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Perceived Self-Efficacy of Preservice Agriculture Teachers toward Specific SAE Competencies

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Abstract

Since its inception, school-based agricultural education in the United States has utilized the home project method, later known as a supervised agricultural experience program (SAE), as a way to provide students with contextual, hands-on learning experiences outside of class that complement classroom learning. While most teachers realize the benefits of SAE programs, the use of SAE has declined over time, and many agriculture teachers new to the profession may not be as proficient in implementing SAE programs. Therefore, the purpose of this study was to determine preservice agriculture teachers' self-efficacy of the AAAE-SAE Competencies. Results indicated that 95% of the respondents considered SAE to be important or somewhat important components of agricultural education. Additionally, all respondents reported to have moderately high efficaciousness for their ability to perform all of the SAE competencies. What is more, few differences were found between preservice teachers who possessed SAE and agricultural education experience versus preservice teachers who had little or no experience with SAE and agricultural education. The researchers recommend that teacher preparation program in agriculture continue to provide instruction over SAE and should implement learning experiences in SAE that provide authentic, relevant instruction to preservice teachers on developing, implementing, maintaining, sustaining, evaluating, and supervising an SAE program.

Keywords: agricultural education, project method, Supervised Agricultural Experience

Since the early 1900's, the home project, now known as supervised agricultural experience (SAE) programs, has been an integral component of school-based agricultural education (Phipps, Osborne, Dyer, & Ball, 2008). In 1907, Rufus W. Stimson introduced a revolutionary idea to engage agriculture students in naturalistic inquiry opportunities outside of the traditional classroom and school setting (Moore, 1988). Stimson firmly believed that student learning required more than mere observation alone when he stated,

> neither skill nor business ability can be learned from books alone, nor merely from observation of the work and management of others, both require active participation, during the learning period, in productive farming operations of real economic or commercial importance. (1919, p. 32)

Later in 1917, the Smith-Hughes Act included the following verbiage regarding naturalistic inquiry opportunities within agricultural education programs, requiring that all students were engaged in "directed or supervised practice in agriculture, either on a farm provided for by the school or other farm, for at least six months per year" (as cited in Phipps et al., 2008, p. 443).

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However, since the passage of the Smith-Hughes Act of 1917 wording regarding the utilization of SAE programs in agricultural education has been removed from federal legislation (Steele, 1997). Since the mid-1980's, student participation and teacher usage of SAE programs has continued to decrease (Barrick, Hughes, & Baker, 1991; Dyer & Osborne, 1995; Phipps et al., 2008; Retallick, 2010; Roberts & Harlin, 2007; Steele, 1997; Wilson & Moore, 2007). Further, Steele (1997) conjectured that the removal of the federal legislative requirement has affected the utilization of supervised experiences within school-based agricultural education (SBAE) nationwide. Consequently, teacher understanding and participation in a total agricultural education program has been on decline (Dyer & Osborne, 1995; Retallick, 2010; Wilson & Moore, 2007).

Within agricultural education research, the agriculture teacher has been found to have the largest impact on the utilization of SAE programs (Dyer & Osborne, 1995; Phipps et al., 2008; Swortzel, 1996). Further, agriculture teachers expect students to be engaged in SAE programs (Roberts & Dyer, 2004). However, Terry and Briers (2010) found that teachers dedicated, on average, three percent of their time to SAE. Moreover, Camp, Clarke, and Fallon (2000) concluded that agriculture teachers do not believe that SAE is appropriate for their school-based agricultural education programs. Research has indicated that teachers do not implement SAE programs as they conceptually and theoretically define SAE (Dyer & Osborne, 1995; Retallick, 2010; Wilson & Moore, 2007). Likewise, teachers have reported that teaching and utilizing SAE is one of the most difficult components to teaching agricultural education (Dyer & Osborne, 1995; Robinson & Haynes, 2011). One of the main teacher constraints to utilizing SAE programs is the inclusion of supervision for each student's SAE program (Osborne, 1988; Dyer & Osborne, 1995; Dyer & Williams, 1997; Swortzel, 1996). SAE may be a challenging component of SBAE, however, SAE makes SBAE unique in education as it provides learners with an authentic experience, connected to careers and as an extension of the classroom. Teachers should realize the benefits from engagement in SAE specific professional development seminars (Retallick, 2010; Roberts & Dyer, 2004; Sorensen, Tarpley, & Warnick, 2010; Wilson & Moore, 2007; Young & Edwards, 2005).

