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An examination of the differences in flow among players of different games and sports

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Abstract
The purpose of this study was to measure the difference in flow experiences among players participating in Individual Sports, Team Sports and E-Sports. For the purpose of the present study, 100 male subjects (individual sports=44, team sports=36 and e-sports=20) volunteered participate in the study were chosen. Their age ranged between eighteen to twenty five years. Subjects ready to participate in the present study were selected from different colleges affiliated to Punjabi University Patiala. To measure the flow experiences of selected subjects for the present study, the Dispositional Flow Scale-2 (DFS-2) developed by Jackson & Eklund (2004) was administered. To find out the differences in mean of every selected group for chosen variable, One-way ANOVA was applied. For more analysis Scheffe's Post-Hoc test was applied. To test the hypotheses, level of significance was at 0.05. Found results were insignificant on all sub-variable of Flow State except on sub-variable Loss of self-consciousness among selected groups of athletes.

Keywords: Individual Sports, Team Sports, E-Sports, Flow State, Players

Introduction

Sport Psychology has significantly changed our lives and the lives of so many athletes, coaches, and other sport and exercise experts with whom we have worked and trained over the years. Sport Psychology is the area of performance enhancement and has much of practical value to offer sports performers. The profession of sport psychology developed during the 1970s and 1980s based on this premise (Jackson and Eklund) [3, 4, 5]. Flow in an activity is highly pleasing for competitors because of the association among flow and peak performance (Jackson and Roberts 1992; Landhäußer and Keller 2012) [6]. According to Jackson, [8] "Flow" is a state of mind – achieved when athletes feel totally emerged in their performance, lose their awareness of time, focus on the given task (without distraction or dilution), and, perform at very high levels. According to Ryan *et al*., [10] Flow experience throughout activity can lead to enjoyment, which, thus, seems to play a significant role in exercise adherence. Apparently accomplishing flow in work out may encourage inborn inspirations, which, in turn, has been shown to enhance persistence in participation. According to Brewer, *et al*., [1] "effect of performance outcome on self-report assessments of psychological states could be compromised by procedure of retrospective introspection. Accompanying an alert mindset are factors such as knowing exactly what one is going to do and how one is doing, having a sense of oneness with the task being performed, and feeling in control of one's performance". It as "a deeply rewarding and optimal experience characterized by intense focus on a specific activity to the point of becoming totally absorbed in it" (Jackson & Csíkszentmihályi, 1999) [7]. According to Jackson and Eklund (2004) [2] flow construct in terms of nine dimensions; "the first of these dimensions, challenge– skill balance. The other dimensions are action–awareness merging, clear goals, unambiguous feedback, concentration on task, sense of control, loss of self-consciousness, time transformation, and autotelic experience". Collectively, all these nine dimensions represent the most favorable psychological state of flow; by themselves, they mean conceptual elements of the flow experience. The Flow state tool (DFS-2) constructed by Jackson & Eklund (2004) was administered to find out the differences in flow experiences among players participating in Individual Sports, Team Sports and E-Sports.

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Subjects

One Hundreed male athlete's interested volunteerely to participate in the study were selected for this study with age ranged between eighteen to twenty five years. These athletes were selected purposively, from the colleges affiliated to Punjabi University, Patiala and Punjab.

Table 1: Detail of selected subject's (Individual Sport, Team Sport and E-Sports) of Punjabi University, Patiala, Punjab (N=100).

Punjabi University, Patiala, Punjab (N=100)				
Individual Sports(N1=44)	**Athletics (12)**	**Archery (12)**	**Gymnastics (06)**	**Badminton (7)**	**Chess (7)**
Team Sports (N2=36)	Volleyball (12)		Kabaddi(N.S) (12)		Handball (12)
E-Sports (N3=20)	E-Sports (20)				

