3D Volleyball project

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Title

« Relevance of 3D video observation training tool in competitive context: Exploratory research with volleyball coaches »

Starting point

Analysis of the literature treating about the observation by coaches in competition

Lack of study in competitive context

Very few study concerning the coaches

➔ It is a problem because of the importance of the competitive context and the coach for the performance

How can we explain this lack of data ?

1) Difficulty to get an access to the observation
2) Difficulty to act without interfering with the context

3D [3]

Starting point

Creation and evaluation of a 3D device

Analysis of the interest of the 3D device as an education tool

Descriptive tool

1) Analysis of the observations during the game
2) Analysis of the use of these observations during the timeout

Self-evaluation tool

1) Analysis of the awareness of his/her strategy of observation

Project structure

Analysis of the literature
(Article 1)

Creation and analysis of the 3D device
(Article 2)

Descriptive tool

Self-evaluation tool
(Article 5)

1) Observations during the game
(Article 3)

2) Use of the observations during the timeout (Article 4)

Article n° 1 – Scoping review

Step 1 – Research question : What does the literature contain concerning the observation by the actors in an open competitive context ?

Step 2 – Identifying the relevant studies :

➢ *Inclusion criteria* : English/french, 2001-2021, peer-review, « observation » as study object, competition context, open context

➢ *Research strategy* : Sport* AND ("Visual attention" OR "Visual attentions" OR Observation* OR Sighting* OR Vision* OR "Visual search" OR "Gaze Pattern" OR "Gaze patterns" OR "Gaze behavior" OR "Gaze behaviour" OR "Gaze Behaviors" OR "Gaze behaviours") AND (Competition* OR Contest* OR Championship* OR Tournament* OR Game*)

➢ *Database* : SPORTDiscus, Psycinfo, Eric, Sciencedirect, Scopus → 107/13.229 articles

➢ *Bibliography* : 65/4.667 articles

➢ *Main journals database* (12) : 14/8.927 articles

➔ *Total* : 186/26.823 articles

6

Article n° 1 – Scoping review

Step 3 – Articles selection : 2 researchers + 1 if difficulty to find consensus → 60/128 articles

Step 4 – Data extraction :

➢ Descriptive information : year, country, journal type, aims, designs, tools, sport, population

➢ Thematic information : results of the studies

Step 5 – Results

R

Article n°1 – Scoping review

Step 5 – Results

➢ Observation more and more studied trough the last years in several types of journals

➢ Majority of cross-sectional studies using eye-tracking → Lack in term of phenomenon comprehension + Eye tracking limits

