Investigation of the Relationship Between E-learning Attitudes and Dual Career Competence Levels of E-athletes

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A B S T R A C T

This study investigated the relationship between dual career competencies and e-learning attitudes among e-athletes who simultaneously pursue education and sports careers. The research examined a sample of 631 licensed e-athletes (392 male, 239 female) using the Dual Career Competency Scale for Athletes and the Attitude Towards E-learning in Sport Scale, along with demographic data collection. Using a quantitative, correlational survey design, the study analyzed relationships between key variables through descriptive statistics and correlation analyses. Results revealed no significant correlation between e-athletes' income levels and either their dual career competence perceptions or e-learning attitudes (r=-.023, -.004, -.019, -.018, .068, p>.05). However, the study found positive correlations between e-athletes' dual career competence perceptions and their attitudes toward e-learning (r=.529, .461, .497, .431, p<.01). Additionally, age showed significant positive correlations with multiple dimensions of dual career competence, including career management, career planning, emotional awareness, social intelligence, and adaptation (r= .111, .169, .114, .113, p<0.01). This research contributes to the growing literature on e-athletes' career development and educational engagement in the digital age.

Keywords: e-sports, e-athlete, dual career, e-learning, digital gaming

INTRODUCTION

It is very difficult to keep up with the pace of technological and digital developments in today's world. These rapid technological and digital developments are fundamentally transforming multiple domains of human activity, including social, economic, cultural, and academic spheres (Kocadağ, 2017). The field of sports has not been immune to these transformative changes. As a universal phenomenon with mass appeal, sports continue to evolve in response to changing societal needs, particularly those of younger generations. Perhaps the most striking example of this evolution is the emergence of e-sports, which has experienced exponential growth within the broader sports landscape (Heidenreich et al., 2022; Demir & Sertbaş, 2020).
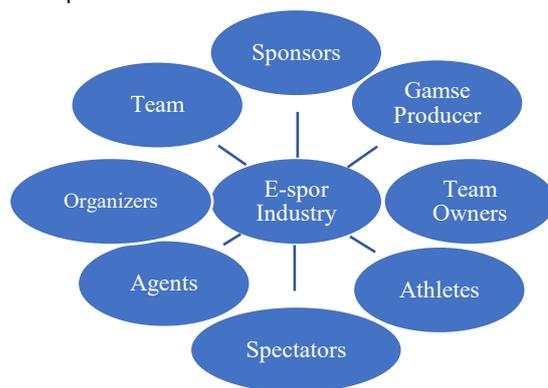
The rise of e-sports represents the convergence of digital gaming and traditional sports paradigms. While various terms such as "electronic sports," "cyber sports," "virtual sports," and "competitive computer gaming" are used interchangeably to describe this phenomenon (Yükçü & Kaplanoğlu, 2018), e-sports continues to evolve as it seeks recognition as a legitimate sports discipline. Wagner (2006) defines e-sports as "a field of sports activities where people develop their mental and physical abilities using information and communication

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technologies." This definition acknowledges both its technological foundation and its potential for skill development. Recent research characterizes e-sports as both an emerging trend in the entertainment industry (Jordan-Vallverdú et al., 2024) and a distinct branch of competition based on online and offline digital content (Kocadağ, 2017).

The historical development of e-sports can be traced back to 1958, paralleling broader technological advances (Gábriš et al., 2024; Brookhaven National Laboratory, 2008; Deen et al., 2006). While the contemporary e-sports landscape encompasses numerous games and formats, several primary categories have emerged as standardized competitive disciplines: MOBA (Multiplayer Online Battle Arena), FPS (First-Person Shooter), RTS (Real-Time Strategy), Battle Royale, Sports games, MMORPG (Massively Multiplayer Online Role-Playing Games), and Fighter games (Funk et al., 2017; TESFED, 2024). This diversification has given rise to a unique ecosystem, supported by various stakeholders who contribute to its ongoing development and legitimization. Yükçü and Kaplanoğlu (2018) offer a framework for understanding the e-sports ecosystem by identifying key stakeholders, as illustrated in Fig. 1 below.

