Remittances Review
June 2024,
Volume: 9, No: 3, pp.1755-1773
ISSN: 2059-6588(Print) | ISSN 2059-6596(Online)
Received: 20 May 2024, Accepted: 15 June 2024
DOI: https://doi.org/10.33282/rr.vx9i2.95

THE ROLE OF MENTAL GAME PLAYING ON PRODUCTIVITY OF EMPLOYEES: AN INTERVENTION STUDY IN UK CALL CENTRES

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Abstract

This study explores the significance of mental game playing as a strategy to enhance objective productivity among call center employees. By leveraging work breaks effectively, mental game playing aims to maintain employee productivity and improve work arrangements. Employing an exploratory design, the research involved a four-week on-site intervention study with both a comparative group and an intervention group. Variations in productivity were analyzed using Analysis of Variance (ANOVA), with the average speed of answer serving as the primary performance metric. Results indicated that the intervention group exhibited peak efficiency during weeks three and four, attributed to improved workflow mid-week. However, the intervention group's average productivity (37.7 calls per hour) was lower than the comparison group's (55.62 calls per hour). These findings offer valuable insights for integrating mental game playing into employees' workflows to boost productivity, benefiting both employees and organizations.

Keywords: Mental game playing, work breaks, work environment, call centres, productivity.

Introduction

The importance of play at work has been propagated by various researchers who have belonged to different but relevant areas of the topic. Gaming activities such as points, badges and medals have helped amplify the motivation of individuals (Yang et al., 2023;

Oxarart, 2023), it can help amplify creativity (Hunter et al., 2010), is a tool for problem solving at work (Jacobs & Statler, 2006), helps to reduce stress (Koçak & Bakker, 2023) and increases engagement at work (Dontcheva et al., 2014). It also helps in attaining a positive attitude towards work and having flexible ways to seek problem solving on an individual level (Carpenter & DeLiema, 2024; Proyer & Ruch, 2011). On an organizational level, it helps in attitude towards team building (Lasley, 2024; Sørenson & Spoelestra, 2012). It can also help an individual self-organize to enhance work experience by integrating playful design at work (Parker et al., 2017). The importance of play at work is evident from these studies. But while all these studies have looked at play in a different context, it has a made the research more fragmented. It is now important that an integrative role of play at work is explored and how its contribution to the work environment be studied.

Outcomes of Play at Work

The outcomes of play, on an individual level, group level and organizational level has been discussed below.

Individual level outcomes

Play reduces fatigue (Hunter et al., 2010), stress (Roy & Ferguson, 2016; Sørenson & Spoelestra, 2012), and boredom (Westgate & Steidle, 2020). It enhances learning abilities of the worker (Kolb & Kolb, 2010). It regulates hormones and blood flow, which helps to bring creative and flexible thought patterns (Shen, 2023; Urquhart, 2005). Employees tend to spend more time on a work task if it is considered a form of play (Celestine & Yeo, 2021).

Group level outcomes

Play builds trust amongst employees (Justin & Joy, 2024; Hunter et al., 2010), it fuels the creative process and decision making abilities (Wu & Zhang, 2024; West et al., 2013), as well as enhancing communication skills among colleagues (Hunter et al., 2010; Sørenson & Spoelestra, 2012).

Outcomes for the organization

Organizational commitment is enhanced when play at work helps in bonding amongst the colleagues (Sørenson & Spoelestra, 2012). Play has also been shown to bring openness in

the organizations which increases the intrinsic motivation amongst employees (Averill et al., 2024; West et al., 2013).