In order to prepare preservice agriculture teachers, instruction in SAE programs should be an essential component to agriculture teacher preparation programs (McLean & Camp, 2000). McLean and Camp (2000) conducted a study of 10 preservice agriculture teacher preparation programs and found that every program reported teaching SAE to their preservice teachers. However, the researchers found that three teacher preparation programs offered SAE specific courses to preservice agriculture teachers. Later, Young and Edwards (2005) surveyed Oklahoma State University preservice teachers who reported the importance of SAE as the lowest item both before and after their student teaching internships.

Currently, agriculture teacher preparation programs do not spend an equal amount of time instructing preservice teachers on SAE when compared to classroom/laboratory instruction and FFA (McLean & Camp, 2000). Sequentially, this has led preservice teachers to report a lower level of importance towards SAE program utilization as compared to the other major components of SBAE (Joerger, 2002). However, preservice teacher's low level of importance towards SAE could be perpetuated by a decreased number of preservice agriculture teachers with agricultural education experience. Furthermore, preservice agriculture teachers are at a unique point of Hawkin's (1990) educational loop. Hawkins reported that change in the educational system was slow due to preservice teachers' experiences within the educational system. Shulman (1986) purported that preservice teachers are shaped by their interactions with mentors and former teachers. Hawkins purported that due to the influence former teachers and mentors have on preservice teachers; therefore, integration of new concepts or ideals within education can take decades or generations to become accepted common practice (Thoron & Myers, 2010). Due to this loop, it is vital for teacher educators to be actively engaged in examining preservice teachers' ability and perceptions of SAE programs in SBAE.

In 2013, the Teacher Education Special Interest Group of the American Association for Agricultural Education (AAAE) proposed a set of SAE competencies for preservice agriculture

teacher education programs. During the National AAAE Research Conference, the proposed competencies were accepted by the membership body. The competencies were developed by a subcommittee of the Teacher Education Special Interest Group from prior research and philosophical underpinnings of SAE programs. The accepted AAAE-SAE Competencies included:

1. All students have supervised agricultural experience programs based on career pathways/clusters/interests and agricultural curriculum standards.
2. Supervised agricultural experience programs are planned, developed and managed by the student with instruction and support by the agriculture teacher, parents and/or employer.
3. The agriculture teacher maintains accurate records of SAE supervision.
4. Continuous instruction and supervision of SAE programs are provided by the agriculture teacher throughout the calendar year.
5. Each agriculture student maintains up-to-date and accurate SAE records.
6. An annual summary of students' SAE programs is completed and submitted to appropriate entities.
7. Students have comprehensive SAE programs that show evidence of growth in size and/or scope (AAAE, 2013, p. 1-4).

Currently, a gap in the knowledge-base exists in teacher self-efficacy towards developing, implementing, and sustaining SAE programs. In order to increase teacher utilization of SAE programs, preservice teachers must feel adequate in their ability to utilize SAE programs and feel confident in their ability to assist students in the development, implementation, and sustainment of SAE programs. Before practice can change, research should be conducted to establish a baseline understanding of preservice teachers' perceived ability to implement and utilize each component of a SAE program. Therefore, this study aimed to examine graduating preservice agriculture teachers' self-efficacy towards the accepted AAAE-SAE Competencies before SAE programs become non-existent in SBAE.

Theoretical Framework

The theory that guided this study was social cognitive theory (Bandura, 1986). Social cognitive theory hypothesizes that humans learn as a result of internal processes, such as cognition, self-regulation, and self-reflection, which interact with external influences. Thus, Bandura (1986) posited that individuals' motivations, thoughts, and actions are caused by reciprocity among three determinants, which include environmental variables, personal factors, and behaviors. One personal factor that has played a significant role in social cognitive theory has been self-efficacy. Therefore, the specific component of social cognitive theory that was examined for this study was self-efficacy.

