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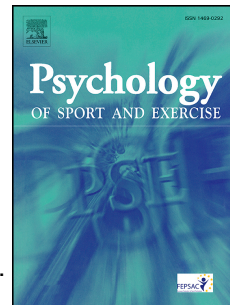
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Kristoffer Henriksen: Conceptualization; Methodology; Data Curation; Formal analysis; Writing – original draft.

Natalia Stambulova: Conceptualization; Methodology; Data Curation; Formal analysis; Writing – review & editing.

Emily Cartigny: Project administration; Data Curation; Formal analysis; Writing – review & editing.

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Ten Essential Features of European Dual Career Development Environments:

A Multiple Case Study

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Abstract

Aim: Dual career development environments (DCDEs) support athletes' effort in combining their competitive sporting careers with education or work. The characteristics of the environments may differ across cultures. The aim was to identify essential features of DCDEs based on a cross-case analysis of seven European DCDEs in Belgium, Denmark, Finland, Slovenia, Spain, Sweden, and the United Kingdom within the Erasmus+ Sport project "Ecology of Dual Career".

Design: The study was designed as a multiple case study and based on two holistic ecological working models (Henriksen et al., 2020). The cross-case analysis included series of focus group discussions, in which two-three researchers from each partner country and four dual career (DC) support providers compared the findings across seven national cases with a primary focus on similarities rather than differences.

Results: A list of ten essential features of the DCDEs, structured into two overarching themes. (1) Holistic structure with five subthemes: Dedicated DC support team, Integration of efforts across the whole environment, A clear understanding of DC issues and support from across the environment, Role models and mentorship, and Access to expert support. (2) Shared DC philosophy also had five subthemes: A whole-person approach, An empowerment approach, Flexible DC solutions, Care of DC athlete's mental health and wellbeing, and An open and proactive approach to the development of the environment.

Conclusion: The features are introduced in the manner of discussions, thus providing detailed information about the DCDEs without losing (too much) contextual information. These features can help researcher-practitioners to understand DCDEs and guide their optimization.

Keywords: Holistic ecological approach, case study, sport and education, cross-national, Erasmus+

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Ten Essential Features of European Dual Career Development Environments:

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Athletes strive to succeed not only in sport but also in education or work (European Commission, 2012). They have to prioritize and make shifts in this prioritization depending on life situations (e.g., school during the exam period or sport when approaching competitions). The potential value and benefits of combining sport and studies are short-term and long-term. For example, the skills learned in one area may be transferable and valued in others; the intellectual stimulation may also help to maintain interest and commitment in training when athletes face ups and downs; a dual career (DC) gives a sense of balance and that there is more in life than elite sport; and finally, having a fall back plan provides a sense of security, that may even influence the athletes in manners so they perform better (e.g., Aquilina, 2013; Stambulova et al., 2015). Additionally, DC athletes are often better prepared for the post-sport life (e.g., Torregrossa et al., 2015). The DC pathway can be challenging, and inflexible schedules can be a major barrier for DC athletes (Lopez de Subijana et al., 2015; Stambulova & Wylleman, 2019). Therefore, maintaining an optimal DC balance defined as “a combination of sport and studies that helps student-athletes achieve their educational and athletic goals, live satisfying private lives and maintain their health and well-being” (Stambulova et al., 2015, p. 12) should be supported to safeguard athletes from burnout (e.g., Sorkkila et al., 2017) and staying motivated (e.g., Lupo et al., 2017). Obtaining an optimal DC balance also means the possibility of shifting priority for sport or studies in certain periods (Cartigny et al., 2019).

European DC Research

Two major factors are influential in DC adjustment, including personal resources of the DC athlete (e.g., DC competencies; see De Brandt et al., 2018) and the external DC support provided on different levels (Giudotti et al., 2015; Stambulova & Wylleman, 2019). In European countries, sport

54 is usually club-based, and therefore, special arrangements are needed between sport and educational
55 institutions to facilitate athletes' DCs. Within the European context and taking into account the
56 differences between educational policies in different European countries, Aquilina and Henry
57 (2010) identify four different types of policy systems: (1) A state-centric regulation where the
58 responsibility is placed on the institution to provide adapted opportunities for student-athletes (e.g.,
59 Spain), (2) the state as sponsor or facilitator, whereby the state promotes formal agreements to
60 ensure that student-athletes' needs are met (e.g., Belgium, Denmark, Finland, Sweden), (3) the
61 national federations or sports institutes as facilitators or mediators between student-athletes and
62 educational bodies (e.g., United Kingdom: UK), and (4) systems with no formal structures where
63 arrangements rely on individually negotiated agreements (e.g., Slovenia). This typology illustrates
64 the diversity in DC management approaches across Europe.

65 Recently, in a state-of-the-art critical review on the psychology of European athletes' DCs,
66 Stambulova & Wylleman (2019) identified a lack of "a whole environment" perspective as a major
67 gap in the literature. The holistic lifespan perspective (Wylleman et al., 2013) is a central driving
68 force of the current European DC research. It promotes "a whole person" and "a whole career
69 approach" and illustrates that across the athletic life span, DC athletes interact with different people
70 (e.g., coaches, teachers) in a variety of organizations, such as schools, colleges, universities and
71 sports clubs (see Debois et al., 2015). Accordingly, there is a need to capture the whole spectrum of
72 athletes' experiences in sport and beyond, including environmental influences from micro and
73 macro levels, as well as athletic and non-athletic domains (Stambulova et al., 2020).

74 **The ECO-DC Project, Holistic Ecological Approach, and the European Context**

75 This study forms part of the Erasmus+ Sport project "Ecology of Dual Career - Exploring
76 Dual Career Development Environments across Europe" (ECO-DC). Within the ECO-DC project, a
77 dual career development environment (DCDE) is defined as a purposefully developed system that

78 aims to facilitate athletes' investment in combining their competitive sporting careers with
79 education or work (see also Morris et al., 2020). The ECO-DC project invites researchers to look
80 beyond the individual student-athlete and shift their attention to exploring DCDEs.

81 The holistic ecological approach (HEA) shifts researchers' and practitioner's attention from
82 the individual athletes to the broader environment in which they develop, and it provides a
83 theoretical grounding (systems theory, ecological psychology and cultural psychology), two
84 working models, and methodological guidelines for researching environments (Henriksen, 2010;
85 Henriksen & Stambulova, 2017). Inspired by the HEA and research into athletic talent development
86 environments (Henriksen et al., 2010a), the ECO-DC project was conducted to advance the
87 knowledge of DCDEs across Europe. The initial step in the project was to create a taxonomy of
88 DCDEs, and eight types were identified across seven European countries (i.e. Belgium, Denmark,
89 Finland, Slovenia, Spain, Sweden, and the UK) involved in the project: (a) sports friendly schools,
90 (b) elite sport schools /colleges, (c) professional and /or private club programs, (d) sports friendly
91 universities, (e) combined DC systems, (f) national sports programs, (g) defense forces programs,
92 and (h) players' union programs with a range of approaches to supporting DCs (Morris et al., 2020).
93 A natural extension of this work was to explore these types of environments in more detail by
94 conducting case studies informed by the HEA after adapting it to grasp specific features of DCDEs.

95 Based on the original HEA working models designed to investigate talent development
96 environments (Henriksen et al., 2010), the ECO-DC consortium designed two working models for
97 the investigation of DCDEs (see Henriksen et al., 2020, for a detailed description). These two are
98 interconnected and serve as a lens through which to analyze a whole DCDE. First, with the DCDE
99 working model, there is a focus on the structure of the environment, particularly the roles and
100 cooperation of key persons and organizations. The model is structured into two levels (micro and
101 macro) and three domains (sport, study and private life). Second, with the DC-Environment Success

102 Factors (DC-ESF) working model, there is a focus on the DC preconditions, DC processes, DC
103 philosophy of the DC support team, the student-athletes' development as athletes, students and
104 persons, and their acquisition of DC competences. These elements are analyzed to explain the
105 effectiveness of the environment (i.e., the student-athletes' athletic and academic achievements,
106 wellbeing and satisfaction). After developing the working models case studies were conducted to
107 provide holistic descriptions of local DCDEs in seven countries (more details in the Methodology),
108 which are compared and contrasted in this current study, prioritizing the identification of
109 similarities.