➢ Very few studies using new technologies

➢ Only two studies analysed an entire competition
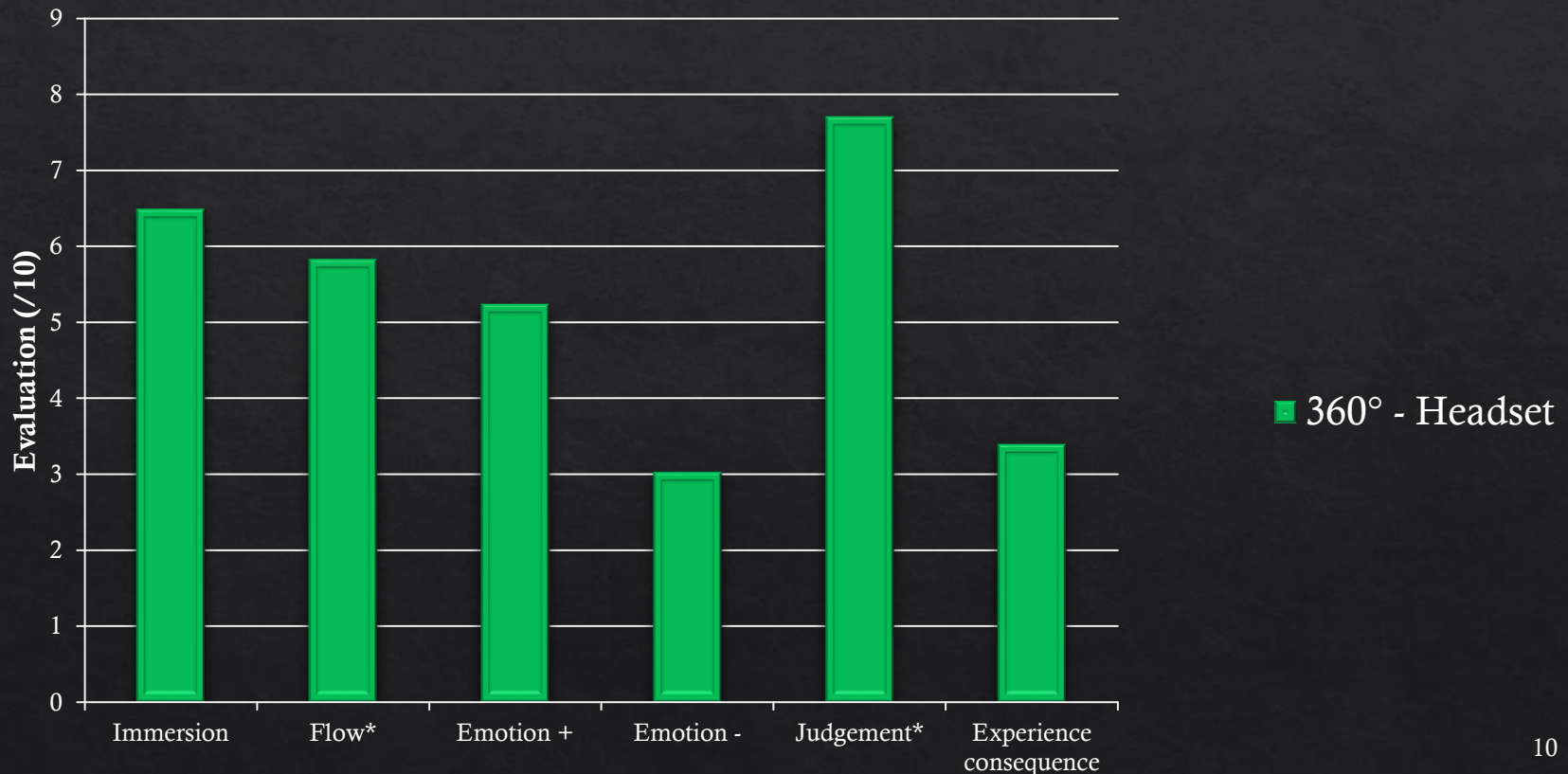
➢ Very few studies analysing coaches observations

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Article n°2 – Creation and evaluation of the device

◈ **Aim :** Characterize the coaches's feelings in the environment

1) 17 coaches

Introduction	Think aloud training	Sequence n°1	Sequence n°2

Questionnaire
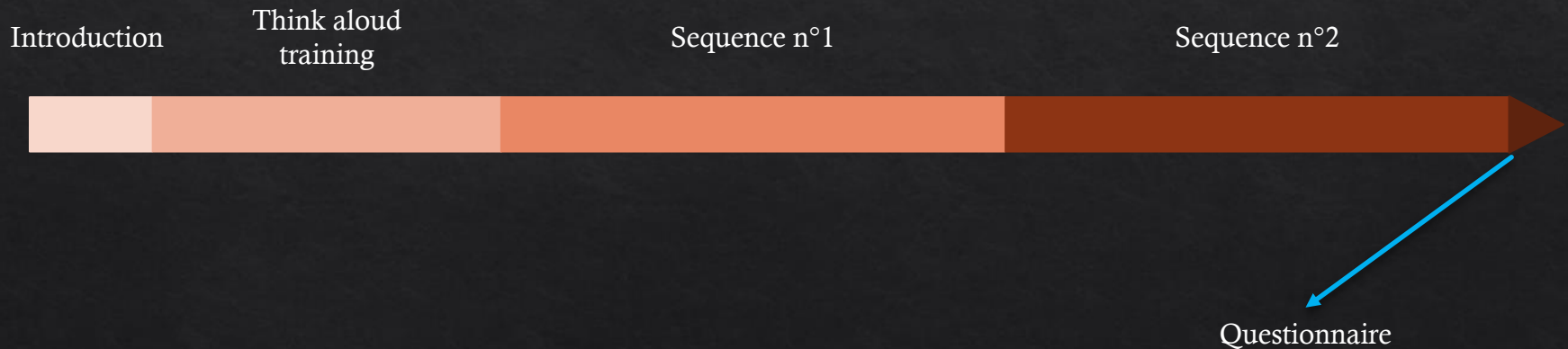
Article n°2 – Creation and evaluation of the device

Article n°2 – Creation and evaluation of the device

➢ Great score of immersion despite the lack of some important elements : body movement, self-representation, interaction … (Salter & Wilbur, 1997) BUT Engagement because of the scenario and the texture of the environment → Correlation between immersion and learning outcomes (Makransky & Lilleholt, 2018)

