It's Crunch Time: Burnout, Job Demands and Job Resources in Game Developers

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Abstract. Although game development is a recent profession, many of its issues have been associated with the straining working conditions experienced by workers to keep themselves in the industry. This requires balancing job demands and job resources, and, in cases of extreme and prevalent job demands, it can elicit burnout as an occupational phenomenon. This study aims to identify burnout and job demand-resources levels among game developers, their relationship, and variation according to social individual/labour characteristics. An online questionnaire collected data from 193 game developers. Regarding burnout, results showed moderate levels of exhaustion and disengagement, while job demands revealed high levels of mental and concentration demands, moderate levels of time, emotional, material, and physical demands. For job resources, we found high levels of autonomy and moderate values of personal development, quality of personal relations, ethical, and social utility of work. Exhaustion is positively correlated with working hours per week and job demands, and negatively with job resources. The same happens with disengagement, except for mental and concentration demands. Time demands explained 27% of exhaustion, and personal development explained 14% of exhaustion and 51% of disengagement. Therefore, game developers face very demanding work conditions, alerting to the need to develop strategies for burnout prevention, and for the adequate manage of job demands using job resources, thus, promoting happier and healthier workplaces.

Keywords: Burnout · Job demand-resources · Game developers

1 Introduction

In May 2019, the World Health Organization [1] recognized burnout as an occupational phenomenon that affects several professions, due to job demands and the difficulties that workers experience while trying to adjust to them and using their job resources. The video game industry is roughly 50 years old, and it currently has a larger growth potential than many other creative industries, surpassing music and film [2]. Although game development is a recent profession, many of its issues have been associated with the straining working conditions experienced by workers to keep themselves in the industry. Throughout the years, multiple cases have been made public, denouncing the enormous monetary gain for the companies at the expense of their workers' health [3]. Yet, crunch

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remains a matter of concern to the industry, contributing to the experience of burnout and eventually leading its workers to leave their jobs and move to more sustainable jobs or even industries [3].

Therefore, it's necessary to understand how game developers deal with these issues and learn how they affect their health and their ability to work, in order to develop more effective strategies to diagnose, treat and ultimately prevent this problem in the future. Hence, this study aims to identify burnout, job demands and job resources levels among game developers, their relationship, and variation according to sociodemographic and labour characteristics.

1.1 Burnout

During the 60's, Freudenberger [4] and Maslach and Jackson [5] defined burnout as a syndrome of emotional exhaustion and depersonalisation that often affects people who work in human services, making the person feel dispirited about themselves and lacking job fulfilment. Emotional exhaustion is the major dimension of burnout, and it relates to being so emotionally overwhelmed and worn out by work, that it results in the depletion of the person's emotional and physical resources [6]. Depersonalisation refers to negative, cynical behaviours and emotions towards those whom one serves or cares for. This reaction might come across as insensitive and disinterested [5]. Finally, there is a feeling of reduced personal accomplishment, where the individual no longer perceives himself as capable of fulfilling the responsibilities of his job [6].

Exhaustion is usually the most apparent direct display of burnout. However, although necessary, it is not enough on its own to identify the presence of the phenomenon, because it fails to consider the relation that one has with their job. It leads to emotional and cognitive detachment from work, to deal with the overload. Depersonalisation then emerges to manage work demands, due to the constant feeling of exhaustion and discouragement, leading to a cynical behaviour towards the recipient of one's services [6].

Burnout has been strongly associated with negative consequences on one's job performance (e.g., absenteeism and turnover), lowering their productivity and effectiveness overtime, ultimately resulting in a reduction in their job and/or organisational commitment and satisfaction. This can lead to an increase in personal conflicts between work colleagues and disturbances in some related tasks. It also has an impact on one's health, especially mental health, and can lead to an increase in anxiety, depression, a lower self-esteem, as well to work-family conflict. Finally, burnout is viewed as a process that happens gradually overtime and it is not tied to a specific event or situation [4, 6–8].

