

# Development of the Strength and Conditioning Coach Student-Athlete Satisfaction Survey (SCC-SASS®)

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## ABSTRACT

The purpose of this study was to develop a valid and reliable survey for student-athletes to assess their satisfaction with their strength and conditioning coach (SCC) and the services they provide. This three-round Delphi Method study utilized experts to establish group consensus on survey items. Round one was completed by 28 experts, round two by 24 experts and round three by 22 experts. The Delphi Method resulted in the 32 item Strength and Conditioning Coach Student-Athlete Satisfaction Survey (SCC-SASS®). Next, test-retest reliability was established by a sample (n=25) of student-athletes who were asked to complete the SCC-SASS® twice, one to six days apart. The mean pre-test score was 126.62, and the post-test score was 126.04. A Two-Way Mixed Intra Class Correlation was run, resulting in an ICC of .956. Finally, Cronbach's alpha was calculated at an alpha value of .98. The results of these tests established the reliability of the SCC-SASS®. This study led to the development of a valid and reliable survey to assess student-athlete satisfaction with their SCC and the services they provide. Knowing student-athlete satisfaction is important because student-athletes spend significant time with their SCC and higher athlete satisfaction with their sport coach is commonly associated with increased athletic performance. The development of this tool was vital to aid in assessing SCCs in hopes to further enhance the quality of the profession and

the services and quality of care SCCs provide.

**Keywords:** strength coach, college-age, quality improvement tool, group consensus, Delphi method

## INTRODUCTION

The strength and conditioning coach (SCC) is an individual the student-athlete interacts regularly with, and as such, it is important to evaluate their scope of practice to determine student-athlete satisfaction (4). Past research has shown that athletes satisfied with their sport coach translates into performing optimally in their sport (16). Moreover, research on athlete satisfaction has been primarily with coaching behaviors, athlete learning styles, and particularly with athletic training (AT) services (1, 5, 9, 15, 18, 19). Athlete satisfaction has been evaluated in regards to male and female differences and profile of sport (18, 19).

Currently, the level of student-athlete satisfaction with their SCC and their services is unknown and to the authors knowledge, there is no known evaluation tool. Therefore, the study objective was to develop a valid and reliable tool to assess student-athlete satisfaction with their SCC and the services provided in order to improve the delivery of services, student-athlete satisfaction and ultimately student-athlete performance (18).

## METHODS

A three-round Delphi procedure using an expert panel was implemented to create a satisfaction survey instrument followed by recruiting NCAA Division II student-athletes to assess the instrument's reliability. The study was approved by the Institutional Review Board at Rocky Mountain University of Health Professions (Provo, UT, USA) and a letter of support was given by the institution where the athletes were recruited.

### *Experimental Approach to the Problem*

The purpose of the Delphi Method is to obtain the most reliable consensus of a panel of experts who have real-world knowledge and experiences in the strength and conditioning profession. Implementing the Delphi technique for the purpose of this study was appropriate to establish the necessary items for a survey instrument evaluating student-athlete satisfaction with their SCC and the services they provide, as there is currently no valid or reliable tool to evaluate this phenomenon. Once the instrument was developed, reliability was established with NCAA Division II student-athletes.

### *Subjects*

For the development of the strength and conditioning coach student-athlete satisfaction survey (SCC-

SASS®), Delphi panelists were recruited through purposive sampling and contacted via email, and LinkedIn National Strength and Conditioning Association, Certified Strength and Conditioning Specialists (CSCS) interest groups. Selection was based on the following criteria: 1) must be a certified CSCS for at least one year, 2) must be proficient in reading and writing in the English language, and 3) willing to participate in two to four rounds of the Delphi study. Two additional preferred criteria were 1) current or previous experience as an SCC in the collegiate setting, and 2) teaching content related courses at the university level. The initial Delphi panel consisted of 23 males and five females. In response to work setting, two reported being in strength and conditioning education, 24 reported being full time SCCs, seen in Table 1. The mean Delphi panel coaching experience was 5.19 years. Four panelists had their bachelor's degree, 20 had their master's degree, and four had their doctorate degree. Round one was completed by 28 experts, round two by 24 experts and round three by 22 experts.