Variables

To determine the difference in flow experiences of selected subjectsfor the study in hand, thequestionnaire(DFS-2) created by Jackson & Eklund (2004) was administered. This DFS-2 tool consists of nine sub-variables as shown in Figure-1.
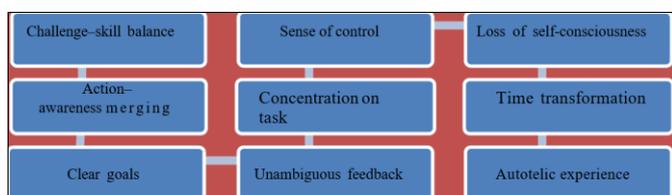
Statistical techniques employed

The following parametric statistical techniques were used:-
1. ANOVA (Analysis of Variance).
2. Scheffe's Post-Hoc test.
3. The level of significance was set at 0.05.
4. Statistical Package for the Social Science (SPSS) version 14.0 was used for all analysis.

Table 2: Result of ANOVA with regards to variable Flow State among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	795.895	2	397.947		
Within Groups	19281.745	97	198.781	2.002	.141
Total	20077.640	99			

Found p-value is .141, insignificant at p > .05.

According to Table-2 found result of ANOVA with regard to variable Flow State amongst Individual Sports group, Team Sports group and E-Sports group were recorded statistically in significant.

Table 3: Result of ANOVA with regard to sub-variable Challenge skill balance amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	3.509	2	1.754		
Within Groups	277.081	97	2.857	.614	.543
Total	280.590	99			

Found p-value is .543, insignificant at (P > .05).

As Table-3 shows that results of ANOVA with regards to sub-variable Challenge skill balance amongst Individual Sports group, Team Sports group and E-Sports group were statistically insignificant.

Table 4: Result of ANOVA with regards to sub-variable Action-awareness merging among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	4.459	2	2.229		
Within Groups	464.301	97	4.787	.466	.629
Total	468.760	99			

Found p-value is .629, insignificant at p > .05.

According to Table-4 result of ANOVA with regards to Action-awareness merging between Individual Sports group, Team Sports group and E-Sports group were recorded statistically insignificant.

Table 5: Result of ANOVA with regards to sub-variable Clear goals amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	6.884	2	3.442		
Within Groups	344.756	97	3.554	.968	.383
Total	351.640	99			

Found p-value is .383, insignificant at p > .05.

According to Table-5 result of ANOVA with regards to Clear goals between Individual Sports group, Team Sports group and E-Sports group were recorded statistically in significant.

Table 6: Result of ANOVA with regard to sub-variable Unambiguous feedback amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	20.304	2	10.152		
Within Groups	599.086	97	6.176	1.644	.199
Total	619.390	99			

Found p-value is .199, insignificant at p > .05.

According to Table-6 results of ANOVA with regards to sub-variable Unambiguous feedback amongst Individual Sports group, Team Sports group and E-Sports group were recorded statistically insignificant.

Table 7: Result of ANOVA with regard to sub-variable Concentration on the task at hand amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	8.229	2	4.114		
Within Groups	355.081	97	3.661	1.124	.329
Total	363.310	99			

Found p-value is .329, insignificant at p > .05.

According to Table-7 results of ANOVA with regard to sub-variable Concentration on the task at hand amongst Individual Sports group, Team Sports group and E-Sports group were recorded statisticallyinsignificant.

Table 8: Result of variance (ANOVA) with regard to sub-variable Sense of control amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d. f.	Mean square	F-value	p-value
Between Groups	11.435	2	5.717		
Within Groups	577.725	97	5.956	.960	.387
Total	589.160	99			

Found p-value is .387, insignificant at p > .05

According to Table-8 results of ANOVA with regards to sub-variable Sense of control amongst Individual Sports group, Team Sports group and E-Sports group were recorded statistically insignificant.

Table 9: Result of variance (ANOVA) with regard to sub-variable Loss of self-consciousness, amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d. f.	Mean Square	F-value	p-value
Between Groups	36.584	2	18.292		
Within Groups	411.416	97	4.241	4.313	.016
Total	448.000	99			

Found p-value is .016, significant p < .05

According to table-9 results of ANOVA were recorded statistically significant among Individual Sports, Team Sports and E-Sports players on the sub-variable Loss of self-consciousness. As the acquire F-value was recorded significant, after that post-hoc test was applied to learn the direction and significance of differences amid paired means. Outcomes of post-hoc test have been presented in Table-10.