1.2 Job Demand – Resources

The Job Demand – Resources (JD-R) model argues that there are particular risk factors associated with job-related stress in all activities [8, 9]. These risk factors can be divided in two main categories: job demands and job resources, which can vary according to the specific characteristics of one's occupation [9].

Job demands relate to all the aspects (e.g., physical, social, psychological or organisational) of work that involve the continuous use of cognitive and/or emotional effort and, therefore, have a certain degree of psychological and/or physical cost (e.g., workload,

time pressures, and irregular working hours) [8–10]. The higher the level of activity, the greater the cost [8]. These demands are not automatically negative, since they only become job stressors when the workload surpasses the capacity of the individual to handle and recover from the effort [7, 11, 12]. This process drives the individual to use strategies to protect himself, but that too can have similar consequences over long periods of time [8, 9, 13].

Job resources refers to sources of motivation for one's job, whether by allowing to achieve work goals, reduce the cost of job demands or by stimulating the personal growth and development of the employee, therefore playing either an intrinsic or extrinsic motivational role in this process [8, 9]. In moments when job demands seem to be high, job resources can be particularly useful and influence work engagement and motivation. Furthermore, personal resources can also somewhat regulate this relationship and develop themselves through job resources [9].

1.3 Burnout and Job Demand – Resources

Since burnout is related with the work context, it is necessary to consider situational factors, such as specific tasks, as well as occupational and organisational characteristics, in its development. Factors such as workload, time pressure, role conflict (i.e., when conflicting demands of one's job have to be met), role ambiguity (i.e., there's insufficient information for one to be able to perform one's job well) and lack of social support from supervisors and co-workers have a moderate to high correlation with burnout [14]. Those that suffer from lack of feedback, autonomy, and have little opportunity to be part of the decision-making process are more likely to experience burnout [6].

Demerouti and colleagues [8], proposed the JD-R model, assuming burnout occurs when there is a clear discrepancy between the person's job demands and job resources. Thus, when job demands are immense and job resources are scarce resulting from unfavourable working conditions, it leads to a decrease in employees' motivation due to being in a state of exhaustion. This reasoning can be applied to any given type of occupation.

According to this model, burnout can, therefore, develop through two different processes. The first defends that extreme job demands at one's work can cause exhaustion. The second process argues that inadequacy or shortage of resources does not allow the employee to fulfil job demands properly, subsequently leading to a disinvestment in one's work [8]. Thus, it suggests that the symptoms related to burnout may develop under a specific combination of working conditions.

1.4 Game Developers

Since the 1970's with the development of Pong, the first commercially successful game [15], the game market has grown so much that in 2018 it produced over 131 billion dollars in revenue, and it is expected to reach over 300 billion in 2025 [16]. The Asia-Pacific region alone was said to reach 52% of the global game earnings, and the prediction is that it will continue to grow throughout the years, with China being the biggest single market in the world, grossing roughly 51 billion dollars by 2021 [17]. In 2018, Grand Theft Auto V, created by Rockstar Games in 2013, became the most financially successful media

product of all time, raising more than six billion dollars in revenue and currently selling over 110 million copies worldwide [18, 19].

According McGuire and Jenkins [20], a *game developer* is someone who takes part in the production of a game, working on its mechanics (i.e., gameplay), content (e.g., art, music, storytelling) and technology (e.g., software), and can, therefore, integrate the art, design, programming, writing, or sound design teams. This could be done by only one person, a team of two, or up to hundreds. It is often the case that teams share certain responsibilities and, in some instances, it is also possible that one person can also be a part of two teams depending on the project and the size of the company. The authors emphasize that games are art as well as science, and as such a game developer must also be a multidisciplinary professional to meet the job requirements.