Figure 1. Key stakeholders in e-sports

The global gaming industry's substantial investments have driven rapid expansion of e-sports' participant base (GSB, 2018; Kocadağ, 2019; Gaming in Turkey, 2023). However, despite its growing prominence in the sports industry, e-sports' status as a legitimate sport remains a subject of debate within the International Olympic Committee (IOC). At the IOC's 7th Olympic Summit, the committee acknowledged the undeniable growth of e-sports and its significance as a recreational activity among youth. Nevertheless, the IOC determined that e-sports' inclusion in the Olympic medal program would be premature, citing two main concerns: the need for further development of the relationship between traditional sports and e-sports, and the misalignment of certain games with Olympic values (IOC, 2018). However, despite these views, the IOC did not ignore the developments in the fields of e-sports and decided to organize the first Olympic E-sport Games in Saudi Araba in 2027 (IOC, 2025).

This technological advancement has diversified educational methodologies, with traditional approaches giving way to internet-based and digital media platforms (Özdemir, 2011). Among these developments, e-learning has emerged as a significant innovation in education and training, leveraging the capabilities of the online environment (Mutlu Bozkurt & Tamer, 2020).

E-learning represents the process of acquiring knowledge and skills through digital technologies and materials, unrestricted by temporal or spatial constraints (Govindasamy, 2002). Its historical development can be traced through several key phases: educational radio broadcasting in the 1920s, educational television in the 1950s, broader technological innovations in the 1980s, and the rapid expansion of internet usage in the 1990s (Delen, 2021; Cura, 2009). While e-learning offers numerous advantages—including flexibility, learner-centricity, customization options, cost-effectiveness, motivation enhancement, and improved accessibility—it also presents certain challenges, such as the absence of direct teacher-student interaction, limited applicability across disciplines, and potential communication barriers (Babuçoğlu, 2006). In the sports domain, the integration of technological and digital developments has become essential, with mixed educational techniques facilitating more effective information access and knowledge dissemination (Mutlu Bozkurt, 2021).

Career development represents a process of gaining expertise through professional experience, rather than merely advancing in hierarchical position (Bird, 1994). In sports, while the concept of athletic career may be described differently across

competitive categories and disciplines, these descriptions share fundamental commonalities (Stambulova et al., 2009). Alferman and Stambulova (2007) define a sports career as a voluntarily chosen, long-term athletic pursuit aimed at achieving maximum performance.

A "dual career" involves an individual's capacity to successfully pursue two career paths simultaneously (Stambulova, 2010). The European Commission formally defines dual career as the integration of educational and athletic activities that enables athletes to reach their full productive potential (EC-European Commission, 2012). This integration represents a developmental and challenging process that spans childhood, youth, and maturity (Stambulova et al., 2009; Macnamara & Collins, 2010). Recent research emphasizes the importance of proactive behavior in facing professional challenges and building comprehensive skill sets (Uysal & Özsarı, 2024). Studies have documented both positive and negative effects of dual careers on academic performance (Purdy et al., 1982; Simons & Van Rheenen, 2000; Chuan et al., 2012). The COVID-19 pandemic has accelerated developments in both e-learning and e-sports (Türkmen & Özsarı, 2020), expanding the career opportunities within the e-sports ecosystem. The emergence of e-sports-related educational programs has particularly benefited young people, facilitating the simultaneous pursuit of athletic and academic careers (Kocadağ, 2019).

The IOC's 15-item Olympic Agenda 2020+5 document has established a strategic direction for the Olympic Movement through 2025. The IOC has taken significant steps toward embracing virtual sports, organizing the first Olympic-licensed virtual sports event prior to the Tokyo Olympics and establishing a dedicated virtual sports department within the IOC Sports Department (IOC, 2022; IOC, 2021). Developments in the field of e-sports are being shared at various meetings before the first Olympic E-sports Games to be held in 2027 (IOC, 2025).

The global appeal of e-sports is particularly pronounced among Generations Y and Z through digital gaming platforms (GSB, 2018). As e-sports participants increasingly engage as licensed athletes while simultaneously pursuing their education, they face a complex array of academic, athletic, and social challenges in managing their dual careers (Wylleman & Rosier, 2016; Kocadağ, 2017). While existing research has extensively examined digital gaming and gaming addiction (Özsarı & Deli, 2023; Özsarı & Görücü) and various aspects of e-athletes' experiences (Hong, 2022; Keçeci & Çelik, 2024; Şimşek et al., 2023), there remains an evident gap in the literature regarding the intersection of e-athletics, e-learning, and dual career development. This study addresses this gap by investigating the relationship between e-athletes' dual career competency perceptions and their attitudes toward e-learning, thereby contributing to the knowledge base supporting the evolving e-sports ecosystem.

