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45 **Abstract**

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47 Recent work has espoused the idea that within applied sporting environments, 'fast'
48 working practitioners should work together with 'slow' working researchers.
49 However, due to economical and logistical constraints, such a coupling may not
50 always be practical. Therefore, alternative means of combining research and applied
51 practice are needed. A particular methodology, which has been utilized in recent
52 years, is qualitative research. Examples of qualitative methods include the use of
53 online surveys, one-on-one interviews, and focus groups. This article aims to discuss
54 the merits of using qualitative methods to combine applied practice and research in
55 sport science. This includes a discussion of recent examples of the use of such
56 methods in published journal articles, a critique of the approaches employed, and
57 future directions and recommendations. The authors encourage both practitioners and
58 researchers to utilize and engage with qualitative research with the ultimate goal of
59 benefitting athlete health and sporting performance.

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89 **Introduction**

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91 In a recent editorial in the *International Journal of Sports Physiology and*
92 *Performance*, Coutts¹ discussed the need to work both fast and slow in applied, high-
93 performance environments. ‘Working fast’ refers to the practitioner on the frontline,
94 required to constantly interact with coaches and athletes, whilst planning and
95 delivering preparation programs. ¹ ‘Working slow’ refers to a researcher embedded in
96 the environment whose role is to investigate new and innovative methods, ensuring
97 that they are reliable and ecologically valid. ² Examples of ‘working slow’ may
98 include investigating the sensitivity and inter-individual variability of recovery
99 monitoring tools that are implemented by practitioners, ¹ or as suggested by McCall et
100 al.², providing graded recommendations of new technologies/procedures based on the
101 robustness of scientific evidence and expert opinion. ² A parallelism of ‘fast’ and
102 ‘slow’ work should ultimately enhance many aspects of applied practice.

103

104 However, although ‘fast’ working practitioners are now common in applied
105 environments, even at semi-professional and also amateur levels, the presence of
106 ‘slow’ working researchers is more unusual. This is likely to be a function of
107 economics and the availability of resources to not only pay researchers, but also
108 provide the necessary capital to conduct pertinent research. There may also not be a
109 university or research institute with academics of a requisite skillset in close
110 proximity to the applied environment. Therefore, although it is commendable that
111 researchers have highlighted this important area, the utopic vision of having both
112 ‘fast’ and ‘slow’ workers employed in an applied setting may not always be possible.
113 Furthermore, in terms of developing research projects, researchers want data from
114 multiple sources so that a wide range of potential issues can be identified. Therefore
115 seeking alternative means of bridging the gap between research and practice is
116 necessary.

117

118 One particular methodology that has become more prevalent in recent years is the use
119 of qualitative research to connect applied practitioners and the researchers whose goal
120 is to influence applied practice. Qualitative research is a methodological approach
121 used in a wide range of disciplines, predominately to investigate human behaviour
122 and the factors influencing behavioural processes. ³ Examples of qualitative methods
123 include the use of online surveys, one-on-one interviews, and focus groups. Popular in
124 psychology, qualitative methods are utilized less frequently than quantitative methods
125 in sport science research. However, some researchers have acknowledged the role that
126 qualitative research could play in benefitting the applied environment. In Bishop’s⁴
127 “Applied Research Model for the Sport Sciences”, stages one and two refer to
128 ‘defining the problem’ and ‘descriptive research’. ⁴ These stages not only involve the
129 researcher using their own knowledge of the sport and the fundamental science
130 underpinning performance, but also approaching coaches, athletes, and practitioners
131 to gather their opinions and perceptions of pertinent issues influencing performance.

132

133 This model was refined specifically for association football (soccer) by Drust and
134 Green⁵. Within this model, the authors suggest that researchers should investigate the
135 aetiology of a problem by conducting descriptive/qualitative research, thereby gaining
136 an understanding into the possible barriers preventing uptake, while coordinating
137 studies that test the effectiveness of an intervention and its possible implementation in
138 an applied setting. ⁵ Thus, using qualitative methodologies can be the starting point of
139 pertinent and practically relevant research (both quantitative and qualitative in
140 nature).

141

142 When using a mixed-methods approach to investigate a particular issue, researchers
143 should be aware of the ontological (nature of reality) and epistemological (theory of
144 knowledge) differences between quantitative and qualitative paradigms.
145 Ontologically, in quantitative research there is a singular, objective truth, independent
146 of human perception. ⁶ However, in qualitative research there can be multiple truths
147 that are formed by an individual's perception of reality (which is seen as a social
148 construct). Epistemologically, quantitative research separates the investigator from
149 the investigated, so as not to influence the study of particular phenomena, whereas
150 qualitative research allows an interactive immersion of both parties, thereby
151 developing a mutually created picture of reality. ⁶ Qualitative methods emphasize
152 interaction and process, allowing discoveries to be made together. However, despite
153 this polarity, both methods can be used concurrently in a single study or sequentially
154 in a series of studies, predicated on the philosophies of pragmatism and
155 contextualism. Additionally, researchers who are currently reticent to use qualitative
156 methods should be aware that undertaking this type of research may not only just
157 answer particular research questions, but also provide a mutual development of
158 creative ideas that could potentially lead to future quantitative projects that are not
159 only empirical and objective, but also relevant and ecologically valid.