Regarding employment, according to the International Game Developers Association (IGDA) [21] 74% are employed, 15% work freelance and 11% are self-employed. In 2019 data showed the average tenure is only 2.2 years for employed individuals, this is due to being a project-based type of work, each game is therefore divided in three major stages requiring very different resources: pre-production; production; and post-production Hence, in addition to being a precarious type of project-based work, engaging in cycles of hiring, firing and reallocation depending of the stages of the projects, the worker is tasked to complete the project accordingly to the clients satisfaction by any means necessary [22].

In 2004 a disgruntled wife felt compelled to share with the world a blog post denouncing the working conditions at Electronic Arts (EA), revealing that its workers were facing constant crunch, being required to work up to 90 h per week. These long hours eventually started taking their toll on the employees, allowing them to be less effective while doing their jobs, deteriorating their health and, in many cases, leading them to even abandon their jobs [23]. Similar situations have been reported ever since.

Although most game developers love their work, there has been a growth in reports about long, uncompensated hours under extreme working conditions of "make it or break it". According to the 2019 IGDA survey most game developers work on average 40–44 h in regular weeks and 50–59 in periods of crunch. Crunch time is a term usually used in the game industry to refer to periods of extreme workload to ensure the release of the game in the time frame previously established. A lot of game developers tend to accept this kind of working conditions while still considering their job very positively and viewing crunch as a necessary and normalized condition to game development [21, 22, 24]. Additionally, unpaid, and unlimited overtime, poor work-life balance, musculoskeletal disorders, burnout, unsupportive work environment or lacking development opportunities are all issues that game developers often face in their line of work [25].

2 Method

To identify burnout and job demand-resources levels among game developers, their relationship and variation according to social individual and labour characteristics, a cross-sectional study was designed.

2.1 Participants

This study was conducted using a snowball sample of game developers, that is we relied on our participants to recruit other individuals from among their acquaintances to participate in this study. The total sample composed of 193 participants was obtained through the Portuguese and English version of the survey. Most of the participants identify themselves as male (78%), 20% as female and 2% as other, with ages ranging between 18 and 62 years old (M = 29.56, SD = 7.21). They were mainly Portuguese (46%), British (9%), American (8%), and 44% married or partnered. Their years of experience in the game industry vary between 0 and 35 years (M = 6.54, SD = 6.21), spending from 0 up to a 100 h a week working (M = 40.44, SD = 14.61) on their job. Regarding current employment status 64% were employed, 18% self-employed, 11% unemployed and 7% were freelancing. The majority of the participants were working in small companies with 10 or less people (37%), 37% were working at companies with more than 100 people, 21% in a company that employs between 10 and 50 people, and 5% in a company that employees between 51 and 100 people. In addition, their time in the current company ranged between one week and 15 years (M = 2.65, SD = 2.77).

2.2 Materials

The participants were asked to fill anonymously, either in the Portuguese or English version, a sociodemographic questionnaire inquiring about sex, age, civil status, country of origin, residency, country where they were working for, working situation, years of experience in the industry, dimension of the company they are working in, number of hours worked in a week, and whether they've ever experienced crunch along with the frequency and moments that it happened. This was followed by of the Oldenburg Burnout Inventory (OLBI) [26, 27], the Job Demand Scale [28] and the Job Resources Scale [29].

The OLBI has a total of sixteen items scored in a 5-points Likert scale (1 = strongly disagree and 5 = strongly agree) and divided into two dimensions: exhaustion (work overload along with a sentiment of physical, emotional, and cognitive depletion), and disengagement (negative and cynical behaviours and distancing towards one's job), both indicating that higher scores implies higher burnout level. The Job Demand Scale includes 28 items scored in a 4-point Likert scale (1 = almost never and 4 = almost always) split into five dimensions: time demands, mental and concentration demands, physical demands, emotional demands and lack of support, material demands and role ambiguity. The Job Resources Scale has a total of 31 items scored in a 6-point Likert scale (1 = strongly disagree and 6 = strongly agree) that divide into five dimensions: personal development, social utility of work, ethical, autonomy and quality of personal relations.