110 The ECO-DC project expands the growing trend of focusing on athletes' DC support network,
111 including coaches, teachers, parents and DC support providers (Defruyt et al., 2019; Gledhill &
112 Harwood, 2015, Knight et al., 2018; Tessitore et al., 2020). Previously, environmental aspects such
113 as flexible study programs (Brown et al., 2015; Fuchs et al., 2016; Pink et al., 2018), mentorship
114 processes (Pink et al., 2018) and the interactions between the agents in athletes' different life
115 domains (Defruyt et al., 2019; Tekavc et al., 2015) have been identified as vital facilitators of DC
116 management. HEA seems to hold merit for DC research and the analysis of the whole environment
117 (Henriksen et al., 2020; Kiens & Larsen, 2020; Korhonen et al., 2020; Linnér et al., 2020; Nikander
118 et al., 2020). In order to further construct and yield meaningful linkages across cases, the natural
119 next step is to identify the similarities between a selected sample of European DCDEs. The
120 outcome of this study may enable researchers and practitioners to identify areas for optimization
121 and the promotion of practices that develop positive DCDEs. Further, this could provide the basis
122 for the development of a monitoring and evaluation tool to support the management of DCDEs.
123 Therefore, and inspired by previous studies in the field on defining specificities and commonalities
124 of different environments (e.g., Henriksen, 2010; Kuettel et al., 2018), the aim of the current study

125 is to identify essential features of DCDEs based on a cross-case analysis of seven European
126 DCDEs. Outlining analogous features of DCDEs would enable further development of DC support.

127 **Methodology**

128 The study is a qualitative post-positivist study with a multiple case design in which several
129 bounded cases are selected to develop a more in-depth understanding of the phenomena than a
130 single case can provide (Chmiliar, 2010). Following the guidelines of Stake (2006), the interest in
131 the single cases is instrumental since they belong to a particular target collection of cases that are
132 categorically bounded together. In this study we compared and contrasted processes and outcomes
133 across seven cases of European DCDEs focusing primarily on their similarities (i.e., features) but
134 also acknowledging their uniqueness and how each of them is influenced by local conditions (Miles
135 et al., 2014). We position this study within realist ontology and post-positivist epistemology
136 meaning that DCDEs exist as material structures that operate independently of our experience and
137 that we strive for an accurate portrait of the European DCDEs' features but understand that it can
138 only be grasped imperfectly (Smith, 2019; McGannon et al., 2019).

139 **Background Case Studies**

140 Partners of the ECO-DC project represented geographically and culturally diverse European
141 countries, including Belgium, Denmark, Finland, Slovenia, Spain, Sweden and the UK. Based on an
142 initial mapping of different types of DCDEs across Europe (Morris et al., 2020), the seven national
143 research groups each selected a DCDE based on the context-specific criteria including effectiveness
144 of the DCDE (e.g., sport and/or academic achievements, wellbeing, drop-out; see Table 1). For
145 example, the Finnish case was awarded the best DC environment in Finland (Nikander et al., 2020),
146 and the Swedish case was selected as a national example of best practice (Linnér et al., 2020).

147 The case studies were collected at the same time (i.e. parallel design; Stake, 2006) by national
148 research groups, based on the HEA (Henriksen & Stambulova, 2017), guided by the DCDE and the

149 DC-ESF working models (Henriksen et al., 2020), and the same templates for observation and
150 interview guides (see more in Henriksen et al., 2020). The purpose of each of them was to provide
151 holistic in-depth and rich descriptions of selected European DCDEs, and to investigate the factors
152 influencing the environments' effectiveness in supporting the development of student-athletes (see
153 Table 1 for an overview of the data collection). Case presentations relied on transforming the
154 working models into empirical DCDE and DC-ESF models grounded in the empirical data of each
155 DCDE. The overall ECO-DC project received ethical approval in a relevant university [removed for
156 blind review]. All single case studies were conducted in accordance with the local ethical
157 guidelines. For a detailed description of the data collection method employed and an example of a
158 case study see Henriksen et al. (2020). Several of the case studies were presented at international
159 conferences (De Brandt et al., 2019; Linnér et al., 2019; Ramis et al., 2019; Ronkainen et al., 2019).

160 [Insert Table 1 around here]

161 **Stages in the Cross-Case Analysis and Reflections on the Rigor**

162 The project research group¹ consisted of two-three researchers from each partner country (15
163 in total) and four DC support providers from Belgium, Denmark, UK and Sweden (from now – the
164 project research group). The project research group represents relevant expertise (i.e., DC research,
165 the HEA, case studies) and experience from applied work within the European DC support systems
166 at different organizational levels (e.g., managers of DC provision in national sports federations).

167 Cross-case analysis is a research method that can mobilize knowledge from individual case
168 studies. The mobilization of case knowledge occurs when researchers accumulate case knowledge,
169 compare and contrast cases, and in doing so, produce new knowledge (Khan & VanWynsberghe,
170 2008). The qualitative data analyzed in this study were case descriptions and focus group notes, and
171 the analysis across cases proceeded through five stages.

172 In the first stage – *familiarization with the seven DCDE case studies through oral and video*
173 *presentations* – the project research group worked to get a feeling of the key features of all seven
174 cases. A written report of each case study, supplemented by the empirical versions of the DCDE
175 and DC-ESF models, and 15-minute video presentations were provided by the seven national
176 research groups to enable familiarization with the cases studied. One researcher from each partner
177 country provided a short oral presentation at a research meeting, and all from the project research
178 group were able to ask questions and get clarification on uncertainties if needed. The project
179 coordinators compiled a preliminary list that initiated discussion and critical reflection and the
180 project research group agreed that further cross-case analytical work was needed.

181 In the second stage - *series of focus group discussions* - the project research group compared
182 and contrasted the cases to identify similarities and differences of the seven cases and developed the
183 list of *shared features*. To avoid the project research group overlooking important differences
184 between the multiple types of DCDEs (Morris et al., 2020) when identifying shared features, the
185 participants were divided into two smaller groups. First, one group compared and contrasted cases
186 of sport schools (Finland, Spain, Slovenia, Belgium) and the other university cases (Denmark,
187 Sweden and UK). The project research group acknowledged that all environments are unique and
188 that they are embedded in and shaped by specific local contexts and cultures; however, after lengthy
189 discussions and negotiations, the project research group agreed on a preliminary list of features
190 (e.g., shared philosophy, clear responsibilities, whole person approach, flexibility) for further
191 elaboration, which was developed inductively from the data. Guided by the two working models the
192 project research group constructed the two overarching categories, i.e. holistic structure and shared
193 DC philosophy. From this point the analysis turned to a deductive strategy. Second, two new focus
194 groups were established. One was focusing on the holistic structure of the DCDEs and the other on
195 the shared DC philosophy. The meaning of each feature was clarified and described within these

196 groups. Two persons in each focus group took notes and were leading the discussion in a
197 collaborative and democratic manner, and were making sure that all members of the project
198 research group contributed with their individual expertise and insights from their case studies. At
199 this point, the common features of talent development environments served as inspiration
200 (Henriksen, 2010) and provided a common understanding of what a description of shared features
201 might look like. The project research group reached consensus that all DCDEs do have space for
202 improvement; they compensate for their weak points, and not all features are present in all cases.
203 Therefore, the idea of identifying shared features turned into the idea of defining *essential features*,
204 which we define as the most characteristic and important features of European DCDEs.

205 In the third stage *an appointed working group* (consisting of the first four authors of this
206 paper) constructed a list of essential features (based on case descriptions and focus group notes),
207 worked on providing descriptors of these features and following the example of Henriksen (2010)
208 also the opposite pole descriptors (see Table 2). The opposite poles are meant as examples.
209 However, they are not only inferred logically, but also grounded in the project research groups'
210 applied experiences on optimization of less successful DCDEs and from the focal cases, where the
211 participants reflected on both the strengths and the weaknesses of their environments. The stage was
212 an iterative process going back and forth between notes from the focus group discussion, the case
213 descriptions, and the list of shared features of talent development environments (Henriksen, 2010).

