needed. This study examined the perceptions of creative self-efficacy of students in the third, fourth, and fifth grades (n=495). A comparison between students with learning disabilities and their peers in general education and peers with gifts and talents was made. Results indicate similar perceptions of creative self-efficacy amongst students with learning disabilities and students in general education. However, a significant difference was indicated between students with learning disabilities and students with gifts and talents.

Keywords: creative self-efficacy, learning disabilities, creativity, 21st century, creative thinking

Creativity is a term with no singular definition, but it is most often thought of as something that is both novel and appropriate (Kaufman & Baer, 2012; Mayer, 1999; Schaefer, 1975). Categorizing the areas of creativity further, Guilford (1950; 1968) identified four areas of necessary components for creative thinking, which include fluency, flexibility, elaboration, and originality. Fluency is the ability to produce a large number of ideas. Flexibility is the ability to adapt or change ideas. Elaboration is the ability to extend upon an idea. Originality is the ability to produce something unusual.

Creativity is cited as a 21st century skill that will prepare students to be college and career ready (Gothberg et al., 2015; Lombardi et al., 2015). Yet, within curricula for both general education and special education, creativity is generally not included (Kleiman, 2008). Creativity

is often more of an afterthought or an add-on when there is time to include it in the curriculum

(Plucker et al., 2004). However, as progress continues to change, this skill is becoming more valued, especially by employers (Abbott, 2010; Amabile et al., 2005; Capron Puozzo & Audrin, 2021; Huang et al., 2016; Tierney & Farmer, 2002), and research indicates that creativity is a skill that can be developed (Byrge & Tang, 2015; Tierney & Farmer, 2011).

Because creativity may provide greater opportunities for employment and economic stability, creativity has been cited as an essential skill for employees to have in the 21st century (Abbott, 2010; Amabile et al., 2005; Huang et al., 2016; Tierney & Farmer, 2002). Employers are looking for employees who will help their companies be innovative and move the company to the top of the field. However, training or development in creativity is often expected before employees join the workforce, as companies largely expect new employees to come prepared to be creative (Capron Puozzo & Audrin, 2021; Pazey et al., 2016). This means educators must consider how early intervention of this skill might be included and developed across a student's K-12 educational career to ensure students are well-prepared.

For students with a learning disability (LD), who are at greater risk for underemployment (NCES, 2021), ensuring thorough preparation for post-secondary life before leaving K-12 is vital. This means consideration must be given for all students to have educators who ensure they have the opportunities to develop all necessary skills, including creativity, before leaving high school (Author, 2019). To develop creativity, it is important for creativity instruction to begin as early as possible as part of the transition process for students with disabilities (Author, 2021). However, the literature surrounding creativity and students with LD is limited and often focuses on students who are twice-exceptional (i.e., students identified as having both a disability and identified with gifts and talents; Author, 2019; Baldwin et al., 2015).

Creative self-efficacy, a term that combines creativity with Bandura's (1986) self-efficacy, is the belief in one's ability to be creative (Tierney & Farmer, 2002). Because it has been linked as a predictor with overall creative ability and production (Beghetto, 2007; Tierney & Farmer, 2002), it is important that consideration be given regarding a person's creative self-efficacy. Within creative self-efficacy research, focus in terms of the four areas of creativity (i.e., fluency, flexibility, elaboration, originality; Guilford, 1950; 1968) is minimal, leaving a gap in our understanding of how each of these areas of creative thinking impact a student's perceived creative self-efficacy (Author, 2019). Further, research regarding creative self-efficacy and students with LD is almost non-existent (Author, 2019). Because children with higher creative self-efficacy may be more likely to explore more complex activities with persistence and motivation (Richter, et al., 2012; Tierney & Farmer, 2002), understanding the perception of a student's creative self-efficacy in order to consider ways to develop creative self-efficacy is necessary (Author, 2019). To further understand how this construct (i.e., creative self-efficacy) may be developed for students with LD, research to determine what a student perceives their creative self-efficacy to be is needed. Thus, this study aimed to examine the perceptions of personal creative self-efficacy of students with LD.

Literature Review

Creativity and Students with Learning Disabilities

Students with specific learning disabilities have "a disorder in one or more of the basic psychological processes involved in understandings or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations" (IDEA, 2004). Their learning difficulties are not the result of intellectual disability.