2.3 Procedure

The data was obtained through an online form, either in Portuguese or in English, shared within the online game development community. Participation was fully anonymous and voluntary. It was also solicited the collaboration of associations as well as newly formed unions such as Game Workers Unite UK and Game Makers of Finland in sharing the

questionnaire with game developers. Data collection occurred between February of 2019 and June of 2020, taking a total of 16 months.

3 Results

A descriptive analysis sorted by dimensions reveals, in relation to burnout, moderate levels of both exhaustion and disengagement. It also shows high levels of mental and concentration demands and moderate levels of time, emotional, material, and physical demands. Regarding job resources the results reveal high levels of autonomy and moderate values of personal development, social utility of work, ethical, and quality of personal relations (Table 1).

Results also revealed that 85% of the participants report that they have already experienced crunch time at least at one point during their careers (Fig. 1). Of these, 80% reported no intention of leaving the industry in the foreseeable future, 10% reported that they had an intention of leaving now or soon and 10% were unsure of their stay in the industry (Fig. 2).

Table 1. Descriptive analysis of burnout, job demand and job resources' dimensions

Dimensions (range)	Minimum	Maximum	Mean	Standard Deviation
Exhaustion (1–5)	1,00	4,63	2,91	,768
Disengagement	1,00	4,50	2,51	,696
Time demands (1–4)	1,17	3,83	2,27	,607
Mental and concentration demands	1,71	4,00	3,09	,522
Lack of support, material demands and role	1,17	3,50	1,98	,414
ambiguity	1,00	3,50	1,62	,498
Physical demands	1,00	4,00	2,17	,610
Emotional demands				
Personal development (1–6)	1,40	6,00	4,89	,881
Social utility of work	1,00	6,00	4,26	,943
Ethical	1,00	6,00	4,76	1,305
Autonomy	1,25	6,00	5,02	,924
Quality of personal relations	2,00	6,00	4,87	,878

Comparative analysis considering sociodemographic revealed statistically significant differences (Table 2) according to sex, civil status, nationality, years of experience and the experience of crunch time. Thus, women in the industry tend to experience higher levels of emotional demands than men, and although not statistically significant women present higher levels of exhaustion and men have higher levels of disinvestment. Married or partnered individuals experience higher mental and concentration, and emotional demands than single, divorced, or widowed participants. Non-Portuguese individuals reported higher levels of mental and concentration, and emotional demands in comparison to Portuguese. Participants with more or equal to six years (senior) of

Fig. 1. Percentage of experience of crunch

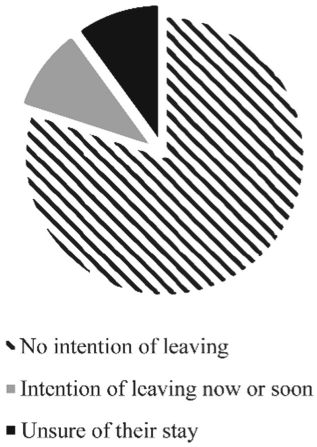

Fig. 2. Intention of leaving the video game industry

experience report more time, and mental and concentration demands than those with less experience. Finally, those that have reported having experienced crunch time during their career experience higher levels of time, mental and concentration, and emotional demands and experience lower levels of ethical resources.

The correlation analysis (Table 3) revealed that age, years of experience in the industry, average of working hours per week and time working at the current company present a weak positive correlation with mental and concentration demands. In relation to number of workers at the company it presents a weak negative correlation with material demands, hence signifying that the bigger the company the less the individual will experience material demands, functioning as a protective factor in the experience of burnout. Concerning the average of working hours per week, it shows a weak positive correlation with exhaustion, time as well as physical demands, and presents a weak negative correlation with ethical. Weak positive correlations were found between the time working at the company and time and physical demands. In relation to burnout, the variable exhaustion correlated positively with job demands and negatively with job resources. The same happens with disengagement, correlating significantly with all job demands and resources variables, except for mental and concentration demands.