Insights on theoretical perspective of play

Social and cognitive processing perspective of play

The less prevalent in the literature is the social cognitive processing perspective of play. Combination of social information theory and cognitive categorization theory has been used to explain the effect of play on work tasks and subsequent task performance by Webster and Martocchio (1993). According to the social information theory, individuals tend to resort to task labelling to make better sense of the world. According to cognitive categorization theory, one categorizes things in the understandable context, to bring cognitive ordering to one's understanding. If this is applied to the context of an organization, employees tend to categorize 'work' differently from 'play' which carries a more positive connotation (Webster & Martocchio,1993). Therefore, if one labels work tasks as play, it has the potential to enhance performance by having a positive attitude towards it. Furthermore, contextual determinants can enhance self-determined motivation (Ryan et al., 2017; Ryan et al., 2019). If one of the contextual determinant is play, it can enhance self-determined motivation at work (Sousa et al., 2023).

Flow perspective of play

To understand what 'flow' means regarding game playing, it is important to know its meaning. These are activities which demands a certain level of skill, the required stimulus, and evading consciousness of the self. As a result, the individual gains more control over self, having feedback free of ambiguity (Abramis, 1990). So, it can be argued that games are a type of play that involves skill, are challenging, provides autonomy and give feedback, and hence can provide flow (Sakalidas et al., 2024; Abramis, 1990).

Resource regulation perspective of play

In a similar way in which time is a resource, this perspective looks at play as a resource. It is a part of the conservation of resources (COR) theory which states that people keep striving to attain and build resources (Hobfoll, 1989). These resources are then conserved to overcome upcoming challenges at work (Halbesleben et al., 2014).

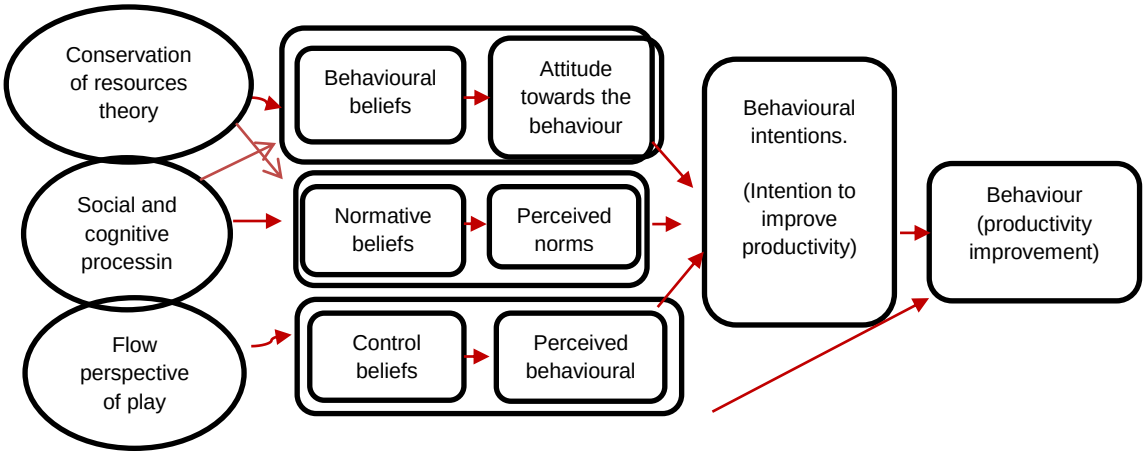
The COR theory further bifurcates the resources into two categories: psychological resources, and psychosocial resources. These two resources can have a great impact on team bonding and communication at work. It is also important that these resources be regulated and timed, to determine its effect on outcomes at work, both short term and long term (Petelcyzc et al., 2018).

While play can be a useful resource, it should also be noted that time spent on playing can also lead to outcomes which are dysfunctional, which can become synonymous to time wastage. This can lead to a resource being lost (time) rather than utilized (Petelcyzc et al., 2018).

Theoretical framework

At the heart of the study is theory of planned behaviour, given by Ajzen (1985). The behaviour in this case is the improvement in objective productivity. The conservation of resources theory of play can act on both behaviour and normative aspects of the employees and can contribute in improvement in productivity. Similarly, social and cognitive processing perspective of play can contribute to both normative and behavioural beliefs while flow perspective can contribute to control beliefs and help improve productivity.