214 The fourth stage was *the final agreement of the list of essential features* as presented in Table
215 2. The draft list of descriptors and opposite poles was sent from the working group to the project
216 research group who were invited to reflect, comment, and revise. This “member reflection” (Smith
217 & McGannon, 2017) provided further intellectual precision of the essential features of European
218 DCDEs. Based on comments and feedback, the working group revised the list, which again was

219 sent to the entire project research group. The project research group reached final agreement on the
220 essential features of European DCDEs, with descriptors and opposite poles, as presented in Table 2.

221 The fifth stage - *the list of essential features used as a coding frame for a deductive analysis*
222 *of all the seven cases* - provided enriched detailed descriptions for direct comparisons of the cases.
223 In line with the post-positivist stance of the ECO-DC project, we used a coding reliability thematic
224 analysis approach, conceptualized themes as data domains (Braun & Clarke, 2019) for the second
225 round of the case descriptions. Each national research team deductively analyzed their data set (see
226 Table 1) using Table 2 as a coding frame and produced descriptions of their DCDEs (now) based on
227 the essential features. Then, the working group summarized and condensed these descriptions in
228 Tables 3 and 4 to finally confirm the overarching categories – the holistic structure and the shared
229 DC philosophy – and the relevant essential features.

230 Reflecting on the rigor of this five-stage cross-case analysis grounded in the post-positivist
231 epistemology (see McGannon et al., 2019 about various approaches in defining rigor in qualitative
232 research), we would like to mention the following: (a) from the very beginning we didn't plan to
233 identify (exactly) ten DCDEs' essential features but we kept in mind that these features should have
234 clear connotations with the DCDE and DC-ESF working models; (b) during the analysis we
235 realized that all the DCDEs under comparison had stronger and weaker points, and that is why we
236 shifted from the concept of shared features to essential features and also provided descriptions of
237 positive meaning and opposite meaning of each feature; (c) in all the stages of the analysis, we went
238 back and forth between the cases and the crystalizing list of DCDEs' essential features moving
239 through a series of open and critical discussions in which members of our project research group
240 challenged each other and searched for mutual understanding; (d) we moved to each next stage in
241 the analysis only after the partners had agreed on a previous stage; and (e) we think that the
242 outcome of the fifth stage (i.e., of the deductive analysis of all the cases using the essential features

243 as a code-frame; Braun & Clarke, 2019) confirmed the list of essential features as comprehensive
244 and credibly derived from the DCDEs compared.

245 **Results**

246 The European DCDEs varied in terms of the age of the athletes, the type of environment (e.g.,
247 sport friendly university, private sport club and elite sport school), and the level of sport and
248 education they supported. All the essential features of DCDEs will be introduced below in the
249 manner of the discussion to illustrate how the project research group contrasted, debated, and
250 developed the features in the focus groups and reached consensus. We selected extracts from the
251 dialogues in the project research group and give the readers a feel of our discussions. Table 2 is an
252 overview of the ten essential features and their descriptors. We include in this table the opposite
253 poles of the essential features to further clarify the meaning of each. The positive pole and the
254 opposite pole can be seen as designing a continuum that provides a richer and more nuanced
255 reading of each feature. The ten features are structured into two overarching themes - Holistic
256 structure and Shared DC philosophy - each with five subthemes. Table 3 displays the characteristics
257 of the holistic structure and Table 4 displays the characteristics of the shared DC philosophy across
258 the seven DCDEs. Tables 3 and 4 should be read one case (vertical) and thus one feature
259 (horizontal) at a time. While the horizontal reading of Tables 3 and 4 allow the reader to look at one
260 DCDE at a time, we emphasize that the condensed analysis does not present the rich in-depth
261 illustration that is expected of a case study (Hodge & Sharp, 2016). In the following, we illustrate
262 the diversity of the DCDEs and provide selected examples, but not all cases are mentioned in each
263 feature even though all national research groups contributed with insights in the construction of
264 each feature.

265 [Insert Table 2 around here]

266 **Holistic Structure**

267 As an overarching theme, the *holistic structure* refers to the specific components of the
268 environment (people, institutions etc.), the roles and functions of these components, and the
269 communication and coordination between the different components and levels of the environment.
270 The holistic structure of each DCDE was centered around the student-athletes and embraced micro-
271 and macro-levels, and sport, study and private domains. This overarching theme contains five sub-
272 themes representing five essential features of DCDEs (see Tables 2 and 3).

273 [Insert Table 3 around here]

274 ***Dedicated DC Support Team***

275 The dedicated DC support team refers to having a designated team (or person) responsible for
276 coordinating sport and study that helps to facilitate an optimal DC balance. In the best cases, one
277 central entry point was provided, but promoted helping student-athletes as everybody's (e.g.,
278 coaches, managers, teachers, family) business.

279 Organization of the DC support varied across the seven cases. The Swedish research group
280 investigated a combined DC system for university student-athletes and identified that the DC
281 support team consisted of four stakeholders with a clear distribution of roles and functions (e.g.,
282 coordination, organization, contacts with student-athletes, coaches, teachers, administration,
283 experts, and external partners). This team coordinated flexible study and helped with other aspects
284 of DC athletes' life (e.g., planning and prioritizing), facilitating their search for optimal DC balance.
285 Student-athletes' main entry point for DC support was the coaches from whom they got initial
286 support and advice on how to proceed. Then the DC support team, who had close contact with the
287 coaches, organized a more attuned support based on the nature of student-athletes' needs. By
288 contrast, the Finnish research group investigated a Finnish elite sport school for winter sports and
289 found no DC support team. Athletes still combined sport and studies, but the school did not have a
290 person or team responsible for DC issues. If athletes struggled with school issues, they had to

291 approach student counselors like all other students. The Slovenian research group found two
292 designated people (a pedagogical school coordinator and a school psychologist) that provided DC
293 support. If the student-athletes had problems with school grades, the teachers contacted the
294 pedagogical coordinator and they collaborated to find a solution. The Spanish research group,
295 studying a private multiple sports club, found no people with formal responsibility for helping
296 student-athletes manage their DCs, but a few well-intentioned people (a teacher and a sport
297 psychologist) compensated for this lack of formal structure by helping the athletes regardless. These
298 well-intentioned people met adolescents who needed help finding a balance in life. The Spanish
299 research group described this as a weakness, because it left the athletes uncertain of whom to
300 approach. When they discussed this with the club management, they agreed and decided to remedy
301 this in the future.

302 *Integration of Efforts Across the Whole Environment*

303 The integration of efforts across the whole DCDE refers to the coordination and
304 communication between representatives from the sport, study, and private life domains (e.g.,
305 coaches, teachers, family, DC support team). Micro- and macro-levels were linked through formal
306 or informal networks. When integrated, the efforts to support the student-athletes allowed them to
307 experience concordance and synergy in daily life.

308 The Danish research group investigated a sports friendly university and identified a DC-
309 support team that functioned as a key connector between the sport and the study domains, especially
310 at the macro-level. The head of this team had a large network in the local and national elite sport
311 system, as well as within the university system. To the benefit of the student-athletes, the head of
312 the team ensured that the efforts of people across the DCDE were in sync. For example, he visited
313 the national training centers to explain the ideas of DC to coaches, family, and athletes. The day-to-
314 day coordination of the DC, however, was mainly the task of the student-athletes. In general, in

315 Denmark, the combination of sport and study is considered the norm and a key ingredient of the life
316 of an elite athlete, not a barrier to sporting achievements. The Belgian and Finnish research groups
317 explored DCDEs where the student-athletes lived, trained, and studied within the same
318 environment. In the Finnish elite sport school, the student-athletes did not experience integration
319 and coordination, but rather contradicting priorities in daily life. The coaches primarily focused on
320 sporting achievements, whereas the teachers expressed concerns over sports interrupting day-to-day
321 rhythm of student-athletes. The Flemish (i.e. northern part of Belgium) elite sport school for
322 gymnastics provided integrated efforts due to a successful collaboration between three
323 organizations - boarding school, sports federation, and the school. One person from each domain
324 constituted the DC support team and they had weekly meetings, which provided good
325 communication and quick follow up if problems occurred. Living at a boarding school facilitated
326 integrated efforts, but some student-athletes (aged 12-18) suffered from homesickness.