Bandura (1986) defined self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). Bandura (1997) suggested that self-efficacy is a cognitive representation of one's ability that impacts each determinant by exerting an influence on the activities in which individuals choose to participate, their persistence in those activities, their level of motivation, and affective state, which all contribute to an individual's behavior and performance. Moreover, Bandura (1997) stated that an individual cannot possess a general self-efficacy; instead their efficacy must be context-specific. For example, Pajares (1996) indicated that in an educational context, self-efficacy encompasses students' perceptions of their competence in given task-specific situations. In the context of this study, the self-efficacy of preservice agriculture teachers to complete tasks associated with SAE competencies was examined.

The development of one's perceived self-efficacy is influenced by several factors, including past accomplishments and failures, communication of messages by others, and the vicarious observation of accomplishments and failures of others (Ormrod, 2008). Further, Bandura (1997) described that an individual's past accomplishments and failures are the most influential

factor in developing self-efficacy, because they provide an individual with an accurate measure of performance capability. Bandura (1997) indicated that self-efficacy beliefs are part of a cognitive schemata built through prior experiences, and "these self-schemata of personal efficacy influence what people look for, how they interpret and organize the efficacy information generated in dealings with their environment, and what they retrieve from their memory in making their efficacy judgments" (p. 81) when faced with new challenges. Therefore, the assumption can be made, that individuals who possess little or no experience with certain tasks should be less efficacious with that task. Operationally within this study, this means students with little to no experience with SBAE and SAE should be less efficacious with the AAAE-SAE Competencies.

Purpose and Objectives

The purpose of this study was to determine preservice teachers' self-efficacy of the AAAE-SAE Competencies. Since it is believed that preservice teachers must be able to perform each of the AAAE-SAE Competencies, this study supported Priority Area 4 "Meaningful, Engaged Learning in All Environments" of the National Research Agenda (Doerfert, 2011, p. 9). The specific objectives that guided this study were:

1. To ascertain preservice teachers' self-perceptions of their ability to perform the AAAE-SAE Competencies within their agricultural education program,
2. To ascertain the influence of prior SBAE experience on a preservice teachers' self-efficacy, and
3. To ascertain the influence of prior SAE experience on a preservice teachers' self-efficacy.

Methods

This study used a non-experimental survey design (Ary, Jacobs, Razavieh, & Walker, 2014) to determine preservice teacher self-efficacy of the AAAE-SAE Competencies. Survey research is frequently used in education research to gather information from a sample of people within a target population (McMillian & Schumacher, 2010). McMillian and Schumacher (2010) stated that survey research is frequently used in education research for three primary reasons: versatility, efficiency, and generalizability.

Population

The population of this study was graduating preservice teachers from nine preservice agriculture teacher preparation programs. The population of this study was a purposively selected based upon criteria determined *a priori* by the researchers. The criteria used to invite participation included representation of three teacher preparation programs from each AAAE region. Universities were purposively selected by a panel of experts based on the AAAE Regions. A total of nine teacher preparation programs were invited to participate in this study (N = 114). A university faculty member at each institution was asked to participate in the study and administer a paper-based questionnaire to their graduating preservice teachers. The participants of this study had completed their student teaching internships and were preparing to graduate from their respective institutions. Since a purposive sampling technique was utilized, the findings from this study may not be generalized beyond the population.

Data Collection and Analysis

Data were collected through a researcher developed paper-based questionnaire utilizing Dillman's Tailored Design Method (2009). The questionnaire consisted of 20 Likert-type items that measured preservice teachers' self-efficacy of each AAAE-SAE Competency. The instrument utilized a 5-point Likert-type scale that ranged from (5) high, (4) moderately high, (3) neutral, (2)

moderately low, and (1) low. The questionnaire was reviewed for face validity by a panel of self-efficacy and SAE experts and was approved. Further, post-hoc reliability was run and the Cronbach's alpha coefficient was .95.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0. Participant responses were analyzed using descriptive statistics to ascertain preservice agriculture teachers' self-perceptions of their ability to perform each SAE competency. An independent samples t-test was used to determine the statistically significant differences between students who had or had no high school experience with agricultural education and/or SAE programs. Participants self-reported their high school involvement with agricultural education and/or SAE programs. The alpha level of statistical significance was set *a priori* at .05.