Fig 1: Perspectives of play acting on theory of planned behaviour



Objective productivity as construct of performance in call centres

Performance measurement has generally been associated with publicly administered institutions (Behn, 1995; Dalehite, 2008) and statistics is usually tied to performance management (Townley et al., 2003). For proponents of objective reality, contextual matters do not contribute towards an objective performance measurement (Adcroft & Willis, 2008).

There is a concept of perceived performance as well, where intangibles such as communication and teamwork can enhance perceived performance measures as well (Setiawan & Antonio, 2023). In call centres, it is the objective productivity which is deemed important. Calls and related response systems (both inbound and outbound) are measured on a statistical metric already decided by the management (Plaza & Pawlik, 2021; Liebow et al., 2012). Under general circumstances, this common metric determines the efficiency of the call centre and this common metric usually takes "time" as a centre for the measure (Anton & Gustin, 2000), for example average speed of answer, average talk time, average time in queue etc.

In call centres, other measures of performance such as quality, training and recognition related to call centre work is also given due consideration (Miciak & Desmarais, 2001). However, due to dependence on the measurement of time, objective productivity is at the centre of call centre performance measurement (Robinson & Morley, 2006). This research, therefore, make use of the objective productivity in call centres because of the non-availability and less dependency on perceived productivity measures.

Methodology

Overarching purpose of the quasi-experiments

This study followed quasi experimental method, in which the non-equivalent control group design was followed. In this study the pre-test, post-test design was utilised to make the design as robust as it can be.

Sampling

Three call centres took part in the experiments. Under the umbrella of purposive homogenous sampling, volunteer sampling was used for this method, due to challenges in implementing perfect randomization.

Time Frame

This study depended on a 4-week intervention. For the intervention to take place effectively, a one-week pre-test data was taken. The participants from both the comparison group and the intervention group did not play games for the first week. Hence, this study follows a serial cross section time-plan. The two focus groups were conducted, two weeks apart, involving two different call centres

Game playing

It was important that the employees felt a sense of immersion in the games. Therefore a minimum time of 5 minutes was determined to be the time for immersion of the game (Chung & Gardner, 2012; Glass, 2007; Skalski et al., 2006). Games such as hangman, crosswords, wordsearch, jigsaw puzzles and board games were placed in the break areas of the employees. It was compulsory for all employees from the playing group to play the games at least once in one of the breaks provided during the shift.

Data collection

There were a number of limiting factors involved, which included dropouts because of employees quitting their jobs or reporting sick leave. After attrition, the actual number of employees taking part is given in table 1

Table 1: Number of employees who took part in the intervention

Call centre	Comparison group	Intervention group
Call centre A	6	8
Call centre B	5	4
Call centre C	5	4
Total	**16**	**16**

Recording objective productivity

The call centre heads provided average speed of answer as the single most important metric. The average speed of answer is defined as “the amount of time it takes to answer a typical call once it has been routed to the call centre” (Call centre helper.com, 2020). These measures were provided by the call centre manager at the end of the 4 - week period.

The intervention

The interventions took place from September 2018 to January 2019, over a period of 5 months. Five visits were planned to each call centre. A 6th visit was made according to circumstances (this was done if an employee forgot to do the readings and had not yet completed the readings). The interventions were carried at each site one by one and not concurrently.

Ethical consideration

The study was approved by the Ethics approvals (Human participants) sub-committee, which reports to the Ethics committee of the concerned university involved in this research. The participants had the opportunity to read a participant information sheet before the experiments and consent to the study. They had the right to withdraw from the study at any stage, without reason.

Analysis

The data was analyzed by entering the data electronically, using IBM SPSS Statistics for Windows, version 23.0 (Armonk, NY: IBM Corp).

The objective productivity data included average speed of answer. A higher value in productivity indicated a decrease in productivity. For example, an employee who is taking 40 seconds to answer a call is more productive than an employee taking 60 seconds, so a higher value means less productivity score. The values were then converted to calls per hour in the graphical representation, to make it easy to understand. Productivity scores were provided by the call centre heads which was measured in seconds.