327 *A Clear Understanding of DC Issues and Support from Across the Environment*

328 A clear understanding of the challenges faced by student-athletes allows the support network
329 to provide appropriate support for student-athletes to allow them to focus on the sport and study at
330 different time points depending upon key priorities at that time. It refers to family, coaches, and
331 teachers acknowledging, accepting, and supporting the DC athletes' dedication to combining sport
332 and study.

333 The UK DCDE under study was a sports friendly university, the DC support team promoted
334 the importance of DC as a protective factor for the wellbeing of the athletes. The UK research
335 group identified that the environment was characterized by a shared understanding of the issues
336 related to DC. The DC support team worked deliberately on disseminating knowledge to family,
337 coaches, teachers, and peers so that they were able to recognize and understand the specific needs
338 of student-athletes (e.g., shift in prioritizing depending on the situations). The Belgian research

339 group found that families played a positive supporting role. However, because there is little chance
340 to make a living from gymnastics, some parents unwittingly pressured their children by
341 emphasizing the importance of school. Responding to the Belgian story, the Finnish research group
342 similarly described how student-athletes rated (from the case descriptions) the financial support
343 provided by parents as crucial for them to be able to pursue a dual-career.

344 ***Role Models and Mentorship***

345 Role models and mentorship refer to the presence of appropriate persons who student-athletes
346 can learn from and be guided and inspired by. Role models and mentorship was regarded essential
347 in all cases, but each environment varied in terms of how formalized the setup was. All the
348 environments provided opportunities for student-athletes to learn from others.

349 The focus group discussions showcased multiple types of role models and mentorship across
350 the European DCDEs. The UK research group identified that all student-athletes coming into the
351 environment were assigned a “buddy”, who was a second or a third-year student-athlete. The buddy
352 demonstrated what was expected within the environment and acted as an additional point of contact
353 for questions or support for the new student-athletes. The tight-knit community among student-
354 athletes within the scholarship system promoted peer learning and support. Student-athletes
355 communicated with each other through the scholarship hub, in the gym facilities, or when they
356 attended workshops. Some even shared accommodation with other student-athletes. Furthermore,
357 alumni gave presentations and willingly passed on their knowledge. Responding to this story, the
358 Danish research group described how the Danish student-athletes were a part of a virtual
359 community tied together by shared narratives. The DC support team provided opportunities for
360 vicarious learning by sharing stories of challenges, dilemmas, and solutions based on previous
361 experiences. So even if the student-athletes did not necessarily meet within the environment, they
362 still learned from each other. The management of the Danish DCDE explained that one-size-fit-all

workshops would not suit a diverse group of athletes from different sports and education backgrounds, and, therefore, the DC team used examples of previous individualized solutions as a part of their supervision of student-athletes. The project research group agreed that peer learning, role models and mentorship were essential in a well-functioning DCDE. Role models helped student-athletes to become aware of their career options and ways to cope with adversity and challenges.

Access to Expert Support

The project research group agreed that access to expert services, such as nutrition, physiotherapy, sport psychology, sports medicine was essential for a successful DC. In the different cases, such access was either provided within the DCDE, or the DC support team knew how to signpost the DC athletes to the relevant support.

The Spanish research group explored a private sports club and explained that the student-athletes had access to clinical and educational sport psychology support, physiotherapists, and sport medical staff in the DCDE. Although access to experts was crucial in helping the athletes solve their DC related issues, it was up to the student-athletes to ask for this support, and often they were not aware of the services available to them. In the Finnish DCDE, the services were based in the sports domain (e.g., full time employed physiotherapist and support for physical training). Access to sports medicine and a mental coach was only for national team athletes, which provided them with an express lane to expert assistance, however, everyone had access to a free, albeit slower and less specialized, health care system. The Swedish research group found a well-organized performance team of experts in sport psychology, sport medicine, nutrition, and strength and conditioning training. The Swedish research group emphasized that these experts were also teachers and researchers at the university, which provided a coherent structure across the sports and study domains. Hearing this, the Danish research group shared how they did not find expert support

387 within the university, but clubs and national sport organizations offered expert support services, and
388 the DC support team would refer athletes when needed. By contrast, the Slovenian research group
389 shared that in Slovenia student-athletes (or their families) pay for expert support. The project
390 research group agreed that access to expert support was not implemented in the same way across
391 the DCDEs, but it was essential for the student-athletes to thrive and develop.

392 **Shared Dual Career Philosophy**

393 The second overarching theme, a *shared DC philosophy*, suggests that key stakeholders (DC
394 support providers, sport staff, academic staff) in the environment share basic ideas and values
395 related to DCs. At the most fundamental level, there was agreement inside the environment that
396 sport and education can benefit each other and that competencies acquired in one domain (study,
397 sport, or private) could be of value in the others. The content of the philosophy, i.e. the key values
398 and ideas that were highlighted as essential to success, included five features (see Tables 2 and 4).

399 [Insert Table 4 around here]

400 ***A Whole Person Approach***

401 A whole person approach represents the acknowledgement that sport, study, and private life
402 domains all influence student-athletes' lives. It represents the idea of developing the student-
403 athletes holistically, as seen when people from one domain take an interest in the student-athletes'
404 experiences, challenges, and learning in the other domains.

405 The Swedish research group found a shared DC philosophy among the stakeholders in the
406 combined DC system (i.e. university): Student-athletes were neither only approached as students
407 nor only as athletes. All people in the DCDE agreed that student-athletes are whole persons with
408 individual needs and interests. For example, the coaches agreed that studies are important for
409 athletes and that a focus solely on sport is not beneficial for development. The research group
410 quoted a coach who said: 'First and foremost you are a person, then an athlete, and only then a pole

411 vaulter.’ The Slovenian research group investigated a swimming club and its collaboration with a
412 sport friendly school as a DCDE. The coaches considered the athletes to be more than athletes and
413 emphasized the importance of studies, and the teachers emphasized the importance of personal
414 development through elite sport. Unfortunately, a lack of communication across the domains
415 challenged this whole person approach in several ways. Coaches and teachers did not always agree
416 on what came first and did not collaborate to find an optimal balance. Inspired by the other project
417 cases, the Slovenian research group discussed this with the school management and the club coach
418 as a challenge to the optimal functioning of the environment. They agreed that more communication
419 is needed in the future, but no one had the time allocated for this task. In the UK DCDE (i.e. sports
420 friendly university), the UK research group found lifestyle advisors employed to support a whole
421 person approach. For example, the lifestyle advisors encouraged the student-athletes to nurture their
422 network and friendships outside the sport domain.

423 *An Empowerment Approach*

424 An empowerment approach refers to the student-athletes having opportunities to develop
425 competencies and internal and external resources to manage their own DC and become
426 autonomous. This was visible when student-athletes were actively involved in key decisions
427 regarding their own DCs.

428 In the Danish sports friendly university, the DC support team played a pro-active supporting
429 role in the athletes’ first year as a student-athlete, but a more reactive role later in the development.
430 This meant the DC support team gradually supported the student-athletes’ autonomy development
431 and helped developing their DC competences. The student-athletes matured as students, athletes,
432 and persons along the way, and the DC support team adapted to this development by increasing
433 empowerment of the athletes. In contrast, the Belgian research group investigated an elite sport
434 school in an early specialization sport (i.e. gymnastics; age 12-18). This DCDE was highly

435 structured, and compared to the Danish case, it was more controlling and protective. For example,
436 large training and study loads and the set schedules restricted student-athletes in their interactions
437 with peers outside the elite sport context. The student-athletes developed skills such as self-
438 discipline, planning skills, and work ethic in function of the demands they encountered, but they
439 sometimes struggled with motivation. Still, within this gymnastics context, the Belgian research
440 group found that the DC support team shared a philosophy and aimed for an empowerment
441 approach. The Spanish research group explored an environment for a similar age group (age 10-18),
442 and they gave an example of how the sports psychologists supported the student-athletes in
443 developing a sense of control over their own lives, within a structured set-up.