The creative potential of students with LD has been shown to be similar to that of general education students, yet students' specific area(s) of disability may impact specific types of creativity. For example, Eisen (1989) compared the verbal and figurative creativity of students

with LD and students in general education. Students with LD scored significantly higher than general education students in originality and remoteness as related to figural creativity. These students also scored significantly lower than general education students in verbal creativity, a possible outcome associated with verbal deficits due to their disability.

More recently, Hong and Milgram (2010) analyzed the relationship between general creativity and domain-specific academic creativity amongst students with LD and their peers without LD. Students with LD scored significantly lower in creative thinking in academic problem solving; yet there were no statistically significant differences in their scores in general creative thinking when compared to their typical peers.

Research points not only to the creative potential of students with disabilities but to the promise of instruction in creativity. Jaben et al., (1982) examined the effects of the Purdue Creative Thinking Program (Feldhusen et al., 1970) on the creative thinking ability of students with LD. Students with LD were placed in either the intervention group or the control group, which did not receive intervention. Those who participated in the intervention scored significantly higher in overall verbal creativity and in the areas of fluency, flexibility, and originality than their peers in the control group. Building on this research, Shondrick et al. (1992) compared the creativity of students with and without LD through two creativity measurements, the *Alternate Uses Test* (Wallach & Kogan, 1965) and *Eisen's Test of Remoteness* (Eisen, 1989). No significant difference was indicated between students with LD and students without LD on either of the creativity measurements. These results allude to the likely potential for students with LD to increase their creativity similarly to students without LD.

Creative Self-Efficacy

Creative self-efficacy, coined by Tierney and Farmer (2002), is a construct that combines the term creativity with Bandura's (1986) self-efficacy. It is the belief in one's ability to produce something or be creative, (Tierney & Farmer, 2002). Bandura (1986) explained that self-efficacy is a vital component of being able to do something. If a person is confident in their ability to complete a particular task, they are more likely to be successful (Alabbasi et al., 2022; Haase et al., 2018). Thus, promotion of self-efficacy development will likely lead to greater and continued success in future endeavors.

While there is some literature in the field of education, most of the literature surrounding creative self-efficacy is housed within the field of business (Author; 2021; Capron Puozzo & Audrin, 2021). Research has demonstrated that creative self-efficacy has a significant positive relationship with an employee's innovative abilities (Javed et al., 2021), and developing creative self-efficacy is necessary for an employee to produce creative products and solutions (Bandura, 1997; Beghetto, 2007, Tierney & Farmer, 2002) Specifically, within the K-12 context, and perhaps due to the lack of research within the K-12 educational context, research surrounding student perception of their personal creative self-efficacy is somewhat unclear.

Creative Self-Efficacy in the Context of Education

The existing, albeit minimal, creative self-efficacy research conducted in educational contexts has primarily occurred in general education settings. A well-developed sense of creative self-efficacy has been linked as a predictor for positive outcomes for creativity (Beghetto, 2007; Karwowski & Beghetto, 2018). Links have been found between a well-developed sense of creative self-efficacy and the areas of creative performance, the ability to produce creatively, and personal competence (Beghetto, 2007; Tierney & Farmer, 2002).

Creative self-efficacy contributes to the ability to generate, develop, and communicate new ideas. Recently, Liu et al., (2017) found that creative self-efficacy was significantly correlated with creative ideation in undergraduate university students. Students with higher creative self-efficacy demonstrated higher creative ideation.

The ability to produce more and higher quality ideas due to higher levels of creative self-efficacy may also lead to better educational outcomes. Putwain et al. (2012) examined the relationship between students' self-beliefs of

their creativity (i.e., fluency, flexibility, elaboration, originality), their academic motivation, fluid intelligence, and achievement of 120 eighth graders in general education. Fluency, flexibility, and originality were positively correlated with fluid intelligence and academic achievement (i.e., literacy achievement). Thus, students with higher creativity self-beliefs were more likely to have better educational outcomes through the production of more ideas with greater depth and originality (Putwain et al., 2012).

Research appears to indicate that students with LD demonstrate similar creative potential to their peers without LD. To provide opportunities for developing creative self-efficacy for students with LD, research is needed to address the gaps in the literature and to examine creative self-efficacy perceptions of these students.