We executed a multiple regression analysis, utilizing the enter method, to understand the predictive value of sociodemographic and work variables as well as work demands and wok resources (Table 4). Thus, we were able to determine that work demands explain 32% and work resources explain 16% of exhaustion. In relation to disengagement, work demands explain only 12% while work resources explain 50% of this dimension.

Using a multiple regression with the stepwise method (Table 5) we analysed the contribution of specific variables, verifying that time demands are associated with higher levels of exhaustion, explaining a total of 27% of this dimension. Personal development is associated with lower levels of both exhaustion and disengagement, explain 14% and 51% respectively.

Table 2. Comparative analysis of job demands and resources according sociodemographic characteristics

	Female N = 39	Male N = 150	*t student*	*p*
Emotional demands	2,4974	2,0693	-4,054	,000***
	Married or partnered	Single, divorced or widowed	*t student*	*p*
Mental and concentration demands Emotional demands	3,2269 2,3765	2,9894 2,0019	3,278 4,433	,001** ,000***
	Non-Portuguese N = 105	Portuguese N = 88	*t student*	*p*
Mental and concentration demands Emotional demands	3,2041 2,3181	2,9627 1,9864	– 3,240 – 3,896	,001** ,000***
	Senior N = 80	Junior N = 113	*t student*	*p*
Time demands Mental and concentration demands	2,3771 3,2232	2,1947 3,0025	– 2,075 – 2,953	,039* ,004**
	Crunch yes N = 163	Crunch no N = 30	*t student*	*p*
Time demands Mental and concentration demands Emotional demands Ethical	2,3241 3,1306 2,2160 4,6687	1,9778 2,8952 1,9000 5,2667	2,930 2,296 2,646 – 3,341	,004** ,023* ,009** ,001**
*p ≤,050 **p ≤,010 ***p ≤,001				

4 Discussion

Although we were able to find moderate levels of both exhaustion and depersonalization, these may not realistically represent the degree to which burnout is experienced in the industry. In fact, due to the healthy worker effect phenomenon, individuals who suffer from stronger levels of burnout may no longer be able or willing to participate in studies [30]. Moreover, workers affected early on in their careers by burnout are no longer in their jobs, suggesting that the respondents are the survivors, hence presenting lower levels of burnout than expected [6]. Finally, the moderate levels of job resources can function as a protective effect, mitigating the development of burnout [9].

The underrepresentation of women in the industry may help explain why they experience higher levels of emotional demands [22]. Additionally, the majority represent roles within art, project management and non-development roles (e.g., management, marketing, human resources) [31], which due to the specifications of the job might require more

Table 3. Pearson correlation between individual characteristics, burnout, job demands and job resources' dimensions

	Age	Experience in industry	Work hours per week	Experience current company	Number of workers current company	1	2	3	4	5	6	7	8	9	10	11
Exhaustion	-,033	-,020	,189*	,084	-,072											
Disengagement	-,080	-,032	,095	-,017	,031	,697**										
Time demands	,022	,068	,253**	,188*	-,054	,469**	,254**									
Mental and concentration demands	,199**	,148*	,211**	,241**	-,039	,303**	,046	,486**								
Material demands	-,021	-,060	-,096	-,016	-,187*	,322**	,236**	,175*	,236**							
Physical demands	,029	,063	,247**	,194*	-,114	,503**	,322**	,450**	,465**	,314**						
Emotional demands	,087	,049	,121	,079	,011	,282**	,185**	,405**	,510**	,322**	,427**					
Personal development	,009	-,036	-,042	,029	-,142	-,491**	-,729**	-,197**	,066	-,118	-,264**	-,148*				
Social utility of work	-,001	,024	-,124	,027	-,073	-,267**	-,439**	-,099	,054	-,125	-,122	-,088	,469**			
Ethical	-,073	-,051	-,186*	,013	-,135	-,414**	-,550**	-,282**	-,044	-,168*	-,359**	-,271**	,617**	,310**		
Autonomy	-,077	,022	-,049	,085	-,075	-,404**	-,539**	-,214**	-,011	-,107	-,257**	-,202**	,764**	,305**	,567**	
Quality of personal relations	,055	-,005	-,111	-,119	,095	-,291**	-,356**	-,106	-,055	-,225**	-,281*	-,150*	,358**	,369**	,371**	,274*