444 *Flexible DC Solutions*

445 Student-athletes' needs differ depending on the sport, the education, and the individual
446 circumstances. Because athletes are different, flexibility is an essential feature of a successful
447 combination of sport and school. Appropriate support is provided to all student-athletes as
448 necessary. Flexible DC solutions are seen when the education-based DCDEs allow for extra focus
449 on sport when needed, just as when the sport-based DCDEs allow for extra focus on education
450 when needed.

451 Flexibility was a characteristic of all cases, but was exhibited in different ways. The UK
452 research group explored a well-functioning scholarship system, which was flexible, but also had
453 predetermined content (e.g., time management, career planning). The services and the support were
454 adapted to meet the student-athletes' needs, which they recognized and highlighted as essential for
455 their thriving and success. In the Swedish DCDE, which also was higher education, the most typical
456 flexible solutions were to postpone or move exams, take the exams elsewhere, help athletes take
457 their internship at a suitable location, and to increase length of enrollment. Training was organized
458 to fit into the DC lifestyle of the student-athlete. Coaches knew the study plans of student-athletes

459 and adapted their training to allow the athletes flexibility to study. The Spanish research group, who
460 explored a sport-based DCDE for student-athletes in primary/secondary school (private sports
461 club), responded to these stories by describing how the school displayed considerable flexibility but
462 the sport less so. For examples, teachers allowed for flexible schedules and rearranged exams,
463 whilst coaches did not adapt training or competition plans. The Finnish research group reflected on
464 similarities between the Spanish context and their environment, highlighting that at the elite sport
465 school for winter sports, the school day was built around the three weekly training sessions which
466 student-athletes received credits for. The Danish research group explored an education-based
467 DCDE and found the DC support team shared a philosophical understanding that all student-
468 athletes are different, and therefore provided an individual study plan for each student-athlete. They
469 quoted the manager of the DC support team: 'It's a mantra for us that there is no single solution'.
470 Stakeholders and student-athletes of the Danish DCDE spoke of this flexibility and the individual
471 DC solutions as a key success feature.

472 *Care of DC athlete's Mental Health and Wellbeing*

473 Caring for student-athletes' mental health and wellbeing means that DCs are managed in a
474 socially responsible manner. This feature was visible when the DCDEs recognized their
475 responsibility for athlete wellbeing and provided specialized support. Ethical conduct guidelines
476 and referral systems were embedded in policies to support appropriate practices.

477 In the UK sports friendly university, the care of student-athletes' mental health and wellbeing
478 was largely the responsibility of the sport psychology and lifestyle practitioners, who were sport
479 psychology doctorate students in training (supervised by fully qualified sport psychologists). They
480 followed ethical conduct guidelines for the protection of athletes in their work, and if they believed
481 student-athletes had more complex needs, they referred them to a clinical support team. As an
482 example of the UK DCDE prioritizing their student-athletes' mental health and wellbeing, and

483 unlike many similar systems in UK, the DCDE did not demand that student-athletes compete for the
484 university in order to limit unnecessary stress placed on them. In the Belgian environment, the
485 student-athletes were young (i.e. 12-18 years old) and lived at a boarding school, therefore
486 specialized pedagogues cared for their wellbeing. The Finnish research group agreed that care of
487 mental health was important, but described that their elite sport school lacked an organized support
488 network for student-athletes with mental health problems (e.g., eating disorders, anxiety), although
489 the coaches also agreed that this was an issue. A mental coach employed within the organization
490 was primarily responsible for educating sport coaches and providing performance support for elite
491 athletes representing national teams. The Finish research group found a need for better guidelines
492 and support systems (e.g., referral systems). In response, the Danish research group shared that the
493 head of the DC support team believed that the environment lacked guidelines, and that clear
494 responsibilities for student-athletes' mental health were needed. In Denmark the student-athletes
495 were protected by the Law of elite sport (which was also the case in Sweden and Finland) where it
496 is written that elite sport should be pursued in a socially responsible manner. The project research
497 group agreed that ethical conduct not only at the national level, but also at the local level, was an
498 essential success feature.

499 *An Open and Proactive Approach to the Development of the Environment*

500 As a final feature, an open and proactive approach to the development of the DCDE refers to
501 stakeholders engaging in on-going development of their environment and their own competencies.
502 Continuing professional development, evaluation of the environment, and engaging in scientific
503 projects were described as a foundation for sharing knowledge and improving environment
504 functioning.

505 The Belgian research group found it crucial, for the continued development of the Belgian
506 DCDE, that stakeholders evaluated their services and engaged in research projects. The Belgian

507 DCDE took a proactive approach towards its own development. The close collaboration between
508 the DCDE, the Flemish Sport administration, and a research unit provided ongoing evaluation of
509 the DC services. The UK research group shared how they also found systematic evaluation routines
510 in the UK sports friendly university. The DC support team received feedback from student-athletes
511 or stakeholders at the end of each academic year and adapted the service based on this feedback to
512 enhance the systems' effectiveness. Based on this evaluation, resources could be taken away from
513 services that had not been used by student-athletes and more resources given to the services most
514 used. Additionally, the DC support team was encouraged to engage with the latest research to
515 improve their service. In the Swedish DCDE, the DC support team regularly took part in national
516 meetings on DC. The DCDE welcomed visitors from other environments and went on development
517 trips to get innovative ideas and knowledge, and to share experiences, ways of working, challenges,
518 and lessons learnt. In contrast, the Slovenian research group shared that a lack of a proactive
519 approach to the further development of the DCDE was a limitation in their case. The Spanish
520 research group contributed with a current example. At the time of investigation, the Spanish DCDE
521 did not have a specific person responsible for providing DC support. As a result of the case study,
522 however, the private sports club realized that the responsibility to coordinate and integrate sport and
523 studies should be clearer and employed two people for the task. This in itself bears witness to a
524 proactive approach to strengthening the environment.

525 **Discussion**

526 The present paper makes contributions to the current DC research on three levels: (1)
527 theoretically by expanding on an ecological approach by demonstrating applicability of the DCDE
528 and DC-ESF working models in different sociocultural contexts, (2) empirically by identifying
529 essential features of European DCDEs, and (3) methodologically by showcasing the approach of

530 multiple cases conducted in parallel by cultural insiders (i.e., national research groups) with
531 following cross-case analysis conducted by the multicultural group of researchers.

532 **The HEA Framework and Dual Career**

533 The present paper shifts the attention from the individual student-athletes and their significant
534 others (e.g., Brown et al., 2015; Wylleman, 2019) to the whole environment in which student-
535 athletes are embedded. DC research has vigorously demonstrated that DC pathways contain several
536 transitions with different demands and barriers, for which the athletes need specific resources and
537 coping strategies (Stambulova & Wylleman, 2019). Previous research has also shown that student-
538 athletes' motivation, identity, and health are related to DC, and that a DC is a protective factor
539 against mental ill-health and identity foreclosure at the time of retirement from the athletic career
540 (e.g., Stambulova & Wylleman, 2019; Stambulova et al., 2020). This research has been used
541 successfully to design career assistance programs to organize DC support services (Torregrossa et
542 al., 2020).

543 Using the HEA as a framework, the ECO-DC project also expands the HEA. Where
544 previously, the HEA has mainly been used to study talent development environments, ECO-DC
545 uses HEA to investigate a new type of environment, the DCDE. We looked at micro- and macro-
546 structures, sport, study, and private domains, and how different parts of a DCDE collaborate to
547 facilitate the development of student-athletes. First, a pioneer study of a DCDE within HEA
548 (Henriksen et al., 2020) provided a holistic description of a specific case. This current paper
549 presents a cross-case analysis using the HEA as a lens to study the environments. To facilitate these
550 studies, we developed contextualized versions of the original HEA models (DCDE and DC-ESF
551 working models) designed specifically for DCDEs. As such we follow a current trend towards
552 contextualized career research (Stambulova et al., 2020). The working models (Henriksen et al.,

553 2020) guided the data collection in several different European contexts and were helpful in
554 presenting the cases in a similar manner, thus preparing the grounds for the cross-case analysis.