➢ Great score of flow for an environment without interaction BUT the lack of interaction is mentionned in the open-ended questions → Use of the device limited to the observation of the action

➢ Great score of judgment is important to remain involved in a task (Gagné & Deci, 2005)

➢ Very few negative consequences

➢ More positive than negative emotions → Positive for the intrinsic motivation

Article n°3 – Analysis of the observations

◈ **Aims :** Analysis of the coaches' observations and the capacity of the device to give interesting information for coaches education

| Introduction | Think aloud training | Sequence n°1 | Sequence n°2 |
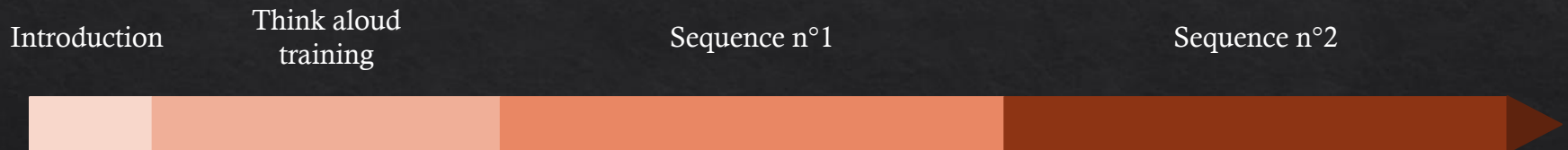
Article n°3 – Analysis of the observations

> 24 coaches

> Two independant variables :

- Gender of players

- Trainers expertise

> Multidimensional analysis : referencial/target/register (tactical, technical…)

> Analysis of specific actions

Article n°3 – Analysis of the observations

Main results :

1) General

   1) More than 80% of observations on his/her team

2) Referencial

   1) The experts seem to take their eyes off the ball more than the otehrs (Serve/Attack vs Reception/Block)

   2) Coaches of male teams look more the block and less the defense

3) Register

   1) The experts seem to target more their observations

4) Specific actions

   1) More frequent observations by the experts

   2) Confirmation of the decentration of the gaze theory

Article n°4 – Observation during the timeout

◇ **Aim :** Analysis of the relevance of the information selected et transmitted to the players during the timeout

Introduction

Think aloud training

Sequence n°1

Sequence n°2

Recall questionnaire
+ Rating (/10)
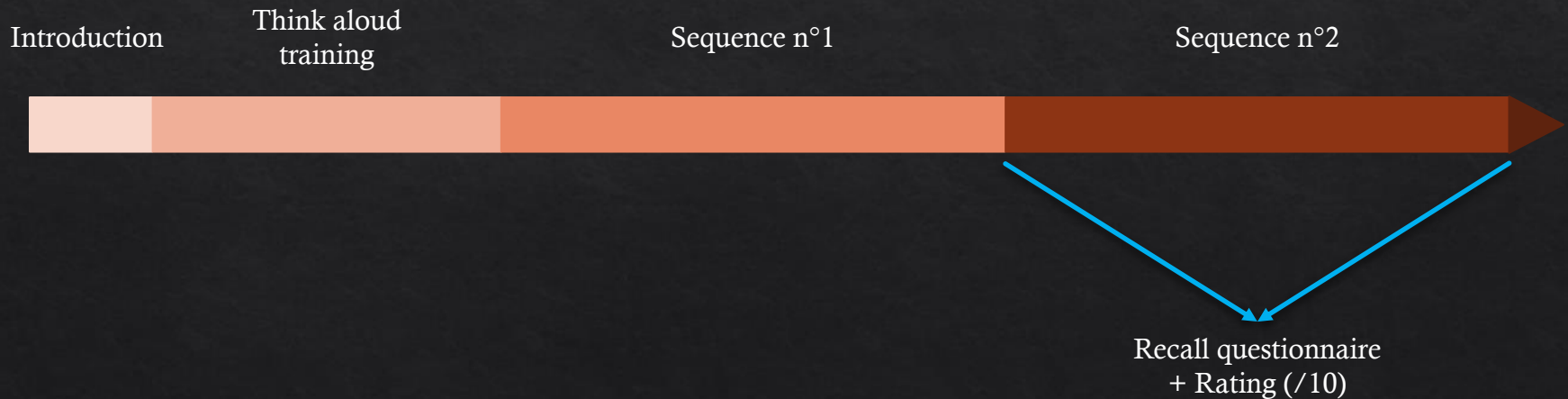
Article n°4 – Observation during the timeout