The Present Study

For students with LD, who comprise 33% of the population of persons with disabilities (NCES, 2021), a marked underemployment is seen within the workforce. Approximately 77% of persons without a disability are a part of the workforce compared to approximately 27% of persons identified with a disability (NCES, 2016). This vast disparity demonstrates a necessary change in the preparation provided to persons with disabilities. With this disparity in mind, for students with LD, for whom a transition plan is developed by age 16 or earlier as part of their Individualized Education Program (IEP) stating how the student will transition beyond K-12 schooling into the workforce or higher education, development of creative self-efficacy as an essential transition skill must be considered to ensure greater chances of positive post-secondary outcomes (Author, 2021).

With creativity being an essential skill for 21st century employees, it is vital that research regarding creative self-efficacy begin early on in a student's educational career (Author, 2021) so that the development of creative self-efficacy has time to continually improve over a student's K-12 education. While creative self-efficacy for students with LD has largely been unstudied, based upon previous research indicating that students with LD generally show lower levels of overall self-efficacy, this study sought to examine if this result also potentially translated to the context of creative self-efficacy. In order to first gather an understanding of current student perceptions of creative self-efficacy, this study examined the self-perceptions of creative self-efficacy in terms of the four areas of creative thinking of students with LD. A comparison was made between students in general education and students with gifts and talents. The research question addressed in this study was: *Is there a significant difference in the perceptions of creative self-efficacy in terms of fluency, flexibility, elaboration, and originality among students with learning disabilities in third, fourth, and fifth grades and their peers in general education, and in gifted education?*

Method

Participants

Students in the third, fourth, and fifth grades in a large, urban school district in the southwestern United States from three elementary schools, each representing a low, middle, and high economic identification, were recruited for participation in this study. Due to gifted education only provided in grades three, four, and five in the school district, only students from these three grade levels were recruited for this study. The three schools represented a culturally, linguistically, and ethnically diverse population of students. Participants were between 8 and 11 years of age. Assent from the students, along with consent from their parents, were collected from 495 students. Students identified with a learning disability (n=35), identified with gifts and talents (n=90), or in general education (n=370) were analyzed for this study. These numbers (i.e., n=35) demonstrate consistency with national averages for students identified with a learning disability. No participant was included in more than one educational subtype. Students identified as twice-exceptional (i.e., identified with a disability along with identified with gifts and talents) were excluded from the analysis due to the low number of students identified as such.

Table 1

Student Demographic Information

Characteristics	Learning Disabilities	General Education	Gifted and Talented	Total
School Level				
Third Grade	14	129	22	165
Fourth Grade	10	116	37	163
Fifth Grade	11	125	31	167

Instrument

For this study, a questionnaire was adapted, with permission, from Abbott's (2010) *Creative Thinking Self-Efficacy* (CTSE) survey for use at the elementary level. A Fry's (1968) readability assessment was conducted to ensure the questionnaire was at a third-grade readability level, the grade level of the youngest participants in the study. The instrument consisted of 16 items, four for each of Guilford's (1950; 1968) four domains of creative thinking (i.e., fluency, flexibility, elaboration, originality), rated on a 5-point Likert scale, ranging from 1 (never) to 5 (always). See Table 1 for an example item for each domain. Each participant was provided a hard copy of the adapted CTSE, and each question was read aloud one by one for students to complete, to ensure reading fluency did not hinder student ability to understand the questionnaire. Demographic information (i.e., grade, age, gender, ethnicity, and educational subtype) also were included.

Table 2

Questionnaire Examples for Each Creativity Domain

Creativity Domain	Example Item on the Questionnaire
Fluency	I can think of a large number of ideas or answers.
Flexibility	I can think of many types of ideas while thinking about a problem.
Elaboration	I can link new ideas to things I have learned before.
Originality	I can think of ideas no one else has.