The analysis scheme

The data was looked at different aspects in the following table

One-way ANOVA.

For one-way ANOVA, the data was grouped into days. So across 4 weeks, day 1 was compared to day 2, day 3 and so on. For multiple comparison of the day groups, a post hoc test (Tukey) was carried out, to make multiple inferences.

Repeated measures ANOVA.

In this the readings were taken across all 4 weeks and multiple comparisons were made for both the workload and the productivity data. Readings from week 1 were compared with

readings from week 2 and so on. The Bonferroni test was carried out to make multiple comparisons.

Independent T test

This test followed a 'between subjects' design which means that the comparison is to be drawn between two groups. In this case it is the comparison and the intervention group. For this test too, the assumption of normal distribution was followed.

Results

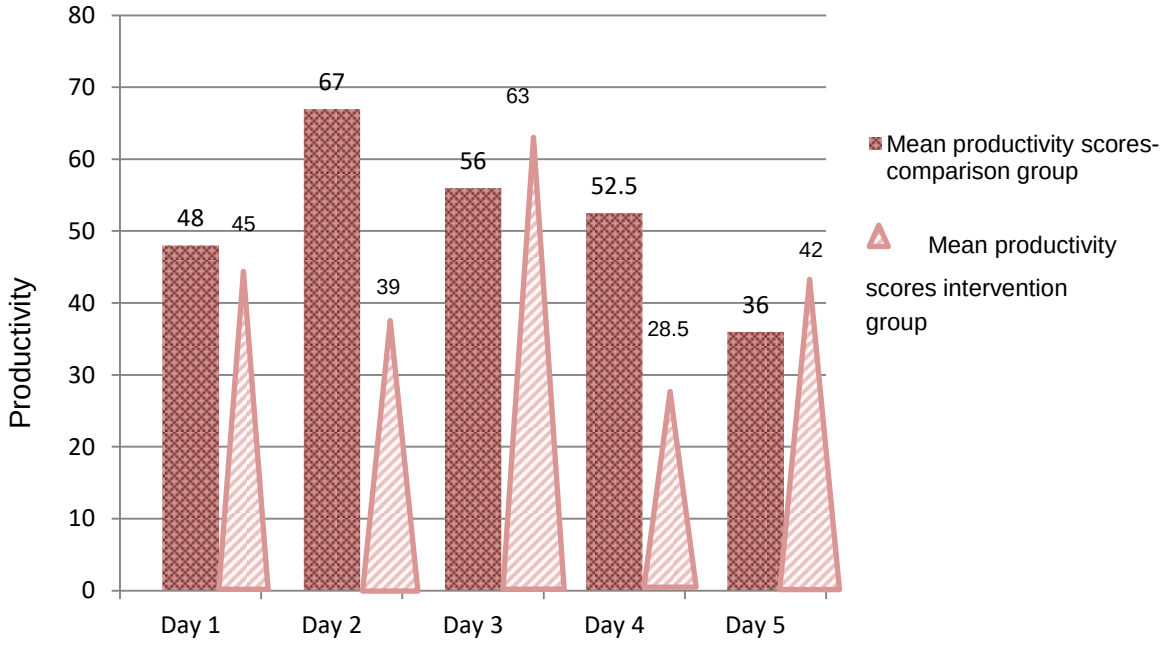
Experiments

The statistical tests have been carried on the original data but for better understanding, the data was converted to calls per hour in the graphical representation.

Figure 2 shows that the productivity of the comparison group was low on Day 1 before suddenly rising at day 2. It then gradually descended through the rest of the days. The change in the productivity was non-significant ($F= 0.680$, $p=0.606 >0.05$), as shown in table 2. The comparison at table 3 shows the relevant changes amongst the day groups as non-significant. In the intervention group, productivity dropped at day 2, it rose sharply at day 3 before dropping again on day 4 and then increasing on day 5 (figure 2).