Findings

One teacher preparation program declined to participate in the study. Therefore, that program was removed from the study and not represented in the sample. Demographic information of the respondents (n = 92) was collected (80.7% response rate). Nearly three quarters of respondents (70%; n = 65) self-reported being female. More than 9 out of 10 respondents (94%; n = 86) self-reported they were Caucasian, Non-Hispanic. The majority of respondents had high school SBAE and SAE experience (88%; n = 81), (74%; n = 68) respectively. Further, information was collected from respondents regarding the structure of their collegiate coursework and perceptions of the importance of SAE. A majority reported they received instruction from at least one course that focused on SAE. Conversely, nearly a tenth (n = 9) of respondents reported no instruction on SAE within their teacher preparation program (see Table 1).

Table 1

Preservice Teacher Coursework and Perception of the Importance of SAE (n = 92).

Item	*f*
SAE-Focused Collegiate Coursework	
A portion of more than one course that focused on SAE	37
A portion of one course that focused on SAE	33
Entire course focused on SAE	13
No instruction was provided specifically about SAE	9
Importance of SAE	
Very important	71
Somewhat important	17
Neither important or not important	1
Somewhat not important	2
Not important	1

The first objective of this study was to ascertain preservice teachers' self-perceptions of their ability to perform the AAAE-SAE Competencies within their agricultural education program. Overall, all mean scores of preservice teachers' self-efficacy toward the AAAE-SAE competencies were reported above four (moderately high). Respondents reported their lowest mean self-efficacy level of 4.24 (SD = .83) toward assisting students in completing a record of the financial transactions related to their SAE program. Conversely, respondents reported their highest mean

self-efficacy level of 4.64 (*SD* = .73) in their perceived ability to encourage students to improve their SAE programs (see Table 2).

Table 2

Preservice Teacher Self-Efficacy Towards AAAE-SAE Competencies (n = 92)

Item: My ability to …	*M*	*SD*
Encourage students to improve their SAE programs	4.64	.73
Build positive relationships with administrators	4.63	.62
Clearly communicate the purpose of SAE programs with others	4.59	.69
Assist students in selecting SAE programs that meet their individual abilities	4.55	.74
Identify SAE programs that connect to agriculture curriculum	4.52	.72
Assist students in planning an agriculturally based SAE program that meets their needs	4.50	.79
Encourage students to complete a record book for their SAE program	4.46	.70
Assist students in developing SAE programs that meet their capabilities	4.45	.72
Instruct students in how to complete SAE programs	4.44	.71
Evaluate SAE programs	4.41	.74
Coordinate communications between a student, parent, employer, and myself	4.40	.88
Evaluate student's knowledge and skill development within their SAE program	4.38	.77
Provide students meaningful supervision during their SAE program	4.38	.77
Identify SAE programs that are beneficial for individual students	4.38	.79
Inform administrators about the benefits of SAE programs	4.38	.84
Identify SAE programs within a community	4.37	.72
Provide individualized instruction related to a student's SAE program	4.35	.86
Clearly communicate the procedures of SAE programs with others	4.34	.86
Assist students in acquiring necessary resources to complete an SAE program	4.28	.83
Assist students in completing a record of the financial transactions related to their SAE program	4.24	.83

Note. 5 = high, 4 = moderately high, 3 = neutral, 2 = moderately low, 1 = low

The second objective sought to ascertain the influence of prior school-based agricultural education experience on a preservice teachers' self-efficacy. There was no significant difference found between respondents with SBAE experience in comparison to respondents without SBAE experience across all items. Respondents without SBAE experience reported higher self-efficacy mean scores on "build positive relationships with administrators," "encourage students to improve their SAE programs," and "assist students in completing a record of the financial transactions related to their SAE program" (see Table 3).

The final objective of the study was to ascertain the influence of prior SAE experience on preservice teachers' self-efficacy. When examining preservice teachers' self-efficacy toward SAE, respondents who had no previous secondary-school experience with SAE reported a lower mean score (*M* = 4.08; *SD* = .78) than respondents who had secondary-school SAE experience (*M* = 4.48; *SD* = .75) on the item "provide students meaningful supervision during their SAE program." The difference in mean scores was statistically significant (p = .03). The following items reported

higher mean scores for respondents with no secondary-school SAE experience when compared to respondents with secondary-school experience: "inform administrators about the benefits of SAE programs," "clearly communicate the purpose of SAE programs with others," "assist students in selecting SAE programs that meet their individual abilities," "assist students in planning an agriculturally based SAE program that meets their needs", "evaluate SAE programs," "encourage students to improve their SAE programs," and "assist students in completing a record of the financial transactions related to their SAE program" (see Table 4).

