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Whitehead, AE, Cropley, B, Huntley, T, Miles, A, Quayle, L and Knowles, ZR (2016) 'Think Aloud': Towards a framework to facilitate reflective practice amongst rugby league coaches. International Sport Coaching Journal, 3 (3). pp. 269-286. ISSN 2328-918X

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'Think Aloud': Towards a framework to facilitate reflective practice amongst rugby league coaches.

Journal:	<i>International Sport Coaching Journal</i>
Manuscript ID	ISCJ.2016-0021.R3
Manuscript Type:	Original Research
Keywords:	Coach Education, Pedagogy, rugby league, reflection

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Review

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8 **‘Think Aloud’: Towards a framework to facilitate reflective practice amongst rugby**

9 **league coaches.**

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12 **Date of Submission: 18/02/2016**

13 **Date of Revision: 19/07/2016**

THINK ALOUD FOR REFLECTIVE PRACTICE

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Abstract

15 This study aimed to design, implement and evaluate a protocol encompassing *Think Aloud* (TA)
16 as a technique to facilitate reflection-in-action and delayed reflection-on-action to aid coach
17 learning. Six British, male rugby league coaches, who reported little previous exposure to
18 reflective practice, consented to participate. Participants were: (a) instructed on how to engage
19 in TA; (b) observed in practice using TA; (c) provided with individual support on delayed
20 reflective practice on their first coaching session and use of TA; (d) observed in practice using
21 TA a second time; and (e) engaged in a social validation interview regarding their experiences
22 of TA. Analysis of in-action verbalizations revealed a shift from descriptive verbalizations to a
23 deeper level of reflection. Both immediate and post eight week social validation interviews
24 revealed that coaches developed an increased awareness, enhanced communication, and
25 pedagogical development. The participants also recommended that TA can be a valuable tool for:
26 (a) collecting in-event data during a coaching session; and (b) developing and evidencing
27 reflection for coaches. Future recommendations were also provided by the participants and
28 consequently, this study offers a unique technique to reflective practice that has the potential to
29 meet the learning development needs of coaches.

30

31 **Key words:** Coach education, pedagogy, rugby league, reflection.

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34 **‘Think Aloud’: Towards a framework to facilitate reflective practice amongst rugby**
35 **league coaches.**

36 In general terms, reflective practice is often depicted as a process of experiential learning, which
37 differs to that of in-depth analysis of practice (Leitch & Day, 2013). Individuals undertaking
38 reflective practice benefit from a representation of authentic practice, through which the
39 articulation of knowledge and practical experience leads to sustained development (Blair &
40 Deacon, 2015; Leung & Kember, 2003). Consequently, reflective practice research has, for
41 some time, contributed to the development of practitioner education amongst the ‘educare’
42 professions such as, nursing (e.g., Asselin, Schwartz-Barcott, & Osterman, 2013) and education
43 (e.g., McKenzie, 2015). More recently, coach education programs have responded, like the
44 educare professions, to the dynamic and complex world that coaches work in on a daily basis
45 and have begun to incorporate elements of experiential learning and reflective practice into both
46 the formal and informal elements of courses (Burt & Morgan, 2014; Cropley, Miles, & Nichols,
47 2015; Gilbert, 2009; Knowles, Gilbourne, Borrie, & Nevil, 2001). Some have argued, however,
48 that coach education has suffered from focusing on a type of reflection that links retrospection
49 and review to projection, differing very little from the concept of performance evaluation. The
50 view of projection refers to coaches considering ‘so what am I going to do next time’ without
51 really considering the potential implications of their proposed actions (see Cropley et al., 2015;
52 Dixon, Lee, & Ghaye, 2014 for a review). As a result, it seems necessary for coach education
53 providers to develop a more holistic understanding of reflective practice and also the tools to
54 facilitate reflective practice, so that coaches can be educated and supported to engage in
55 reflective practices that are both meaningful and impactful (Peel, Cropley, Hanton, & Fleming,
56 2013).

57 Reflective practice can be defined relative to the time in which it is conducted. For
58 example, reflection-in-action (e.g., a process of thinking-on-your-feet and reflecting during the
59 moments of actually 'doing'), reflection-on-action (e.g., a process of looking back after the event

THINK ALOUD FOR REFLECTIVE PRACTICE

4

60 and making sense of your practice to improve future action), and retrospective reflection-on-
61 action or staged reflection (e.g., reflection that occurs at different/multiple times phases and
62 outside of the action-present where the situation can no longer be affected) (cf. Gilbert & Trudel,
63 2001; Knowles, Gilbourne, Tomlinson, & Anderson, 2007; Mirick & Davis, 2015). Typically,
64 coach education courses have focused primarily on reflection-on-action as a way of helping
65 coaches to learn from their practical experiences in a productive manner (Gilbourne, Marshall, &
66 Knowles, 2013). Indeed, the premise of reflecting *on-action* via multiple time points affords
67 opportunity for the revisiting of experiences in attempts to make sense of practice, the self, the
68 context, and the symbiotic interactions between these variables. However, retrospective reports
69 of any kind are affected by reporting accuracy from memory decay (Ericsson & Simon, 1993;
70 Nicholls & Polman, 2008); distortion from knowledge about success of efforts to resolve
71 stressful events (Brown & Harris, 1978); and personal bias where an individual's reports may be
72 distorted by perceived success or failure (Bahrlick, Hall, & Berger, 1996). Nevertheless,
73 Knowles et al. (2001) found that by exposing undergraduate coaching students to reflection-on-
74 action based reflective workshops, students were able to develop reflective skills in a way that
75 countered some of the issues associated with reflection-on-action. In a follow-up to this
76 research, Knowles, Tyler, Gilbourne, and Eubank (2006) identified that, post-graduation, the
77 participants in Knowles et al.'s (2001) earlier study still engaged in reflective practice although
78 a clear gap had emerged between what had been learned through academic pedagogy and
79 delivery and the reflective practice experience of the 'real world'. Such findings suggest that
80 traditional coach education methods can have some influence on the use of reflection; however,
81 individual and situational adaptation appear to be influential for sustained use of reflective
82 practice post-completion of education (Gilbert & Trudel, 2005).

83 More recently, Burt and Morgan (2014) reported that UKCC Level one and Level two
84 rugby coaches emphasized that organization, motivation and time allowance were significant
85 barriers to their sustained engagement in reflective practice, with joint responsibility for these

THINK ALOUD FOR REFLECTIVE PRACTICE

5

86 barriers being attributed to themselves, the governing body, and also club support. There
87 appears, therefore, to be an identified need to support reflective practitioners more
88 longitudinally, building perhaps on the premise of staged reflection (e.g., Knowles et al., 2007),
89 as opposed to that of ‘taught’ sessions alone designed to educate coaches on reflective practice.
90 Such an approach is likely to foster sustained engagement in the reflective process via
91 appropriate pedagogy amongst a comprehensive, efficient educational ‘package’ to promote and
92 support the development of reflective skills over time (e.g., Burt & Morgan, 2014; Cropley et al.,
93 2015; Huntley, Cropley, Gilbourne, Sparkes, & Knowles, 2014; Taylor, Werthner, Culver, &
94 Callary, 2015).