One-way ANOVA for day groups

Figure 2: One-way ANOVA for comparing productivity of the comparison group



As with the comparison group, performance increased and then decreased gradually as the weekend approached, but it fluctuated in the intervention group. Productivity levels were lower in intervention group as compared to comparison group. The change in productivity was non-significant in this test as well (F= 0.465, p=0.762), shown in table 2

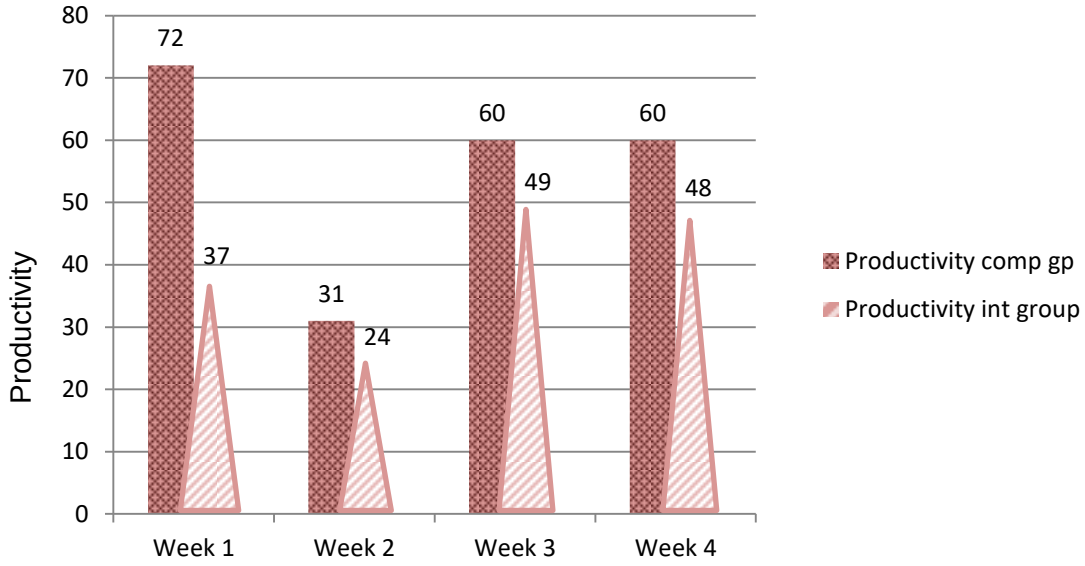
Table 2 One-way ANOVA for productivity scores

Productivity scores (Comparison group)	Number	Mean	Std. deviation	F value	Sig (p)
Day 1	62	74.64	16.13	.680	.606
Day 2	62	53.63	5.27		
Day 3	62	64.40	5.91		
Day 4	62	69.03	11.17		
Day 5	63	100.89	42.55		
Productivity scores (Intervention group)					
Day 1	59	80.62	85.68	.465	.762
Day 2	59	92.01	125.27		
Day 3	59	124.77	357.13		
Day 4	59	124.36	357.26		
Day 5	59	87.13	82.5		

Repeated measures ANOVA for productivity

In figure 3, the productivity of the comparison group dropped sharply at week 2 before rising sharply again at week 3 and week 4. The sharp difference in week 2 can be attributed to an employee who has shown extraordinary lengthy times for taking a call.

Figure 3 Repeated measures for productivity based on individual group data



This is apparent from the standard deviation at week 2, at table 3 (Std dev =212.75) which is large as compared to standard deviation for the rest of the weeks. The productivity in the intervention group followed the same trend as in the comparison group. But the drop in productivity in week 2 is not as sharp as in the comparison group. This was because of individuals catering to a different market or personal issues. The large difference in standard deviation for week 2 is apparent in table 3. The productivity changes stood non-significant (F=0.831, p= 0.390).