> 17 coaches

> Two dependant variables :

- The relevance of the content transmitted during the timeout (information <-> score /10)

  - The delay between the observation and the timeout

> Two independant variables :

- Coaches characteristics : expertise + level of coaching

  - Characteristics of the situation

Article n°4 – Observation during the timeout

Main results :

1) General

    1) Operating ratio : 20%

    2) High importance score (P50=8/10, P75=10/10)

    3) 30% of the information recalled in each 1/3 de séquence

2) Relevance score

    1) Only 2 coaches with the maximal score

    2) Higher in a difficult game situation
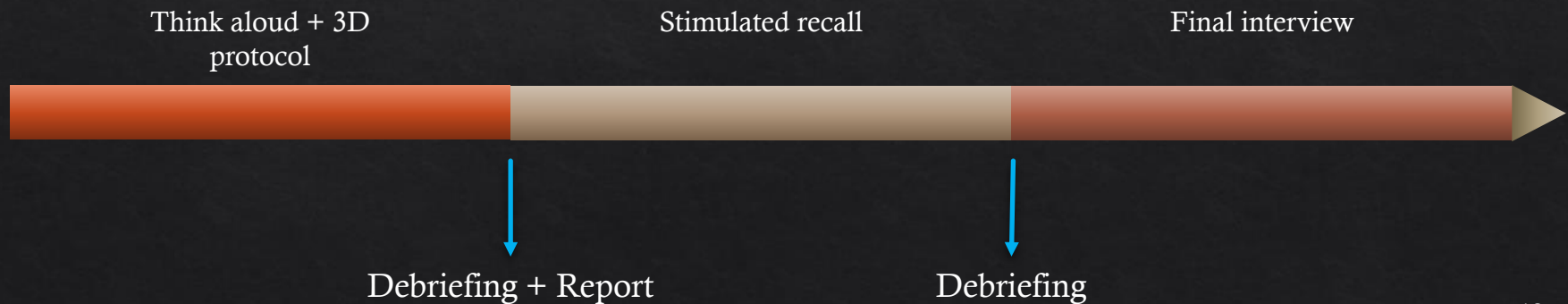
3) Delay score

    1) Median : 7 elements

Article n°5 – Analysis of the interest of the device as a self-evaluation tool

◇ **Aims :** Analysis of the impact of the protocol on the awareness of his/her observation strategy
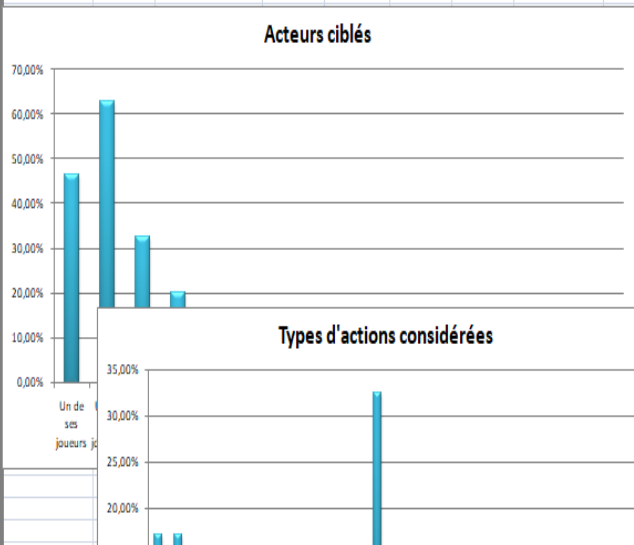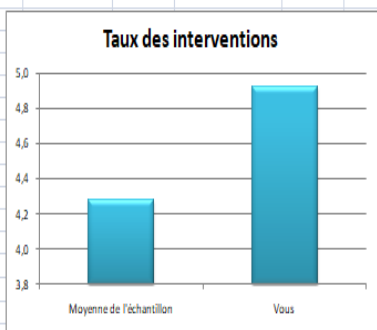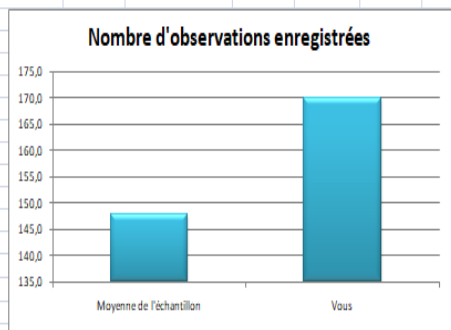
➢ Cases study – 7 coaches