95 Traditionally, coaches have been introduced to the act of reflective practice through the
96 medium of writing, which is often facilitated through structured models (e.g., Gibbs, 1988) that
97 aim to appropriately orientate the reflective practitioners’ thoughts through a series of questions
98 (cf. Cropley et al., 2015). It is likely that the seemingly unquestioning adoption of this approach
99 within the field of sport coaching emerged as a result of the wide support gained for it within the
100 education domain (e.g., Gadsby & Cronin, 2012). However, written, journaling reflective practice
101 approaches within sport coaching (e.g., Knowles et al., 2001; Peel et al., 2013) have come under
102 recent scrutiny for being too mechanistic and outdated (e.g., Dixon et al., 2013). Further, it is
103 believed that retrospective reflective writing could be detrimental due to the common consensus
104 that negative aspects of practice should be the focus of reflection (Dixon et al., 2013; Smith &
105 Jack, 2005). Consequently, Dixon et al. (2013) have encouraged the field of sport coaching to
106 embrace approaches to reflection that emphasize participation and facilitate innovative
107 explorations, experimentations, and purposeful alterations. Similar suggestions have been made
108 previously by Cropley, Miles, and Peel (2012) who suggested that reflective practice would only
109 be effective if the approach adopted suited the individual coach in question.

110 In light of such arguments, within the education and sport coaching domains, it has been
111 noted that reflective practice could be more effective beyond journaling alone by incorporating

THINK ALOUD FOR REFLECTIVE PRACTICE

6

112 shared conversational practices with peers or others (Dixon et al., 2013; Huntley & Kentzer,
113 2013; Knowles et al., 2007; Manrique & Sanchez Abchi, 2015). It is proposed that such shared
114 approaches afford opportunity for facilitation of ‘levelness’, and thus more critical reflective
115 practice (Knowles & Gilbourne, 2010). Gallego (2014) noted the benefits of both journaling and
116 oral scaffolding with the latter denoted as a process of supportive development, whereby an
117 individual is guided by the shared conversational practices with another to complete a task
118 (Stupans, March, & Owen, 2013). Oral scaffolding provides practitioners with the ability to
119 apply, and approach difficulties in implementing methodologies and understanding into practice.

120 In attempts to synthesize the potential benefits of a collaborative, oral approach to
121 reflective practice, Ericsson and Simon’s (1993) work into Think Aloud (TA) might offer an
122 innovative approach to reflective practice for sport coaches. Indeed, TA has been used
123 successfully in supporting reflection within pre-service teaching and advocated as a supportive
124 process for individuals to develop more critical levels of reflection in association with
125 collaborative reflection (Epler, Drape, Broyles, & Rudd, 2013). TA protocol analysis involves
126 participants verbalizing what they are thinking concurrently during a task. Ericsson and Simon
127 (1993) defined three levels of TA. *Level one verbalization* is simply the vocalization of inner
128 speech where the individual does not need to make any effort to communicate his or her
129 thoughts externally, usually this will be into a Dictaphone or a microphone. *Level two*
130 *verbalization* involves the verbal encoding and vocalization of an internal representation that is
131 not originally in verbal code. For example, verbal encoding and vocalization of scents, visual
132 stimuli, or movement (Ericsson & Simon, 1980; Ericsson & Simon, 1993). With this level of
133 verbalization, only the information that is in the participant’s focus is to be verbalized. *Level*
134 *three verbalization* requires the individual to explain his or her thoughts, ideas, hypotheses, or
135 motives (Ericsson & Simon, 1993). At level three, participants are able to engage in a level of
136 reflection where they can verbalize thoughts and feelings outside of their current or natural
137 thought processes.

138 In comparison to retrospective reports, concurrent TA reports are thought to provide a
139 more complete cognitive representation of current thought processes, and thus, facilitate a better
140 understanding of the ways in which a person is shaping their practice as it is happening (Whyte,
141 Cormier, & Pickett-Hauber, 2010). Both Gardin (2010) and Whitehead et al. (2015) have found
142 TA to be a valuable technique for collecting representative and realistic cognitive thought
143 processes, without negatively influencing performance outcomes for individuals (Whitehead et
144 al. 2015). Therefore, this technique could have similar implications for coaches, in that it will
145 not negatively influence coaching ability. Further, Whitehead et al. (2015) assessed the
146 verbalizations of thoughts provided using TA during golf performance in comparison to that
147 reported retrospectively during post performance interviews. Findings revealed only a 40%
148 similarity between themes verbalized during concurrent TA in comparison to retrospective
149 interviews. More specifically, fewer, as well as contrasting themes were verbalized during
150 interview in comparison to TA, providing support for the use of TA due to evidence of memory
151 decay and bias during retrospective recall.

152 Concurrent TA activities share similar principles to that of *reflection-in-action*, which
153 has been described as a way of ‘thinking whilst doing’ and involves rapid interpretation of an
154 event to orientate the reflector for future, better action (Schön, 1987). Given this description,
155 reflection-in-action is a fundamentally complex process. For sport coaches, for example,
156 reflection-in-action is underpinned by the socially and contextually derived nature of practice
157 and requires coaches to be both flexible in general approach and dynamic within live coaching
158 episodes (cf. Cropley et al., 2015). Research that has considered reflection-in-action in sport
159 coaching is limited due to the challenges associated with accessing what is inherently an implicit
160 process, and as a result, it is difficult to understand how reflection-in-action works and what
161 impact it has on the quality of coaching practice (Cropley et al., 2015). It is permissible,
162 therefore, to suggest that TA could be used as a technique to capture reflection-in-action during
163 the event in a dynamic and individualized way. This could then be used to contribute and

190 reflective practice prior to the study (evaluated by an initial participant selection questionnaire,
191 which is available upon request). The participants gave voluntary and informed consent prior to
192 the data collection. They had between 2 and 15 years ($M = 10.00$; $SD = 5.01$) of coaching
193 experience, and were employed within the club's youth academy at the time of the study.

194 **Data Collection**

195 **Observations of TA.** Participants were observed by the first author during their typical
196 coaching activities on two occasions. During these sessions their verbalizations were recorded
197 via an Olympus DM-650 digital recorder and a small microphone attached to the shirt collar to
198 ensure clarity of sound. In order to minimize the awareness of the recording device
199 (microphone), wires were placed inside the shirt and the device placed in the trouser pocket. The
200 observer was positioned out of the eye-line of the participant at all times in an attempt to reduce
201 disruption to normal activities. Participants were instructed to verbalize their thoughts as much
202 as possible (Level 3 verbalization) throughout their one hour coaching session. This included
203 their normal coaching session with additional reflections throughout. For example, participants
204 would give instructions and feedback to their athletes and then step back and verbalize their own
205 thoughts and reflections in action, whenever they felt the need to do so. The role of the
206 researcher within this part of the project was to prompt the coach to TA if necessary whilst
207 remaining as distant as possible in attempts to reduce the potential for bias due to the presence
208 of the researcher. Prompting involved instructing the coach to 'please keep thinking aloud' if it
209 was thought that they were not engaging in the process.