555 **European DCDE Essential Features**

556 Investigating DCDEs across Europe allowed us to identify essential features of DCDEs. Ten
557 features were divided under two overarching themes. Holistic structure refers to the roles and
558 functions of the different components and relationships within the environment at both micro and
559 macro levels and across the different domains, and thus relates to the descriptive DCDE working
560 model. Shared DC philosophy refers to the daily DC processes and the underpinning values and
561 ideas, and thus relates to the explanatory DC-ESF working model.

562 The list of ten essential features (see Table 2) enables us to provide the following summary
563 portrait of successful European DCDE as reflected in the student-athletes' athletic and academic
564 achievements, wellbeing, and satisfaction. The student-athletes are sufficiently supported by a
565 designated DC support team or person. This team or person facilitates coordination and
566 communication between key stakeholders at micro and macro levels across several life domains.
567 These integrated efforts across the whole environment provide concordance and synergy in the
568 student-athletes' daily life. There is a clear understanding of DC issues and support from teachers,
569 coaches, families and peers. Student-athletes communicate and interact with mentors and role
570 models in their daily life and have good access to expert support. The daily routines in the DCDE
571 are designed in accordance with a set of shared key values and ideas. First, student-athletes are
572 considered whole persons. Second, student-athletes are gradually empowered to take charge of their
573 DCs. Third, flexible solutions are provided to help student-athletes shifting focus and balancing
574 resources towards studies, sport and private life. Fourth, caring for DC athletes' mental health and
575 wellbeing should be important for everyone, but the primary responsibility lies with a few

576 designated people. Finally, an open and proactive approach of the DC support providers helps to
577 develop and optimize the whole DCDE.

578 Features already found to be important in several DC studies conducted in the European
579 context included academic flexibility and role models. Previous research support that DC athletes
580 require individualized solutions including sport and/or academic flexibility (Brown et al., 2015;
581 Fuchs et al., 2016; Pink et al., 2018). Large workloads, set schedules, mandatory class attendance
582 and a reluctance to allow for any alternative focus are all referenced as major DC barriers (López de
583 Subijana et al., 2015). Further, the presence of tutors, mentors or role models offer DC athletes
584 valuable resources for multifaceted identity development (Ronkainen et al., 2019) and observational
585 learning (Gledhill & Harwood, 2015; Pink et al., 2018). While previous research considered various
586 single aspects of student-athletes' environment, this study provides a coherent account of DCDEs as
587 wholes. Not all environments in this study were characterized by all features, and therefore the
588 above portrait should be seen as an ideal type. All DCDEs faced challenges. Nonetheless, the list of
589 features can inform the development of tools and strategies to support further investigation and
590 optimization of DCDEs.

591 **DCDEs in a Larger Context**

592 The DCDEs were in different countries (i.e. in different sociocultural contexts) with different
593 national policy systems (Aquilina & Henry, 2010) and varied according to the number of student-
594 athletes and sports they supported. Previous work has identified different national approaches taken
595 to support DCs (Aquilina & Henry, 2010; Kuettel et al., 2018). Some countries have a state-centric
596 regulation, others do not have formal structures for DCs at all, and not every country has a national
597 policy for DC support. For example, the Slovenian sport friendly school was situated in a policy
598 system with a lack of national regulations. The DCDE compensated this by providing flexible
599 solutions for student-athletes in their daily lives. Thus, the DCDEs function as a bridge between the

600 national policy level and the student-athletes daily lives in their micro contexts. All DCDEs were
601 unique and had developed their own ways of supporting student-athletes. Still, the environments in
602 many ways employed the same principles in their work. These principles were, however, not
603 implemented in the same way across the European DCDEs. Therefore, the uniqueness of each
604 environment reflects that DCDEs are always contextually contained within socially and culturally
605 available resources (Ryba, Stambulova, Si, & Schinke, 2013).

606 Previous research on successful talent development environments (Henriksen, 2010;
607 Henriksen & Stambulova, 2017) provided inspiration to the current study in the form of an overall
608 focus on the environment, a case study methodological approach, specific working models and
609 definitions, and finally through a list of shared features (e.g., proximal role models; training that
610 allows for diversification). The essential features of DCDEs partly overlap with the shared features
611 of successful talent development environments, which is not surprising. Indeed, the athletes in most
612 of the investigated talent development environments were also students, and all the case studies
613 highlighted coordination between sport and school as a key to success (Henriksen et al., 2010a;
614 2010b; 2011). But these case studies did not investigate the environments *as DCDEs* and did not
615 consider the school context in the same detail as the sport context. More specifically, the features
616 related to the holistic structure of the DCDE (i.e., role models, integrated efforts and support of
617 sporting goals by the wider environment) were essential in both the talent development and DC
618 contexts. A unique feature of the successful DCDEs was the dedicated DC support team that
619 managed the holistic structure of the DCDE (see also Henriksen et al., 2020; Linnér et al., 2019).
620 The coherence and coordinated communication across domains were needed at the organizational
621 level to avoid unnecessary contradicting pulls in the daily life of the student-athletes.

622 The shared DC philosophy was an essential overarching feature of DCDEs, whereas
623 successful talent development environments were characterized by a coherent organizational culture

624 (e.g., Henriksen et al., 2011). DCDEs cannot have strong coherent organizational cultures, simply
625 because they are composite environments. They consist of several organizations that collaborate
626 (e.g., school and club), each of which has an organizational culture. The organizational culture is a
627 set of shared assumptions (i.e. beliefs and values) specific to a particular group of people who
628 interact regularly (Schein, 2010). Thus, this concept is relevant inside a club or a team, but not in a
629 composite environment. Organizational culture might provide stability and clarity and safeguards
630 against uncertainty and confusion (Pink et al., 2015). We argue that in composite environments, the
631 shared DC philosophy serves the same function for athletes, coaches, managers, and teachers.
632 Additionally, we consider coaches (see also Linnér et al., 2020), teachers and DC support providers
633 (Defruyt et al., 2019) as the key social agents who are in a position to take responsibility for
634 developing, furthering, and upholding such a shared philosophy. We believe that a degree of
635 coherence between the culture of an organization (i.e. elite sports school or private club) and the
636 shared philosophy of a DCDE is required for the whole environment to work.

637 **Practical Implications**

638 The empowerment approach found in the present study helps student-athletes build personal
639 resources to manage challenges and barriers. Autonomy supportive environments (Knight et al.,
640 2018; Stambulova et al., 2015) with flexibility in both sport and educational domains teach student-
641 athletes to be proactive and ask for help (i.e. facilitate adjustment/coping). The list of ten essential
642 features can be a provisional practical guideline for DC practitioners (e.g., DC support providers,
643 sport psychology consultants, coaches) to optimize DCDEs. We suggest that conversations around
644 the essential features of DCDEs can help support providers and managers develop awareness and a
645 clearer understanding of their role, relationships, and effectiveness. The list of ten essential features
646 can be useful for evaluation and optimization of existing DCDEs and provide insights for
647 stakeholders working on development of new DCDEs. Taking into account the differences between

648 DC systems in different European countries, a valuable next step is to design context-sensitive
649 interventions to optimize DCDEs (e.g., workshops) with inspiration from the content of Table 2.
650 Further, ecological approaches previously used to develop the organizational identity of a talent
651 development environment (Storm, 2020) and to create a high-performance culture in a national
652 team (Henriksen, 2015) might inspire practitioners within the DC context. The DCDE is a potential
653 resource for the individual athlete, but how the individual DC athlete utilizes the benefits of the
654 DCDE might not be similar for all individuals. Therefore we posit that future research could benefit
655 from investigating how environments are experienced and utilized differently by individuals.

656 **Methodological Reflections**

657 The development of the list of essential features of DCDEs was a collaborative and reflexive
658 task and included lengthy discussions among researchers and DC support providers representing
659 seven countries and cases. The project research group possessed extensive experience and
660 knowledge in the area of ecological perspectives, DC research, and DC support. The aim of
661 reaching consensus in the project research group was fulfilled. Therefore, the cross-case analysis
662 lends itself well to the naturalistic and analytical generalization (Smith, 2017), in the sense that we
663 believe the list of features will resonate with DC support providers from across Europe and provide
664 them with ideas to improve their practices. Additionally, the study provides the basis for the
665 development of a monitoring tool to support a quantified evaluation of specific DCDE.