160

161 **Examples of the use of qualitative research**

162

163 Contemporary qualitative research involving professional soccer practitioners has
164 investigated the use of training load and player monitoring, ⁷ warm-up and half-time
165 practices, ⁸ injury prevention strategies, ^{9,10} and issues surrounding the extra-time
166 period. ¹¹ McCall et al.⁹ used a bespoke questionnaire to ask 44 practitioners working
167 worldwide at professional soccer clubs their perceptions of non-contact injury risk
168 factors, the screening tests used to detect potential injuries, and the injury-prevention
169 exercises applied at their club. ⁹ Furthermore, McCall et al.¹⁰ used an online survey to
170 determine the injury prevention strategies used, and the challenges faced by,
171 physicians working for the 32 international soccer teams competing at the FIFA 2014
172 World Cup in Brazil. ¹⁰ Gathering this type of information is useful as injuries have a
173 negative impact on successful team performance, ¹² the short- and long-term health of
174 players, ¹² and creates a large financial burden. ¹³ Follow-up research projects from
175 these investigations may include assessing the validity, reliability, and sensitivity of
176 screening tests and injury-prevention exercises, as well as developing novel and

177 ecologically valid tools that help address the needs of practitioners and the sports they
178 work in.

179

180 Furthermore, Towlson et al.⁸ surveyed 19 practitioners working in the top two levels
181 of English professional soccer about their practices related to warm-up strategies, the
182 situational and theoretical factors that underpin their use, and their value in enhancing
183 player work-rate, and ameliorating injury risk. ⁸ This work has subsequently informed
184 quantitative research projects investigating the influence of re-warm-up strategies on
185 intermittent exercise performance (i.e., ¹⁴⁻¹⁶). Anecdotally, the number of soccer teams
186 now performing re-warm-ups in the minutes before the resumption of the second half
187 of matches would appear to have increased in the last few years. Qualitative research
188 could also be used to investigate how practitioners use published research findings in
189 their applied environment. For example, questions relating to how practitioners
190 modify or adapt research findings for their own environment, or the barriers to
191 utilizing performance enhancing interventions would be of use to researchers in future
192 planning, as well as measuring the impact of their research.

193

194 Notably, and with the use of an online survey, Stoszkowski & Collins¹⁷ recently asked
195 320 coaches how they acquire and apply new coaching knowledge. ¹⁷ The results
196 demonstrated that, on the whole, coaches predominately acquire knowledge through
197 informal learning activities (with social interaction in person or through social media
198 a key factor). ¹⁷ This type of information is important as it allows researchers to
199 understand the best ways to interact with coaches and disseminate research findings.
200 As such, asking applied sport science practitioners to complete this type of survey
201 provides itself as a future research opportunity.

202

203 Qualitative methods have also been used to assess the nutritional knowledge of
204 athletes, ¹⁸ and practitioners and athletes' perceptions of concussion guidelines. ^{19,20}
205 As the importance of nutrition for optimal performance is well understood,
206 elucidating athletes' understanding of what/when they should be eating can allow
207 practitioners and coaches to better understand what level of nutritional support their
208 athletes require. Furthermore, this type of investigation can identify the (mis)use of
209 supplements, which not only has health implications, but also potential consequences
210 related to anti-doping procedures. A recent study (albeit utilizing a quantitative
211 survey) by Kelly et al.²¹ identified that only small percentages of professional rugby
212 union, rugby league, and Australian Rules football players who take β -alanine know
213 the correct dosage and the purported ergogenic benefits of the supplement. ²¹ Thus,
214 identifying gaps in athlete knowledge of nutrition and doping procedures through the
215 use of open-ended survey questions, focus groups and interviews may allow for better
216 education. ²² However, a recent systematic review of current nutrition knowledge
217 measures has identified a lack of quality with existing questionnaires. ¹⁸ The authors
218 recommend that before future studies are conducted, a new, bespoke, up-to-date and
219 validated measure of general and sport nutrition knowledge be created. ¹⁷

220

221 Utilizing qualitative research

222

223 When answering particular research questions, qualitative methods lend themselves to
224 a number of potential uses both in isolation and to compliment quantitative
225 techniques. These include talent identification and development, the translation of
226 knowledge to practice, investigating compliance, and ethnography. In terms of talent
227 identification and development, both quantitative and qualitative methods have been
228 used to assess expert performance (for a review see ²³), however, qualitative studies
229 are less common. Utilizing a mixed-methods approach, Weissensteiner et al.²⁴ used
230 both a temporal occlusion task (observing the run-up and delivery action of a swing
231 bowler and identifying at different stages in the delivery if it was an out-swing, in-
232 swing, or a short ball) and a structured interview to assess what factors contribute to
233 anticipatory skill in cricket batting. ²⁴ During the interviews, players of a range of
234 ages and playing level answered questions related to the number of hours spent
235 performing organized and unorganized sporting activities. More skilled players were
236 identifiable from their ability to use the pre-delivery information to discern what type
237 of delivery they were facing, however; hours of cricket-specific practice did not
238 explain the variance in anticipatory skill. Nevertheless, this type of mixed-method
239 approach has potential to be used in talent identification and development in a number
240 of sports, alongside the traditional quantitative approaches that are commonly used.