210 **Social validation and follow-up interviews.** Within three days of completing the
211 intervention (stages one to six, see Figure 1), semi-structured, social validation interviews took
212 place. Social validation procedures are suggested to strengthen the external validity of technical
213 and practical action research by offering a personal insight into the intervention through the
214 experiences of the participants (Newton & Burgess, 2008). Based on recommendations by Page
215 and Thelwell (2013), interviews were used to give participants the opportunity to expand on

THINK ALOUD FOR REFLECTIVE PRACTICE

10

216 answers that could influence future delivery of the TA intervention. An interview guide was
217 created based on the aims of the study and the extant literature (e.g., Whitehead et al., 2015) to
218 help facilitate the gathering of rich, in-depth data (Patton, 2002). The interview guide (see
219 appendix 1) consisted of three sections. Section one asked introductory questions regarding
220 demographic information and the participants' experiences of coaching, which were used to help
221 make them feel more comfortable to talk in the presence of the interviewer whilst being audio
222 recorded. Section two consisted of questions designed to elicit evaluation of the TA program,
223 including the TA coaching sessions and reflective practice workshop and the experiences of the
224 participants throughout the study. The interviews were focused around how this process had
225 impacted their own coaching and development. The final section focused on the participants'
226 experiences of the interview in order to ensure trustworthiness and accuracy. For example,
227 participants were asked whether they had been led or influenced in any way during the interview
228 process.

229 Follow-up interviews were conducted eight weeks post-intervention to explore the
230 potential retention effects of the intervention (Patton, 2002). Again, an interview guide (see
231 appendix 2) was developed that focused on the ways in which the initial TA and reflective
232 practice process had been maintained, developed, or halted. The aims here were to explore the
233 potential longitudinal impact of the TA protocol on both the reflective and professional practices
234 of the participants.

235 Procedure

236 After receiving institutional (first author) ethics approval for the study the Super League
237 rugby club were contacted and invited to participate in the study. Following their consent, the
238 participant coaches were recruited in line with the selection criteria and asked to take part in an
239 eight stage process (see Figure 1), all of whom agreed.

240 [INSERT FIGURE 1 CLOSE TO HERE]

THINK ALOUD FOR REFLECTIVE PRACTICE

241 During *stage one* participants were familiarized with the TA process. Following the
242 guidelines of Kirk and Ashcraft (2001) and Eccles (2012), participants were: (a) given
243 information about the nature and application of TA by the first author; and (b) engaged in a role
244 play task that required them to provide verbal reports of their thought processes associated with
245 a non-coaching problem. Participants were given the opportunity to ask questions during this
246 stage, given feedback on their use of TA and had the opportunity to work with the other
247 participants to discuss the practical application of TA into their coaching practice. In *stages two*
248 and *five* participants were independently observed during one of their normal coaching sessions.
249 The participant's speech and TA were audio recorded during the coaching sessions via a
250 microphone attached to their shirt collar. The participants were asked to engage in TA
251 throughout the session, however, they were prompted (by the observer, first author) to engage in
252 the process if they remained silent for longer than ten seconds. Following these coaching
253 sessions, in *stages three* and *six*, verbatim transcriptions of the participants' recorded
254 verbalizations were created and returned to them to read in order to familiarize themselves with
255 their in-action thought processes associated with the coaching session. Furthermore, coaches
256 were encouraged to reflect on their actions and their TA verbalizations prior to attending the
257 *stage four* workshop. During *stage four*, all participants attended a two hour TA and reflective
258 practice workshop conducted by the first author. The workshop consisted of: (a) information
259 relating to reflective practice and reflective questioning that could be used to support TA; (b)
260 open discussions focusing on the participants' perceptions of engaging in TA during a coaching
261 session; (c) shared reflective practice on their transcripts produced during stage three; and (d)
262 potential ways to improve the application and impact of TA. The main premise of the workshop
263 was to encourage the participants to integrate reflective questions into their thought processes in
264 attempts to improve the nature of their verbalizations. It was hoped that this would orientate
265 participants for more explicit exploration of their agency in shaping the coaching environment
266 and the learning experience inherent within it. In *stage seven*, individual social validation

267 interviews were conducted with the participants within three days of completing the intervention.
268 These interviews aimed to explore the coach's experiences of the TA protocol, the study's
269 procedures, the reflective workshops and the impact that this comprehensive process potentially
270 had on each coach and their own coaching practice. Certainly, given the unique and embryonic
271 nature of the approaches adopted in this present study (e.g., TA; professional practice
272 intervention), it was deemed necessary to support future development of the approach by
273 providing a richer account of participants' subjective experiences (cf. Mellalieu, Hanton, &
274 Thomas, 2009). Finally, follow-up interviews were conducted (*stage eight*) eight weeks post-
275 intervention to assess if there were any lasting effects (e.g., an assessment of retention, or
276 development, of approach) on the coaches' thoughts and behaviors. All interviews (stages seven
277 and eight) were conducted by the first author in a meeting room at the Super League club's
278 training facility at a time suitable for the participants. All interviews lasted between 20-40
279 minutes, were audio recorded in their entirety and transcribed verbatim to allow for a thorough
280 and trustworthy analysis of the data.

281 **Data Analysis**

282 Given the aims of the study, and the nature of the data collected, data analysis was
283 conducted in two distinct phases. The phase involved the analysis of the participants' TA verbal
284 reports that had been transcribed verbatim following the two observed coaching sessions. These
285 transcripts were inserted into NVivo 10 (QSR International, 2012) and coded based on the
286 themes modified from Gibbs' (1988) model of reflection. Table 1 provides two participant
287 examples, which were selected to represent the general experiences of all six participants and
288 provide quotes to illustrate how Gibb's model was used. Gibbs' model is presented for
289 reflection-on-action by wording questions in the past tense (e.g., what were you thinking and
290 feeling?). In this instance, the model was modified by altering the questions to the present tense
291 (e.g., what is good about what I am currently doing/observing?) and then the questions used as
292 deductive themes under which data could be categorized. Using Gibbs' model in this way was

THINK ALOUD FOR REFLECTIVE PRACTICE

293 deemed appropriate due to the efficacy of the questions given the specific context of the sport
294 coaching environment and situation (cf. Knowles et al., 2007). The data were coded in to six
295 themes. The first theme, *description*, included any verbalizations about what was happening
296 during the coaching session. The second theme, *feelings*, included any verbalizations about how
297 the participants were feeling in the given situation. The third theme, *evaluation*, involved any
298 verbalizations about what the participant thought about the situation in terms of the positives
299 and negatives. The fourth theme, *analysis*, involved any verbalizations about what might have
300 helped or hindered the situation. The fifth theme, *conclusion*, was linked to verbalizations based
301 on the participant drawing conclusions about the situation (e.g., thinking about how their
302 coaching could have created a more positive experience for themselves and their athletes). The
303 final theme, *action plan*, referred to any verbalizations that involve the participant talking about
304 possible future actions that they are going to engage in to improve or modify the situation. As
305 previously mentioned these themes were adapted from Gibbs (1988) reflective model. Once all
306 data were coded, the frequency that each theme emerged from the participants' coaching
307 sessions could be identified. Means and Standard Deviations of the quantity of themes
308 verbalized by all participants were calculated for the two TA sessions to allow for comparison
309 between pre- and post-reflective practice workshop (represented in Figures 2 and 3).