Analysis

All data were entered into the Statistical Package for the Social Sciences (SPSS) for analysis. Statistical and inferential statistical analyses were conducted. A two-way multivariate analysis of variance (MANOVA) was conducted to determine differences in student perceptions of creative self-efficacy for each domain of creative thinking for students in the third, fourth, and fifth grades with an identified learning disability, in general education, and identified with gifts and talents. The two-way MANOVA was selected to allow for the analysis of the interactions between multiple independent variables on the dependent variables (Laerd Statistics, 2016). A 3 x 3 x 4 analysis (i.e., the 3 educational subtypes x 3 grade levels x 4 domains of creative thinking) was conducted, with an alpha level set at .05. The independent variables were educational subtypes (i.e., students with LD, students in general education, and students identified with gifts and talents), grade level (i.e., third, fourth, and fifth grades.). The dependent variables were scores on the four domains of creative thinking: fluency, flexibility, elaboration, originality.

A test of assumptions was conducted before analysis to ensure that data did not violate study assumptions and that a MANOVA analysis would yield accurate results. Each cell was found to have more cases than the number of dependent variables (i.e., n > 4; Laerd Statistics, 2016) and a linear relationship between variables as assessed by a scatterplot. No evidence of multicollinearity was found by Pearson correlation (r < .09) and no univariate outliers in the data were found. One multivariate outlier was found as assessed by Mahalanobis distance (p > .001) but given that the case was within the largest cell size, the case was still included (Laerd Statistics, 2016). While all four areas of creative thinking were found to not be normally distributed by the Komogorov-Smirnov test of normality (at p > .05), the analysis was moved forward due to consensus that a MANOVA is robust to normality and the large sample size of the study (Laerd Statistics, 2016). Finally, the homogeneity of the covariance was assessed by Box's M test. Homogeneity of covariance was found from this test (p = .214; p = .034; p =.217). Given the results of all test of assumptions, a MANOVA was determined to be appropriate for data analysis in this study.

Following the two-way MANOVA, a univariate analysis of variance (ANOVA) was conducted to determine which areas of creative thinking had a significant difference for educational subtypes. Once the ANOVA was completed, Tukey pairwise comparisons were run to determine the differences in mean for each domain of creativity between educational subtypes.

Results

The study aimed to examine the perceptions of personal creative self-efficacy of students with LD and compare them to their peers in general education and peers identified with gifts and talents. For students in third, fourth, and fifth grades with gifts and talents, the descriptive analysis indicated higher self-reported mean scores of perceptions of creative self-efficacy in terms of fluency, flexibility, elaboration, and originality than students in general education and students with LD. For students in third, fourth, and fifth grades in general education, the descriptive analysis also indicated higher self-report mean scores of perceptions of creative self-efficacy in terms of fluency, flexibility, elaboration, and originality than students with LD.

Creative self-efficacy scores did not yield a statistically significant interaction effect between grade level and educational subtype $F(11, 483) = 1.239$, $p < .196$, Wilks' $\Lambda = .940$, partial $n^2 = .015$. There was also not a statistically significant main effect for grade level,

F(11, 483) = 1.018, p < .420, Wilks' Λ =.983, partial n² = .008, however, a statistically significant main effect was found for educational subtype, F(11, 483) = 2.092, p < .001, Wilks' Λ =.931, partial n² = .024. See Table 2 for results.

A follow up univariate ANOVA was conducted for educational subtype to examine whether there were significant differences among the four areas of creative thinking. Results indicate statistically significant differences in all four areas of creative thinking in relation to educational subtype, fluency score, F(3, 483) = 7.793, p < .001 partial n² = .046, flexibility score, F(3,483) = 4.908, p < .002, partial n² = .030, elaboration score, F(3, 483) = 3.063, p < .028, partial n² = .019, and originality score, F(3, 483) = 7.959, p < .001 partial n² = .047. See Table 3 for results.

To determine where the differences took place, Tukey pairwise comparisons were conducted. A statistically significant difference was found between students with LD and students with gifts and talents in each of the four domains of creative thinking (i.e., fluency 2.27 (95% CI, .73 to 3.81), p < .001, flexibility 1.85 (95% CI, .32 to 3.38), p < .010, elaboration 2.02 (95% CI, .36 to 3.67) , p < .010, originality 2.96 (95% CI, 1.19 to 4.74), p < .001). There was no statistically significant difference between students with LD and students in general education in any of the four domains. See Table 5 for results.