666 Unlike previous cross-case analyses within the field of talent development, in which the same
667 researcher investigated all cases (e.g., Henriksen, 2010; Kuettel et al., 2018), no one person from
668 the project research group has firsthand experience from all seven environments. The cases were in
669 seven different countries and demanded language skills and cultural competence. We, therefore,
670 relied on people thoroughly researching each national DCDE. A thorough process of getting
671 familiar with all cases included reading reports and watching presentation videos from each national

672 research group to get immersed with data. This was followed by a two-day meeting with several
673 rounds of focus group discussions that challenged the results from both research and applied
674 perspectives. The nature of the project also brought with it some ethical issues. In the focus group
675 discussions, we had to accept the dual role as both participants (when representing, elaborating and
676 discussing the cases) and researchers (when integrating and summarizing data across cases; Probst,
677 2016). The shifts in role required awareness and involved movement between different levels of
678 reflection. We aimed for reflexivity and transparency by talking openly about it and by clearly
679 agreeing when we moved between the levels. We consider this approach successful and a format
680 that can be replicated in other cross-national studies that aim to balance contextual sensitivity with a
681 common message.

682 In the project research group all had their idiosyncratic approaches and backgrounds, and we
683 used our different positions to challenge each other's blind spots. Despite the (member) diversity in
684 terms of gender, nationality, and researcher/practitioner experiences, the project research group
685 reached consensus on the ten essential features of European DCDEs based on analysis of diverse
686 cases. We consider the list of the DCDE essential features (Table 2) to be provisional and open. The
687 DCDEs included in this study represent a variety of cases (i.e. countries, types of DCDEs, age
688 groups, and sports). It would be interesting to explore a case sample of similar types of
689 environments to provide a more context-sensitive list of essential features of DCDEs for example,
690 particular types of sport, types of DCDEs (Morris et al., 2020), or across different national support
691 systems (Aquilina & Henry, 2010). Important nuances related to specific contextual factors need to
692 be considered in more detail. Therefore, we invite fellow researchers to elaborate, clarify, and
693 challenge the list in future research.

694

Conclusion

695 DCDEs support student-athletes in combining sport and school. Such environments vary in
696 terms of their type, sports context, national culture, target groups, and degree of effectiveness. In
697 the current study, national research groups investigated seven DCDEs across Europe. A large and
698 diverse project research group of both researchers and practitioners, with extensive knowledge and
699 experience in DC research and support, shared and discussed the seven cases in focus groups to find
700 consensus on essential success features of European DCDEs. We identified ten essential features of
701 European DCDEs that contributed to the success of the environments. Two overarching features
702 were a holistic structure and a shared DC philosophy. The HEA supports holistic and ecological
703 exploration of athletes' DCDEs, and we encourage practitioners to evaluate and optimize their
704 environments based upon the current findings. Appropriately contextualized, the ten features can
705 serve as an inspiration for evaluating and optimizing. Case studies are time consuming and, from a
706 practical perspective, rarely possible for DC support providers to conduct as part of their daily
707 workload. The development of a monitoring tool based on the essential features, therefore, might be
708 an important next step.

709 **Author note**

710 ¹The project research group includes those who took part in the focus group discussions in this
711 study (the authors plus names removed for the purpose of blind review). The findings presented in
712 Table 2 constitute an intellectual output of the work in this group. The national research groups
713 provided empirical data for this study. The ECO-DC consortium includes all people involved in the
714 Erasmus+ Sport project entitled “Ecology of Dual Career - Exploring Dual Career Development
715 Environments across Europe” (ECO-DC).

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718

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Table 1*Overview of European Cases and Data Collection*

	Belgium	Denmark	Finland	UK	Slovenia	Spain	Sweden
Type of DCDE	Elite sport school	Sport friendly University	Elite sport school	Sport friendly University	Sport friendly school	Private club	Combined DC system
DCDE effectiveness	International sporting success; student-athletes continue DC in higher education; low drop-out.	International sporting success; competent and satisfied students; low drop-out.	International junior and senior sporting success; no drop-out; high graduation rates.	Long term success as athletes, in their careers and as members of the community.	Long term vocational success; high graduation rates; academic success.	Athletic (results) and academic (grades) achievements.	Athletic and academic achievements Low drop-out rate.
Sports	Gymnastics	Multiple	Winter sports	Multiple	Swimming	Multiple	Athletics
Age group	12-18	19+	16-20	19+	16-18	10-18	19+
DC support	Organisational set-up	Three DC support providers	No DC support team or system	Three DC support providers	Two part-time employees	School's sport coordinator	Four DC support providers
Data Collection of the Case Studies							
Interviews	Athletes (5) Coaches (3) Support staff from sport federation (2), Flemish sport adm. (2), boarding school (3) and elite sport school (5) Parents (2) Health team (2)	Athletes (2) Coaches (2) DC support (2) Vice-counsellor Teacher	Athletes (6) Coaches (2) Teachers (3) Student counsellor Mental coach Dormitory attendant Principal Head of the sports academy	Athletes (2) DC support (5)	Athlete Coach DC support (2)	Athletes (5) Retired athlete Management (3) Sport and clinical psychologist Focus group interview (manager, teacher, coach)	Coaches (2) DC-support (4) Vice-counsellor Focus group interviews (4 DC-athletes and 4 coaches)
Observations	30 hours	50 hours	144 hours	75 hours	30 hours	90 hours	85 hours
Documents	Web page Policy documents	Web page Social media	Social media Web page Surveys Work sheets Banners Policy documents	Web page	Web page Policy documents Social media Athlete's diaries	Web page Official documents	Web page
Case-data	Each country provided a DCDE empirical model, a DC-ESF empirical model, a case description (5000 words), and a deductive case analysis using Table 2 as a lens.						

Table 2*Ten Essential Features of European Dual Career Development Environments*

Holistic Structure		
	Descriptors	Opposite Poles
Dedicated DC support team	Designated team (or person) responsible for coordinating sport and study domains. One central entry point. Helping student-athletes manage their DC is everybody's business (e.g., coaches, teachers), but the responsibility to coordinate lies with the support team.	Multiple contact points leave DC athletes uncertain about who to approach for assistance with DC issues. DC athletes are sent to multiple people in the system and feel no one has overall responsibility.
Integrated efforts	Coordination and communication across the sport, study and private domains. Coaches, teachers, family, DC support providers etc. have on-going communication. Micro and macro levels are linked through networks. Student-athletes experience concordance in daily life.	Lack of communication. Conflicting interests. DC athletes experience contradicting priorities in daily life - for example, when coaches advise athletes to primarily focus on their sport and teachers on their studies.
Understanding and support from the environment	Opportunities for DC athletes to focus on the sport and study at different times. Family, coaches, teachers, peers and others understand, acknowledge, and support the athletes' dedication to combining sport and study.	Lack of understanding of the demands involved in pursuing a dual career. Academic staff considers sport as a barrier to education. Sport staff and teammates consider studies as a barrier to sport performance.
Role models and mentorship	The presence of persons who DC athletes can be guided by in the form of direct mentorship or observational learning. Opportunities to learn from other DC athletes. Inspirational narratives from other DC athletes.	Impermeable boundaries between DC athletes across sports or across levels of sport or education. Athletes regard other athletes as rivals and are unwilling to share. Successful DC stories are not told for inspiration.
Access to expert support	Access to experts and services, such as nutrition, physiotherapy, sport psychology, and medical services (through the sport or study domain). DC support team knows how to help the DC athletes get access when needed.	No access to experts. DC athletes who need expert support do not know how to get this help.
Shared Dual Career Philosophy		
A whole person approach	Acknowledgement that all domains influence DC athletes' lives. Developing the athletes holistically. People from one domain take an interest in the athletes' experiences, challenges, and learning in the other domains.	People in the sport domain see the athletes as athletes, and people in the study domain see students as students.
An empowerment approach	Opportunities for DC athletes to develop competencies and resources to manage their own dual career and become autonomous. Increasing empowerment of the athletes.	Focus only on sport and study specific skills and not on DC competencies. Excessive control. No active involvement of DC athletes in key decisions regarding their own DCs.
Flexible DC solutions	Recognition that DC athletes require individualized solutions, including sport and / or academic flexibility. Education based DCDEs allow for extra focus on sport when needed. Sport based DCDEs allow for extra focus on education when needed.	Dual career initiatives and services are fixed. Support services are not appropriately contextualized to the different sport and to the needs of individual athletes. Academic and sport staff compete for the limited time DC athletes have.
Care of DC athlete's mental health and wellbeing	Dual careers are managed in a socially responsible manner. Recognition of responsibility for athlete wellbeing. Ethical conduct guidelines and support systems (e.g., referral systems) are embedded in policies.	No recognition of responsibility for athletes' mental health. Gladiator philosophy that sport is hard, and athletes should toughen up. Staff colludes when they learn of inappropriate practices. No policies in place.
An open and proactive approach to the development of the environment	Dual career support providers engage in on-going development of their environment and their own competencies through e.g., further education, reading scientific literature, on-going evaluation of services, visits to other DCDEs, and involvement in research projects.	Lack of time for on-going professional development and evaluation. There may be knowledge sharing within the team but no expansion of horizons. Seeing other DCDEs as rivals.