Table 3 Repeated measures ANOVA for workload scores

Comparison group	No.	Mean	Std.Dev	F value	Sig (p)
Week 1	15	50.24	35.41	1.142	0.306
Week 2	15	114.89	212.75		

Week 3	15	60.97	32.39		
Week 4	15	61.72	50.32		
Intervention group					
Week 1	14	86.64	80.033	0.831	0.390
Week 2	14	151.27	334.755		
Week 3	14	78.18	65.16		
Week 4	14	76.77	67.02		

T-test for productivity

In figure 4, there was a significance level for differences between the two groups in week 1 but not the rest of the weeks.

Figure 4 T-test for productivity

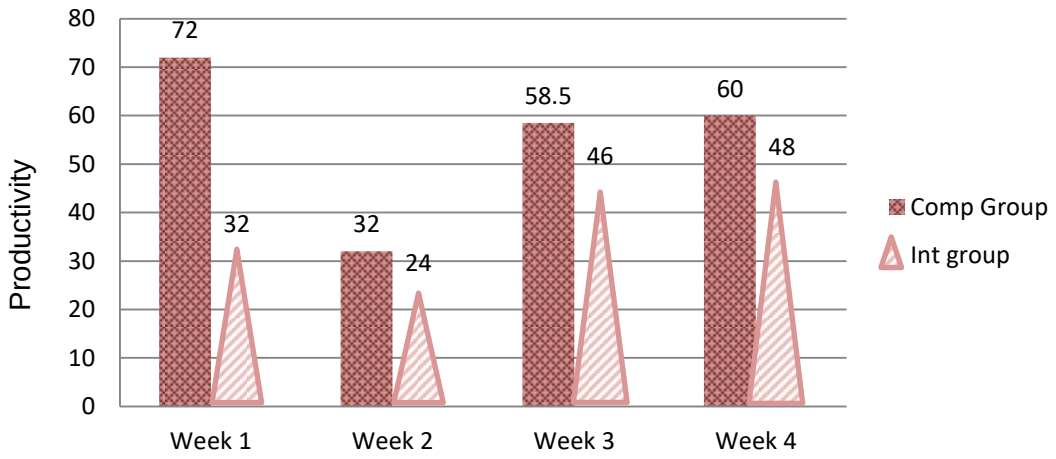


Table 4 T-test result based on individual score as a group

	N	Mean	Std. dev	t value	Sig (p)
Productivity wk 1 comparison group	16	50.37	34.2	-2.24	.033
Intervention group	15	99.40	80		
Productivity wk 2	16	111.1	206.08	-.412	.684
Comparison group	15	150.8	322.58		
Intervention group					

Productivity wk 3 Comparison group Intervention group	16 15	61.54 78.40	32.18 62.80	-.950	.350
Productivity wk 4 Comparison group Intervention group	15 14	60.26 76.77	50.77 67.02	-.751	.459

Percentage comparisons to overall average productivity

The day group data was compared with percentage variation against one's own group and overall percentage variation of both groups. The results are displayed in table 5

	Average Productivity overall calls/hour	Average productivity score according to day groups	Percentage variation against own group	Overall percentage variation against average of both groups
Comparison group	50 (group score) (overall score 50+36/2=43)	Day 1 48	4 ↓	12 ↑
		Day 2 67	34 ↑	56 ↑
		Day 3 56	12 ↑	30 ↑
		Day 4 52.5	5 ↑	22 ↑
		Day 5 36	18 ↓	16 ↓
Intervention group	36 (group score) (overall score 50+36/2=43)	Day 1 45	25 ↑	5 ↑
		Day 2 39	8 ↑	11 ↓
		Day 3 63	75 ↑	46.5↑
		Day 4 28.5	21 ↓	34 ↓
		Day 5 42	17 ↑	2 ↓

Table 5 Percentage comparison of the productivity at each day of the group

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Table 5 indicates that comparison group showed more levels of productivity regarding day group data. The intervention group showed increase too, as compared to its own group but overall, it showed a decrease compared to both groups average.