METHOD

Research Model

The study employed a quantitative correlational survey design to examine relationships between variables Relational survey models are designed to determine the presence and degree of covariation between such variables (Karasar, 2019).

Study Group

The study sample comprised 631 licensed e-sports players (392 male, 239 female). All participants provided voluntary informed consent.

Data Collection Tools

The study employed three data collection instruments.

Dual Career Competency Scale for Athletes: This 29-item scale, originally developed by De Brandt et al. (2018) and adapted to Turkish by Karadağ and Aşçı (2021), assesses concepts related to dual career competencies in four dimensions: dual career management, career planning, emotional awareness, and social intelligence and adaptation. The original scale demonstrated robust internal consistency, with Cronbach's alpha coefficients ranging from 0.75 to 0.87 across subscales (De Brandt et al., 2018). In the present study, Cronbach's alpha coefficients for the subscales were as follows: dual career management (.82), career planning (.71), emotional awareness (.76), and social intelligence and adaptation (.75).

Attitude Towards E-learning in Sport Scale: E-learning attitudes were assessed with this 12-item, unidimensional scale developed by Mutlu Bozkurt and Tamer (2020). The scale demonstrated excellent internal consistency in the original study (Cronbach's α = .92) and maintained strong reliability in the current study (Cronbach's α = .89).

Personal Information Form: This researcher-developed demographic questionnaire collected information concerning participant characteristics relevant to the study objectives.

Data Analysis

Research data were analyzed through appropriate statistical software. Analyses included descriptive

statistics for demographic variables and correlation analyses to examine relationships between study variables.

RESULTS

Table 1. Demographic Findings of Participants

		N	*%*
Gender	Male	392	62.1
	Female	239	37.9
	Total	631	100.0
Time devoted to e-sports per day Male	1-3 hours	149	38.0
	4-6 hours	143	36.5
	7-9 hours	81	20.7
	10+ hours	19	4.8
	Total	392	100.0
Time devoted to e-sports per day Female	1-3 hours	92	38.5
	4-6 hours	92	38.5
	7-9 hours	40	16.7
	10+ hours	15	6.3
	Total	239	100.0
Duration of license Male	1 year or less	223	56.9
	2 years	118	30.1
	3+ years	51	13.0
	Total	392	100.0
Duration of license Female	1 year or less	139	58.2
	2 years	81	33.9
	3+ years	19	7.9
	Total	239	100.0
Most played e-sports genre	MOBA	83	13.2
	FPS	146	23.1
	RTS	66	10.5
	BATTLE ROYAL	64	10.1
	SPOR	165	26.1
	FIGHTER	60	9.5
	MMORPG	47	7.4
	Total	631	100.0
Educational background	Primary School	21	3.3
	Middle School	26	4.1
	High School	126	20
	Associate Degree	111	17.6
	Bachelor's Degree	304	48.2
	Postgraduate	43	6.8
	Total	631	100
Weekly physical activity	None	122	19.3
	1 - 2 days	238	37.7
	3 - 4 days	197	31.2
	5+ days	74	11.7
	Total	631	100

Table 1 presents the demographic characteristics of the 631 e-sports athletes in the sample. The majority of participants were male (n=392, 62.1%), with 239 (37.9%) female. Regarding daily e-sports engagement, a similar distribution pattern emerged between genders. Among males, 149 (38%) spent 1-3 hours, 143 (36.5%) spent 4-6 hours, 81 (20.7%) spent 7-9 hours, and 19 (4.8%) spent 10 or more hours. Among females, the corresponding figures were 92 (38.5%), 92 (38.5%), 40 (16.7%),

and 15 (6.3%). Overall, 38.2% of participants spent 1-3 hours daily, 37.2% spent 4-6 hours, 19.2% spent 7-9 hours, and 5.4% spent 10 or more hours. License duration varied, with 223 (56.9%) male athletes having a license for one year or less, 118 (30.1%) for two years, and 51 (13%) for three years or more. For female athletes, the breakdown was 139 (58.2%), 81 (33.9%), and 19 (7.9%), respectively. In total, 57.4% of participants had a license for one year or less, 31.5% for two years,

and 11.1% for three years or more. Participants' primary e-sports genre interests included MOBA (n=83, 13.2%), FPS (n=146, 23.1%), RTS (n=66, 10.5%), Battle Royale (n=64, 10.1%), Sports (n=165, 26.1%), Fighter (n=60, 9.5%), and MMORPG (n=47, 7.4%). Educational levels were distributed as follows: primary school (n=21, 3.3%), secondary school (n=26, 4.1%), high school

(n=126, 20%), associate degree (n=111, 17.6%), bachelor's degree (n=304, 48.2%), and postgraduate degree (n=43, 6.8%). Regarding weekly physical activity, 122 (19.3%) participants reported no activity, 238 (37.7%) engaged in activity 1-2 days per week, 197 (31.2%) for 3-4 days, and 74 (11.7%) for 5 or more days.