Reliability was established with student-athletes, selected based on participation as an individual or on a team roster at an NCAA Division II university, and having a SCC assigned to them or the team, respectively. For the reliability testing, 25 student-athletes completed both rounds of the SCC-SASS®. Twenty-four were included in the analysis, as one was eliminated as an outlier. Of the sample, 20.80%

**Table 1.** Delphi Expert Panel Qualifications

| Variables  | Panelists |
|--|-----------|
| <b>Years of CSCS certification</b>                                       |           |
| 2 years  | 2         |
| 3 years  | 3         |
| 4 years  | 4         |
| More than 5 years  | 19        |
| <b>Other Employment</b>  |           |
| Military   | 1         |
| Sports Therapist   | 1         |
| Head of Athletic Performance   | 1         |
| Performance Coach at Private Facility                                    | 2         |
| Full time S&C Researcher, Part Time Coach,<br>Part Time Lecturer         | 1         |
| Part-Time, Private Sector  | 1         |
| Exercise Physiologist & Assistant Director of a<br>Human Performance Lab | 2         |
| Athletic Trainer/Strength and Conditioning<br>Coach.                     | 1         |

were individual sport athletes, 79.20% were team sport athletes, 20.80% were male and 79.20% were female.

### Procedures

Three rounds of the Delphi process were used to develop the SCC-SASS®. The first round was a structured questionnaire with an initial pool of 159 items developed by the authors, based on their experiences and areas in the literature, discussing the role and interactions a SCC might have with a student-athlete. The panel members were asked to rate the 159 items on the level of importance with a Likert scale (1=not at all important, 5=very important). Panel consensus was achieved when >75% of the panelists rated an item at a 4 or better to keep an item or a 2 or less to eliminate it (3). The first round had space for qualitative comments from the panelists for recommended rewording and item additions to the subsequent round.

For round two, the remaining items and the additional questions created were then ranked using the same Likert 5-point scale. Additionally, panelists were asked to place questions into categories: Social Dynamics, Instruction, Professionalism, Services of the SCC, and Nutrition Education and Counseling. These categories were created by the PI and content expert to create structure and ensure a variety of content areas were being covered. Determination for item consensus in round two was an item having a mean of >4 and the categories the items were placed was determined by the mode.

Panelists rated the remaining items in round three using the same Likert scale in the previous two rounds. The criteria for an item to meet consensus in round three was having a mean >4.33. The items making the final round became the SCC-SASS®.

Following the development of the SCC-SASS®, a group of student-athletes were recruited to take the survey a total of two times to evaluate the test and retest reliability of the instrument (15). The recruited student-athletes self-administered the SCC-SASS® via Qualtrics by clicking on the link in the email they were sent with their invitation to participate. A reminder email was sent out one week from the initial email. Upon completing the survey, approximately 24 hours later, a link was sent to them to take the survey a second time, from which they were allotted six days to complete.

### Statistical Analyses

The Delphi round items were analyzed in round one by using the percentile ranking, and the mean was used for rounds two and three, along with the mode for category determination in round two. Statal calculations were completed using Intellectus Statistics.

Data collected from the student-athlete's reliability test were screened for accuracy, completeness, and normality. Descriptive statistics were used to describe participant characteristics. A Two-Way Mixed Intra Class Correlation (ICC), and Cronbach's Alpha were run to establish the reliability of the instrument.

## RESULTS

In round one, the panelist rated and reviewed the 159 items. No items met consensus to be eliminated (<2 on Likert scale along with >75% of the panel agreeing). Based on panelists qualitative feedback, 58 items were reworded, and 14 new items were included in round two. For round two, 173 items were reviewed and categorized by the panelists. After evaluating the cumulative mean score on each item, 69 were eliminated due to having a mean <4.00. In the third and final round, the remaining 104 items were reviewed and rated. The means for the items were evaluated and 72 items were eliminated due to having a mean <4.33. The final version of the SCC-SASS had 32 items, see table 2.