310 The second phase involved the analysis of the social validation and follow-up interviews.
311 In both instances, all transcripts were independently studied in detail by members of the research
312 team to ensure content familiarity. Utilizing themes deduced from, and categorized based on
313 links with the extant literature (e.g., Whitehead et al., 2015) and in accord with the specific aims
314 of the study, the data were then deductively analyzed via the clustering of common underlying
315 trends from the transcripts. Following procedures advocated by Hsieh and Shannon (2005), the
316 emerging deductive framework was then used to facilitate the inductive analysis of the data,
317 which involved identifying and extracting quotations that captured participants' thoughts and

THINK ALOUD FOR REFLECTIVE PRACTICE

14

318 experiences. This level of analysis allowed the opportunity to identify any emerging themes not
319 considered within the deductive framework (cf. Adams, Cropley, & Mullen, 2016).

320 Several methods were used to ensure trustworthiness throughout the data analysis
321 procedures. Member checking helped to ensure the adequacy and accuracy of the information
322 and to protect against potential misinterpretations and researcher subjectivity (Shenton, 2004).
323 All of the participants, following a review of their own interview transcripts, ratified the
324 accuracy of the data via written confirmation. All participants reported being satisfied with the
325 accuracy of the transcripts and no requests for deletions/amendments were made. In addition, at
326 every phase of the analysis, the authors engaged in coding consistency checks where validity
327 was established when the same conclusions were drawn from the data. Peer debriefing was also
328 employed at each phase of the study to mitigate researcher bias (Shenton, 2004).

329 **Results**

330 **Changes to TA Verbalizations**

331 Analysis of the frequency with which each theme was verbalized in each of the TA
332 sessions (stage 2 and 5, see Figure 1) identified that *description* was the most prevalent theme
333 across the entire study when considered both as total references (Figure 2) and when averaged
334 across all six coaches (Figure 3). However, it is apparent that the amount of *description*
335 decreased markedly (120 verbalizations to 70 verbalizations, a 41% change) from coaching
336 session one to session two (stage 2 to stage 5). Conversely, the frequency of verbalizations
337 categorized in all of the other themes increased across the two data collection points. This
338 suggests that the coaches moved away from being predominantly descriptive in their second
339 coaching session in favor of adopting other forms of comment as they became more familiar and
340 educated in the process of TA.

341 [INSERT FIGURE 2 and 3 CLOSE TO HERE]

342 In order to further exemplify the nature of the changes that occurred to the participants'
343 TA over the course of the two coaching sessions comparative quotes from the TA transcripts for
344 two of the participants are presented in Table one.

345 [INSERT TABLE 1 CLOSE TO HERE]

346 **Social Validation**

347 In order to explore how and why potential changes occurred as demonstrated in figures 2
348 and 3 social validation interviews were conducted (stage 7 of the intervention and data
349 collection procedure, see Figure 1). In line with the aims of the current study, the social
350 validation interviews focused on the efficacy of the TA and reflective practice workshop
351 intervention, and the potential impact the program had on the participants' coaching practice.
352 Three main themes emerged from these interviews, which had an overall impact and influence
353 on coaching practice: (1) increased awareness; (2) enhanced communication; and (3)
354 pedagogical change.

355 **Increased awareness.** Coaches reported becoming aware of their verbalizations due to
356 being asked to TA, however this was also reported as a benefit, in that coaches thought more
357 carefully about what they were going to say, as exemplified by C6 who said: "you're more
358 conscious obviously because you've got a microphone on you so you're a bit more picking and
359 choosing what you would say at first". Similarly, C5 said: "because I was getting recorded
360 sometimes I'd be more selective in my language as it might have sounded harsh". Furthermore,
361 increased awareness was found to be evident as a result of attending the RP workshop, as this
362 provided coaches with the opportunity to explore and question areas related to themselves. For
363 example, C6 said: "I found that it made me think both bad and good about my practice, when I
364 listened to the first tape and discussed it in the workshop, I was quite surprised how much I
365 repeat myself". Furthermore, C1 identified an increased awareness by saying:

THINK ALOUD FOR REFLECTIVE PRACTICE

16

366 It's really made me think about myself, everything really in terms of the players and
367 thinking about myself and that performance, and that's even in a game situation, thinking
368 am I doing right to intervene with the players now should I just let them get on with it.

369 **Enhanced communication.** The second theme emerging from the data related to
370 coach's perceptions that both the TA and RP workshop helped improve their communication
371 skills. For example, participants expressed how they became more articulate when providing
372 instruction to players. One coach explained: "It made me think about how I had to vocalize
373 things better...it improved my way of getting information across" (C3). Similarly C4 alluded to
374 the experience as RP workshop helping him become more confident: "now I am more confident
375 in putting it [instruction] into words, getting my point across". Furthermore, C4 said:

376 I'm trying to structure things, you know structure what I say to individuals in a certain
377 kind of way, rather than being sporadic, for example, not trying to overload them with
378 information, giving them little snippets and making sure I've got my message across.

379 **Pedagogical change.** Finally, coaches' reported improved pedagogical awareness, which
380 enhanced their practice, specifically in relation to the timing and type of coaching interventions
381 used in sessions. For example the impact of TA on C4 was evident in the following quote:

382 "when they first did the drill they were going to ground too early, so I stood back and through
383 thinking aloud, I made a few tweaks to change technique that improved the session a lot".

384 Whilst C5 attributed the safe environment of the RP workshop to providing a safe place to
385 question his approach:

386 I'm questioning myself when do I jump in, when do we question, when do I hold back,
387 when do I give them a free reign when do we stop it and say that's enough, so that's the
388 way I'm thinking now from this, I don't think I'd have had that beforehand.

389

390 Further evidence of pedagogical change was provided from C2 who said:

391 I'm not just doing a drill for the sake of it now, I'm thinking all the way through it, I'm
392 thinking could it be improved, what went well, like you said I'd set up a drill and do it
393 for the sake of doing a drill, but now I'm doing a drill and I'm thinking about how the
394 players have performed in it and how I've done in it in terms of where I'm standing, did
395 I give the right feedback, did I give too much so I'm thinking 50 times more than what I
396 was thinking for that one drill at the first.

397

398 **Follow-up (Retention and Development) Interviews**

399 The follow-up interviews (eight weeks post social validation) afforded the opportunity to
400 explore any lasting effects of the intervention as well as to examine the overall experiences of
401 the participants. Increased awareness, enhanced communication, and pedagogical change were
402 still reported as the most prevalent themes to emerge from these interviews. However,
403 participants did not directly attribute their development specifically to the TA and workshops
404 but discussed the impact of the overall project on their practice.