Table 3

Characteristics of the Environments under Study: The Holistic Structure

Journal Pre-proof

	The holistic structure of European DCDEs						
	Belgium	Denmark	Finland	UK	Slovenia	Spain	Sweden
Dedicated DC support team	Representatives from the elite sport school, sports federation and boarding school constitute the dedicated DC support team.	An open and accessible team of three university people with specified roles and responsibilities is the point of entry.	No specific DC support team. Two student counsellors provide support in course related matters at school.	A well-coordinated DC support team with specified roles communicates with sport and academic stakeholders.	A DC support team situated in the school system provides DC support mainly for the educational aspirations.	No specific DC support team, but coaches, sport psychologists, teachers, the school's sports coordinator provide support.	A coordinated team of DC support providers and coaches had clear roles, and coaches were often first point of entry.
Integration of efforts across the whole environment	The structure is the key connector between the three domains, and student-athletes use sport and school friends for emotional support.	A relationship between the student athletes and DC team connected sport and study, and micro- and macro systems were integrated.	Poor communication between school and sport, coaches and family were a barrier. The Olympic Committee provided support for coach and DC education.	On-going and largely informal and 'person-dependant' communication between DC team, sport and study ensured coherent support.	A club and school that work as separate organisations with little or no integrated efforts was considered a barrier.	Families provide practical support, and the school domain adapted to the sport domain to compensate for a lack of integration and coordination.	The DC support team integrated efforts of sport and study staff. At the macro-level, university, local authorities, and regional and local sports collaborated
A clear understanding of DC issues and support from across the environment	Shared understanding of the mission to develop gymnasts with focus on graduation and wellbeing. Strong family support.	Coaches were supportive and allowed flexibility. Study peers provided practical and emotional support. The whole system acknowledged the importance of DC.	Academic staff considers prioritising sport as a barrier to education. Coaches support professionalisation of athletic career.	Promoted by the DC support team, the importance of DC is mostly supported. Some stakeholders did not see a reason to accommodate DC athletes.	A lack of shared understanding and a main focus on education were compensated for by coaches being flexible, and by sport peers being supportive.	Coaches' being insensitive to the athletes' academic commitments were in contrast to parents' emphasis on education.	A shared understanding of athletes' needs and challenges was visible in how coaches and teachers acknowledged DC dedication, and in peer support.
Role models and mentorship	No formal structures, but pedagogues were mentors and supported a balanced life.	Experienced DC athletes were role models in a virtual community based on stories.	Olympic athletes are present, but their potential role as mentors is not fully utilized.	Mentorships include a buddy system, a tight-knit community, and active alumni.	No formalized mentorships, but peer student-athletes were helpful informal mentors.	Successful student-athletes were acknowledged, and coaches were role models.	Informal mentorship between student-athletes at the training centre.
Access to expert support	Multidisciplinary meetings to follow up on injuries and training schedules, and daily access to physiotherapists.	The DC support team referred athletes to clubs, federations, and Team Denmark for expert support.	Access to some experts within the support system in the environment is based on athlete status.	Lifestyle, sport science, sport psychology and physiotherapy services are inside the DCDE.	The school provides support related to education, and the clubs provide physiotherapy and sport psychology.	Clubs provide sport psychology, medical services, and physiotherapy, and school offers clinical psychology.	A performance team organized by the DCDE provided sport psychology, medicine, nutrition and physiotherapy.

Table 4

Characteristics of the Environments under Study: Shared DC Philosophy

Journal Pre-proof

	Belgium	Denmark	Finland	UK	Slovenia	Spain	Sweden
A whole person approach	All stakeholders took an interest in the other domains, and the boarding school was a main driver of the whole person approach.	A clear aim was to teach the athletes to prioritize and plan, and to help them develop social skills.	Student-athletes were mainly seen as athletes, and time spent on studies was seen as a barrier for sport development.	DC support team took an interest in all domains, and aimed to develop competences for long-term success in sport and job.	Student-athletes were seen as more than students and athletes, but there was a lack of support for this challenge.	The sports domain stimulated multiple roles (friend, student, partner) but a lack of communication was challenging.	Student-athletes seen as whole persons with individual needs and interests and learned to switch between domains.
An empowerment approach	Promotes the development of competencies such as autonomy, self-discipline, planning, and resilience.	A shift from proactive to reactive support stimulated growth in autonomy.	Direct instructions from coaches were a barrier to empowerment.	Student-athletes were encouraged to take their own path in both sport and vocational careers.	Student-athletes were co-creators of a good environment and expected to act as grown-ups.	Athletes learnt time-management and emotion- regulation skills.	Support was provided in ways that empowered athletes to be in command of their own development.
Flexible DC solutions	Modular study systems, online courses, teachers tutoring during lunch breaks, and coaches shortening practice sessions in exam-periods.	Flexible solutions were formalized through an individual study plan, that could be changed along the way.	Student-athletes' curriculum differed from that of regular students, and there was possibility for night school and for prolonging the education.	An aim to provide individual solutions was visible when services and support were adapted to the athletes' needs.	Student-athletes were allowed to spend PE classes in the club, and the school offered additional teaching.	Flexibility was mainly seen from the study domain, where teachers supported athletes with planning exams and homework.	Athletes received help to move exams, take exams elsewhere, or reduce study pace. Training facilities were accessible 8-10 hours per day.
Care of DC athlete's mental health and wellbeing	Some athletes struggled with homesickness, but everyone had easy access to sport psychology support and pedagogues.	A well-balanced DC and free access to health care was seen as protective factors. Socially responsible sport was obliged by law.	Lack of specific mental health care was compensated through free access to national health care and life-skills classes.	The lifestyle and sport psychology practitioners managed mental health and well-being issues.	The pedagogical coordinator was a psychologist and provided mental health literacy. Clinical issues were referred.	A clinical and a sport psychologist were responsible for athletes' mental health.	The DCDE mission was healthy performance in the long run, which stimulated to help athletes achieve balance.
An open and proactive approach to the development of the environment.	Improvement through on-going evaluation of services and taking part in research.	Development through inspiration visits, sharing perspectives, on-going evaluation and taking part in research.	Satisfaction questionnaires and coaches engaging with sport science research. Teachers lack development opportunities.	Openness to feedback, formal evaluation at the end of each academic year, and engagement sport science research.	No time spend on developing the environment.	No resources spend on develop the environment, but the present project stimulated a new focus and additional resources.	Dialogue about improvement stimulated engagement in national networks and visits from other DCDEs.

Highlights

- Seven European dual career environments (DCDEs) employed similar principles in their work.
- Holistic structure and shared dual career philosophy were essential features of the DCDEs.
- DCDEs recognized their responsibility for student-athlete wellbeing.
- Focus group discussions facilitated a context sensitive international cross case analysis.
- Ten success features can serve as an inspiration for evaluating and optimizing environments.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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