Table 3

Two-Way MANOVA of Grade Level and Educational Subtype

Effect		F	df	Error df	*p*	Partial Eta Squared
Grade	Wilks' Lambda	1.018	8	960	.420	.008
Educational Subtype	Wilks' Lambda	2.902	12	1270	.001*	.024
Grade*Educational Subtype	Wilks' Lambda	1.239	24	1676	.196	.015

*Note. * represents significance at the p<.05 level.*

Table 4

Two-Way ANOVA of Educational Subtype

Effect	Dependent Variable	F	df	Error df	*p*	Partial Eta Squared
Educational Subtype	Fluency	7.793	3	483	.001*	.046
	Flexibility	4.908	3	483	.002*	.030
	Elaboration	3.063	3	483	.028*	.019
	Originality	7.959	3	483	.001*	.047

*Note. * represents significance at the p<.05 level.*

Table 5

Tukey HSD Peer Comparison of Perceived Creative Self-Efficacy of Students with LD

Creativity Domain	Educational Subtype Comparison	Mean Difference	Std. Error	*p*
Fluency	General Education	-.60	.531	.675
	Gifts and Talents	-2.27	.597	.001*
Flexibility	General Education	-.57	.528	.698
	Gifts and Talents	-1.85	.594	.010*
Elaboration	General Education	-1.22	.572	.143

	Gifts and Talents	-2.02	.643	.010*
Originality	General Education	-1.25	.612	.174
	Gifts and Talents	-2.96	.688	.001*

*Note. * represents significance at the p<.05 level.*

Discussion

This study aimed to examine the perceptions of personal creative self-efficacy of students with LD and compare them to their peers in general education and peers identified with gifts and talents. The results of this study demonstrate that students with LD have similar perceptions of their creative self-efficacy as their peers in general education in all four areas of creative thinking (i.e., fluency, flexibility, elaboration, originality). This indicates that students with LD perceive their creative self-efficacy similar to their general education peers. These results could be attributed to the fact that most students with LD have average or above-average intelligence (Horowitz et al, 2017), and thus, having LD likely does not affect their perception of their ability to be creative. Though different instruments were used, these results corroborate previous research in creativity demonstrating a lack of significant difference in creative thinking between students with LD and students in general education (Hong & Milgram, 2010; Shondrick et al., 1992).

However, lower perceptions of creative self-efficacy for students with LD were indicated when compared to their peers identified with gifts and talents in all four areas of creative thinking. This indicates that students with LD perceive their creative self-efficacy to be lower than students identified with gifts and talents. While these results are based upon self-perceptions, the results add to previous research indicating students with gifts and talents have higher creativity than their peers (Kettler & Bower, 2017).

These results may be attributed to variances in programming. Students with gifts and talents are often provided curricula that includes participation in creative activities. Differentiated thinking is also often fostered in gifted and talented programs. However, for students with LD and their general education peers, these creative activities and the fostering of differentiated thinking are often not included in their curricula. If this is the case, then it is vital that considerations regarding student programming be made. Schools and teachers should consider what curricula are being offered and implemented in gifted and talented programs and then determine how that curricula might also be included in programming provided to students with learning disabilities.

If the goal of K-12 education is to set all students, including those with LD, up for future success, a movement to work towards ensuring they are provided equitable opportunities to develop the creative skills necessary to be successful in the 21st century is necessary. In view of the findings from this study, along with the literature indicating that a well-developed sense of creativity is necessary to prepare students with LD for post-secondary success (Pazey et al., 2016; Author, 2021), further exploration to determine what differences may be found for the difference between students with learning disabilities and students without learning disabilities is needed. Future research on curricula variances for these populations of students is suggested.

In addition, with creative self-efficacy being a relatively new construct, further research is also needed to determine how it may affect student creativity. This is especially true for students with LD as they move on from K-12 learning. An investigation of how including creative self-efficacy development within transition planning may assist students with LD as they transition to post-secondary life is also suggested.

The results and implications of this study should consider the limitations of the study. Participants were selected based on convenience sampling, so it may not truly represent the community. In addition, this study only examined perceptions of students in the third, fourth, and fifth grades, so results may not generalize to other ages. These limitations should be considered for future investigation of the construct of creative self-efficacy.

Additional studies that include a mixed-method study with continued collection of quantitative data using the *Creative Thinking Self-Efficacy* (CTSE) survey and with qualitative questioning may enhance further understanding of student perceptions of their creative self-efficacy.

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