Table 10: Result of post-hoc test with regard to sub-variable Loss of self-consciousness among Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Group (A)	Group (B)	Mean Difference	Sig.
Individual Sports (16.9773)	Team Sports	.17172	.934
	E-Sports	1.57727*	.021
Team Sports (16.8056)	Individual Sports	-.17172	.934
	E-Sports	1.40556	.055
E-Sports (15.4000)	Individual Sports	-1.57727*	.021
	Team Sports	-1.40556	.055

According to Table-10 calculated mean of Individual Sports group was recorded as 16.977. While Team Sports group had calculated mean value as 16.805 and the difference in mean amid these two groups was recorded as .17172. Result of post-hoc test shows that the Individual Sports group had performed significantly superior with regards to sub-variable Loss of self-consciousness than the Team Sports group.

Calculated mean of Individual Sports group was recorded as 16.9773. While mean value of E-Sports group was recorded as 15.4000 and the mean difference amid these two groups was recorded as 1.57727. It revealed that the Individual Sports group had performed significantly better on sub-variable Loss of self-consciousness than the E-Sports group.

Calculated Mean of Team Sports group was recorded as 16.8056. But mean value of E-Sports group was recorded as 15.4000 and the mean difference amongst these two groups was recorded as 1.40556. It revealed that the Team Sports group had performed significantly better on Loss of self-consciousness E-Sports group.
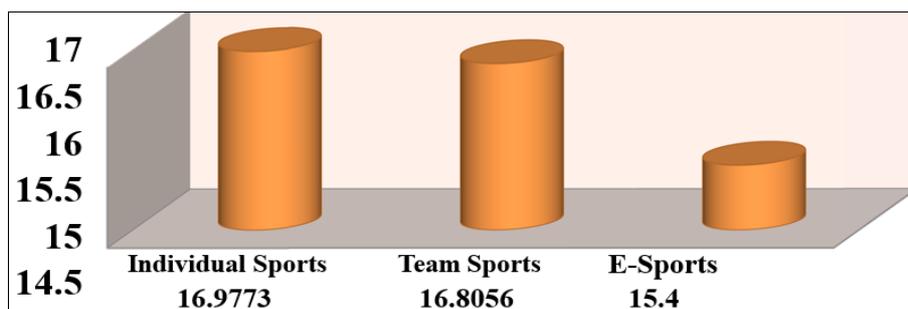
Fig 1: Graphical representation of mean scores with regards to sub-variable Loss of self- consciousness among Individual Sports, Team Sports and E-Sports players.

Table 11: Result of variance (ANOVA) with regards to sub-variable Time transformation among. Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	.192	2	.096		
Within Groups	260.718	97	2.688	.036	.965
Total	260.910	99			

Found p-value is .965, insignificant at p > .05.

According to Table-11 results of ANOVA with regard to sub-variable Time transformation among Individual Sports, Team Sports and E-Sports were recorded statistically in significant.

Table 12: Result of variance (ANOVA) with regard to sub-variable Loss of Autotelic experience amongst Individual Sports, Team Sports and E-Sports players of Punjabi University, Patiala.

Source of Variation	Sum of Squares	d.f.	Mean Square	F-value	p-value
Between Groups	25.051	2	12.525		
Within Groups	417.949	97	4.309	2.907	.059
Total	443.000	99			

Found p-value is .059, insignificant at p > .05.

According to Table-12 results of ANOVA with regard to sub-variable Autotelic experience among Individual Sports, Team Sports and E-Sports were recorded statisticallyinsignificant.

Conclusion

Results of the present investigation revealed that no significant differences were found among. Individual Sport group, Team Sport group and E-Sports group on the sub-variables i.e., Challenge Skill Balance, Action-Awareness Merging, Clear Goals, Unambiguous Feedback, Concentration on the Task at Hand, Sense of Control, Time transformation and Autotelic experience. But there was significant difference with regards to Loss of self-consciousness among players of selected groups.

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