Think aloud + 3D protocol	Stimulated recall	Final interview

Debriefing + Report   Debriefing

Encodage

Cible	Référentiel	Registre	rquants
3	0	4	
2	0	4	
3	5	2	
3	9	2	
3	9	2	
3	5	2	
3	9	2	
2	9	1	
3	7	2	
3	5	1	
3	7	2	
1	4	2	
3	9	2	
2	4	1	
1	2	2	
2	2	2	
2	4	2	
2	9	2	
0	11	2	
3	4	2	
1	9	1	
0	11	2	
0	11	2	
2	9	1	
2	3	1	
2	4	1	
2	9	1	
5	0	0	
2	2	1	
2	4	2	
0	11	2	
2	1	2	
2	9	2	
2	4	1	
2	4	1	
2	1	2	
2	4	2	
2	9	1	
2	4	1	
2	1	2	
2	1	2	
3	10	2	
0	11	2	
3	4	5	
2	9	5	
2	1	2	
2	9	2	
1	9	1	
2	3	1	
2	4	1	
2	4	1	
2	1	2	
2	9	2	
1	9	2	
1	9	1	
2	9	2	

Nombres d'informations

Cible		Référentiel		Registre		Total
Sans objet	12	Sans objet	8	Sans objet	3	170
mon équipe	34	service	21	technique	39	
un de ses joueurs	107	réception	7	tactique	113	
équipe adverse	13	passe	18	organisation	0	
joueur adverse	1	attaque	29	composition	4	
arbitre	2	défense	3	autre	11	
coach adverse	1	relance	3			
autre	0	couverture d'attaque	5			
		couverture de bloc	1			
		contre	55			
		écran	8			
		temps mort	12			
		autre	0			

% d'informations

Cible		Référentiel		Registre	
Sans objet	7,06%	Sans objet	4,71%	Sans objet	1,76%
mon équipe	20,00%	service	12,35%	technique	22,94%
un de ses joueurs	62,94%	réception	4,12%	tactique	66,47%
équipe adverse	7,65%	passe	10,59%	organisation	0,00%
joueur adverse	0,59%	attaque	17,06%	composition	2,35%
arbitre	1,18%	défense	1,76%	autre	6,47%
coach adverse	0,59%	relance	1,76%		
autre	0,00%	couverture d'attaque	2,94%		
		couverture de bloc	0,53%		
		contre	32,35%		
		écran	4,71%		
		temps mort	7,06%		
		autre	0,00%		

Graphiques

Cible		Référentiel		Registre		Total		Taux	
Un de ses joueurs	46,47%	Attaque	16,99%	Tactique	52,26%	ne de l'écha	147,8	ne de l'écha	4,3
Un de ses joueurs	62,94%	Attaque	17,06%	Tactique	66,47%	Vous	170	Vous	4,9
Mon équipe	32,56%	Passe	15,41%	Sans objet	34,29%				
Mon équipe	20,00%	Passe	10,59%	Sans objet	1,76%				
Joueur adverse	13,16%	Sans objet	13,46%	Composition	7,22%				
Joueur adverse	0,59%	Sans objet	4,71%	Composition	2,35%				
Equipe adverse	4,29%	Service	12,63%	Technique	5,94%				
Equipe adverse	7,65%	Service	12,35%	Technique	22,94%				
Sans objet	1,88%	Réception	12,48%	Organisation	0,30%				
Sans objet	7,06%	Réception	4,12%	Organisation	0,00%				
Autres	1,13%	Contre	12,03%						
Autres	0,00%	Contre	32,35%						
Arbitre	0,38%	Autres	5,19%						
Arbitre	1,18%	Autres	0,00%						
Coach adverse	0,15%	Défense	3,53%						
Coach adverse	0,59%	Défense	1,76%						
		Relance	2,41%						
		Relance	1,76%						
		Couv. bloc	2,03%						
		Couv. bloc	0,53%						
		Couv. attaque	1,65%						
		Couv. attaque	2,94%						
		Temps mort	1,58%						
		Temps mort	7,06%						
		Ecran	0,60%						
		Ecran	4,71%						

Nombre d'observations enregistrées

(bar chart: Moyenne de l'échantillon, Vous)

Taux des interventions

(bar chart: Moyenne de l'échantillon, Vous)

Acteurs ciblés

(bar chart)

Types d'actions considérées

(bar chart: Un de ses joueurs jo...)