405 **Increased awareness.** One coach explained that the project had helped him reflect more
406 on the coaching session and the impact it had on the players:

407 At my own coaching club it has certainly got me thinking more, especially away from
408 training too and things like that, I think a heck of a lot more about the training sessions
409 and what the players are thinking and try put myself in their shoes really. (C5)

410 Whilst another coach suggested that the project has made him aware of the politically
411 correct sporting landscape "I think you're very conscious with being more politically correct, not
412 just with the children but, your outlook on life, with the adults, things like that". (C1)

413 **Improved communication.** Similar to the post workshop interviews the coaches felt
414 that 8 weeks on they had become more aware of their communication limitations and were
415 conscious of attempting to be more concise when communicating with players, as demonstrated

THINK ALOUD FOR REFLECTIVE PRACTICE

18

416 by the following quotes: “yeah it’s made an impact on me, I am more conscious of actually what
417 I say, I’d sort of say little but I’d be more specific” (C6), and:

418 I have got quite like a colloquial tone but I think when I observed myself coaching in
419 different environments [with children & adults], I couldn't coach the way I do there [at
420 the club] because the way I speak to people is different. (C3)

421 **Pedagogical change.** Coaches felt that pedagogical approaches were improved
422 particularly in session whereby coaches often need to respond to the needs of their players. One
423 coach suggested that he had learnt to reflect in and on action to bring about change: “now if
424 something's going wrong I've learned to work on the fly, change it there and then rather than
425 reflect on it when I get home” (C3). With another suggesting the reflection-in-action had
426 improved:

427 It helps me to think more when I'm actually coaching, thinking on the spot a bit more, it
428 helps me analyze it a bit more so you know you're not afraid to advance it [the drill] if it
429 needs to advance a bit. (C2)

430 **Future recommendations.** The themes that emerged from coaches perceptions of how
431 to enhance the effectiveness of this project was centered on self-improvement with four
432 solutions identified: longer intervention, include video evidence, increased personal attention
433 and embed RP in coach education. In suggesting longer interventions the coaches felt that this
434 would lead to greater improvements as demonstrated by C1 who said: “It would be great if we
435 could do more consistently to see if there are any trends. I'd think you'd see bigger
436 improvement and be able to reflect more” (C1). Similarly, the addition of using video evidence
437 was stated in the context of identifying if any learning had taken place: “video a 20 minute drill,
438 possibly go away and watch it then do the same drill the week after and see any difference” (C4).
439 Greater improvement could also be achieved through more personal attention as depicted by
440 C2, who said: “I think if we can continue to have personal attention then we would improve
441 even more”. Finally, coaches felt that RP should be embedded within coach education

442 workshops: “yeah I would definitely like to see more of this [reflective workshop] in Level 2
443 [coaching]” (C6).

444 **Discussion**

445 Whilst there has been an increase in the amount of research attention afforded to
446 reflective practice in the field of sport coaching (cf. Huntley et al., 2014), some have argued that
447 there is a need for more idiographic research within coaching practice (e.g., Partington &
448 Cushion, 2013), as well as more domain specific explorations of reflective practice and the
449 novel approaches to reflection that might best suit sport coaches (e.g., Dixon et al., 2013). The
450 aim of the current study, therefore, was to design, implement and examine the potential of using
451 TA as a way of facilitating reflection-in-action and improving coach learning. Following the
452 design and implementation of a technical and practical action research intervention program for
453 rugby league coaches, participants in demonstrated improvements in their abilities to engage in
454 TA as a form of reflection-in-action, and reported beneficial effects of engaging in TA for their
455 coaching practice. Whilst the degree of change varied amongst the participating coaches, the
456 findings of offer a unique insight into the efficacy of TA as a technique for reflective practice in
457 coaching.

458 Findings revealed that participants’ reflections-in-action using the TA protocol shifted
459 from descriptive verbalizations to feelings-driven verbalizations, although varying degrees of
460 this shift were found, with some coaches demonstrating large changes while others minimal.
461 Huntley et al. (2014) emphasized how descriptions of what is happening or happened are not (by
462 way of definition) reflection and are only part of the initial stages of the facilitation of reflection
463 and therefore, it could be postulated that the coaches in this study have demonstrated a
464 movement away from describing their experiences to a position where they are able to actually
465 start reflecting more explicitly, particularly during their in-action coaching episodes. Although
466 the description of an event is an important aspect of the reflective practice process (cf. Gibbs,
467 1988), it is argued that reflection should move beyond examining description and move to

THINK ALOUD FOR REFLECTIVE PRACTICE

20

468 critically examining the self (e.g., values, beliefs, prejudices) and how the agency a person has
469 can lead to change at local (e.g., coaching practice) and/or institutional (e.g., developing a more
470 positive culture) levels (Knowles & Gilbourne, 2010; Zeichner & Liston, 1996). Knowles and
471 Gilbourne (2010) discussed how critical reflection might serve to challenge and contest
472 established thinking and so unhinge views that a person may have had for some period of time.
473 Although we cannot identify for certain if this has happened through the data, we can observe a
474 shift in the frequency of verbalizations and thinking through the use of TA. Furthermore, in the
475 second coaching sessions, coaches TA transcripts demonstrated a higher frequency of evaluating,
476 analyzing, concluding and action planning. It could be argued here that the levelness of
477 reflection has moved to higher levels of criticality which has caused the coach to challenge and
478 question prior established thinking, and as a result, is more beneficial to the coach. TA may also
479 have allowed the coach to be more aware of their thought process, which in turn may stimulate
480 this shift in the coach's reflection and increase the likelihood of questioning his/her own
481 thoughts and actions.

482 Social validation interviews demonstrated that coaches perceived the intervention
483 positively. Coaches revealed that they had developed their coaching practice and more
484 specifically developed three main areas; their self-awareness, communication and pedagogical
485 approach. These self-recognized areas of development are what have also been described as part
486 of the role of a 'good coach' by Jacobs, Claringbould, and Knoppers (2014). By having a
487 microphone attached and being asked to verbalize thoughts and reflections in action the coaches
488 felt that they had an increased level of awareness. This included awareness of their own
489 behaviors and their interactions between other coaches and their players. This increased level of
490 self-awareness is a positive observation within the study data, as it has been acknowledged that
491 if coaches wish to change or develop themselves into individuals who create a positive
492 pedagogical setting, they must continually reflect on their knowledge and be self-aware of their
493 underlying beliefs and practices (Denison & Avner, 2011; Jacobs et al., 2014). There is also

494 both a practical and methodological implication to this finding, in that if TA facilitates reflective
495 practice and self-awareness within a coach then it can be recommended as a valid tool for future
496 use and development. In addition, using TA can allow for the move from traditional pen and
497 paper exercises, which have been deemed mechanistic and outdated (Dixon et al., 2013) to
498 embrace approaches to reflective practice that encourage an individual approach (Cropley et al.,
499 2012).