Table 2. Rest of Correlation Analysis

Scale		Attitude Towards E-Learning	Age	Income Level
Attitude Towards E-Learning	r	-	-.051	-.023
	p	-	.201	.562
Dual Career Management	r	.529**	.111**	-.004
	p	.000	.005	.927
Career Planning	r	.461**	.169**	-.019
	p	.000	.000	.632
Emotional Awareness	r	.497**	.114**	-.018
	p	.000	.004	.645
Social Intelligence and Adaptation	r	.431**	.113**	.068
	p	.000	.005	.088

Table 2 presents the correlational relationships between the study variables. A statistically significant positive correlation was found between e-athletes' attitudes towards e-learning and each of the four dual career competency sub-dimensions: dual career management (r= .529, p< .01), career planning (r= .461, p< .01), emotional awareness (r= .497, p< .01), and social intelligence and adaptation (r= .431, p< .01). Age also demonstrated a statistically significant positive relationship with each of the dual career competency sub-dimensions: dual career management (r= .111, p< .01), career planning (r= .169, p< .01), emotional awareness (r= .114, p< .01), and social intelligence and adaptation (r= .113, p< .01). However, no statistically significant relationship was observed between age and attitudes towards e-learning (r= -.051, p> .05). Furthermore, no statistically significant correlations were found between income level and either the dual career competency sub-dimensions (dual career management: r= -.023, p> .05; career planning: r= -.004, p> .05; emotional awareness: r= -.019, p> .05; social intelligence and adaptation: r= -.018, p>.05) or attitudes towards e-learning (r=.068, p> .05).

DISCUSSION AND CONCLUSION

This section examines the implications of the findings derived from the investigation of e-athletes' engagement patterns, dual career competencies, and e-learning attitudes. The data revealed that e-athletes predominantly dedicate 1-6 hours daily to training and competition, with a marked

concentration in the 1-3- and 4-6-hour ranges. These observations align with prior research by Bayrak (2019), who reported comparable daily time allocations among e-sports participants. However, Kocadağ (2019) documented a contrasting trend, finding that 52% of student e-sports enthusiasts engaged in gameplay exceeding 6 hours daily, suggesting potential variances in sample demographics or definitions of "engagement." Furthermore, participants in the current study exhibited a preference for MOBA, FPS, and Battle Royale game genres, consistent with Bayrak's (2019) findings on genre-specific interactions and training modalities. License duration analysis indicated that most e-athletes held professional licenses for ≤1 year, reflecting the relatively nascent career trajectories common in this population.

A significant positive correlation emerged between athletes' e-learning attitudes and the sub-dimensions of the Dual Career Competency Scale including dual career management, career planning, emotional awareness, and social intelligence and adaptation. This aligns with Van Rens et al.'s (2019) assertion that dual-career athletes can harmonize educational and athletic pursuits without detrimental trade-offs. The symbiotic relationship between academic and athletic identities was further underscored by Simons and Van Rheenen (2000), who identified their integration as critical to academic performance. Aquilina (2013) emphasized the importance of pursuing sport and academic careers concurrently, particularly given the potential for unexpected early termination of athletic pursuits.

Karadağ (2021) suggested that education can provide a respite from the demands of sport, while sport can positively contribute to academic life. Simons and Van Rheenen (2000) found that the integration of sport and academic identities is crucial for academic performance in dual-career athletes. Such dynamics were corroborated by Chuan et al. (2012), who demonstrated that supportive learning environments positively influenced academic achievement among dual-career athletes. In the context of the results obtained within the scope of the research, the significant relationship between e-learning attitudes of e- athletes and dual career competencies can be explained by the fact that e-athletes are prone to using digital and technological tools. Although there are serious differences in practice between e-sports and the sports branches that make up the sample of other studies, it is thought that the generally similar results are due to the close relationship of athletes with technological and digital tools. As a matter of fact, in the research conducted by Karadağ et al. (2023), it is emphasized that athletes define digital technologies as an indispensable part of life. In this context, considering that athletes closely follow digital technological developments, it is thought that the opportunity to pursue both their education and sports careers together can be provided through the distance education model. Considering the power of elite athletes to represent their country, institutions and organizations, it is thought that it is important for educational authorities to produce policies that support dual career opportunities for athletes.