Table 3

Preservice Teacher Self-Efficacy Towards AAAE-SAE Competencies Based on High School Ag Ed Experience

	Ag Ed Experience (n = 81)		*No Ag Ed Experience (n = 11)*		
Item: My ability to …	*M*	*SD*	*M*	*SD*	*p*
Identify SAE programs within a community	4.41	0.71	4.09	0.83	0.06
Identify SAE programs that connect to agriculture curriculum	4.56	0.73	4.27	0.65	0.09
Identify SAE programs that are beneficial for individual students	4.42	0.73	4.09	0.7	0.10
Build positive relationships with administrators	4.6	0.65	4.73	0.47	0.17
Inform administrators about the benefits of SAE programs	4.4	0.86	4.18	0.75	0.18
Instruct students in how to complete SAE programs	4.49	0.69	4.18	0.75	0.20
Clearly communicate the purpose of SAE programs with others	4.59	0.66	4.45	0.82	0.20
Clearly communicate the procedures of SAE programs with others	4.36	0.87	4.27	0.79	0.20
Assist students in selecting SAE programs that meet their individual abilities	4.56	0.78	4.55	0.52	0.21
Assist students in developing SAE programs that meet their capabilities	4.46	0.75	4.40	0.52	0.24
Assist students in acquiring necessary resources to complete an SAE program	4.35	0.79	3.91	1.04	0.31
Assist students in planning an agriculturally based SAE program that meets their needs	4.53	0.79	4.27	0.79	0.40
Provide students meaningful supervision during their SAE program	4.41	0.76	4.09	0.83	0.44
Coordinate communications between a student, parent, employer, and myself	4.48	0.9	4.00	0.63	0.54
Provide individualized instruction related to a student's SAE program	4.42	0.85	3.91	0.83	0.55
Evaluate SAE programs	4.46	0.71	4.18	0.87	0.56
Encourage students to improve their SAE programs	4.62	0.77	4.82	0.41	0.76
Encourage students to complete a record book for their SAE program	4.49	0.67	4.36	0.81	0.82
Assist students in completing a record of the financial transactions in their SAE program	4.26	0.82	4.27	0.79	0.97
Evaluate student's knowledge and skill development within their SAE program	4.41	0.77	4.09	0.7	0.97

Note. 5 = high, 4 = moderately high, 3 = neutral, 2 = moderately low, 1 = low

Table 4

Preservice Teacher Self-Efficacy Towards AAAE-SAE Competencies Based on High School SAE Experience

	SAE Experience (n = 68)		*No SAE Experience (n = 24)*		
Item: My ability to …	*M*	*SD*	*M*	*SD*	*p*
Provide students meaningful supervision during their SAE program	4.48	0.75	4.08	0.78	0.03
Identify SAE programs within a community	4.44	0.72	4.17	0.72	0.1
Clearly communicate the procedures of SAE programs with others	4.43	0.9	4.13	0.68	0.14
Encourage students to complete a record book for their SAE program	4.53	0.68	4.33	0.7	0.23
Coordinate communications between a student, parent, employer, and myself	4.49	0.94	4.25	0.68	0.26
Provide individualized instruction related to a student's SAE program	4.42	0.87	4.21	0.83	0.32
Inform administrators about the benefits of SAE programs	4.32	0.89	4.5	0.72	0.38
Encourage students to improve their SAE programs	4.6	0.81	4.75	0.44	0.4
Assist students in completing a record of the financial transactions related to their SAE program	4.24	0.87	4.35	0.65	0.57
Identify SAE programs that connect to agriculture curriculum	4.55	0.74	4.46	0.66	0.59
Assist students in selecting SAE programs that meet their individual abilities	4.53	0.82	4.62	0.5	0.59
Identify SAE programs that are beneficial for individual students	4.40	0.85	4.33	0.64	0.74
Assist students in planning an agriculturally based SAE program that meets their needs	4.49	0.84	4.54	0.66	0.78
Instruct students in how to complete SAE programs	4.46	0.73	4.42	0.65	0.79
Evaluate SAE programs	4.41	0.74	4.46	0.72	0.79
Evaluate student's knowledge and skill development within their SAE program	4.38	0.8	4.35	0.71	0.85
Assist students in developing SAE programs that meet their capabilities	4.45	0.79	4.43	0.51	0.91
Clearly communicate the purpose of SAE programs with others	4.57	0.7	4.58	0.72	0.95
Assist students in acquiring necessary resources to complete an SAE program	4.3	0.82	4.29	0.86	0.95
Build positive relationships with administrators	4.62	0.65	4.62	0.58	0.96