500 Furthermore, coaches reported that their communication had improved in relation to
501 player interaction. Carreiro da Costa and Pieron (1992) and Jones (1997) all identified
502 communication as being a key ingredient for effective coaching. Communication can have a
503 huge effect on how an athlete perceives their coach, and that perceived relationship between
504 coach and athlete can have a profound impact on the quality of both practice and performance
505 (Poczwadowski, Barott, & Henschen, 2002). Cushion, Armour, and Jones (2006) found that
506 within coach education one of the priorities has been to improve coaches' communication skills.
507 Jacobs et al. (2014) found that the coaches in their study highlighted how the system of formal
508 and normative coach education may not meet the needs of many coaches, and as such,
509 introducing the process of TA to develop key areas, such as reflection, self-awareness and
510 communication could be a recommendation within coach education courses.

511 From a pedagogical perspective, coaches acknowledged how the intervention (both TA
512 and workshop) has allowed them to see how they can enhance their own coaching sessions.
513 Within effective coaching practice, pedagogy is seen to be one of the key areas along with many
514 other forms of knowledge and skills (Saury & Durand, 1998). However, it is important to
515 acknowledge that there is no one-size-fits all pedagogy that prepares a coach for so many
516 contexts; however, by allowing coaches to TA during their coaching sessions and explore their
517 own thoughts and practices during a workshop, this allowed each coach to develop their own
518 practice at their own level (Lawson, 1990).

THINK ALOUD FOR REFLECTIVE PRACTICE

22

519 These reported developments were also evident post eight weeks following the coaching
520 intervention. This is important to note, as a large problem associated with continued professional
521 development (CPD) research is that it is difficult to link CPD activity and its impact on the
522 practitioners practice (Cushion, Armour, & Jones, 2003). However, within this current study
523 coaches stated that as a result of the intervention that they were involved in eight weeks prior to
524 the follow-up interview, they still had an increased awareness and enhanced communication
525 skills. They also felt their coaching practice had improved. During this set of post eight week
526 follow-up social validation interviews, coaches spoke less about specific elements of the
527 intervention and more about their development as a whole. This is a key finding given that
528 Nelson, Cushion, and Potrac (2013) have emphasized how coach education has had a limited
529 impact on the learning and development of coach practitioners.

530 Further, the present study has provided a methodology for capturing reflection-in-action
531 using TA which can then be used as a framework to facilitate reflection-on-action. By providing
532 coaches with real time in event reflections, and referring to this data following a coaching
533 session, coaches were able to reflect of real time data and information. Therefore, reducing the
534 risk of memory decay or bias (Ericsson & Simon, 1993; Nicholls & Polman, 2008) which would
535 occur if coaches are only asked to ‘think back’ to a previous session.

536 The coaches within this study provided future recommendations for this intervention,
537 with an emphasis being placed on increasing the duration of the project. Participants specified
538 that they would have liked to do more TA sessions over time and with different athletes. The
539 rationale for this was that it would enable them to reflect on their own coaching behaviors across
540 different situations, given that coaching occurs in complex, unpredictable, and changeable
541 environments. They also emphasized how they would have liked to spend more time on a one-
542 to-one basis with the facilitator to analyze and reflect on their TA transcripts and coaching
543 practice. Interestingly participants emphasized how they would like to see this kind of
544 intervention within their coach education courses that are run through their national governing

545 body. Nelson et al. (2013) identified that the participants in their study suggested that future
546 coach education courses should include relevant and usable course content and should be
547 delivered through pedagogical approaches that actively involve the course learners. Further, the
548 coaches in their study urged coach educators to provide a range of learning resources and
549 mentoring opportunities. These findings resonate with Armour and Yelling's (2004) work in
550 which PE teachers suggested that effective courses are practical in nature, with relevant
551 application to 'practices'. In line with these suggestions, this current study has attempted to offer
552 an approach to development that focuses on practical application of techniques that enhance
553 coach understanding.

554 Based on the findings from the present study and previous research (Armour & Yelling,
555 2004; Nelson et al., 2013), it is recommended that future research employs TA as a method to
556 create a practical and interactive coach education workshop that facilitates both reflection-in-
557 action and reflection-on-action by allowing TA transcripts to be further probed and discussed.
558 Further, the findings of this study support the notion that coach education courses would benefit
559 from adopting a similar framework of using TA to enhance reflective practice. This should be
560 done, however, across a greater number of coaching sessions and over a longer duration of time
561 to explore a coach's own practice at a deeper level whilst attempting to facilitate more enduring
562 change. Furthermore, additional research is needed to explore how such an intervention can be
563 used with coaches at all levels of the coaching continuum and across in a wide range of sports. If
564 previous research such as, Nelson et al., (2013) suggests that coach education has had a limited
565 impact on learning of the coach practitioner, then a potential change in learning approach may
566 be needed. Therefore, there may be a need for a shift from traditional 'stand and talk' coach
567 education over a short period of days, to a similar framework proposed within this study, where
568 the coach is supported by a facilitator over a longer period of time. In addition to making the
569 process much more self-reflective and personal to the coaches own learning journey. Moreover,
570 this type of intervention has the utility to be transferred into other educate professions whereby

THINK ALOUD FOR REFLECTIVE PRACTICE

24

571 reflective practice is acknowledged as a valuable and core element of professional training (e.g.,
572 nursing; Banning, 2008).

573 It is important to acknowledge that given the novel and embryonic nature of this research,
574 there are limitations. First, it is appropriate to highlight the small sample size and the short term
575 nature of the intervention. However, the present study serves as a pilot for future studies of this
576 nature to build upon and develop further. Second, increasing awareness via asking participants
577 to verbalize their thought processes may force participants to provide inaccurate and/or biased
578 statements as a result of participant bias (Tuckman & Harper, 2012). If this TA framework is to
579 be adopted by NGBs for their coach education programs, then it is important that they consider
580 some potential limitations of using TA. For example, the current study would suggest that TA
581 does create increased self-awareness that can lead to personal bias and appropriate training
582 (Ericsson & Simon, 1993) for coaches in the use of TA is needed for the reported benefits to be
583 achieved. It is important to note that this training process should be supported by a trained
584 practitioner. Further, future research and also those responsible for developing coach education
585 curricula within NGBs may wish to consider use of appropriate technology to reduce the
586 potential of observer bias and thus create more naturalistic environments for their coaches.
587 Matic, Osmani, Maxhuni and Mayora (2012) highlighted how classical measures of social
588 interaction (diaries, questionnaire and self-report tools) are limited in detecting social
589 interactions and are limited by recall bias issues. Therefore, they proposed such technologies as
590 smartphones as appropriate methods for collecting such data. Finally, it cannot be ignored that
591 the current study has only taken into consideration the personal views of the participating
592 coaches and it is not known what affect this has had on the athletes being coached. Therefore, it
593 is recommended that future research involves both the coach and the athlete in the evaluation to
594 identify both enhanced coaching practice and performance enhancement of the athlete.