Registres concernés

(bar chart)

A.3) Les types d'actions considérées

La figure 4 démontre la proportion des observations concernant la nature des actions de jeu. De nouveau, les bâtonnets bleus et verts concernent respectivement les observations des autres coaches et les vôtres.
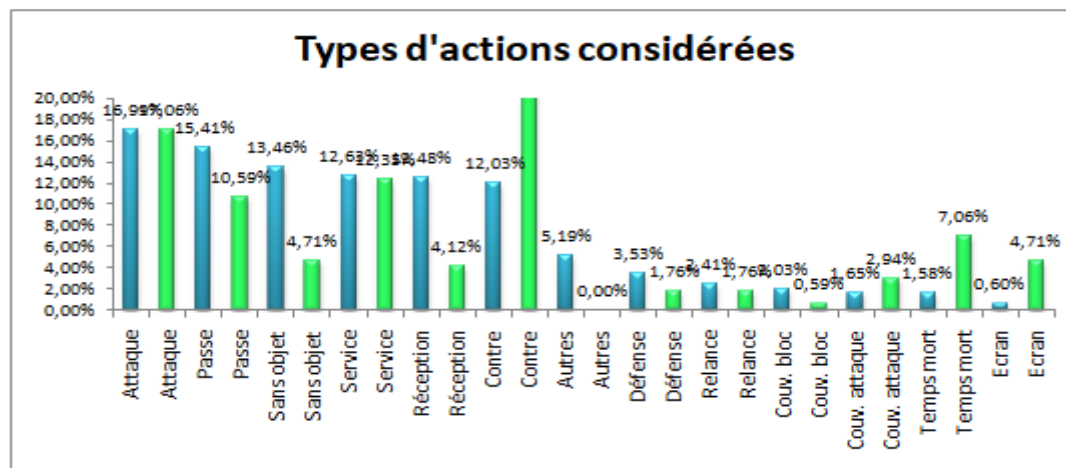
Au-delà des interventions « sans objet », 5 types d'actions sont plus observées que les autres par l'échantillon. Dans l'ordre, il s'agit de l'attaque, de la passe, du service, de la réception et du contre. La défense, la relance, les couvertures, la prise de temps mort et les écrans sont en-dessous de 10%.

A.4) Les registres d'action

La figure 5 traite des grandes catégories d'observation pouvant se réaliser. Encore une fois, les bâtonnets verts représentent vos observations.
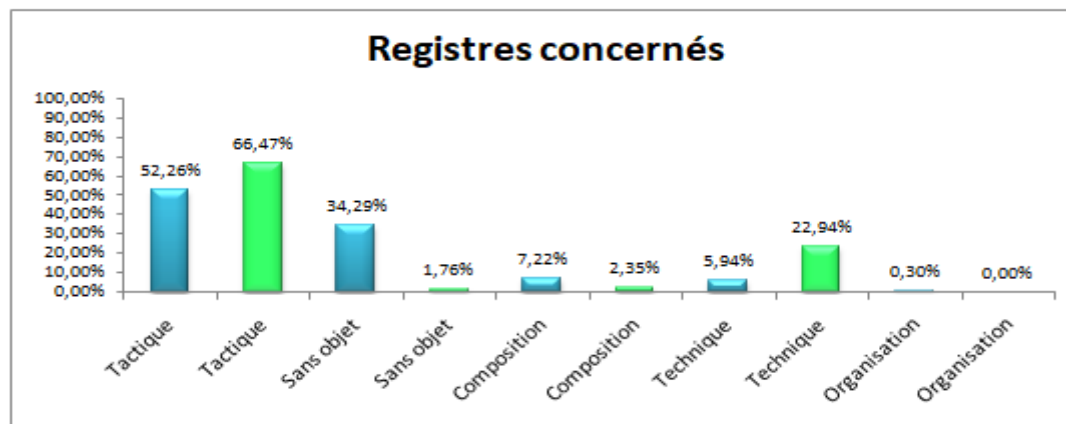
Article n°5 – Analysis of the interest of the device as a self-evaluation tool

Analysis of the results :

➢ Multidimensional analysis

  ➢ Observations report

  ➢ Debriefings

  ➢ Remarques du rappel stimulé

  ➢ Final interview

Article n°5 – Analysis of the interest of the device as a self-evaluation tool

Analysis of the results :

➢ 6/7 coaches question their observation strategy

➢ Positive points : no cybersickness, report, practical aspect, individualisation, quality of the device (immersion, visual quality, innovation)

➢ Improvement points : Longer cycle, level of the game, lack of interaction

Thank you for you attention !