Table 6 shows the percentage comparison of the groups based on weekly data

Table 6 Percentage comparison of the groups to overall productivity

	Average Productivity overall calls/hour	Average productivity of the groups week wise	Percentage variation against own group	Overall percentage variation against average of both groups
Comparison group	50 (overall 50+36/2=43)	Week 1 72	44 ↑	67 ↑
		Week 2 31	38 ↓	28 ↓
		Week 3 60	20 ↑	39.5 ↑
		Week 4 60	20 ↑	39.5 ↑
Intervention group	36 (overall 50+36/2=43)	Week 1 37	3 ↑	14 ↓
		Week 2 24	33 ↓	44 ↓
		Week 3 49	36 ↑	14 ↑
		Week 4 48	33 ↑	12 ↑

In table 6, comparison group showed increased levels of productivity. The intervention group showed lower levels (increases only in last two weeks)

Discussion

Productivity was optimum at the end of the intervention

Productivity of the playing group was highest at the end of the intervention (week 3 and week 4). If the intervention is taken as a small project, the project life cycle has four stages: initiation, execution, termination, and review. The vital stages are the execution and the termination stages (Pinto & Prescott, 1988). One can predict that because the intervention

was approaching the termination stage, employees perceived that this was coming to an end and hence their focus shifted from having fun at playing games towards work.

Another point on why the productivity did not increase in the beginning or middle of the intervention was that playing games at work, at least once in the day was mandatory for the employees. According to (Mollick & Rothbard, 2014), consent in playing games at work have a positive effect but when consent is lacking, there could be a negative effect.

Players are efficient middle day of each week

Productivity increased middle of the week. Bryson and Forth (2007) quotes the UK time use survey 2000, saying that the average person works 360 minutes on Tuesdays and Wednesdays which is the highest as compared to other days. Flaherty and Seipp-Williams (2005) says that Tuesdays, Wednesdays and Thursdays represent the 'productive heart' of the work-week. At another place in the article, they point that distribution of email is highest on Wednesday and this comes as the most productive day of the week. In another place, Gonzalez (2018) argues that workers try to increase their efforts as the work-week progresses.

Theoretical perspectives of play

There are implications for theoretical perspectives of play. If play is categorized as play and not work according to social cognitive processing theory, it will help increase the productivity of workers. Playing games was mandatory, which could have played a factor in the reduced productivity in the beginning and middle of the intervention. The flow perspective of play could have been a major factor, when employees showed increased productivity in the middle of the week. Because middle of the week is the point where employees are most productive. Conservation of resources theory came into play where employees conserved their energies to focus on work at the end of the intervention. It will be interesting how other theoretical perspectives can play part if other interventions are planned for further research.

Limitations

There is a possibility that these experiments could be made more robust e.g, making the work context as homogeneous as possible. There were some employees who were catering to international market; whether this influenced the results of the study cannot be

confirmed. Holiday times such as Christmas and Easter holidays were proven to disrupt work routines of some employees. The fact that other key performance indicators might render different results, could not be ignored either. There were limitations regarding the outreach of the participants, mainly because of timeline and finances involved in the study. Due to geographical proximity, an absence of observer to be present at the time and venue of the experiments for the total time of the experiments, made the study dependent more on human perceptions and less on clinical conditions.

Conclusion

Objective productivity for workers could increase if interventions based on leisure are designed into the workflow of the employees. However, several factors come into play. These leisure activities should be designed in a way that it reaches a balance between being too boring and being too indulging. Being too boring will result in monotony and being too indulging will result in distraction from work. The self-conscious feeling of being measured should prevail, so that the focus of the employee remains on the productivity. Game playing should be considered separate from the rest breaks. Wherever there is an increase in objective productivity, other interventions should be placed to see further effects of workplace interventions on efficiency of the employees. This will help towards improved work policies in the call centre

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article

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