595

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For Peer Review

753 **List of Tables**754 *Table 1.* Example quotes from TA sessions for participants 1 and 6

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757 **List of Figures**

758

759 *Figure 1.* Intervention and data collection procedure

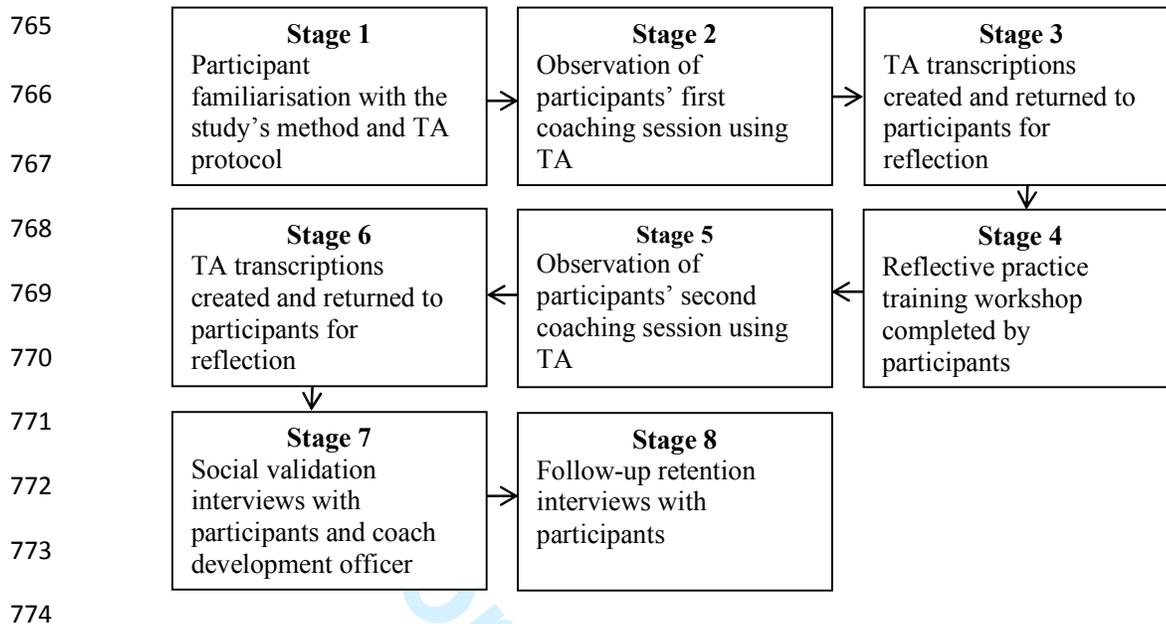
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761 *Figure 2.* Total frequency of verbalization for each of the main themes over both TA sessions762 *Figure 3.* Mean frequency of all participants' verbalizations for each of the main themes over

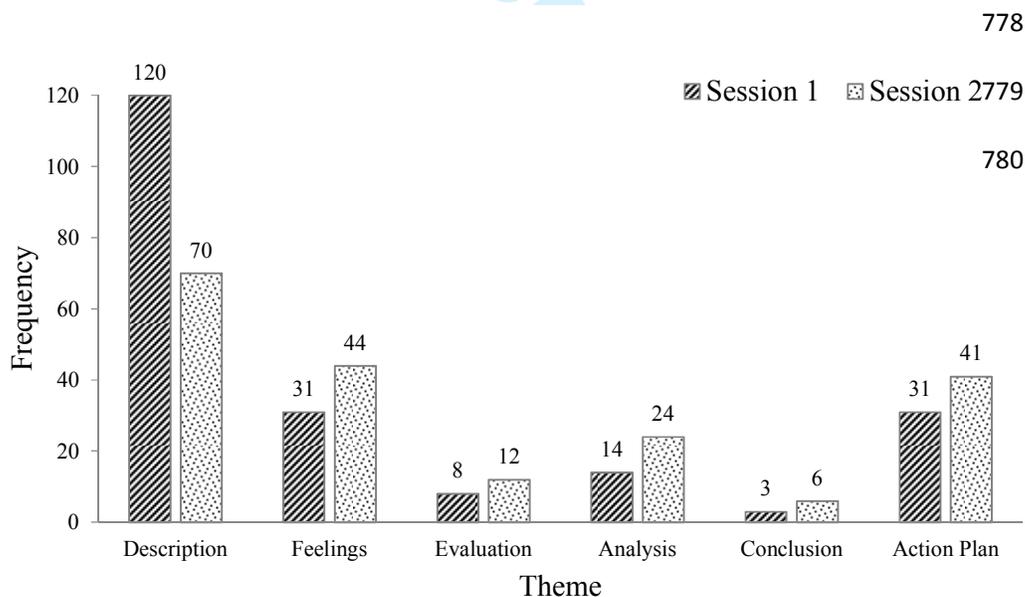
763 both TA sessions.

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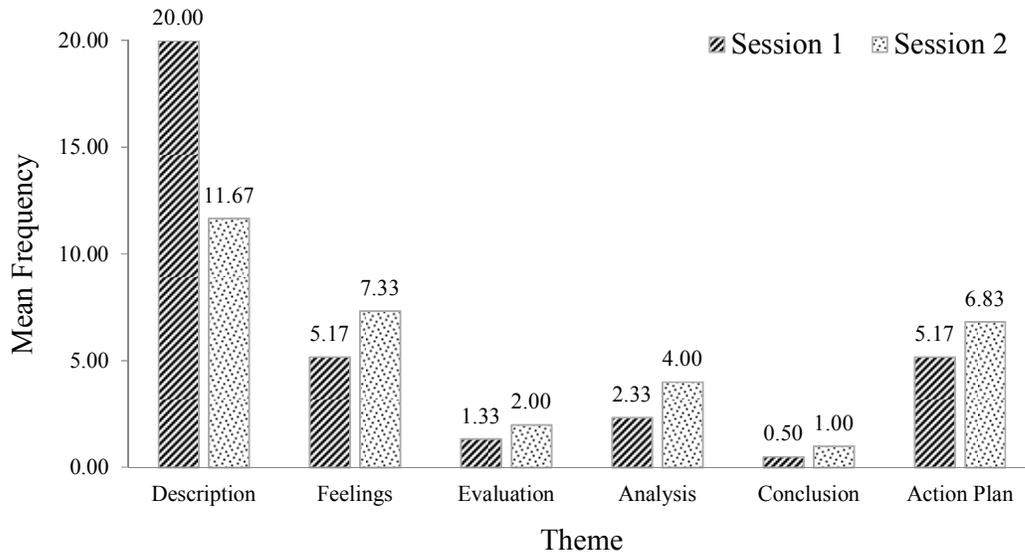


775 *Figure 1.* Intervention and data collection procedure



781 *Figure 2.* Total frequency of verbalization for each of the main themes over both TA sessions

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784 *Figure 3.* Mean frequency of all participants' verbalizations for each of the main themes over
 785 both TA sessions.

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THINK ALOUD FOR REFLECTIVE PRACTICE

787 *Table 1.* Example quotes from TA sessions for participants 1 and 6.