Note. 5 = high, 4 = moderately high, 3 = neutral, 2 = moderately low, 1 = low

Conclusions

Several conclusions can be drawn from the findings of this study. First, 95% of the participants reported SAE as an important or somewhat important component of agricultural education. Additionally, as a whole, respondents had moderately high self-efficacy across all items regarding SAE. Preservice teachers with no prior SBAE experience reported higher self-efficacy than those with SBAE experience on items such as working with administrators and encouraging students. Respondents with no secondary-school SAE experience reported statistically significant lower self-efficacy for their ability to supervise SAE, but reported higher mean scores in their self-efficacy to communicate the purpose, develop, evaluate, and encourage improvement of SAE.

Considering all data, the researchers concluded there was little difference between participants with SAE and agricultural education experience versus participants with no SAE or SBAE experience. Further, the researchers concluded that preservice teachers' prior experience did not play a role in their self-efficacy toward SAE. Finally, the researchers concluded that differentiated instruction was not needed in a preservice program based upon respondents' prior experience. The researchers agreed that further investigation of self-efficacy should be examined after respondents enter the classroom and have had an opportunity to implement what was taught in the preservice program.

Implications and Recommendations

Examining the results of the study would lead agricultural teacher educators to believe the programs that were examined in this study are successful in preparing preservice teachers for SAE development, instruction, evaluation, and supervision. Consideration of Bandura's (1986) self-efficacy, and the respondents' perceptions of their competence in SAE task-specific competencies, beginning teachers should be successful in all areas SAE. However, previous studies indicated that SAE is a struggle and, at times, seen as unimportant in SBAE by practicing agriculture teachers (Dyer & Osborne, 1995; Robinson & Haynes, 2011).

Further, unlocking the gap between theory and practice should be examined. Novice (preservice) teachers are entering the profession having high self-efficacy toward their perceived abilities to develop, implement, communicate, maintain, sustain, evaluate, and supervise SAE; yet current teachers struggle with many aspects of SAE (Swortzel, 1996). Dyer and Osborne (1995), Retallick (2010), and Wilson and Moore (2007) all indicated that teachers do not implement SAE programs as they are conceptually and theoretically defined. Therefore, a gap between what is taught in pre-service programs and what is implemented in the classroom by practicing teachers exists. Future research should examine what is happening in SBAE programs and what is feasible in regards to SAE. Future research should also examine realistic expectations of student SAE programs and the educator's role in the SAE programs.

The researchers concluded that preservice programs build preservice self-efficacy toward SAE, yet once in practice, teachers struggle to implement. There are many variables that may add to the gap between a teacher's conceptual/theoretical definition of SAE. Investigations should be conducted that examine administrators perceptions of SAE being recognized as an important part of a SBAE program, SAE importance in the community, SAE worth the implementation and supervision time by the educator, student motivation to conduct SAE, and feasibility should all be investigated to understand why SAE continues to be a struggle in a majority of SBAE programs (Terry & Briers, 2010). Further research should examine the changes in respondent's self-efficacy following their first, third, and fifth year(s) of teaching.

Finally, Stimson (1919) stated that learning is achieved through active participation during learning over and above merely observation and book learning. Therefore, SBAE preservice programs

should work to promote authentic experiences for preservice teachers to develop, implement, maintain, sustain, evaluate, supervise, and communicate an SAE program. Using the AAAE-SAE competencies in conjunction with student authentic experiences could initiate a reverse in the negative educational loop (Hawkins, 1990) that SBAE finds itself in currently regarding SAE.

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