*p < 0.050 ** p < 0.010

Table 4. Multiple regression (enter method) for burnout's predictors

Dimensions	Predictors	R^2	R^2 change	F	p
Exhaustion	Sociodemographic variables	,026	,026	1,222	,304
	Work variables	,066	,039	1,371	,247
	Work demands	,384	,318	13,023	,000***
	Work resources	,541	,157	8,296	,000***
Disengagement	Sociodemographic variables	,030	,030	1,386	,250
	Work variables	,039	,009	,309	,872
	Work demands	,158	,119	3,554	,005**
	Work resources	,656	,498	34,982	,000***
*p ≤,050 **p ≤,010 ***p ≤,001					

Table 5. Multiple regression (stepwise method) for burnout's predictors

Dimensions	Predictor		R^2	R^2 change	β	t	F	p
Exhaustion	Work demands	Time demands	,270	,270	,244	3,323	50,638	,001**
		Material demands	,329	,059	,269	3,948	12,056	,000***
		Physical demands	,366	,037	,191	2,928	7,814	,004**
	Work resources	Personal development	,502	,136	-,380	-6,048	36,576	,000***
Disengagement	Work demands	Physical demands	,093	,093	,090	1,609	14,104	,110
	Work resources	Personal development	,607	,514	-,634	-9,695	177,71 6	,000***
		Ethical	,629	,022	-,190	-2,805	7,870	,006**
*p ≤,050 **p ≤,010 ***p ≤,001								

emotional demands. Results regarding the civil status may be related to a work-family conflict, allowing the individual to feel a higher level of emotional and mental demands while trying to balance both aspects of his life.

The fact that non-Portuguese nationals experience higher levels of mental and emotional demands might be related with both the competitiveness of the industry and labour market internationally. Therefore, non-Portuguese individuals have more contact with

bigger companies with recognized brands and franchises, as such they participate in more noticeable projects with more responsibility, changes, and tighter deadlines.

Also, data shows that individuals with higher levels of experience in the industry encounter a higher degree of time and mental demands. This might be related to the underlying requirements of their position: doing more demanding tasks, needing a wider skillset, acquired responsibilities, coordinating, and supervising larger teams. Thus, their time is mostly spent overseeing the work of others and less on executing other important tasks. The experience of crunch shows that working conditions with extreme job demands can easily take toll on individuals. Additionally, the lower levels of ethical resources in those that have experienced crunch demonstrate a violation of the psychological contract and disrespect of equity and justice [6]. Furthermore, the fact that time demands explain 27% of exhaustion displays the risk that crunch presents to the appearance of burnout, while personal development functions as a protective factor to its occurrence, positively affecting one's work engagement [8, 9].

5 Conclusion

Despite being an exploratory and cross-sectional study, with voluntary participation, the results show that this professional group is often subjected to intense working conditions, with a high level of demands that they struggle to meet, leading to job turnover and health concerns, both physically and mentally. Fortunately, these concerns have started being addressed by the newly created unions, as well as news outlets for the past couple of years, making companies revise and change their policies. However, despite all these efforts, crunch still is prevalent issue.

This study can contribute to help identify the risk of burnout within the game industry, alerting for the need to prevent and even reduce this occupational phenomenon, such as EUROFOUND already suggested in 2018 [32]. Thus, intervention should be designed and adapted accordingly to the context, identifying job demands which have more impact on exhaustion, and work towards their reduction, while promoting job resources that increase workers' engagement, which leads to a reduction of both exhaustion and disengagement and could lead to an improved, healthier, safer, and happier workplace [8]. Future research should analyse whether there is a protective effect of personal resources, namely against crunch.

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