The first 27 items utilize a 5 point Likert scale from very dissatisfied (1) to very satisfied (5) (5, 14). The remaining five items were on a yes or no scale. The mean total satisfaction score for the pretest was 126.62, while the mean total satisfaction score for the posttest was 126.04. The ICC for single measures was .956, with a 95% CI (.902-.981). The Cronbach's alpha was .98 with a lower bound of .96 and an upper bound of .99.

## DISCUSSION

The current study used high methodological rigor to develop a valid and reliable survey to assess student-athlete satisfaction with their strength and conditioning coach and the services they provide. The Delphi Method established face and content validity of the SCC-SASS® through expert panelists reviewing and rating the potential items to determine

**Table 2.** Final Survey-Item Break Down

| Categories                          | Mean <4.33      | % of Survey |
|-------------------------------------|-----------------|-------------|
| Social Dynamics                     | 2 items         | 6.25%       |
| Instruction                         | 6 items         | 18.75%      |
| Professionalism                     | 8 items         | 25.00%      |
| Services of the SCC                 | 14 items        | 43.75%      |
| Nutrition Education and Counselling | 2 items         | 6.25%       |
| <b>Total</b>                        | <b>32 items</b> | <b>100%</b> |

inclusion on the final survey iteration. The Delphi Method was chosen due to its flexibility which allowed for the inclusion of many content experts to participate asynchronously.

Recommended Delphi panel sizes have been anywhere from four to 3,000 panelists, but most commonly there are 15-20 individuals included (13, 17). The current Delphi panel was near the most common ranges in the literature. Recommendations were also followed for suggested number of rounds and panelists having a variety of backgrounds and experiences in the field (2, 12). Another goal of a Delphi study is to combine panelists from both practice and academia relating to that content area to ensure the quality and expertise of the panel, which was accomplished with our panel (16).

After each round of statistical analysis and failing to narrow down the item list, the decision was made to change the criteria for item elimination to shorten the survey to increase response rate, increase compliance, and avoid carelessness in responding (6, 8). Other surveys that have been created for student-athletes have 41 to 50 items and estimated to be ten minutes in length (7, 14, 18, 19). Similarly, the 32 item SCC-SASS® takes approximately 10 minutes, meeting the length seen in the literature.

Reliability testing was fundamental in displaying the reliability of the newly developed SCC-SASS® tool. Male, female, individual, and team sport athletes at the NCAA level were represented in the sample, which is who the tool was developed for (11). The ICC displayed excellent agreement between the scores which indicated very high reliability in the tool. Additionally, the results of the high Cronbach's alpha level showed that student-athletes taking it once and again one to six days later would have the same results, showing the survey is worded in a way that would elicit the same response in that period. Having a tool with high reliability helps detect a true change in a student-athlete's satisfaction level with their SCC from season to season or when they are

assigned a new SCC.

The SCC-SASS® survey is currently the only tool known to the authors that assesses student-athlete satisfaction with their strength and conditioning coach and the services they provide. A previously developed student-athlete satisfaction survey was designed to evaluate ATs (18, 19). Unruh's (1998) survey was developed based on the Role Delineation document created for ATs (10). SCCs have a set of professional guidelines and areas they must be competent in for CSCS certification. Still, they do not have a Role Delineation standard document to describe all the features of their position. Because of this, it was necessary to gather experts in the field to build this survey through the Delphi Method.

The SCC-SASS® included items covering five domains: Social Dynamics, Instruction, Professionalism, Services of the SCC, and Nutrition Education and Counseling. The student-athlete satisfaction survey with ATs mentioned previously, created their questions from the five domains outlined in their Role Delineation paper (18). There are five domains for the CSCS examination, but they do not cover the roles and interactions that the SCC would have with a student-athlete. Therefore, they needed to be created, and categorized in order to mimic what has been done in sports medicine team member satisfaction surveys (18, 19). This study helped fill the gap in the literature on what aspects of the SCC role are important to student athletes as well as the relevant interactions in the collegiate setting.

## PRACTICAL APPLICATIONS

The SCC-SASS® has been developed to encapsulate the current trends in the strength and conditioning profession. With the survey taking student-athletes approximately 10 minutes, it can be a quick tool to evaluate annual performance and used for quality improvement. The SCC can also use the results as

evidence to their supervisors during their annual review to aid in job security.

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