241

242 Translating knowledge into practice in the field of injury prevention has been
243 investigated using face-to-face interviews ²⁵ and an online survey. ²⁶ Using these
244 qualitative methods can allow researchers to identify barriers inhibiting the use of
245 particular injury prevention strategies in applied settings. This is of particular
246 importance as positive injury prevention outcomes may rely on coach and athlete
247 adherence. ²⁷ Another potential type of qualitative enquiry is ethnography.
248 Ethnography is broadly the systematic study of human races and culture, and involves
249 the close integration of a researcher in a particular environment. ²⁸ In the field of sport
250 science, ethnography may not only just benefit researchers, but also practitioners.
251 Practitioners may be able to utilize ethnographic methods through the logging of
252 observations made during interactions with athletes, coaches, and fellow practitioners.
253 This collating of data may provide useful information regarding potential issues that
254 need addressed, which practitioners may subsequently use to change their own
255 practice, in a form of effective reflection.

256

257 Due to its increasing ubiquity, social media may provide a less formal method of
258 conducting qualitative research due to its convenience and ability to bring researchers
259 and practitioners together in the same virtual space. ²⁹ The use of Twitter polls to
260 gather information is popular, as they are quick and easy to establish. However, such
261 polls can be left open to abuse, as theoretically anyone can vote and not necessarily
262 only the target audience. Other options such as private, invite-only Facebook groups
263 or password-protected forums may provide a platform for an informal interaction
264 between researchers and practitioners. Anecdotally, practitioners on social media have

265 previously bemoaned the lack of ecological validity and applicability of research that
266 is ostensibly conducted for the benefit of their applied practice. Therefore it is
267 imperative that practitioners engage with qualitative research projects (such as
268 surveys, interviews, and/or focus groups) to voice their concerns and elaborate on
269 how research can be best planned, executed, and disseminated for the benefit of their
270 practice.

271

272 Researchers beginning a doctoral program of study that is designed to impact applied
273 sport science practice may benefit from including qualitative research methods early
274 in their studies. Such investigations, and thus interactions with their target audience,
275 could potentially inform future projects, making them more ecologically valid and
276 applicable to applied practitioners. Therefore, doctoral candidates may benefit from
277 undergoing qualitative research training (if they have not been exposed to this
278 methodology previously) at the beginning of their studies to facilitate this approach,
279 whilst also ensuring rigorous and impactful research is conducted. This will also
280 allow sport science researchers to be pragmatic, protean thinkers who are able to use
281 qualitative or mixed methodological approaches to produce novel and cogent research
282 throughout their academic careers.³⁰

283

284 Researchers setting up qualitative research projects should be conscious of a number
285 of factors. Online surveys are particularly useful when trying to approach a larger
286 number of participants, as they do not require as much contact time as interviews or
287 focus groups. Although focus groups and interviews are conducted with a smaller
288 number of participants, they provide researchers with an opportunity to follow
289 different avenues of enquiry and are more likely to elicit additional information
290 compared to an online survey. When creating online surveys, it important to consider
291 the number of questions and so the time required to complete the survey, the layout
292 and aesthetics, and the language used. A number of platforms are available for the
293 creation of online surveys, including Bristol Online Surveys, Google Forms, and
294 SurveyMonkey. Having a mix of open (i.e., where practitioners are provided space to
295 elucidate their thoughts) and closed (i.e., yes or no; agree or disagree) questions is
296 beneficial as it provides a range of data for analysis and dissemination. When
297 planning focus groups and interviews it is important to develop semi-structured
298 'guides' that will help facilitate the discussions.

299

300 As with quantitative research, it is imperative that validated and robust methods of
301 analysis are used to increase the credibility of the findings. Typically following
302 collection (from open-ended survey questions, focus groups, and interviews), data is
303 transcribed, categorized, coded, displayed, and verified.²⁸ Analyses can be done
304 manually, or using specific computer software such as QSR NVivo. Detailed coding
305 and interpretation of data is performed using one of a number of analytical methods
306 that depend on the type of data collected, the objective of the research, and if an
307 inductive or hypothetic-deductive approach is being used.²⁸ Once analysis is
308 complete, member checking (i.e., sharing the findings of the study with the

309 participants) can enhance the credibility of a study. ⁶ This is because participants can
310 either endorse (thereby providing credibility) or disagree with the analyses (therefore
311 questioning the trustworthiness of the data). For more detail on designing and
312 analyzing qualitative research see ^{3,6,28}.

313

314 **Conclusion**

315

316 To conclude, qualitative research has been used effectively in sport and exercise
317 science research in recent years. The authors urge both researchers and practitioners
318 to engage in this type of research, requiring a ‘buy-in’ from both the research and
319 applied communities. A harmonious coming together of practice and research should
320 ultimately have a positive impact on athlete health and sporting performance.

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