The present study revealed no significant relationship between age and e-learning attitudes, while a significant positive relationship emerged between age and dual career competence perceptions. This finding regarding age and e-learning attitudes aligns with Mutlu Bozkurt (2021), who also found no significant difference between athletes' e-learning attitudes and age. However, the positive relationship between age and dual career competence perceptions contrasts with some existing literature (Şimşek et al., 2023), though the specific nature of these findings isn't specified, suggesting both similar and dissimilar results exist. Furthermore, the broader literature on dual careers offers a cautionary perspective, as Skrubbeltrang et al. (2018) cautioned that early dual-career initiation may incur adverse effects, highlighting the need for age-appropriate support structures. It can be said that athletes' dual-career competence perceptions increase as their education level and age progress. The reason why there is no perception of career anxiety in younger age groups and lower education categories is that people who have dual careers are included in order to advance in age.

Analyses detected no relationship between e-athletes' income level and either their e-learning attitudes or dual career competence perceptions. This null finding contrasts with several studies in the existing literature. Skrubbeltrang et al. (2018), for example, emphasized the direct relationship between family income and dual career attitudes among 1170 Danish student-athletes, highlighting income as a crucial factor in maintaining a dual career. Likewise, Fryklund (2012) found that increased economic opportunity positively influenced dual career engagement. Mutlu Bozkurt (2021) reported a significant relationship between athletes' income level and their e-learning attitudes. Thus, while the current study did not find such relationships, prior research suggests that income may play a more significant role in both dual career attitudes and e-learning attitudes among athletes. There may be some reasons for the differences between the research findings and other studies. First of all, the reason why there is no significant relationship between income level and e-learning attitudes can be shown as the fact that e-athletes consist of a sample group from a wide variety of educational levels. In addition, it can be evaluated that since digital technological developments are now more accessible all over the world, socio-economic factors do not create a difference in distance learning practices among individuals. The implementation of e-learning activities with different methods at every level of education can be considered as another reason. The reason why there is no significant result between the income level of e-athletes and their dual career competency levels can be shown as the way they evaluate the concept of sportsmanship as a profession. As a matter of fact, the acceptance of sportsmanship as a profession by parents is important for athletes' dual career management. The e-sports branch is based on different practices than other sports branches. It is observed that it is suitable for distance participation, especially in games played online. For this reason, it hosts athletes from a wide variety of socio-economic structures. Considering that income level does not constitute an obstacle to participation in games, it can be assumed that e-athletes' dual career competences are not affected by this situation.

In conclusion, the findings indicate a positive relationship between e-athletes' dual career competencies and their attitudes toward e-learning. Thanks to their inherent familiarity and interaction with technology and digital tools, e-athletes may be particularly well-positioned to leverage e-learning to support both their athletic and academic development, thereby facilitating a successful dual career path. Future research could explore longitudinal outcomes of this integration and

institutional strategies to optimize its benefits. The distance learning model is thought to be a preferable method due to the intensity that athletes experience during continuous camp, competition and training periods. Therefore, it is recommended to the authorities that education policies be evaluated by taking into account the special conditions of the athletes. On the other hand, it is important for parents of athletes to be aware that their children can pursue both sports and educational careers. It is thought that parents with high awareness play an important role in the development of dual-career athletes. Therefore, it is recommended that parents be included in these processes and that existing opportunities can be used effectively and efficiently.

Author Contributions

H.U: data collection. H.U: data analysis and original draft preparation. O.M.: review and editing. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The research was conducted in accordance with the Declaration of Helsinki after receiving approval from the Ethics Committee of the Sports Sciences of Atatürk University on 17.11.2021 (Approval No.: E-70400699-050.02.04-2100316289).

Informed Consent Statement

Informed consent was obtained from all subjects involved in this study.

Data Availability Statement

Datasets are available through the corresponding author upon reason-able request.

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Conflicts of Interest

The authors unequivocally assert that this research was undertaken while devoid of any commercial or financial affiliations that might be perceived as potential conflicts of interest.

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