Theme	Participant 1		Participant 6	
	TA Session 1	TA Session 2	TA Session 1	TA Session 2
Description	“The communication has died off a bit”	“I’m moving around too much and my body language isn’t right”	“Looks like they are just going through the motions”	“That’s really lazy defense, they started lazy on the ball”
Feelings	“I don’t think I’ve given them enough confidence”	“I’m worried about how I come across”	“I don’t think they have understood what I’ve asked them to do”	“I’m struggling with their lack of effort tonight”
Evaluation	“I think what I’m asking them to do may be a little too hard, I haven’t assessed it properly”	“I’m conscious that my body language and positioning is putting them off”	“now I’m reflecting on it I can see that they haven’t understood my main points, although I can see a few are getting it”	“I think the heat might be playing a massive factor, they are switching off”
Analysis	“Maybe it’s because they are at different levels they don’t understand”	“I’ll keep watching and see how they react to me walking around”	“I’m just going to keep watching for a few more minutes before I step in”	“I think with the heat, I don’t think I should be too hard on them”
Conclusion	“I’m giving them too many answers, sometimes they just need a bit of probing”	“If I walk round more and use the space well then all players will be aware of me”	“Ok, I think my initial instructions were not clear”	“So perhaps, I need to focus on both teams”.
Action Plan	“Next time I’m going to ask more questions”	“I’m going to make my body language more open”	“I’m going to let them go a few more then I’ll put in a couple of pointers”.	“That’s what I’m going to try and pick up on now, praising both teams, advise each team rather than 1 team”

788

789

790 **Appendix 1: Social validation interview 1**

791

792

Cover Sheet

793 Name:

794 Participant Number:

795 Age:

796 Professional Status:

797 Contact Number:

798 Interview Date:

799 Start Time: Finish Time:

800

801

Participant Information (not recorded)

802

803 ▪ Purpose:

804 ○ To examine your experiences of engaging in the TA and Reflection intervention

805 ○ To consider the impact on you and your practice

806 ○ To consider how the procedure might be improved

807

808 ▪ The focus is going to be on your experiences of TA and what impact (if any) it had on you
809 and your coaching practice – or even just the way that you think about coaching

810

811 ▪ Use of a Dictaphone: required to make sure all information is collected accurately and so
812 that a transcript can be produced. You'll be sent a copy of the transcript to review to ensure
813 it is accurate as far as you are concerned and provides a true representation of your
814 experience

815

816 ▪ Confidentiality – this research has been commissioned by LJMU, however:

817 ○ anonymity will be guaranteed throughout the transcript

818 ○ quotes from transcript to be used but all identifiable factors will be removed or
819 changed

820

821 ▪ Reminder of the participants' right to withdraw and not answer any particular questions

822

823 ▪ Last section will allow you the opportunity to comment on the interview and the interview
824 process. Request for honest answers – we have a set of standard questions but I might follow
825 these up with other questions depending on your answers.

826

827 ▪ Orienting instructions

828 ○ If you're not sure of anything please let me know

829 ○ **Do you have any questions at this point in time?**830 ○ **Are you happy to start the interview?**

Social Validation Interview: Section 1 (Ice Breakers)

- 831
832
833 1. How many years have you been coaching?
834 a. What levels has that experience been at?
835
836 2. At what level do you coach at now?
837 a. Do you have any aspirations of coaching at any other levels? Why?
838
839 3. What level of qualification do you hold?
840
841 4. Who do you currently coach?
842 a. What are your main roles/responsibilities?
843 b. What do you aim to achieve? Why?
844 c. What challenges have you experienced (in line with the aims)?
845

Social Validation Interview: Section 2

- 846
847
848 1. Can you remember back to the first session you did where we attached a microphone to
849 you and asked you to think aloud?
850 a. How did you feel about being asked to do this? (e.g., awkward, confident)
851 b. What specifically can you remember from this session? Why do these things
852 stand out?
853
854 2. Do you think that being asked to think aloud effected your coaching in anyway?
855 a. Can you outline these effects? (examples)
856 b. Explore positive and negative impacts
857 c. Explore when the changes might have occurred
858 d. Explore if the changes can be attributed to TA
859
860 3. Do you think your think aloud verbalisations changed during your second think aloud
861 coaching session?
862 a. Why? In what ways?
863 b. Explore positive and negative impacts
864 c. Explore if the changes can be attributed to TA
865
866 4. How did you feel about the workshop?
867 a. What was useful?
868 b. What could be improved?
869
870 5. Do you think the workshop had any impact on your coaching?
871 a. If yes please give an example.
872 b. If no, please explain why.
873
874 6. Do you think this whole process has impacted on your own practice and learning?
875 a. In what ways? Ask for examples
876 b. If no, explore the reasons why.
877
878 7. On the whole if you had the opportunity, how would you improve this programme?
879 a. What impact would these changes potentially have?
880
881 8. Would you do the project again (why/why not)?

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Social Validation Interview: Section 3 (Conclusion)

1. During this interview do you feel that you were led or influenced in any way?
2. Were you able to tell your full story?
3. Is there anything you would like to add that you don't think was covered within this interview?

For Peer Review

895 **Appendix 2: Follow up social validation interview 8 week post intervention**

896

897

Cover Sheet

898 Name:

899 Participant Number:

900 Age:

901 Professional Status:

902 Interview Date:

903 Start Time: Finish Time:

904

905

Participant Information (not recorded)

906

907 **▪ Purpose:**908

- To examine your experiences of engaging in the TA and Reflection intervention now that some time has passed

909

- To consider the potentially lasting impact on you and your practice

910

- To consider how the procedure might be improved

911

912 **▪ Use of a Dictaphone:** required to make sure all information is collected accurately and so that a transcript can be produced. You'll be sent a copy of the transcript to review to ensure it is accurate as far as you are concerned and provides a true representation of your experience

913

914 **▪ Confidentiality –** this research has been commissioned by LJMU, however:915

- anonymity will be guaranteed throughout the transcript

916

- quotes from transcript to be used but all identifiable factors will be removed or changed

917

918 **▪ Reminder of the participants' right to withdraw and not answer any particular questions**

919

920 **▪ Last section will allow you the opportunity to comment on the interview and the interview process. Request for honest answers – we have a set of standard questions but I might follow these up with other questions depending on your answers.**

921

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929 **▪ Orienting instructions**930

- If you're not sure of anything please let me know

931

- Do you have any questions at this point in time?

932

- Are you happy to start the interview?

933

Social Validation Retention Interview: Section 1

934

1. Since taking part in the think aloud project (since we last spoke), have you noticed anything different about your coaching?

935

936

- a. Please provide examples of this.

937

- b. If yes – What would you attribute this difference to?

938

- c. If no – Why do you think that there hasn't been a difference?

939

940

2. Since we last spoke are you still using TA or different approaches to reflective practice?

941

- a. Why?

942

- b. What was the reason behind the decisions to do these things?

943

944

3. Have you been able to take anything specific away from the think aloud and reflective practice workshop?

945

946

- a. Please provide examples.

947

- b. Explore: coaching knowledge, coaching practice, self-awareness

948

949

4. How would you like to see the programme that you were involved in developed further?

950

- a. What impact would such changes potentially have?

951

952

Social Validation Interview: Section 2 (Conclusion)

953

954

1. During this interview do you feel that you were led or influenced in any way?

955

956

2. Were you able to tell your full story?

957

958

3. Is there anything you would like to add that you don't think was covered within this interview?

959

960